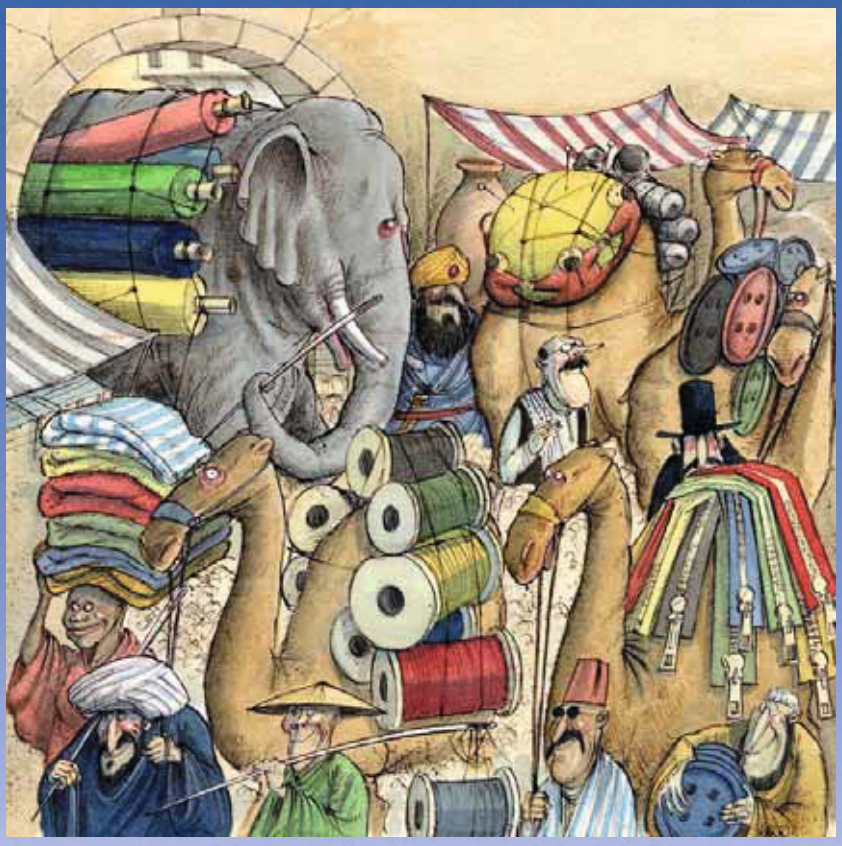
International Trade Centre
UNCTAD/WTO

BERNBAUM'S HANDBOOK

Source-it

Global material sourcing for the clothing industry



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Geneva 2005

ABSTRACT FOR TRADE INFORMATION SERVICES

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INTERNATIONAL TRADE CENTRE UNCTAD/WTO
Source-it – Global material sourcing for the clothing industry
Geneva: ITC, 2005. xvi, 201 p.

Guide dealing with dynamics of the global textiles and clothing supply chain, and why and how garment manufacturers need to develop alternative sourcing and supply management approaches – reviews historical background; discusses Chinese advantage in the international garment industry; explains different stages involved in material sourcing process; deals with fabric and trim sourcing; discusses politics of trade; includes case studies; appendices cover preferential access to the EU, summary of United States rules of origin, measures and conversions, and shipping terms/Incoterms; also includes glossary of related terms.

Descriptors: **Clothing, Textiles, Textile fabrics, Supply chain, Supply management, Value chain, Agreement on Textiles and Clothing**

English, French, Spanish (separate editions)

ITC, Palais des Nations, 1211 Geneva 10, Switzerland

ITC/P187.E/PMD/MDS/05-III

ISBN 92-9137-299-4
United Nations Sales No. E.05.III.T.3

Foreword

The textile and clothing (T&C) sector faces tremendous future challenges as the legal framework that has governed imports from developing countries for the past four decades prepares for monumental change. In the past, developing countries were limited in their export efforts by quantitative restrictions determined by stringent bilaterally negotiated quotas stipulated in binding agreements. From 2005 onwards, imports from World Trade Organization (WTO) member countries will no longer be restricted by quotas. Quantitative limits on T&C exports from developing countries will be abolished and trade will be governed by General Agreement on Tariffs and Trade (GATT)/WTO rules. Although tariffs will still be in place, the liberalization of the T&C sector by means of quota abolition is a decisive step towards free trade. But just what does the liberalization of the T&C sector mean to the market and its players?

Because of phasing out of the quota system, existing trade patterns are already changing. T&C players need to anticipate market changes and prepare their businesses accordingly, developing medium- and long-term strategies that take account of a new legal environment and changing business realities. Countries, industries and companies that neglect the post-2005 legal framework changes will be at a serious disadvantage. All the more so as retailers and buyers in the EU and the United States of America are already preparing to exploit the opportunities which the post-2005 system will offer.

After quota phase-out, buyer requirements will increase, forcing developing country garment manufacturers to take over new functions in the value chain, including sourcing and supply management. This is a difficult task for many garment-exporting developing countries as most lack vertically integrated industry and consequently operate under cut-make-trim (CMT) terms. Manufacturers in most developing countries still depend on imported yarn, fabric, trims and other inputs in order to produce export-oriented apparel. For example, in Bangladesh around 70% of the FOB value of a woven shirt is made up of imported inputs.

Currently the retailers of finished products or their agents source these inputs on behalf of their developing country garment manufacturers. In the future, however, these operations will increasingly be passed on from the retailer or their agents to the factories which will be expected to offer full package services. Alarmingly, because of the quota system and all its implications, most developing country apparel manufacturers are sorely lacking in the necessary business relations, skills or knowledge that effective management of the supply side of the production process will require.

The objective of this ITC book is to assist garment manufacturers in developing countries and transitional economies as they begin to develop their supply management operations and full package services. It is a key resource outlining the skills and knowledge which will be necessary for those wishing to perform independent sourcing and supply operations.

In many cases, however, the book alone will not be sufficient. ITC will therefore conduct training seminars on this subject in developing countries, targeting decision-makers from the business sector, apparel and textile associations, as well as financial and related industry institutions. Topics to be addressed will include the dynamics of the global T&C supply chain, and why and how garment manufacturers need to develop alternative sourcing and supply management approaches. In addition, basic training for future supply managers, merchandisers and garment sourcing training personnel can also be provided if requested.

Because of regional trading schemes and corresponding rules of origin requirements, regional sourcing is expected to increase in importance in the coming years. To further support regional sourcing and overcome the current absence of a competitive supplier base, a database on regional textile, trims and related industry suppliers in South Asia and ASEAN countries has been developed and will be available on the ITC T&C website.

Overall, it appears likely that the anticipated changes in the T&C sector will result in greater risks and challenges rather than opportunities, particularly for smaller exporters in least developed countries (LDCs) and smaller vulnerable economies. Comprehensive preparation is a must to manage these risks, and concrete action must be taken to secure existing or penetrate additional markets.

How developing country manufacturers can prepare for the post-2005 scenario is addressed by ITC's trade-related technical assistance approach for the clothing sector. Clothing manufacturing small and medium-sized enterprises (SMEs) are faced with six major trade-related needs:

- Lack of a clear sector strategy to confront future challenges;
- Insufficient understanding about competitors;
- Absence of fabric and trim sourcing skills to become 'full package' suppliers;
- Insufficient understanding of changing world markets;
- Insufficient understanding of the importance of e-commerce and how to respond to new 'e' requirements of buyers;
- Lack of product and market development skills and approaches, particularly in penetration of fast-growing southern hemisphere markets.

ITC offers technical assistance solutions using a wide range of tools and services to help build the capacity of T&C related trade support institutions (TSIs) and to assist clothing manufacturing SMEs to benefit from growing international markets. ITC's response to the above mentioned six major challenges is as follows:

Sector strategy development (The Shape). ITC guides concerned ministries and clothing sector associations in creating a comprehensive approach towards establishing a national clothing strategy via a 10-step structured thinking process known as 'The Shape'. T&C stakeholders who follow the steps will be able to assess and diagnose their industry's value chain, define problem-solving actions, and exploit export and sourcing opportunities. A two-workshop process conducted under ITC supervision also assists in strategy implementation.

Understanding own and competitors' performances (The FiT). ITC helps enterprises to benchmark themselves against major competitors, using a software-based benchmarking tool called 'The FiT'. SMEs receive clear performance ratings in key competitiveness areas, indicating strong areas to exploit and weak areas to improve. ITC trains T&C associations in using the tool and maintains a global benchmarking database.

Developing fabric sourcing skills to become 'full package' suppliers. This book and accompanying training material will assist developing country clothing manufacturers to develop their sourcing skills both theoretically and in practical training workshops. ITC's regional fabric and trims sourcing database is available on request. Moreover, ITC organizes regular sourcing missions to identify new suppliers of fabrics and accessories.

Understanding changing markets and satisfying customer demand. ITC's website provides business information, data analysis and answers to most of the uncertainties faced by those in the T&C sector. ITC workshops held in developing countries will assist T&C stakeholders to understand future competitiveness requirements and how to confront them successfully. Finally, ITC develops and implements tailor-made projects addressing specific needs with regard to customer demands relating to product and market development, including design.

Applying e-applications in the T&C sector. ITC has published a business guide on business e-applications used in the T&C sector, providing an overview of technology developments and 'e' requirements imposed by Western buyers. The findings can be disseminated during workshops. In addition, advice and training on how to adapt to these new requirements and the development of tailor-made solutions can be provided.

Implementing tailor-made market penetration approaches in line with buyer requirements. ITC helps countries to develop tailor-made projects to improve sector competitiveness. This includes any or all of the above-mentioned items as well as other product and market development activities. As future growing markets are found in other developing countries, South-South trade development becomes increasingly important for the T&C sector.

More information can be found on the ITC T&C website at *www.intracen.org/textilesandclothing.*

Preface

Have you ever noticed how people outside our industry appear to be fascinated by the subject of garments and their manufacture? I am not speaking of fashion design here. I am speaking of the far more esoteric topics of garment sourcing, product development and product cost. Since the Middle Ages, when knights in armour went broke paying for their wives' wimples, people have pondered over these weighty questions. At a cocktail party, no one ever buttonholes a tyre manufacturer to discuss the intricacies of tread design. But let it be discovered that you are a garment sourcing specialist, and you immediately become the center of attention.

We, the so-called specialists, think we have all the answers – big time. In the early days – for maybe the first 20 years – we revel at being the center of attention, patiently explaining why it is reasonable that a pair of trousers consisting of 1.4 yards of denim fabric and less than 25 minutes of labour should cost $180 at Saks Fifth Avenue, or why it takes 24 weeks to produce and ship that pair of trousers. As the conversation proceeds, you see how the expressions on the faces of your audience – the uninitiated, the 'ungarmentoed' – change from anticipation, to bemusement, and finally to comprehension. You can almost see the light go on. 'I finally understand,' the look says.

It takes about 20 years to understand just what 'I finally understand' means. It is neither an epiphany nor a revelation. Your audience, every single person, has reached the same conclusion and it runs something like this: 'This person is crazy. The entire garment industry is made up entirely of crazy people. I have been spending my hard-earned money – $180 – on a pair of trousers which at the factory costs about $7 and this lunatic is assuring me that the process by which garments are made is logical, reasonable, and efficient. When I leave this party, I will go directly to 49th Street and burn down Saks Fifth Avenue.'

I can see the headlines now: 'Angry rioters burn down Saks Fifth Avenue. Firemen contribute firewood.' Okay, this is exaggeration, but less than you might think. The truth is, our entire industry suffers from the delusion that we know what we're doing. Occasionally we meet someone from the real world who tells us the truth.

And so it was when in June 2004 I was contacted by the International Trade Centre (ITC). This was the moment six months before the fateful 1 January 2005 quota phase-out date when garment industry professionals were firmly divided into two groups – those living in la-la land believing that there was no problem and those living in hell believing there was no solution. And yet here were these ungarmentoed outsiders from ITC who all by themselves had reached a series of sane, sensible and ultimately correct conclusions:

- The quota phase-out will bring the greatest buyers' market in the history of the garment industry;
- Customers, finding themselves in a position to demand anything they want from their factory suppliers, will ask for greater service;
- The service most in demand will be material (fabric and trims) sourcing;
- ITC should develop a course in material sourcing for factory owners and managers, particularly the small and medium-sized factories located in developing countries.

The result of our meeting and subsequent collaboration has been this book on material sourcing. As with my other writings, you, the reader, will find its content short on theory and long on practice. Hopefully, you will benefit from our approach.

David Birnbaum
25 December 2004
Pian dei Guillari

Acknowledgements

This book was written by David Birnbaum. The views expressed in this book are those of the author and not necessarily those of ITC.

Chapter 8, Textile testing, was written in its entirety by Louann Spirito, Director of Textile Laboratory and Technical Support, SGS.

EU-related content found in chapter 15, The politics of trade, and the appendix on preferential access to EU was written or contributed by Emma Ormond, International Trade Consultant, PricewaterhouseCoopers, London.

The appendix related to United States Rules of Origin was contributed by Frank Kelly, Head of International Relations, Liz Claiborne.

Josephine Bow edited the original text.

This book is a major output of the ITC project 'Sourcing and Supply Management for the Garment Industry'. The project was developed, implemented and coordinated by Matthias Knappe and Beate Leitgeb, including the publication of the book. Alison Southby edited the manuscript, and Isabel Droste was responsible for page layout and final copy-editing.

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Glossaries

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Note

Unless otherwise specified, all references to dollars ($) are to United States dollars.

The following abbreviations are used:

AATCC	American Association of Textile Chemists and Colorists
ACP	African, Caribbean and Pacific States
AGOA	African Growth and Opportunity Act
ASEAN	Association of South East Asian Nations
ASTM	American Society for Testing and Materials
ATPA	Andean Trade Preference Act
CAFTA	Caribbean Free Trade Agreement
CBERA	Caribbean Basin Economic Recovery Act
CBI	Caribbean Basin Initiative
CBP	Customs and Border Protection
CIF	Cost, insurance and freight
CMT	Cut-make-trim
CPSC	Consumer Product Safety Commission
DTM	Dyed-to-match
EU	European Union
FOB	Free on board
FTC	Federal Trade Commission
FVSM	Full Value Sourcing Model
GSP	Generalized System of Preferences
HTSUS	Harmonized Tariff Schedule of the United States
ISO	International Organization for Standardization
ITC	International Trade Centre UNCTAD/WTO
L/C	Letter of credit
LDCs	Least developed countries
LDP	Landed-duty-paid
MMF	Manmade fibre
MO	Manufacturing order
NAFTA	North American Free Trade Agreement
OCT	Overseas countries and territories
OTEXA	United States Government Office of Textiles and Apparel

OVF	Other vegetable fibre
SAARC	South Asian Agreement on Regional Cooperation
SGS	Sociéte générale de surveillance
SGSM	Standard Garment Sourcing Model
T&C	Textile and clothing
TPLs	Trade preference levels
VVC	Virtual Vertical Company
WTO	World Trade Organization

Chapter 1

The 15-year crisis

The suppliers

On 1 January 2005, garment export quotas worldwide were scheduled to be phased out, forever altering the international garment industry as we know it today. Government and garment industry leaders in developing countries everywhere realize the impending quota phase-out will disastrously affect not only their local industries but their overall economies as well.

Yet the current crisis faced by the garment exporting industries in developing countries long predates the 2005 quota phase-out. In fact, the entire quota system and phase-out issue are but secondary factors exacerbating a series of already existing problems. Some of these problems have been beyond the control of garment exporters in developing countries. Others were not.

To fully understand where the garment world stands today, it is necessary to look at the 15-year period leading up to 1 January 2005. From 1990 to 2002, worldwide garment exports roughly doubled from $108 billion to $201 billion. During that time, half of these exports were controlled by Greater China (China, Hong Kong and Macao) and the major garment exporters of the industrialized countries which included Taiwan Province (China) and the Republic of Korea.

Table 1 Total garment exports from China and developed countries, 1990, 1997 and 2002

	Exports ($ million)			World market share (%)		
	1990	**1997**	**2002**	**1990**	**1997**	**2002**
Greater China	26 186	56 715	65 293	24	31	33
Canada	328	1 015	1 988	0	1	1
EU External	11 338	14 956	15 719	10	8	8
Israel	482	600	549	0	0	0
Republic of Korea	7 879	4 192	4 306	7	2	2
Switzerland	686	715	763	1	0	0
Taiwan Province (China)	3 987	3 409	2 197	4	2	1
United States	2 565	8 672	7 012	2	5	3
Total	**53 451**	**90 274**	**97 826**	**49**	**50**	**49**

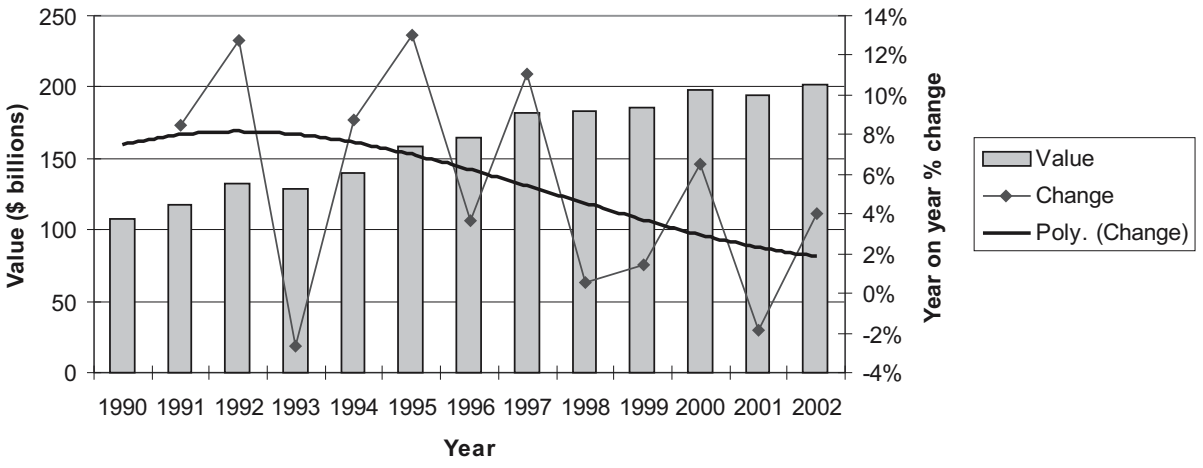
Source: WTO Annual Report 1996, vol. II, table IV.59; 2000, table IV.81; and 2003, table IV.70.

The rest of the world, including the group known collectively as the developing countries, was left to compete for the other half. As long as everything remained the same – the number of suppliers stayed unchanged and demand from industrialized countries for garment imports continued to grow rapidly – there was room for everybody. But everything did not remain the same. In fact, two largely unrecognized trends interacted to create the crisis we now face.

- The substantial annual increases in worldwide garment demand which had characterized the industry for decades finally began to moderate. Demand still increased, but at a far lower rate.

  As illustrated by the lines on the graph in figure 1, short-term fluctuations notwithstanding, garment import demand grew steadily up to 1997, at which point demand growth slowed considerably.

Figure 1 Global garment trade



Source: WTO Annual Reports.

Garment makers in the developing world could no longer rely on annual increases in exports because total demand was no longer increasing at the same rate. At the same time, heightened competition for slower growth demand was further intensified by growing numbers of export garment suppliers.

- New countries were entering the international garment market.

  In 1990 the market was divided three ways. As we have already seen, Greater China and the industrialized countries controlled half. The second group, known as the traditional garment exporting countries – mostly Asian developing countries plus Turkey – controlled 13%, leaving the rest of the developing world with 38%.

Table 2 Total garment exports from traditional garment exporting countries, 1990, 1997 and 2002

	Exports ($ million)			World market share (%)		
	1990	**1997**	**2002**	**1990**	**1997**	**2002**
India	2 530	4 343	5 483[a/]	2	2	3
Indonesia	1 646	2 904	4 531	2	2	2
Malaysia	1 315	2 337	1 963	1	1	1
Mauritius	619	892	949	1	0	0
Pakistan	1 014	1 810	2 228	1	1	1
Thailand	2 817	3 686	3 575	3	2	2
Tunisia	1 126	2 299	2 601	1	1	1
Turkey	3 331	6 697	6 661	3	4	3
Total	**14 398**	**24 968**	**27 992**	**13**	**14**	**14**

Source: WTO Annual Report 1996, col. II, table IV.59; 2000, table IV.81; and 2003, table IV.70.

a/ India data for 2001.

The garment industry world of 1990 was a very comfortable place. Everybody competed, but competition levels were acceptable and everybody had a place. The more competitive countries such as Greater China, the Republic of Korea and Taiwan Province (China) were restricted by quota which allowed the less competitive to co-exist. Each of the first two groups of traditional garment exporters managed to maintain its market share.

However, beginning in 1990, the world began to change and an entirely new generation of garment exporting countries entered the fray, disrupting the previously relatively stable world scenario. Many of these countries had been granted special preferences by industrialized garment importing countries, allowing them to rapidly increase exports. Bangladesh was given duty-free and quota-free access by the European Union and more recently by Canada. Morocco,[1] Poland and Romania also attained duty and quota-free access to the European Union. South Africa and Lesotho, together with most other sub-Saharan African countries, were granted duty and quota-free access to the United States of America under the African Growth and Opportunity Act (AGOA) in 2000. The Caribbean countries were granted limited duty and quota-free access to the United States under the Caribbean Basin Initiative (CBI)[2] way back in 1963, with more favourable clauses tacked on in 2003. Mexico as a member of the North American Free Trade Agreement (NAFTA) was granted duty and quota-free access to the United States in 1994.

Table 3 Total garment exports from new generation garment exporting countries, 1990, 1997 and 2002

Country	Exports ($ million)			World market share (%)		
	1990	1997	2002	1990	1997	2002
Bangladesh	585	1 357	4 131	1	1	2
Cambodia	0	0	1 477	0	0	1
Lesotho	25	86	393	0	0	0
Mexico	587	5 636	8 011	1	3	4
Morocco	722	724	2 342	1	0	1
Poland	365	2 223	1 915	0	1	1
Romania	429	1 752	2 780	0	1	1
Sri Lanka	638	1 474	2 441	1	1	1
South Africa	0	71	238	0	0	0
Viet Nam	0	26	2 375	0	0	1
CBI	1 942	7 584	9 471	2	4	5
Total	**3 351**	**13 324**	**23 727**	**5**	**11**	**18**

Source: WTO Annual Report 1996, vol. II, table IV.59; 2000, table IV.81; and 2003, table IV.70.

Many of the newcomers, such as Bangladesh, Cambodia, El Salvador, Honduras, Lesotho, Sri Lanka and Viet Nam, and rely on garments for over half of their total foreign exchange earnings. For these countries, garment manufacturing has been the locomotive of economic growth, providing jobs and industrial development, and they were little concerned over maintaining the previous status quo. The result, unsurprisingly, has been a dramatic and rapid increase in worldwide garment production capacity. These new players needed garment exports to develop their economies and were willing to do whatever

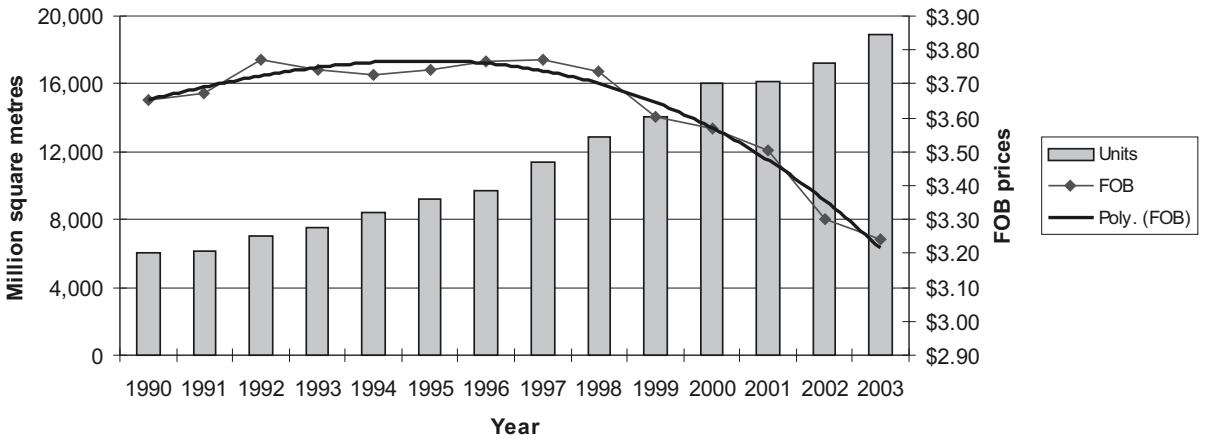
1 In March 2004, Morocco also negotiated duty-free access to the United States.
2 Caribbean access to the United States was enhanced by the recently negotiated CAFTA agreement.

was necessary to attract customers. For countries with little to offer besides cheap labour, that hunger has translated into reduced CMT (cut-make-trim) and FOB prices (prices for complete garments).

By 1997, the changing patterns of supply and demand finally became evident. Just as the new countries were increasing market share, international trade growth in garments stalled. Where previously a good year would bring 8%–13% export increases, now a year with any increase at all could be considered a good year. Seemingly overnight, rising garment capacity became rising overcapacity.

The problem was not that consumers stopped buying garments; rather, there were just too many factories in too many countries too anxious to produce those garments. More importantly, most of these new generation garment exporting countries had little to offer except cheap labour. This resulted in a buyers' market and, as happens whenever buyers' market conditions prevail, FOB prices fell. Nowhere was this more apparent than in the United States.

Figure 2 United States garment imports



Source: United States Government Office of Textiles and Apparel (OTEXA).

The increase in the number of garment exporting countries, the changes in demand from the developing countries, the granting of trade preferences to particular countries over others, these factors have all been beyond the control of the developing world's garment exporters.

However, other characteristics of the quandary facing the garment world today were, in fact, not beyond the control of the garment exporters and could have been addressed. Among these, two stand out:

- The concentration of production into only three product groups;
- The failure to go beyond the dependence on cheap labour.

To understand how these failures came about, we now need to step further back. Another fundamental factor behind the global garment industry's problems has been the quota regime itself. Trade restrictions not only restrict the market, they also distort it, often resulting in entirely unforeseen changes. In the case of the textile-related MFA (Multi-Fibre Agreement) quotas, this distortion has been so great that they have resulted, in almost every case, in a situation exactly opposite to that which was originally intended.

The quota regime, in place since 1963, was originally designed to protect the domestic industries in the garment importing countries. In fact, by providing an artificial protective wall, quotas removed the need for the garment factories in importing countries to make the investments required to remain competitive internationally. Through the years, domestic garment industries in both the United States and almost every country in Western Europe have essentially collapsed.

Likewise, for both the earlier developing country exporters and the latest generation of garment exporting countries with their preferential status agreements, the quota regime initially helped them get on the playing board quickly. But it soon became an obstacle to developing globally competitive industries. Cambodia, Bangladesh, the sub-Saharan African countries, the Caribbean countries and Mexico all entered the garment industry exporting cotton casual trousers, T-shirts and woven cotton shirts and blouses.

These are excellent entry-level products. Quantities per order are large. There is a place in the market for average quality goods. Production is very labour-intensive. Most importantly, these products are also the most heavily restricted by quota and therefore have the highest quota premiums. In most cases, the quota premium cost is greater than the total CMT price and in a 'good' year exceeds the total FOB price. To factories in quota-free regions, the quota advantage alone has often been enough to offset inexperienced management and semiskilled workers with low productivity.

However, there is an unavoidable downside to this scenario. Because these are entry-level products, competition is brutal. In fact, for a basic T-shirt or average quality five-pocket jeans, there is no bottom price.

In a normal market, as management becomes more knowledgeable and worker skills increase, factories move as quickly as they can from entry-level to higher value-added goods. However, the global garment industry does not operate under normal market conditions. The market is restricted by quota and quota has essentially blocked all industrial development. Why should a factory bother to trade upwards to more difficult products when their greatest competitors in China are restricted to a total 2% in T-shirts, 3% in woven cotton shirts and 3% in casual cotton trousers of United States market share?

What has happened is that industry in the new generation garment exporting countries has not progressed at all since 1990. Mexico, CBI and AGOA countries are even more dependent on jeans and T-shirts in 2004 than they were in 2000. They still rely on the same entry-level products. They still rely on the same cheap labour. Were it not for the restrictions currently imposed on their competitors, these industries would not be competitive. Once those restrictions disappear, their industries will become painfully vulnerable.

To understand just how much quota premiums have artificially inflated prices, we have only to look at changes in average FOB prices for made-in-China infantswear, manmade fibre (MMF) brassieres, and cotton and MMF robes imported to the United States following quota phase-out on 1 January 2002. These were the first significant commercial quota categories to be phased out, representing a combined total value of $3.6 billion. As shown in table 4, in 2002, Chinese export volumes rose between 571% and 826% in the four categories while the average FOB prices fell by 43% to 57%.

Table 4 United States: imports from China as compared to the rest of the world, in selected categories, 2001–2002

	Exports (million dozens)		% change	Market share (%)		Exports ($ million)		Average FOB price ($)		% change
	2001	2002		2001	2002	2001	2002	2001	2002	
Category 239 Infantswear										
World	99.5	109.4	9.9	100	100	1 893.2	1 828.6	19.02	16.71	-12.1
China	3.2	29.9	825.8	3.2	27.4	120.7	479.8	37.32	16.03	-57.1
Category 350 Cotton robes										
World	4.1	5.5	33.2	100	100	318.7	328.2	6.42	4.97	-22.7
China	0.2	1.4	523.6	0.2	1.3	19.0	66.1	7.20	4.01	-44.3
Category 649 MMF brassieres										
World	30.8	37.7	22.2	100	100	1 223.7	1 417.5	3.31	3.14	-5.2
China	1.1	7.8	618.0	3.5	20.7	65.3	218.9	5.02	2.34	-53.3
Category 650 MMF robes										
World	2.5	3.0	20.7	100	100	185.4	184.5	6.15	5.07	-17.5
China	0.1	0.8	571.2	2.9	14.5	14.7	56.0	10.25	5.83	-43.1

Source: OTEXA.

On 1 January 2005, garment export quotas were phased out, changing forever the face of the international garment industry. To meet the new challenges of the post-quota era, every garment factory in the world must find answers to two fundamental questions:

- What will customers demand of my factory?
- What steps must I take to meet those demands?

The buyers

The challenges facing importers and retailers are just as serious as those facing their factory suppliers. Everyone agrees that after 2005, garment prices will drop. However, there is as yet very little agreement as to the magnitude of the drop or where in the supply chain the drops will occur.

Industry experts and buyers alike agree that the end of quota premiums plus further FOB reductions resulting from global overcapacity will lead to a minimum of 10%–20% reduction in FOB prices. The disagreement revolves around the possibility of substantially greater savings as some importers and retailers begin to realize that the real benefits of the quota phase-out will not be limited to the disappearance of quota premiums. In the new quota-free world, buyers will suddenly have the freedom to go wherever and source from whomever they want.

Instead of taking advantage of overcapacity simply to reduce CMT and FOB prices, smart buyers will start making greater demands on their factories. Essentially, they will be attempting to shift parts of the manufacturing process from the retailer, importer or their agents to the garment factory in order to reduce major costs incurred traditionally in the buyers' home countries. They will be concentrating orders with those factories that can provide those indirect services and necessary special facilities.

These buyers see that with a proper post-2005 strategy, they can achieve total savings of 30%–40% off current retail prices. At first glance, a 10%–20% drop

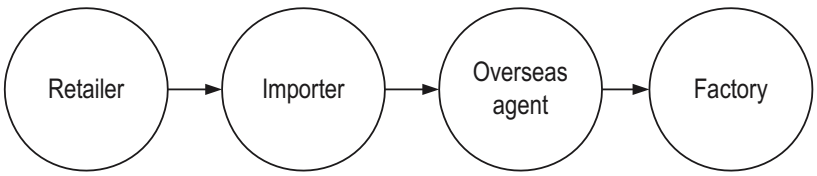
in prices appears to benefit all importers and retailers. After all, lower prices invariably stimulate consumer demand. However, if lower retail prices of as much as 30%–40% are possible, the importer or retailer that reduces prices by only 10%–20% will soon be out of business.

To understand the demands buyers will make, we must first understand how buyers currently source product. For the past half century, garment sourcing has consisted of travelling to the ends of the earth in search of the lowest FOB price, in turn defined as the lowest CMT cost and ultimately the lowest direct-labour rate. With the advent of quotas, the definition of lowest FOB price was expanded to include the lowest quota cost.

Going to the ends of the earth entailed substantial difficulties. The lowest-labour-cost countries seldom had existing garment industries. Much of the work had to be carried out by customers or their locally based agents. What resulted was a global garment industry unable to compete in a free market. The newest players in the industry had a very narrow product base and lacked the necessary skills to provide many of the facilities demanded by customers which were readily available from the established Asian garment exporters. In fact, as we have already seen, most of the new garment exporting countries had but one asset – cheap labour.

To ensure factories in these countries were able to ship quality garments on time, both the importer and agent were forced to play major roles in the garment manufacturing process. Over time, a system was developed to carry out these tasks which we will call the Standard Garment Sourcing Model (SGSM). SGSM became the model for all garment sourcing.

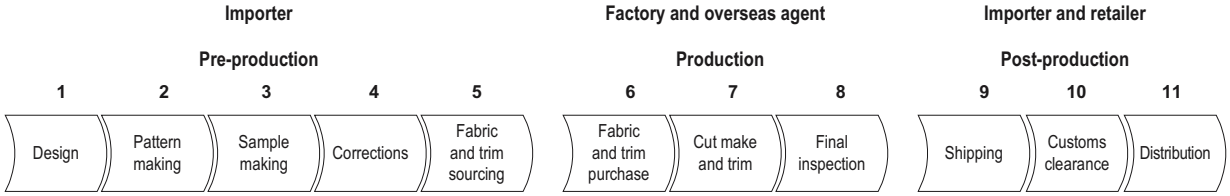
Under SGSM the value chain had four links:



- The customer. This was either a retailer or a branded importer. When the customer was a retailer, its role was limited to post-production processes such as distribution to branch stores. When the customer was a labelled importer, they played the dual role of customer and importer.
- The importer. This player was the centre of the SGSM process. Its role included all pre-production processes, including design, fabric sourcing, and sample and pattern-making, as well as most of the post-production processes such as shipping and customs clearance.
- The factory. Under SGSM, the role of the factory was limited to the production process – cutting and sewing the garments. Even here, responsibility was shared with the importer's overseas agent.
- The overseas agent. Its responsibility was to ensure that the factory carried out the importer's instructions, maintained quality levels and shipped on time.

The following is a very abridged SGSM flow chart, from design through stock garment distribution:

Standard garment sourcing model flowchart



There was always a paradox underlying SGSM. The SGSM system assumes the customer will travel to the ends of the earth in search of cheap labour. Yet, sooner or later, the customer always seemed to end up back in the higher-labour-cost countries with their established export garment industries. In fact, the list of the five largest garment exporting countries includes no cheap-labour country.

China, the world's largest garment exporting country, is the sole exception. This is a country where average labour rates are 200%–400% higher than those in its cheaper-labour Asian competitors such as Cambodia, Bangladesh, India, Indonesia and Viet Nam, and where average FOB prices for major export garment products are 40% higher than the average of United States import prices. If the purpose of sourcing is to buy at the lowest cost, and if lowest cost is defined as lowest FOB price, then why would any rational sourcing professional import garments from a country with demonstrably higher FOB prices? More to the point, why would almost every sourcing professional act in the same way?

Table 5 United States: garment imports of major Chinese garment export products

Chinese average FOB prices vs United States import average from world (2003)

Category	Description	China ($)	World ($)	Premium/ discount (%)
239	Infantswear	14.15	15.64	-9.53
338/339	Cotton T-shirts	6.34	2.93	116.61
347/348	Cotton trousers	9.43	6.12	54.11
350	Cotton robes	3.46	4.07	-14.94
445/446	Wool sweaters	31.92	16.39	94.75
634	MMF M&B coats	21.61	10.25	110.79
635	MMF W&G coats	20.94	9.75	114.66
636	MMF dresses	28.30	9.02	213.89
638/639	MMF T-shirts	6.43	3.70	73.75
640/641	MMF woven shirts/blouses	5.33	4.49	18.89
644	MMF W&G suits	21.95	18.91	16.05
647/647	MMF trousers	7.70	4.79	60.56
649	MMF brassieres	2.28	3.06	-25.59
653/654	MMF down costs	15.90	16.65	-4.51
Weighted average				46.40

Source: OTEXA.

Three years ago someone finally supplied an answer and the world of garment sourcing was turned on its head.[3] Full value costing, a new system to calculate costing, concluded that:

3 David Birnbaum, *Birnbaum's Global Guide to Winning the Great Garment War*, 2nd edition, Fashiondex, New York, 2003.

- Lower labour rates do not equate with lower CMT costs.
- Lower CMT costs do not equate with lower FOB prices.
- Lower FOB prices do not equate with lower garment costs.

To understand the logic of these statements, one needs only to look at a normal garment costing:

Men's woven cotton shirt[4]		**$**
Fabric		3.00
CMT		2.00
Quota category 340		1.80
FOB		6.80
Duty (6205.20.20)	19.8%	1.35
Freight		0.30
Clearance and inland transport		0.14
LDP (landed-duty-paid)		8.58
Private label importer markup[5]	30%	3.68
Wholesale price		12.26
Retail markup	60%	18.39
Retail price		30.65

FOB costs are but a secondary factor in determining retail prices. A men's woven cotton shirt with an FOB price of $6.80 retails for $30.65. Since the FOB price is only 22% of retail garment cost, clearly the place to save money is in the other 78%, not the FOB cost.

CMT costs are also only a secondary factor determining FOB price. The CMT cost is $2.00 – less than 30% of the FOB price. Once again, the place to save money is in the other 70%, not the CMT.

Labour rates which do not take productivity into consideration do not reflect true costs. Even after factoring in productivity, labour cost remains a negligible part of garment cost. A machine operator in Bangladesh is paid 16¢ an hour and will produce a shirt every 25 minutes. The sewing cost in Bangladesh on a shirt is 7¢, or about 1.5% of the FOB Bangladesh price. The same machine operator in China is paid 60¢ an hour and will produce a shirt in 15 minutes. The sewing cost in China is 15¢ or about 2.2% of FOB. In either case, 7¢ or 15¢ is an amount so small that it can hardly be used as the main determinant of an entire sourcing strategy.

The problem with SGSM was that the main garment costs never appeared on the garment costing sheet. These are the pre-production and post-production costs.

Pre-production costs. From the beginning of the design process to the loading of the finished garments onto the ship or other means of transport, the entire cycle takes approximately 24 weeks. Of this period, pre-production accounts for 80% – 19 weeks. Production accounts for only 20% – 5 weeks. Furthermore, it is during the pre-production period that all the expensive salaries go out. A single New York pattern-maker is paid more than 300 machine operators in Bangladesh. If the goal is to save money, don't look at the cost of sewing in Bangladesh, but rather the cost of pre-production in New York.

Post-production costs. The single greatest controllable cost is the markdown rate – the difference between the planned retail price and the average price which

4 Hypothetical case study based on standard United States costing.
5 Markup is the per cent profit based on the selling price (whether wholesale or retail). For example, if a garment is bought for $7 and sold for $10, the markup is 30% ($3 profit/$10 selling price).

the garments are actually sold for. For the men's woven cotton shirt analysed above, the planned retail price is $30.65. The usual markdown would be between $6.13 and $9.20. This is an amount equal to 90%–135% of the total FOB price. Compare this with the sewing cost of between 7¢ and 15¢ which has been the single most important area of concern for the past half century.

If a buyer wants to save money, the largest area of potential savings is in the markdown. From the buyer's standpoint, the solution to savings at markdown is speed to market. Once you include the garment's Full Value Cost, importers' preference for China and the other established exporting countries becomes quite clear.

China is the garment exporting country of choice because it provides the lowest Full Value Costs:

- Not the lowest labour rates. Chinese workers are paid up to 400% more than those in Bangladesh.
- Not the lowest CMT price. The average CMT cost of a made-in-China men's woven cotton shirt is 33% higher than the same shirt produced in Bangladesh.
- Not the lowest FOB price. The average FOB price of a made-in-China men's woven cotton shirt is 58% higher than the same shirt produced in Bangladesh.

What Greater China does provide is the best pre-production of any garment exporting country with the exception of Italy. China provides speed to market from 10,000 miles away faster than Mexico and the Caribbean countries which are located on the United States' doorstep. These are the advantages that make China competitive with any garment exporting country in the world.

After quota phase-out on 1 January 2005, for the first time in 42 years, retailers and importers are free to go wherever they want and buy from whomever they want. This freedom of action will result in the greatest cost reductions in the history of the international garment industry.

Garment retailers and importers are all working hard to understand how best to take advantage of these changes. Each company recognizes that failure to maximize these advantages will render it uncompetitive. Each company is trying to create its own post-2005 strategies. These strategies currently fall into three general categories. The first is simply an extension of the existing SGSM.

The China-first strategy

Most garment importers and retailers have defined their post-2005 strategy in one sentence: 'We are going to China.'

These companies already realize that the indirect cost savings for pre-production are far more important than any direct cost advantages such as low labour rates, low CMT or low FOB. The perception is that China can provide the pre-production facilities they need while other countries cannot.

Retailers, who often lack pre-production facilities of their own but want to import directly (without the use of a private label importer), are drawn to China. So too are companies which may have quite sophisticated pre-production facilities at home but which still have other special needs.

The China-first strategy is based on an underlying assumption that the SGSM will continue in the post-2005 era. In fact, more likely than not, this will not be the case. SGSM is critically flawed. SGSM is inefficient, costly and fails to lead importers to the best suppliers.

The SGSM four-link value chain results in unacceptable delays and duplication of effort. For example, four different people working at three different locations and residing in two countries may be needed to approve a zipper. The factory trim department first checks the zipper, and then passes it upstairs to the factory merchandiser, who is currently out on an inspection but who on return after careful consideration will eventually pass the zipper to the local agent who, unfortunately, is not available until tomorrow but the next morning will look at the zipper and then courier the zipper to the private label importer where the zipper will sit in the in-tray until the zipper expert can find time to okay the sample zipper. The zipper is finally approved, provided that none of the people involved has seen fit to reject the zipper, thus starting the entire procedure anew.

The net result is that zipper approvals may require seven or more days, provided nothing goes wrong. Multiply this by 10 trim products in 4 colours, combine that with 60 separate operations and we arrive at our total. The normal SGSM cycle is about 24-26 weeks – somewhat longer than the time required to build a 747 jet – but still remarkably efficient given the unwieldy system under which importers are forced to work.

SGSM is extremely expensive to operate. Originally the entire system functioned with about five people located in the importing office in the buyer's home country communicating with five people located in the overseas agent's office. Today, the import office may employ hundreds of people housed in entire office buildings communicating with hundreds of others employed in buying offices located in virtually every garment supplying country in the world. The colossal costs of these operations have reached such levels that major importers and retailers will be forced to consolidate their post-2005 sourcing in fewer countries simply to reduce their buying office expenses.

SGSM is biased towards countries where the importer already has a significant presence, regardless of that country's ability to meet the customer's real needs. An importer is required to order larger and larger number of garments from a country in order to amortize costs of the local buying office. Once again, this scenario leads to reducing the number of supplying countries in the post-2005 era. Where the exporting country previously had little to offer except cheap labour and no quota restrictions, there will soon be little sense in running a local buying office.

Consolidation will lock out the smaller exporting countries, which may provide high quality garments, but which lack sufficient export quantities to create critical mass. Put this another way. Whether a buyer approaches a customer like Gap with a style where every piece is guaranteed to be sold at full price but where the factory can only ship 10,000 pieces, or whether Gap is offered the services of a factory located in a remote location like Tierra del Fuego at the extreme tip of Argentina that will ship good quality garments at FOB $0, Gap cannot buy the garments because in both cases the cost would be too high. This is the price of SGSM.

During the past three years, importers and retailers have begun considering ways to scrap the Standard Garment Sourcing Model and replace it with what is referred to as the **Full Value Sourcing Model (FVSM)**. Just as full value cost analysis attempts to get away from defining costs simply as FOB prices, so the FVSM seeks to open up the factory's role to more than just the garment process.

There are now two further post-2005 strategies emerging. Both start with the same concept: reduce the four-link value chain.

The go-it-alone-strategy

To many medium-sized retailers and branded-label importers, 2005 represents a particularly serious challenge. To survive, these companies must reduce costs to compete with the giants of the industry. The solution is to find a limited number of factories which are equipped to take over many of the pre- and post-production processes. The first step of the go-it-alone strategy is to throw out the overseas agent. Not only is the agent costly, it also stands between the factory and the buyer. To succeed, the factory and the customer must work as virtual partners.

The factory must participate in every stage of the garment cycle, including:

- Fabric and trim sourcing;
- Design and design assists including designer sample making and pattern making;
- Pattern making and grading;
- Independent quality control (QC) and quality assurance (QA);
- Fast turn and quick response capabilities;
- Production reporting including electronic data interchange (EDI);
- Logistics, including landed-duty-paid (LDP) facilities and distribution;
- Export credit.

Without these skill sets and facilities, the buyer cannot go it alone and the go-it-alone strategy fails.

Strategic relationships

This last strategy will probably be the most important and have the greatest impact in the post-2005 period. The essence of the strategic relationship is that the importer or retailer no longer bases supplier decisions geographically, but rather selects one or a small number of transnational factory groups which will produce its goods in a variety of countries each selected because that country offers something special to the customer.

The customer might well produce its garments in the cheapest-labour country on the planet, despite the absence of any existing garment industry, trim suppliers, managers or technicians. It will be the transnational supplier which provides the managers, technicians, trims and the efficient factory.

The transnational supplier will also provide full design and merchandising facilities located in the customer's country. Global sourcing will no longer be a journey to the ends of the earth but rather a taxi ride across town.

The transnational supplier will build specially designed factories to meet the customer's specific requirements. For years, suppliers to Marks & Spencer and

other European retailers and branded-label importers have produced their garments in factories purpose-built for each customer. Today, major Korean, Taiwanese and Hong Kong factory groups are beginning to offer the same services to selected customers in the United States.

In the post-2005 era, the transnational supplier will revolutionize retailing. The transnational supplier will design the styles, source the fabric and trim, produce the garments, ship the product on an LDP basis, distribute to the branch stores, be responsible for replenishment, and provide 90+ day credit. In effect, the retailer will hang somebody else's garments in their stores and not pay for the goods until the end of the season.

At the present time, there exists no transnational supplier group capable of delivering the full service required. However, many factories are moving quickly in this direction. In the post-2005 era, 50 transnational suppliers each with sales volumes in excess of $3 billion will control 70% of the global garment export industry.

Chapter 2

Understanding the Chinese advantage

If factory owners and their operations plan to survive in the post-2005 era, they will have to compete against China. If a factory feels it cannot compete, no matter how hard this may sound, it might as well close up shop today and make room for those who feel they can.

Everybody agrees that in the post-2005 quota-free era, China will dominate the international garment industry. The race is now on for second place. From East and South Asia to Latin America, in fact all over the world, exporting countries are gearing up to win the title of 'The Next China'. Yet in all the excitement to become the runner-up, no one has made a real effort to determine just why China has been so successful in the first place. There is no shortage of fast answers:

- Abundant and cheap labour;
- Low FOB prices;
- Extensive government export incentives;
- Highly disciplined workers;
- Controlled currency exchange rates.

In short, everyone seems to agree that China is successful because it does not play fair. But this consensus simply does not hold water. Despite the supposed Chinese cheap labour, their various incentives (both real and imaginary), their abundant and highly disciplined work force, and even the artificially low exchange rate, one indisputable fact remains:

Chinese garment FOB prices are higher than world average (see table 6).

Retailers and importers do not flock to China to buy cheap garments. In fact just the opposite is true. Customers go to China prepared to pay a premium price.

Furthermore, garment quality is also not at issue. A good Chinese factory will ship a properly made garment. So too will a good factory located in India, Guatemala, Romania or Australia. In fact, good quality is no longer an asset, it is a minimal requirement.

Countries hoping to win 'The Next China' race also need to do more than ship nice garments on time. Yet, for the most part, many countries are moving in an entirely different direction to China. China is not a bigger Bangladesh, Mexico or Honduras – countries that look to increase market share by exporting large volume, mass-market items.

Table 6 United States imports: world average FOB prices vs Chinese average FOB prices, 2002

		World		China		Average FOB		
Category	**Description**	**Units**	**$ million**	**Units**	**$ million**	**World ($)**	**China ($)**	**Difference (%)**
239	Infantswear	109 435 086	1 828.323	29 939 449	479.794	16.71	16.03	-4.08
636	MMF dresses	7 962 470	857.859	757 950	234.666	8.98	25.80	187.37
649	MMF brassieres	37 676 800	1 417.501	7 784 987	218.913	3.14	2.34	-25.26
348	W&G cotton trousers	78 953 443	5 640.992	1 703 103	200.434	5.95	9.81	64.72
634	M&B MMF coats	9 884 654	1 201.648	790 923	179.567	10.13	18.92	86.76
639	W&G MMF dresses	40 005 308	2 158.203	2 134 195	172.837	4.50	6.75	50.12
635	W&G MMF coats	10 047 420	1 165.608	739 027	170.890	9.67	19.27	99.32
647	M&B MMF trousers	30 285 566	1 679.557	1 951 287	148.741	4.62	6.35	37.45
648	W&G MMF trousers	27 589 340	1 628.094	1 414 751	136.214	4.92	8.02	63.16
347	M&B cotton trousers	61 352 318	4 763.743	1 084 320	114.618	6.47	8.81	36.14
338	M&B cotton T-shirts	132 794 701	4 774.251	1 351 225	113.017	3.00	6.97	132.64
641	MMF blouses	13 636 215	773.255	1 334 471	107.537	4.73	6.72	42.11
446	W&G wool sweaters	2 678 480	535.407	254 551	95.580	16.66	31.29	87.84
339	W&G cotton T-shirts	132 362 389	5 138.168	1 496 924	92.509	3.23	5.15	59.20

Source: OTEXA.

Table 7 lists the 20 largest import garment products for 2002 to the United States by value of imports. These 20 products accounted for 76% of all United States total garment imports. China's combined share of these products is minimal, taken as a weighted average, about 7%. Clearly, China has not become the dominant international garment supplier by exporting the big volume, mass-market items (see table 8).

Table 7 United States: largest imports by garment category, 2002

Category		**Description**	**United States imports**		**China exports to the United States**		
			Rank	**$ million**	**$ million**	**Market share (%)**	**Rank**
348	W&G	Cotton trousers	1	5 640.992	200.434	4	53
339	W&G	Cotton T-shirts	2	5 138.225	92.509	2	63
338	M&B	Cotton T-shirts	3	4 774.251	113.017	2	58
347	M&B	Cotton trousers	4	4 763.752	114.618	2	57
352		Cotton underwear	5	2 385.914	48.126	2	61
639	W&G	MMF T-shirts	6	2 158.244	172.837	8	40
340	M&B	Cotton shirts	7	1 923.401	80.978	4	50
239		Infantswear	8	1 828.323	479.794	26	16
659		MMF other garments	9	1 736.105	190.340	11	34
647	M&B	MMF trousers	10	1 679.557	148.741	9	37
648	W&G	MMF trousers	11	1 628.094	136.214	8	38
649	W&G	MMF brassieres	12	1 417.501	218.913	15	23
638	M&B	MMF T-shirts	13	1 401.935	31.334	2	59
341	W&G	Cotton blouses	14	1 321.850	80.138	6	44
634	M&B	MMF coats	15	1 201.648	179.567	15	24
635	W&G	MMF jackets	16	1 165.567	170.890	15	25
359		Cotton other	17	923.750	279.813	30	13
636	W&G	MMF dresses	18	857.859	234.666	27	15
351		Cotton sleepwear	19	853.310	46.031	5	45
641	W&G	MMF blouses	20	773.255	107.537	14	27

Source: OTEXA.

Table 8 **United States: apparel imports from Greater China (China, Hong Kong and Macao), by fibre group, product category and percentage of market share, 2003 (in $ million)**

Total $13,613 million

	Cotton	PCT (%)	Wool	PCT (%)	MMF	PCT (%)	Silk	PCT (%)	OVF[a/]	PCT (%)
Infantswear	910	6.7	2	0.0					13	0.1
Playsuits, sunsuits, etc.	79	0.6	0						0	
Handkerchiefs	7	0.1	0		1	0.0			0	
Gloves	50	0.4	13	0.1	79	0.6			4	0.0
Hosiery	7	0.1	2	0.0	87	0.6			0	0.0
Blazers M&B	10	0.1	7	0.1	12	0.1	8	0.1	8	0.1
Coats and other jackets M&B	129	0.9	9	0.1	268	2.0	4	0.0	14	0.1
Coats and jackets W&G	187	1.4	33	0.2	324	2.4	76	0.6	83	0.6
Suits M&B	n.a.		11	0.1	11	0.1	0	0.0	2	0.0
Suits W&G	n.a.		8	0.1	88	0.6	16	0.1	11	0.1
Dresses	55	0.4	5	0.0	318	2.3	124	0.9	64	0.5
T-shirts M&B	257	1.9	130	1.0	91	0.7	56	0.4	293	2.2
T-shirts W&G	573	4.2	0		650	4.8	344	2.5	0	
Woven shirts	393	2.9	2	0.0	97	0.7	136	1.0	306	2.2
Woven blouses	328	2.4	0		193	1.4	298	2.2	0	
Skirts	106	0.8	17	0.1	90	0.7	95	0.7	82	0.6
Sweaters M&B	107	0.8	91	0.7	12	0.1	6	0.0	359	2.6
Sweaters W&G	n.a.		318	2.3	177	1.3	38	0.3	4	0.0
Trousers M&B	378	2.8	17	0.1	228	1.7	29	0.2	573	4.2
Trousers W&G	780	5.7	24	0.2	278	2.0	95	0.7	0	
Brassieres	92	0.7	0		349	2.6	0	0.0	0	
Robes	125	0.9	0		86	0.6	5	0.0	1	0.0
Sleepwear	131	1.0	0		117	0.9	27	0.2	1	0.0
Underwear	237	1.7	0		154	1.1	22	0.2	0	0.0
Down coats M&B	n.a.		0		91	0.7	0	0.0	0	
Down coats W&G	6	0.0	0		124	0.9	0		0	
Other apparel	392	2.9	104	0.8	299	2.2	16	0.1	42	0.3
Neckwear	0						51	0.4	2	0.0
Total imports by fibre type	5 341	39.2	793	5.8	4 225	31.0	1 396	10.3	1 861	13.7

Source: OTEXA.

a/ OVF – Other vegetable fibres, i.e. flax/linen, ramie, etc.
n.a. = not available.

Table 9 lists the 20 products that make up the greatest market share of China's exports to the United States. Only three product categories, namely infantswear (8th), cotton other garments (17th), and MMF dresses (18th), are also in the previous table of top 20 categories of United States garment imports by value.

What we see here is that China's strength lies in its exports of the less important secondary items. In addition to 100% silk and ramie fibre garments, products where it controls the entire market by virtue of its near monopolies on fibre and fabric – categories which are not even included in our tables here – China's dominance is in items such as down coats, gloves and handkerchiefs.

Table 9 United States: market share of exports from China, 2002

Category		Description	United States imports		China exports to the United States		
			Rank	$ million	$ million	Market share (%)	Rank
653	M&B	MMF down coats	52	112.935	88.183	78	1
354	W&G	Cotton down coats	65	3.216	2.355	73	2
431		Wool gloves	62	15.470	11.307	73	3
654	W&G	MMF down coats	49	118.399	85.916	73	4
330		Handkerchiefs	60	18.784	13.051	69	5
237		Playsuits	45	164.203	79.972	49	6
644	W&G	MMF suits	40	211.784	88.261	42	7
459		Wool, other garments	46	163.727	66.541	41	8
349	W&G	Cotton bras	44	183.899	70.900	39	9
631		MMF gloves	50	116.615	41.635	36	10
630		MMF handkerchiefs	64	3.321	1.122	34	11
650		MMF robes	43	184.514	56.022	30	12
359		Cotton, other garments	17	923.750	279.813	30	13
331		Cotton gloves	51	115.814	34.954	30	14
636	W&G	MMF dresses	18	857.859	234.666	27	15
239		Infantswear	8	1 828.323	479.794	26	16
333	M&B	Cotton blazers	58	23.344	5.936	25	17
440	M&B	Wool shirts/blouses	59	19.862	4.42	22	18
350		Cotton robes	36	328.202	66.06	20	19
446	W&G	Wool sweaters	28	535.407	95.58	18	20

Source: OTEXA.

What these numbers clearly demonstrate is that China's success is also not limited to its concentration on the less important products. *In fact, China's overwhelming success is based on the fact that China does not concentrate on any single product at all. Bangladesh may be the world's great cotton shirt supplier and Honduras the T-shirt king, but only China supplies everything.*

China offers the customer three advantages, which any factory wishing to thrive in the post-2005 era must also offer if it wants to compete.

You want it? We will make it. Product flexibility is the first part of the Chinese success formula.

You need it? We have it or, if not, we can find it. Raw materials flexibility is slightly more difficult to achieve. Almost all the contestants in 'The Next China' race believe that China's garment success is based on its strong textile industry. India and Bangladesh are among the many countries eager to develop backward linkages. In fact, for these countries, the development of indigenous textile facilities will be a costly and risky undertaking which might even reverse the hard-won advances made to date if incorrect investment strategies are chosen or because of global supply realities.

Certainly China has the largest textile industry in the world, which gives it an advantage in the 'we-have-it' category. However, where China really excels is in the 'we-can-find-it' category. Few professionals anywhere in the industry recognize the sheer volume of textiles imported by Greater China. Furthermore, the bulk of Hong Kong's textile imports sourced worldwide is actually re-exported to China for eventual export to the rest of the world, while some of it comes from China and then ends up in the rest of the world as finished

garments. Because of how statistics are currently compiled, it is impossible to determine how much of Hong Kong's original textile imports actually stay in China. What we can safely say is that between them, Hong Kong and China are the world's top two textile importers.

Greater China textile imports, 2002

	$ million
China	13 060
Hong Kong[a/]	12 640
Macao (China)	802
Total	**26 502**

Source: WTO International Trade Statistics 2003, table IV.63.

a/ Almost all Chinese textile imports are used for garment export production. However, Hong Kong imports fall into three categories. A small portion ($621 million) is retained in Hong Kong. The balance includes both textiles imported from third countries and later re-exported to China, plus textiles imported from China and re-exported to third countries. To determine Greater China's total imports, the value of this third category should be subtracted. However, as already explained, it is currently impossible to quantify what that amount might be.

China is one of the very few major trading nations which has both a strong domestic textile industry and free market textile imports. Contrast this with almost all other countries where local textile industry lobbying has resulted in severe limitations on textile imports. In most countries, the relationship between the local textile industry and the local garment industry is so divisive that the result is a lose-lose situation. In the fashion industry, where the apparel factory's survival depends on its ability to access the widest possible choice of fabrics, governments attempting to develop a globally competitive garment industry must clearly choose the free market scenario over the protected market one.

You have difficulties? We can help. Theoretically, most good garment suppliers think of themselves as working in a partnership with their buyers. Each side has a role to play and each side has responsibilities. The factory must produce lab dips and the customer must approve lab dips. If each partner performs its tasks correctly and on time, the order is shipped on time. If the customer fails to perform on time, the order will be shipped late. In reality, this step-by-step partnership concept simply doesn't work.

The good Chinese garment supplier also looks at its client relationship as a partnership. However, in the Chinese factory's mind, the buying side has only one responsibility – to pay for the goods. As long as the buyer successfully performs this single task, the factory must do everything else.

In the final analysis it is the successful understanding of this new industrial paradigm that will make the difference between the winners and the losers in the post-2005 era.

The customer pays for the goods – the factory does everything else.

Chapter 3

Paying vs sourcing material

A factory that does not supply fabric or trim is called a CM (cut-make) factory or, in Latin America, a *maquila*. These are terms which will gradually disappear from the apparel industry vocabulary because in the post-2005 era there will no longer be factories exporting garments on a CM basis. Working under CM terms, the risks to the buyer are simply too great. The moment the customer hands over raw materials which it has already purchased, the customer and its order become hostage to the factory.

Material costs are normally 70% of the total FOB price. If the factory has the customer's material, the customer is trapped. If the factory is late, the customer must accept late delivery. If the finished garment quality is not up to standard, the customer must accept poor quality. The customer cannot just cancel the order as the factory has already received the equivalent of 70% of the order's value. Any cancellation leaves the factory with a 30% loss but the customer with a 70% loss. In the pre-2005 world, where cheap labour and low FOB were the sole determinants of cost, some customers were willing to take this risk. In the post-2005 world, any customer who continues to hand over raw materials to a CM factory is simply inviting disaster.

Factories all over the developing world already know that their only road to real profits is in full package production where they pay for raw materials. However, paying for fabric is not the same as sourcing material. In fact, there are three levels of material purchase. Each is different; each provides the customer with a different level of service; and each puts a different level of responsibility on the factory. The greater the level of service, the more important the factory becomes to the customer. At the same time, each increase in services creates greater potential risk to the factory.

Whichever process the factory selects, there are two sacred rules to remember, one of which has already been mentioned. Successful compliance will keep the factory competitive:

- **The customer is responsible for paying.**
- **The factory is responsible for everything else.**

The second rule, as illustrated by the case study below, may one day save the factory's business:

- **Before you, the factory, commit to any expenditure, know your customer.**

Case study I: Buying material for the Wicked Witch of the West

You are a Mexican T-shirt maker. You are approached by the well-known American mass-market retailer Schmidlap Mart. They want to place an order for 83 gazillion yarn-dyed T-shirts. The price is not bad but they require 90-day delivery. You make it very clear to Schmidlap that it will be quite difficult to ship this enormous quantity within this short period unless you begin the yarn dyeing at once. The buyer assures you that she will process the confirmed order while you prepare the lab dips. She promises that the letter of credit (L/C) which guarantees you payment upon successful shipment of goods will be opened the moment the lab dips have been approved and she receives her copy of the signed confirmed purchase order.

Eighty-three gazillion garments is a very large order. You must do everything you can to satisfy the buyer. Actually 90 days – in a pinch, even 70 days – should give you enough time to complete the order. You rush the lab dips and FedEx them to the buyer. The buyer e-mails you back that the puce is 5% too red, the chartreuse has a tinge too much yellow, and the bilious green has too much bile and not enough green, but the other 46 colours are fine.

You tell the buyer that time is running out. You now have only 84 days to ship the goods. 'Do not worry,' she exclaims. 'The confirmed order is going out to you today, and we will open the L/C the minute we receive the signed purchase order.'

The confirmed order arrives two days later. You now have only 82 days to ship the goods, but that is still enough time. You sign the order and personally take it down to your local FedEx office. Unfortunately, it is Thursday and the earliest the customer will receive the order is the following Monday. Four days later, you telephone the buyer at Schmidlap Mart. 'No, I have not received the signed order,' she says. 'I wish I could help but I cannot ask for an L/C to be opened until I have the signed order.'

Wednesday, with only 76 days to go, you telephone the buyer. 'Yes! The signed order has just arrived,' she says. 'Let me check. Oh, you did not initial every page. You were supposed to initial every page. This is our standard operating procedure. I will fax you back the order, you initial the pages and FedEx the order to my attention. No, we cannot accept your faxing the order. We need your original signature. Do this as fast as you can. I will rush the L/C the moment I receive your order.'

You receive the faxed order. You initial each page and fortunately your cousin is flying to the United States the next day. He will take a slight detour – 800 km – and drop the order off at Schmidlap Mart on the buyer's desk. Two days later, with 74 days to go, you telephone the buyer. 'Yes! I have the signed order and I will walk the order personally to finance. They will rush the L/C,' she promises.

Unfortunately, it is a Friday. The following Monday, nothing. Tuesday, nothing, Wednesday, nothing. Thursday, D-Day – only 70 days to go – you are frantic. You telephone the buyer. 'I must put the yarn into dyeing today or I cannot guarantee on-time shipment.'

'Am I stopping you?' the buyer retorts. 'Look, if you do not want the order just say so. If you cannot ship on time, just say so. Many factories are more than happy to accept an order for 83 gazillion T-shirts. Have you ever received an order for 83 gazillion T-shirts?'

You admit you have never heard of an order for 83 gazillion T-shirts.

In the end the Schmidlap Mart buyer takes pity on you. 'I cannot rush the L/C, but I can get you the L/C number the moment the bank processes the L/C application.'

This is not good, but let's face it, an L/C number is something, AND WHAT CAN GO WRONG?

Two days later, the buyer e-mails you the L/C number. You put the yarn into dyeing and then you find out WHAT CAN GO WRONG.

➥

➦

The L/C does not arrive. Not the next day, nor the day after, nor the week after.

You are sitting up to your armpits in puce, chartreuse, and bile green yarn, but no L/C.

You telephone the buyer. She is out for lunch, out for an appointment, and finally just plain out.

You are desperate. You fly to Schmidlap Mart head office. You rush into the buyer's office.

The buyer, on the other hand, is very calm. 'Oh, that order. Sorry, that order was cancelled 10 days ago. Didn't you receive the cancellation notice?'

You explain that you are up to your armpits in puce, chartreuse, bile green and 46 other totally unsaleable colours.

'Yes,' the buyer agrees. 'Totally unsaleable. That is why we cancelled the order. What do you want me to do? Who told you to dye yarn without a confirmed letter of credit?'

Your life flashes before your eyes.

Once again the buyer takes pity on you. 'Let me see if I can help. I do not think it will work, but maybe if you offered the T-shirts at a discount, I could convince my boss to take them off your hands. How much of a reduction can you offer?'

You suggest, less 20%? Less 30%?

The buyer is not happy. 'I am doing you a favour. I cannot go to my boss with less 30%, not for those colours. Let me see what I can do to help.'

The buyer leaves her office. One hour later, just as you are feeling the first symptoms of an oncoming heart attack, she returns to her office – all smiles. 'Yes! We did it. It was not easy but I really wanted to help. He accepted less 50%. Do not thank me. At Schmidlap Mart we believe the relationship is more important than any order. Just remember you owe me a big favour.'

Let's face it – half a loaf is better than none. You thank the buyer from the bottom of your heart. For the first time in weeks you feel like this load has been lifted off your shoulders.

It is only on the plane flying home that your realize Schmidlap Mart just bought its own goods as ordered for less 50%.

And at that moment you recall a voice in the distant past whispering:

Before you, the factory, commit to any expenditure, know your customer.

Material sourcing

The entire material sourcing process can be broken down into 64 steps (see appendix), starting with **designer selects sample fabric** (step 1) and ending with **final manufacturing order issued** (step 62). (steps 63 and 64 relate to in-house calculations for final trim and fabric job costings.) There are three methods of material purchase, each of which brings the factory into the process at a different point. Each requires different responsibilities on the part of both the customer and the factory. Each carrier its own advantages to both customer and factory as well as corresponding disadvantages.

Every value-added service in the garment process, including material purchase, adds cost to the product. These added costs can be quantified in terms of the nature of the service and the value it provides. The less value, the less the added cost. Costs can be direct costs such as salaries and other overheads, or financial

expenses. Costs can also be payments to cover risk. Therefore, where offering these services leads to cost savings, the factory is entitled to a share of those savings as profit.

Factories can choose to purchase fabric in three different ways.

Ordering/paying

This is the simplest form of material purchase. The buyer physically orders the fabric from the mill and the factory pays the mill. The buyer does all the work. In fact, the factory does not even enter the process until **stock fabric paid for** (step 53).

Buyer's responsibility

- In the event of late arrival fabric delivery, the factory notifies the buyer, who either instructs the factory to cancel the fabric order or extends the garment delivery to allow for the delay.
- In the event of damaged fabric, the factory notifies the buyer, who instructs the factory either to produce the garments using the damaged fabric or not to cut the damaged fabric. In this latter case, the buyer must now negotiate with the mill.

Factory's responsibility

- The factory is responsible for inspecting and testing all fabric for potential damages.
- If the factory cuts the fabric before notifying the customer of any problems, the factory is responsible. This leads us to garment industry sacred rule number three:

You cut it – You own it

Advantage to the buyer

- The buyer is no longer held hostage to the factory. In the event of poor quality garments or late garment delivery, the factory suffers the loss.

Disadvantage to the factory

- Simply paying for the fabric is really not much of a service. The customer can still go elsewhere looking for much better factory services and facilities.

Value-added costs

As a rule, the factory that simply buys fabric is entitled to only the cost of finance. This includes an L/C charge of 0.5% (if payment is by L/C) plus interest charges for the period between payment of fabric and receipt of payment for the shipped garments – approximately three months. Total finance charges should not exceed 3%–5% of the total L/C value.

Because the factory has little risk and has added little to the value of the product, it is not normally permitted any profit on the transaction.

Conclusion

Taking this step is a first and necessary move for any factory hoping to compete in the post-2005 era. However, the ability to pay for fabric alone does not automatically make a factory interesting to the customer or competitive with other factories.

In the past, with the traditional Standard Garment Sourcing Model (SGSM) and its total focus on low FOB prices, factory fabric purchases were limited to the ordering/paying option. The buyers preferred to source the stock fabric themselves, thus avoiding any increase to direct material costs. The only exceptions to this scenario were special products, such as made-in-China silk garments, where the factory had overwhelmingly more knowledge and experience.

Now, however, as buyers look past 2005 and move towards the Full Value Sourcing Model (FVSM), they realize that the factory is better suited to source fabric than the customer – provided the factory has proven fabric sourcing capabilities. There are two main factors contributing to that realization:

- The cost of sourcing is lower at the factory than at the buyer's location. Salaries and other expenses are lower at the factory than in the buyer's London or New York offices.
- In many cases, the factory can source fabric more cheaply than the customer, thus providing not only lower-priced garments but also the opportunity for the buyer to reduce its pre-production overheads.

Sourcing against buyers' requests

In this second scenario, the buyer typically locates an interesting fabric and sends a swatch to the garment factory to source. The factory gives the swatch to a mill which in turn makes the closest alternative to the fabric. This option is much more advanced than simply paying for fabric previously ordered by the buyer, and the factory now joins the process at step 26, **sample fabric ordered**. To successfully provide these services, the factory must have established relationships with qualified mills and employ qualified fabric sourcing specialists. Most importantly, the factory must understand what the buyer wants and must be in constant communication with the buyer.

The ability to source fabric against buyers' requests is a tremendous asset for any factory. A buyer will be more loyal and pay higher FOB prices if the factory is competent to source fabric.

Buyer's responsibility

- To provide the original fabric swatch, colours and other technical specifications on a timely basis. Duplicating special fabrics is a very difficult task. If the buyer is late, the entire process will be late.
- To be reasonable. The buyer cannot provide a swatch of cashmere/silk obtained from a fine Italian mill at a cost of 150 euros per metre and expect the factory to source the identical fabric in Asia for 1.50 euros per metre. Likewise, the buyer cannot expect to circumvent mill minimums which are often the result of technical limitations.
- To accept that the duplicate fabric will seldom exactly replicate the original.

Factory's responsibility

- The factory must carry out all the steps in the material sourcing process within the time frame originally confirmed. Especially for fashion buyers, this may include salesperson sample orders (smaller than normal minimum quantities produced in the buyer's construction/colours/patterns allowing factories to produce salesperson sample sets well in advance of confirmed stock production orders).
- The duplicate fabric must be very close to the original, *as defined by the buyer.* If the duplicate does not have the *hand and feel* of the original, telling the buyer that technically the two fabrics are identical is a waste of time.

- The factory is now responsible for the entire stock garment production process. The factory has guaranteed it will ship the correct quality garments on time. Late arrival of fabric or arrival of damaged fabric can no longer qualify as acceptable excuses for late garment shipment.

Advantages to the buyer

- The buyer has taken the first major step to remove itself from the production process. The factory is now responsible for the fabric.
- The buyer is able to reduce its overheads by transferring fabric responsibilities to the factory.

Advantages to the factory

- The factory is now beginning a strategic relationship with the buyer where the buyer no longer looks only at FOB price to determine factory choice.
- The factory has created a service which is very marketable to other buyers.

Disadvantages to the buyer

- If the factory promises more than it can deliver, the buyer has wasted valuable pre-production time.
- The buyer runs the very frequent risk that the duplicate will not be close enough to the original.

Disadvantages to the factory

- Sourcing fabric is very costly and time-consuming.

Value-added costs

Instead of simply playing a role, as in the ordering/paying method, the factory sourcing fabric against a buyer's request is now adding real value to the process. As a result, the factory is entitled not only to the 3%–5% finance charge but to a similar sum as profit. Normal total added costs would be 6%–9% over original FOB prices.

Conclusion

The ability of the factory to source fabric is crucial to the success of both factory and buyer. Few factories today claim to provide this service and fewer still can actually deliver.

For the factory, success depends on not only the abilities of experienced factory staff but, more importantly, their ability to communicate honestly with the buyer. Most factories that try to source against buyers' requests fail because they promise more than they can deliver. If a factory receives a swatch from the buyer, it must notify the buyer within two to three days whether it can provide a reasonable duplicate. Disappointing the buyer at the outset is unfortunate. Disappointing the buyer five weeks later will end the relationship with that customer.

For the buyer, success in this scenario depends on the ability to be reasonable. The motto *'The difficult we do at once, the impossible takes a little longer'* is not appropriate for a factory trying to source a desired fabric. Tasmanian wool has a lovely feel as does vicuña. However, the factory in Cambodia may never have heard of either of them (which is fortunate for both parties since dealing in vicuña is a crime in about 100 countries.) In this option, successful outcomes are measured by the ability of both sides to limit themselves to the realm of the possible.

Sourcing independently

Every designer begins each new season searching for fabric. Few have definite ideas of what they are looking for. In the final analysis, what they find is what they were looking for because that is all there is. The factory with excellent mill relationships can play an important role in that search and thereby joins the process at step 1, **designer selects sample fabric.** This is the ultimate service in fabric sourcing and requires special facilities on the part of the factory, including:

- A clear understanding of fashion in the customer's market;
- A well-developed and experienced fabric sourcing department, whose members regularly attend fabric shows in Asia and Europe;
- Well-established relationships with Asian and at least some European mills.

The ability to assist the designer to select fabrics for the designer's next season collection places the factory in the centre of the manufacturing process.

Buyer's responsibility

- The buyer's designer should feed ideas to the factory which the factory will follow up with the mills.
- There should be considerable feedback between the designer and the factory.
- As the mills will be required to carry out extensive and costly product development work, much of which will never translate into confirmed mill orders, the buyer and designer should exercise some discernment in providing ideas to the factory. Otherwise damage to the factory's hard-earned relationships with its mills will result, creating a lose-lose situation for everybody.

Factory's responsibility

- The factory must regularly show as complete a range as possible of available fabric types, including new lines which the designer has not yet seen.
- The factory must work continually to increase the number of mills with which it has relationships.
- The factory must accept that part of the sourcing service will be convincing its mills to produce large numbers of samples, only a small portion of which will translate into orders.

Factory's and buyer's mutual benefit

- Rather than simply negotiating FOB prices, the factory is now in a much stronger position to engineer garment styles and accompanying material costs to fit into the buyer's price points range.
- Both the buyer and the factory are secure in the knowledge that the duplicate fabric will be identical to the original simply because the duplicate fabric *is* the original.
- The buyer is able to transfer most of its design costs to the factory which can carry out this work more efficiently and at lower cost.

Value-added costs

Offering the buyer the ability to meet its target points by sourcing materials independently now puts the factory very much in the driver's seat. Although

value-added costs for this service would be determined on a style-by-style basis and take into account the cost of the entire garment, as a general rule, the factory could expect to add a further 5%–6% on FOB prices.

Conclusion

Successfully sourcing raw materials is the first and probably most important service a factory can provide to its buyers in the post-2005 era. Without special services and facilities, with nothing besides cheap labour, the post-2005 era factory simply has nothing to offer.

Chapter 4

The material sourcing process – stage I: the buyer's side

Material sourcing must be understood as a process. This statement, in itself, must be understood. We are all brought up educated to find meaning in definitions and not in processes. *All bachelors are unmarried. Bald people have no hair. A factory is a room full of machines.* The problem here is that defining something adds nothing concrete to our overall knowledge. Operational knowledge comes from understanding the entire process of how things occur and how to change them. This is equally true of concepts such as marriage, baldness, and, for our purposes, manufacturing T-shirts and sourcing material.

To understand how material sourcing works, it must be thought of as a process, not as people, places or things.

Manufacturing is a process of production. Anything or anybody that physically changes the product is part of the manufacturing process. Any place where the manufacturing process takes place is called a factory. For example, consider the case of a designer working late at night at home drawing sketches of T-shirts.

- Those sketches physically change the T-shirts. (It would be impossible to even begin to produce the T-shirts without the designs.) Those sketches are the first step in the manufacturing process.
- The designer is therefore as much a part of the manufacturing process as a machine operator or a presser.
- The designer's bedroom, the place where this manufacturing process occurred, is a factory, just as the sewing floor or cutting room are factories.

Accountants will argue differently. They will say that a machine operator is part of variable costs (sewing costs rise and fall based on the number of garments produced), while the designer is part of overhead (salary and expenses remain the same regardless of the number of units produced).

Economists will argue differently. They will say that sewing is manufacturing, while design is service.

Both are correct, in their own context. Furthermore, whatever the context, neither differentiates between the importer's pre-production workshop or the supplier's factory floor. In the admittedly narrow context of T-shirts and trousers, let us, for the time being, define overhead as variable costs and everybody who physically changes the garment as part of manufacturing.

In every phase of garment manufacturing, the process – not the thing – is relevant, because processes can be transferred from one place to another while things often cannot. For example, you can transfer sample making from London to Phnom Penh. However, you cannot transfer the sample makers. They will not go.

Material sourcing is the first and possibly most important part of the pre-production process and is therefore the first step a factory must take in order to enter into the Full Value Sourcing Model (FVSM).

Case study II: The-stay-at-home designer

You are an importer trying to reorganize your design department. You look around you and are dazed by the size of your operation. Not only do you have designers and assistant designers, some of whom have their own assistants, you are also supporting an army of technical designers, fabric sourcing specialists, merchandisers, pattern makers, sample makers and who-knows-what-else.

You could do much of this work in your suppliers' factories. The problem is the designers.

Designers no longer travel. Ten years ago, the designer, who more often than not was a woman, knew her place and that place was sitting in an aeroplane. A London-based designer would make her rounds a minimum of twice and sometimes three times a year. A typical round for a London-based designer consisted of a series of London–Hong Kong–Shanghai–Seoul–Taipei–London trips, then London–Porto–London, with a further London–Paris–New York–Milan–London side trip just to shop the stores.

Of course the designer lived in a perpetual state of jet lag, either away on a trip, just returning from a trip, or planning the next trip, but in those days designers had commitment, stamina and loyalty – qualities, for better or worse, rarely found in the younger generation of designers today.

The ghost of garment importers of past generations now speaks. 'If you and your factory supplier each want to survive, grow up and join the 21st century. Designing is a process. You can move the process without moving the people.'

Designer first samples do not have to be produced in a London sample room. Sketches can be faxed to factories where original samples can be produced in a day and immediately returned by courier. In many cases, the factory will have a merchandiser hand carry the samples to London to review them with the designer. Much of the fabric sourcing work can also be done by the factory.

In the end, designers still have their assistant designers, who often have their own assistants, at home. You, the buyer, are still supporting an army of technical designers, fabric sourcing specialists, merchandisers, pattern makers, sample makers and who-knows-what-else. But only this group is now located in Phnom Penh.

The factory is willing to take on these responsibilities because unless the factory offers these and other services and facilities, it has nothing to offer except cheap labour, and in today's world there is an endless supply of even cheaper labour.

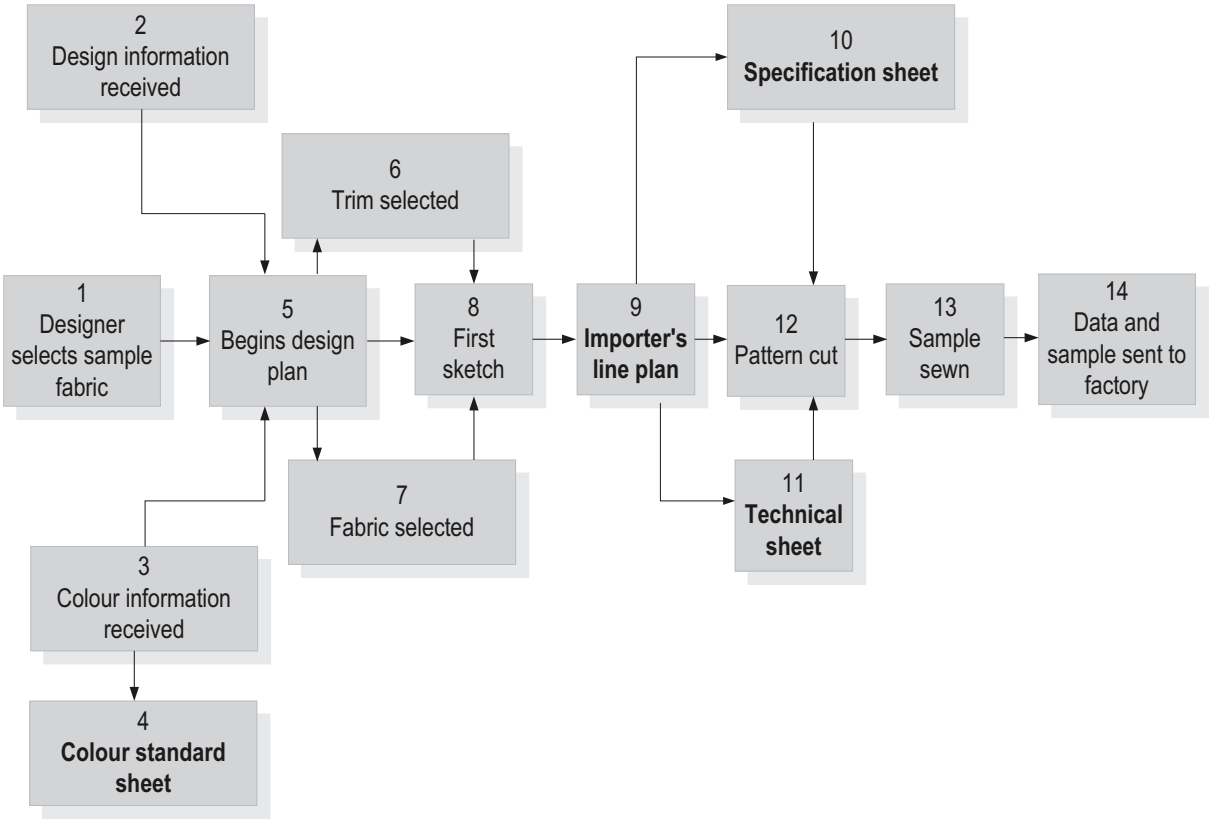
The 64 steps in the overall material sourcing process can be divided into five stages, beginning with **stage I: in the buyer's office**. This stage starts with **designer selects sample fabric** (step 1) and concludes with **data and sample sent to factory** (step 14). Stage I includes four reports:

Colour standard sheet	(step 4)
Importer's line plan	(step 9)
Specification sheet	(step 10)
Technical sheet	(step 11)

This stage of the material sourcing process is purely focused on design, beginning with step 1 where the designer makes an initial selection of the fabrics they plan to use for the coming period. As previously explained in chapter 3, this stage represents an excellent opportunity for qualified factories to enter the manufacturing process.

At the same time the designer selects fabrics, they will also begin the process of collecting design information. The belief that designers begin each season with a blank sheet of paper and that all the styles are based on original concepts is one of the more touching myths of our industry. In fact, all contemporary designers use many, often expensive, design assists. This includes not only

Stage I: In the buyer's office



design information (step 2) but **colour information** (step 3) as well. Most often it is from these assists that the designer will select the colours for the upcoming season.

The chosen colours for each fabric are placed on a **colour standard sheet** (step 4) against which the mills will eventually dye fabric. This is simply a piece of thick paper or cardboard on which the designer staples swatches of the colours they want for a particular fabric.

In the best of all possible worlds, the colour swatches should be in either the same fabric as or at least similar fabric to the one the designer is using as it will allow for easier colour matching. If, for example, the desired fabric is poly/cotton, 2X1 twill, the swatches should at least all be in a cotton twill fabric or even plain cotton. Unfortunately, we do not live in the best of all possible worlds. In the past I have received swatches consisting of carpeting, and even a piece of broken terracotta pottery against which I was supposed to dye silk crêpe-de-chine.

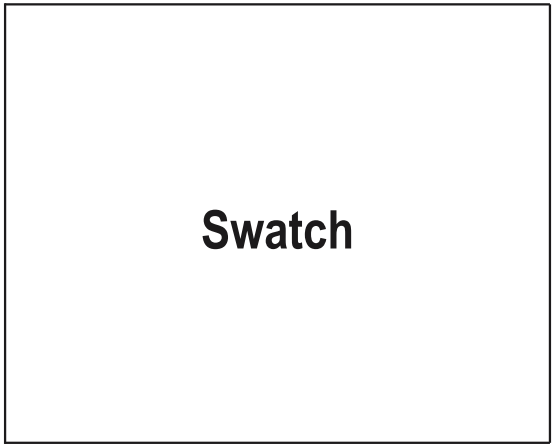
Old dog collars and broken pots notwithstanding, the very worst is when the customer substitutes bits of coloured paper for their swatches, usually taken from a Pantone paper colour book. Let me say at once that Pantone is an excellent company which produces a very extensive range of colour books using fabric swatches of various fibres in which each colour has a specific reference number. Working with a Pantone fabric book makes life very easy for everyone. The designer need not even send a **colour standard sheet**. They can e-mail the Pantone numbers. This works beautifully – provided they are using one of the Pantone fabric books and not the paper book.

Once the designer has selected the fabrics and colours, now comes their basic **design plan** (step 5). By this point, the designer has, for each group of styles, **selected fabrics** (step 7) as well as **selected trims** (step 6). Next the designer starts the physical design process beginning with **first sketch** (step 8).

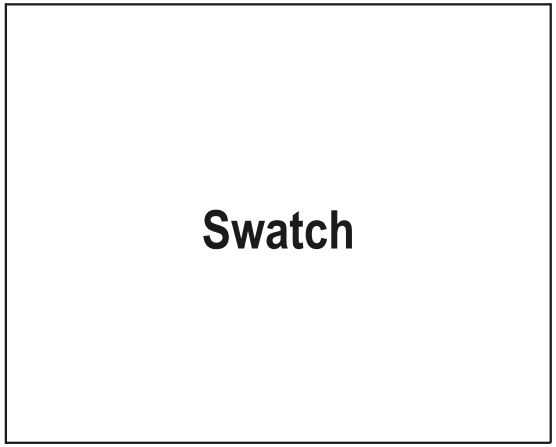
The sketches are put together in groups by fabric, with all the styles for each fabric entered in a **line plan** (step 9). Below each sketch are the colours required for that style. The line plan, which will subsequently be modified by the factory **(factory line plan**, step 16) is one of the key reports required for fabric purchase.

Colour standard sheet

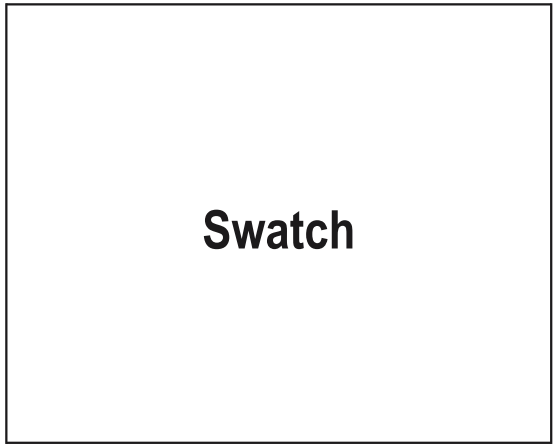
Date _____
Fabric _____
Fabric supplier _____
Season _____



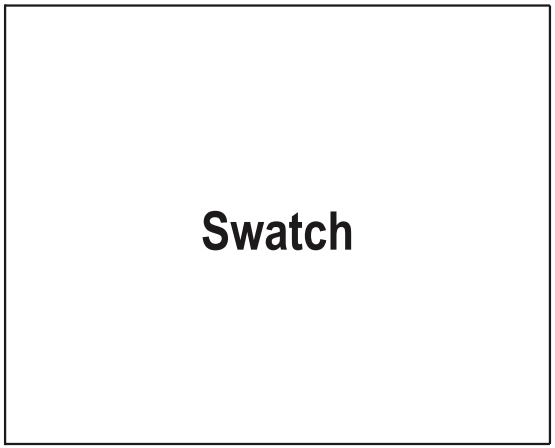
Colour name _____



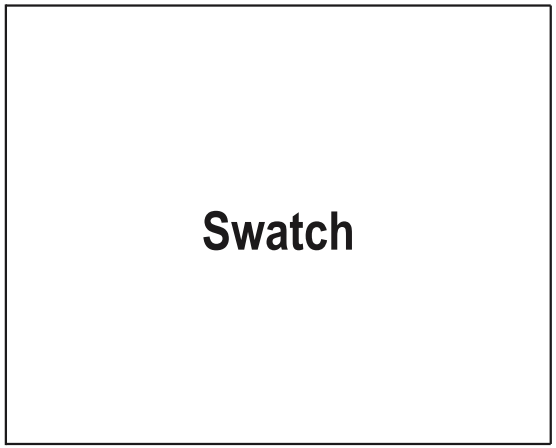
Colour name _____



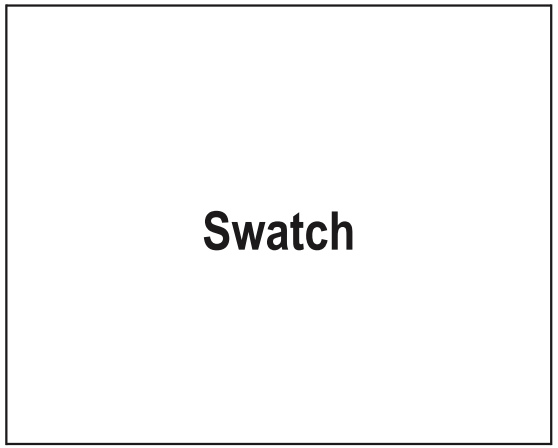
Colour name _____



Colour name _____



Colour name _____



Colour name _____

Importer's line plan

Fabric _____
Fabric supplier _____
Season _____
Factory supplier _____

Date

Sketch	**Sketch**	**Sketch**
Style # _____ Description _____ Colour name _____ _____	Style # _____ Description _____ Colour name _____ _____	Style # _____ Description _____ Colour name _____ _____
Sketch	**Sketch**	**Sketch**
Style # _____ Description _____ Colour name _____ _____	Style # _____ Description _____ Colour name _____ _____	Style # _____ Description _____ Colour name _____ _____

The importer then creates a **size specification sheet** (step 10) which lists the measurements for all sizes. This allows the factory to calculate the quantity of fabric required for that style. A factory must take care not to take the spec sheet measurements for granted. In today's world, where men and women in the industrialized world are more full-bodied, the old S-M-L size specs are a thing of the past. The sample size spec sheet below is by no means unusual.

This is followed by a **technical sheet** (step 11) which describes various technical requirements of that style. In the example overleaf, I have included only the portion related to the fabric. A complete tech sheet can run to many pages.

Tech sheets and spec sheets occur in all shapes and sizes, depending on the importer, the designer and their technical support. Some tech sheets are extremely detailed and complex while others are more informal.

Whatever you receive, ensure that your people examine both spec and tech sheets very carefully. Make sure you understand precisely what is required and that you are capable of meeting those requirements. If something does not make sense, query it at once. Do not, I repeat, do not be afraid that asking questions will make you appear incompetent. In our industry, the incompetents are those who never ask questions. Professional and experienced garment buyers know that whenever the factory manager repeatedly says 'No problem', this really means 'I have no idea what you are talking about.'

Occasionally even the most qualified buyers and sourcing professionals make ridiculous errors. A professional welcomes and respects the factory that asks questions. This means the factory is gradually learning precisely what is required by that buyer, and one time in a hundred, the factory will spot the ridiculous error. Believe me, your buyer would prefer to answer a thousand questions, if, at the end of the day, it can avoid receiving the 1,000 dozen T-shirts which follow the specs precisely but which are totally unsaleable because the buyer forgot to include an extended neck measurement. T-shirts which cannot be pulled over the head are not good.

Finally, fabric terminology and methods of measurement differ considerably between the United States and most of the rest of the world. These differences are not confined to euros vs dollars or metres vs yards. A glossary at the end of this volume provides common measurement conversion tables used in the industry.

Specification sheet

Style number	1007						Date	20-Mar-04	
Description	Women's tailored trousers								
Fabric group	Super century twill								
Size range	XS - 5XL (in inches)								
Size	XS	S	M	L	XL	XXL	XXXL	XXXXL	XXXXXL
Waist	24	25.5	28.5	32	34	38	43	48	53
Hips (8" down)	41.25	42.75	45.75	49.25	51.25	57.25	61.5	66.75	70
Thigh	27	28	30	32.35	33.5	36.5	39	41.5	44
Front rise	13	13.5	14.25	15	15.375	15.75	16	16.25	16.5
Back rise	16.75	17.25	18	18.75	19.125	19.5	19.75	20	20.25
Knee (14" below crotch)	18.75	19.75	20.75	21.75	22.75	24.25	25.25	26.25	27.25
Bottom opening	14	15	16	17	18	18.75	19.75	20.75	21.75
Inseam (w/o cuff)	29	29	29	29	29	30	30	30	30
Cuff opening	5	5	5	5	7	7	7	7	7
Size conversion (United States sizes)		XS	4-6	L	16-18	XXXL	24		
		S	8-10	XL	20	XXXXL	26		
		M	12-14	XXL	22	XXXXXL	28		

Fabric technical sheet

Style number	1007
Description	Women's tailored trousers
Fabric group	Super century twill
Fabric description	65% Poly/35% Cotton
Weave	2X1 LH Twill
Greige construction	85X48
Yarn count	15 O.E. X 9.5 O.E
Finish	R.S. Pre-cured IL
Finished weight	8.0 oz per sq yd

Finished characteristics	Average	Minimum	Test method
Width overall		65.5"	
Width cuttable		65.25"	ASTM D 3774-84
Construction	91 X 48	89 X 46	ASTM D 3775-84
Weight (oz/yd^2)	8.0	7.5	ASTM D 3776-85
Tensile (lb)	180 X 130	150 X 100	ASTM D 5034-95
Tears (lb)	8.0 X 8.5	7.5 X 7.5	ASTM D 1424-83
Pilling	4	3.5	ASTM D 3512-82
Shrinkage - 10 IL	2.5%	3.0%	
Seam slippage (1/4")	35	30	ASTM D 434-75
Flex abrasion (cycles)	2 000+	2 000	ASTM D 3885-80
Fabric appearance	4	4	AATCC 124-1984
Crease appearance	4	3.5	AATCC 88C-1984
Colour loss on crease	3	3	Celanese
Flammability	Class 1	Class 1	CS-191-53
Free formaldehyde (ppm)	100	500	AATCC 112-1984
Crocking (dry and wet)	4.0 and 3.0	3.0 X 2.0	AATCC 8-1996
Lightfast (@ 40 units)	4.0	3.0	AATCC 16-1994
Colourfastness to laundering	4.0	3.0	AATCC 61-1996

At this point, the designer's support staff will **cut pattern** (step 12) and get the **sample sewn** (step 13). The entire package, including the pattern, sample, spec sheet, tech sheet and the line plan is now sent to the factory (step 14).

Chapter 5

The material sourcing process – stage II: the factory side

The factory enters the material sourcing process when it receives the sample package from the buyer and its designer which includes the detailed spec sheet, the detailed tech sheet, the buyer's line plan and the sample. At least, in theory it does. The reality is somewhat different. In garments, as in life, things seldom arrive in neatly tied packages.

- Sometimes you do not receive a sample. Instead you receive this cryptic note: *Just like last season's style 4963, the one with the front and back yoke, or was that 6349, no matter, it is definitely the one with the front and back yoke, only this time just change the front yoke to hand smocking and where the sleeves had French cuffs before, this time use barrel cuffs. Oh, and don't forget 9436 was in single knit; this time we are doing it in corduroy, so make the necessary pattern adjustments.*
- Sometimes the spec sheet has small errors. It would be prudent to check the numbers. This might avoid the possibility of producing 10,000 dozen T-shirts with neck openings too small to get past the ears.
- Sometimes the tech sheet is missing, incomplete, or just plain incomprehensible.
- Sometimes the line plan refers to a fabric group totally unrelated to yours.

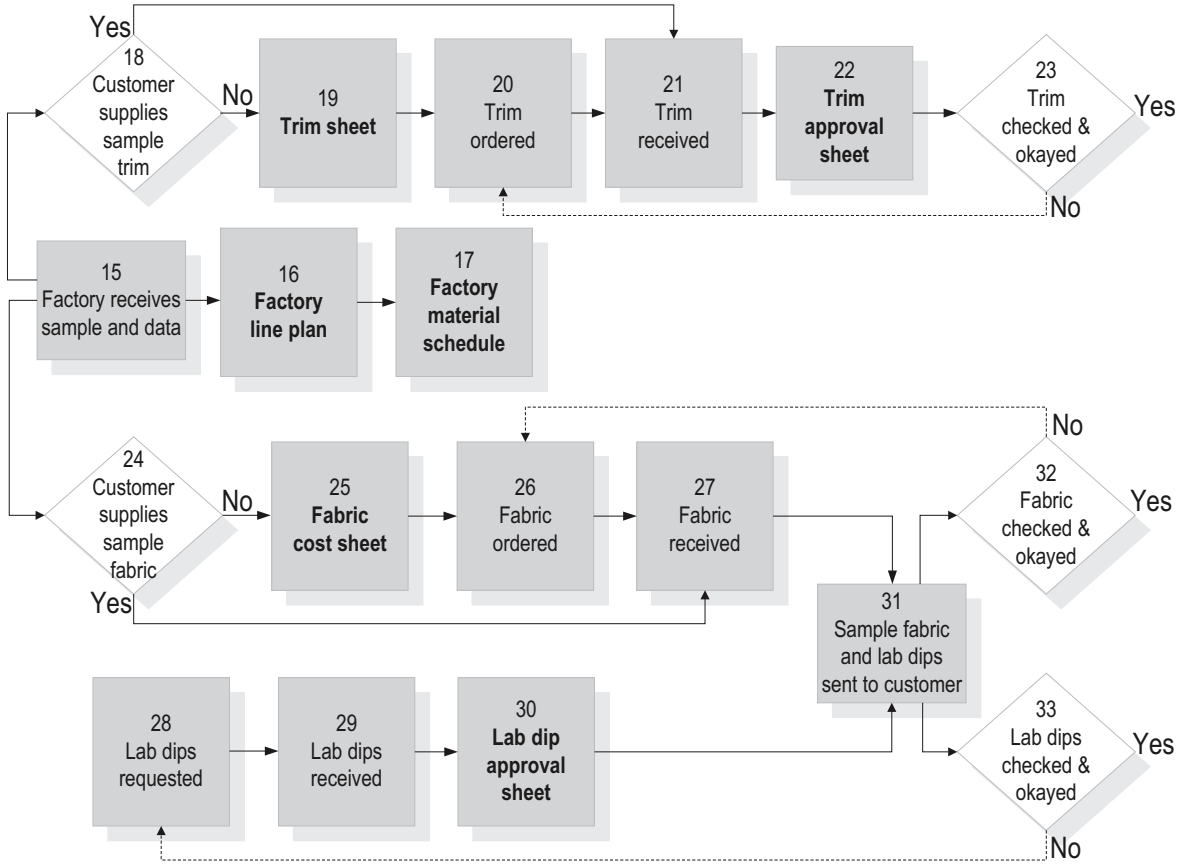
It is conceivable – extremely doubtful but not quite beyond the realm of possibility – that you will receive a complete package. Even then, trust nothing you receive. Check everything twice and ask questions about anything not 100% clear.

Stage II starts with **factory receives sample and data** (step 15) and it concludes with **lab dips checked and okayed** (step 33). This stage of the material sourcing process is focused on factory preparation work. This is the point when the factory determines material requirements and the programming of their efficient and timely delivery.

Stage II includes five reports:

Factory line plan	(step 16)
Factory material schedule	(step 17)
Trim sheet	(step 19)
Trim approval sheet	(step 22)
Fabric cost sheet	(step 25)

Stage II: factory side



For each style, the factory must determine:

- The materials that are required;
- The quantities required for each fabric and trim item;
- The costs of each fabric and trim;
- The times when fabric and trim must be ordered and then later received at the factory;
- The assurance that the buyer has approved and will accept each of these materials.

This is also the stage when the costliest errors are made.

Case study III: Levels of catastrophe

You are a factory manager. One day while walking down a sewing line, you notice that your people have failed to sew two sleeves on each shirt and that your inspectors have failed to notice that each shirt is missing a left sleeve. Your immediate reaction is shock followed by rage. Eventually, you calm down and return to a more rational state. You bring the missing sleeve problem to everyone's attention and ensure that all subsequent shirt production will be of the two-sleeve type. You then turn your attention to the single-sleeved shirts.

How big is the catastrophe?

The answer is a function of time. The longer the period of single-sleeve production, the more damaged garments produced and the greater the loss. A five-minute problem results in a minor loss. A five-day problem results in a major loss. The single-sleeve production may be unbelievably stupid, but not necessarily costly, because sewing errors occur one garment at a time.

Now let's change to a slightly different problem. This time your shirts have two sleeves. The problem is in the country-of-origin label which reads:

Made in Mexico

Normally, this label would be perfectly acceptable. However, in this instance, the shirts have been shipped to Canada which insists that all labels be bilingual English/French.

Made in Mexico
Fabriqué au Mexique

The single-sleeve catastrophe may be unbelievably stupid, but not necessarily costly. The English/French label catastrophe may not be as blameworthy, but is always very costly. In this instance, the Canadian Government will not allow any of your garments to clear customs. Your entire order will be cancelled.

Sewing errors are one-at-a-time. Errors in material preparation are generic – every garment with an offending material item is a reject.

Time spent in Stage II is always well spent.

The factory preparation phase begins with **factory receives sample and data** (step 15). As explained above, check everything and ask the buyer as many questions as necessary until you are confident you understand precisely what is required. At this point you are ready to begin the pre-production process.

Fabric is usually the costliest part of the garment (exceptions include underwear, where the elastic and trim may be more expensive than the fabric) and is therefore the point where the greatest loss occurs. Losses occur because either the fabric quality or the quantity ordered is incorrect. (Fabric quality control and quality assurance will be covered later in this book).

For the time being, we are concerned with material purchase quantity. For a well-run factory capable of satisfying buyers' needs, correct fabric purchase is the difference between real profit and imaginary profit. All too often, a factory balance sheet shows profit but no money because the factory's profit is locked up in last season's or last year's fabric which would not be there had the fabric been ordered in the correct quantity. Fabric sourcing may be an art, but determining quantities to be ordered is very much a science.

You start with a series of rules:

- Unless the fabric is 14 oz denim, white cotton single jersey or some other basic commodity, the value of fabric left over in stock after garment shipment is zero;

- ❑ At the end of the day, inventory should consist 100% of money and 0% of fabric;
- ❑ To achieve this goal, order 99% of the required fabric.

So just how much fabric is required to fill the order? This is not an easy question and depends on two variables, each of which is subject to constant change:

- ❑ How many garments of each style and each colour are required?
- ❑ What is the consumption of material for each garment for each style?

In a simpler and kinder world, the answer to the first question would be obvious. The buyer would order one garment style for each fabric and once the colour/quantity breakdown was given, the order would remain unchanged. In the real world, the buyer may order six styles for each fabric and will change their mind every day until the fabric is physically on the cutting table, sometimes even beyond that point.

Keeping track of all the subsequent changes is the reason for a **factory line plan** (step 16). From the moment the factory receives the sample package, the factory merchandiser creates the **factory line plan**. Each fabric has a separate line plan. The report is divided into three parts.

The first part lists all the relevant information pertaining to all the styles for a single fabric:

- ❑ Fabric name.
- ❑ Fabric supplier.
- ❑ Customer and season.
- ❑ The estimated yield for each style; i.e. the quantity of fabric required to produce one garment.

The second part is style-specific:

- ❑ Style number.
- ❑ Sketch or photograph of each style. Every piece of paper concerning a style has a sketch or photo of that style. This avoids the possibility of having to say to the buyer, 'Oh, you meant style #4972 trousers. I thought you meant style number #4972 blouse.'
- ❑ Description of the style.
- ❑ Colour quantity data.
  - – Colour name;
  - – Number of garments ordered;
  - – Total metres (or yards) of fabric required for that colour.

The third part provides total by colour and quantity:

- ❑ Colour name.
- ❑ Total fabric quantity required for that colour.

The buyer may change the assortment frequently, increasing or decreasing the number of units required for a particular colour for each style and possibly cancelling one style altogether. The **factory line plan** enables the factory to keep track of total fabric required for each fabric type and each colour. The **factory line plan** is a vital tool signalling two critical moments in each style's evolution:

- The point when the mill is given the final order. Before confirming the fabric order with the mill, the factory must ensure the quantities ordered will equal the buyer's specific garment assortment. If the garment quantities are incorrect, the mill order must be amended accordingly.
- The point when the stock fabric is ready to be cut into garments. Before cutting, the factory must ensure that the quantity of fabric received will equal the buyer's latest garment assortment. If the quantities are incorrect, the factory must notify the buyer to change the assortment accordingly.

The buyer has a right to change the assortment breakdown at any time up to the point when the fabric is on the table to be cut. However, each time the buyer changes the assortment, it is responsible for ensuring that the overall assortment will still match the quantities of total fabric and trim ordered.

The **factory line plan** is an indispensable tool. Most factories create it using a spreadsheet format that translates garment assortment changes directly into fabric assortment changes. This not only saves time but also avoids costly arithmetic mistakes.

Factory line plan

Fabric name _____
Fabric supplier _____
Customer and season _____
Date _____

Style	Yield

SKETCH OR PHOTO

Style # _____
Description _____

Colour name	Units	Quantity

SKETCH OR PHOTO

Style # _____
Description _____

Colour name	Units	Quantity

SKETCH OR PHOTO

Style # _____
Description _____

Colour name	Units	Quantity

SKETCH OR PHOTO

Style # _____
Description _____

Colour name	Units	Quantity

TOTAL

Colour name	Quantity

Not only must fabric be ordered in the correct quantity, it must also be ordered on a timely basis. Because this process has many operations, each depending on a previous operation, the entire process should be guided by a **factory material schedule** (step 17).

Every operation should be listed on the **factory material schedule** (see sample provided) together with the time allocated for that operation. Some operations can take zero time in that they can occur at any time during the process as long as they occur before the succeeding operation. For example, the factory can receive the colour/size breakdown (operation 11) or the L/C from the buyer (operation 12) at any time. However, unless and until these operations have occurred, the director will not approve the fabric purchase order (operation 13) and the stock fabric will not be ordered (operation 14).

The buyer should be given a copy of the **factory material schedule** in order to enlist cooperation from its side of the operations. However, at the end of the day, ensuring that the schedule is adhered to is the factory's responsibility.

Simultaneous with the **factory line plan** (step 16) and the **factory material schedule** (step 17), the factory must also start considering the trim items. In some cases, the buyer might actually provide sample trim (step 18). However, more often than not, the factory is responsible for all but the most esoteric trims.

Where the buyer does not provide sample trim, the factory must first determine trim needs. The buyer's sample is closely examined to determine what trims are required, who will supply these trims and the cost of each trim item. This information is entered on a **trim sheet** (step 19). Trim professionals do not first look at the sample and then write the information on a trim sheet. Professionals know that working from sample to trim sheet will inevitably result in missed items. Professionals start with a trim sheet form and then systematically check for each item on the sample.

The trim sheet includes almost all normal trim and packing items. There are also spaces available for more esoteric unlisted items such as frogs (Chinese buttons) or tulle. The following information is always included:

- Item name.
- Supplier name. This can be the name of a local or overseas supplier, the buyer, or even the factory – if the item is in stock from an old order.
- Supplier's quality name or size.
- Unit. This can be pieces, yards (or metres), pounds (kilograms), lignes, etc.
- Quantity. How many or how much per garment. In most cases an exact answer is available simply by looking at the sample; e.g. six buttons. In some cases, the quantity must worked out; e.g. 16" interlining. Finally, in some cases, the quantity can only be estimated; e.g. 1/20 cone of thread. In all cases, the quantity is based on either a single garment or one dozen garments, whichever is the factory's basic unit.
- Wastage percentage. Every unit is subject to wastage and this wastage must be accounted for when ordering the trim item.
- Total. This is the total number per garment (quantity + wastage). It does not matter if the item totals 0.0425 gross, as in 6 buttons plus 2% wastage divided by the basic button unit of one gross (144 pieces). These precise figures are used for cost purposes. Later on, when you actually order for stock, the quantities will be rounded off.
- Price. This is the supplier's price plus cost of transport, if any.
- Amount. This is the cost for one garment for each item.

Take a simple example: a plain shirt button

Item	Supplier	Quality	Unit	Quantity	Wastage (%)	Total	Price ($)	Amount ($)
Button	Schmidlap	4h16l OPP	Gross	0.041667	2	0.0425	0.75	0.038175

- The garment requires 6 buttons, 4 hole, 16 ligne, ocean pearly polyester;
- The supplier is Schmidlap Buttons;
- The standard unit for buttons is a gross (144 pieces);
- 6 pieces equals 0.041667 gross;
- Add 2% wastage – 0.0008333;
- Total required equals 0.0425 gross per garment;
- Cost is 75¢ per gross;
- Total amount per garment is 8.8175¢.

A factory owner operating 50 machines producing four styles of garments per month, and requiring about 50 trim orders during that month, might think this a great deal of work over very little. On the other hand, the factory owner operating 500 machines producing 40 styles per month and requiring 500 trim orders during that month will think this system very cost-effective. There's no need to mention the factory owner operating 5,000 machines producing 400 styles and requiring 5,000 trim orders during that month. Anybody operating 5,000 machines and producing 400 styles per month could not exist without this or a similar system.

Factory material schedule

#	Description	Day	Days required
1	Stock fabric approved	1	0
2	Colour standard sheet sent by customer	1	0
3	Colour standard sheet arrives in factory	6	5
4	Colour standard sheet sent by factory to mill	11	5
5	Lab dips (strikeoffs) requested	11	0
6	Lab dips (strikeoffs) received	16	5
7	Lab dips (strikeoffs) sent to customer	21	5
8	Lab dips (strikeoffs) approved	23	2
9	Salesperson sample fabric ordered	25	2
10	Salesperson sample fabric received	70	45
11	Salesperson sample fabric tested	75	5
12	Colour/size breakdown received	75	0
13	Customer L/C received	75	0
14	Director approves fabric purchase	75	0
15	Stock fabric ordered	75	0
16	Stock fabric paid for	75	0
17	Stock fabric received	120	45
18	Stock fabric tested	127	7
19	Stock fabric inspected	130	3
20	Final colour/size breakdown requested	131	1
21	Final colour/size breakdown received	134	3
22	Final colour/size breakdown checked against line plan	135	1
23	Final manufacturing order approved and fabric ready to cut	135	0

Trim sheet

Date _____
Style # _____
Description _____
Customer _____
Fabric group _____

Comments

Sketch or photo

Item	Supplier	Quality	Unit	Quantity	Wastage (%)	Total	Price ($)	Amount ($)
Lining								
Interlining 1								
Interlining 2								
Thread								
Button								
Snap								
Hook and eye								
Zipper								
Elastic								
Belt								
Shoulder pad								
Tape								
Lace edging								
Main label								
Content label								
Care label								
Hangtag 1								
Hangtag 2								
Hanger								
Foam								
Tissue								
Polybag								
Embroidery								
Total amount								

Trim approval sheet

Date _____ Style # _____ Description _____ Customer _____ Fabric group _____	**Sketch or photo**	

Once the **trim sheet** (step 19) is complete, **sample trim** is **ordered** (step 20). This trim is required not only for duplicates but, more importantly, to ensure that each trim item is of the correct quality and colour. In most cases, the factory is required to submit samples of all trim items, in all colours, to the buyer or its local agent.

After **sample trim** is **received** (step 21), one piece of each item in each colour is attached to the **trim approval sheet** (step 22) and sent to the customer. The trim approval sheet is a very simple form. Other than the basic style/customer data, and the ubiquitous sketch or photograph, it is totally blank. It is, however, made of durable cardboard as trim approval sheets get beaten up a lot. The factory will normally make two copies of the sheet.

The customer or their agent keeps one copy and returns one *signed* copy of the trim approval sheet to the factory, thus avoiding later disasters. The customer's returned trim approval sheet constitutes, **sample trim checked and okayed**, (step 23) and ends the trim procedures for Stage II.

Now back to the fabric.

We have a **factory line plan** (step 16) and the **factory material schedule** (step 17). Whether or not the customer is supplying fabric for making salesperson samples (step 24), since the factory must at some point buy the fabric, it must now calculate its fabric cost to the customer. Creating a **fabric cost sheet** (step 25) is an exceedingly complex process requiring a fair degree of skill and knowledge (see sample cost sheet provided in this chapter).

There are only two factors determining fabric cost: the yield (the quantity of fabric required to produce one piece or a dozen garments) and the per-yard cost of the fabric.

The first step is to make a marker (pattern pieces laid out in efficient manner) and calculate the precise marker yardage. The second step is to calculate the actual cost of the fabric itself including initial *cost of fabric*, followed by *processing* and *additional charges*.

Fabric can be purchased in several states. The easiest calculation occurs when the fabric has already been finished and is purchased on a cost, insurance and freight (CIF) basis; all *cost of fabric* expenses have already been included in the one price. If finished fabric has been bought on an FOB basis, the overseas freight and insurance must be added separately under the item *freight*.

But when fabric is purchased in loom state (greige), further processing is required before it can be cut into garments. This may include printing, dyeing and a variety of finishing processes. Each additional processing cost is added here. Obviously, whenever finished fabric has been purchased, the entire processing section is ignored.

Finance charges and *premiums* are the most complicated and controversial items, involving a number of permutations. The most common situation arises when the customer actually places the order for the fabric, which the factory in turn pays for. Since the price quoted to the customer does not include L/C charges or bank interest payments up to the time of garment shipment, the factory must somehow be reimbursed for these expenses. For this, the factory will add a finance charge, normally between 3%–5% of the value of the order, depending on the factory, the payment terms, and the length of time the factory must hold the fabric prior to garment shipment. Five per cent is fair. More is exorbitant.

The factory will also add a premium (*premium I)* to cover known losses with regard to the fabric. For example, if in the course of processing the fabric shrinks

5%, that loss must be made up somewhere. It is customary to include shrinkage in the cost of the fabric. Acceptable charges for added premiums should be worked out in some detail with the buyer in advance.

Besides the listed premiums, the factory will probably include other charges in *premium II.* The items covered here are not unreasonable, but they are hard to explain and justify to the customer. For this reason, they are generally kept hidden. They are closely related to the item *allowance II* which will be explained in some detail below.

So far, the equation goes something like this: *fabric + processing + additional charges = cost of fabric per yard.*

The *yield per garment* is simply the marker yardage. In addition, some basic allowances must be added. *Allowance I* includes several universally accepted items. First of all, there is basic wastage: after each piece of fabric has been cut, there will be a small uncut balance of perhaps two yards or less. With some fabrics, the leftovers can be used to cut additional garments; with others, piece-to-piece shading makes this impossible. In either case, a balance of small uncut pieces of fabric will always remain. The allowance can be anywhere from 2% to 5% for all wastage and damage depending on the factory, the nature of the fabric and the type of garment.

The problem with these calculations is that cutting floor realities are more complex than counting the number of remaining fabric pieces.

All fabric costings are based on two fundamental axioms:

- The apparel factory can charge its buyer only one price per yard for each fabric, regardless of the garment style.
- The same style must always take the same yardage, regardless of the fabric. (Provided the fabric widths are the same, both styles use the same paper patterns and no fabric has yarn-dyed or printed designs requiring special matching.)

The problem with these axioms is that there are a large number of exceptions. These exceptions are the basis for fabric cost *premium II* and garment yield *allowance II*. As soon as two or more styles are produced in two or more fabrics, we immediately see where these axioms fail.

Let's take the example of a blouse and a dress, each cut first in a silk fabric, then in a polyester fabric.

1. Style 1 is the blouse. It takes two yards of fabric including normal wastage but excluding damage.
2. Style 2 is the dress. It takes three yards of fabric including normal wastage but excluding damage.

A. 100% silk charmeuse fabric, 44" width: $10.00 per yard including finance charges and normal shrinkage but excluding damage.

B. 100% polyester fabric, 44" width: $3.00 per yard including finance charges and normal shrinkage but excluding damage.

1A. Charmeuse blouse – $20.00 total fabric

1B. Polyester blouse – $6.00 total fabric

2A. Charmeuse dress – $30.00 total fabric

2B Polyester dress – $9.00 total fabric

So far, so good. The factory's difficulty arises when it starts calculating the rate of damage, which is very different between silk charmeuse and polyester. For silk charmeuse 10% damage is not unreasonable; polyester damage should be under 2%.

Furthermore, this damage rate is not constant. Because dress pattern pieces are longer than blouse pattern pieces, cutting away a fabric damage may require 1.75 times more fabric for a dress than for a blouse.

Take the hypothetical example of a piece of fabric with a barre shading line every yard. In the case of the blouse, the probable yield would be 3 yards. The damage rate for the blouse would therefore be 33%.

However, in the case of the dress, the damage rate would be 100%. Because a barre line exists every yard and the dress pattern pieces are longer than a yard, it would be impossible to cut even a single dress from the roll of fabric. Of course, a 50-yard piece of fabric with 50 damages would not be accepted in the first place. Nevertheless, even if the piece had only eight barres, the damage rate for the dress would still be 1.75 times higher than for the blouse.

Go back to the original estimates (silk = 10% damage, polyester = 2% damage) and now add the fact that the dress damage is 1.75 times the blouse damage or 17.5% damage. In order to reflect the realities of trying to use the damaged fabric for cutting dresses, it now appears that the fabric cost has changed by $0.75 per yard depending on whether we are cutting the blouse or the dress:

1A. Charmeuse blouse – 2 yards x $11.00 = $22.00

1B. Polyester blouse – 2 yards x $3.06 = $6.12

2A. Charmeuse dress – 3 yards x $11.75 = $35.25

2B. Polyester dress – 3 yards x $3.06 = $9.18

But there is no way the factory can charge the customer $0.75 per yard more for the same fabric. The customer would not stand for it. So the factory has only two alternatives – it can fudge the entire costing and hope the customer does not ask too many questions, or it can keep the price constant and increase wastage in the yardage. However, in that case, the factory runs into another problem.

2A. Charmeuse dress – 3.205 yards x $11.00 = $35.25

2B. Polyester dress – 3.0 yards x $3.06 = $9.18

Now unless the customer understands the factory's realities, the factory has to explain why the same dress takes only 3 yards in solid polyester but 7 inches more in solid silk charmeuse.

The factory's calculations are further complicated by other factors. Not only is the damage rate greater for a dress than for a blouse, but so too is the wastage rate. A leftover piece of 2.5 yards can still be cut into a blouse; for a dress, however, it is a total loss.

In the final analysis, these differences must be accounted for, either in the yield or in the price per yard. The decision of whether to add to the cost premium or to the yardage allowance is made by the factory. The factory should try to be consistent wherever possible.

The yields, including all allowances, are then added to the **factory line plan.**

Fabric cost sheet

Date _____

Fabric _____

Customer _____

Fabric group _____

Style #	_____	Marker Yardage	_____	Yield	_____
Style #	_____	Marker Yardage	_____	Yield	_____
Style #	_____	Marker Yardage	_____	Yield	_____
Style #	_____	Marker Yardage	_____	Yield	_____

Cost of fabric		
FOB cost	_____	_____
Freight	_____	_____
Other	_____	_____
Subtotal		_____
Processing charges		
Dyeing/printing cost	_____	_____
Finishing cost	_____	_____
Other	_____	_____
Subtotal		_____
Additional charges		
Finance charge	_____	_____
Premium I	_____	_____
Premium II	_____	_____
Subtotal		_____
Final fabric cost per yard		_____
Calculated yield/garment	_____	_____
Allowance I	_____	_____
Allowance II	_____	_____
Total		_____

If the customer has not provided the sample fabric, the factory will now **order sample fabric** (step 26). Once the **sample fabric** is **received** (step 27), it is inspected.

Now we turn to fabric colour and design. Even before **receipt of sample and data** (step 15), the factory has received the **colour standard sheet** (step 4). As you recall, these are the colours the designer has selected for the fabric.

The factory retains a small portion of the designer's colour swatches and sends the balance to the mill to replicate (step 28). The mill returns its version of the desired colours in the form of small swatches of approximately four inches square (10 cm^2) called – in the case of solid dye fabric – **lab dips** (step 29). Normally the mill will provide two or three lab dips for each colour. Usually the difference between these lab dip versions is minute.

Where the designer is using yarn-dyed or printed fabric, the mill's replicates are known as strikeoffs. The mill usually sends only one strikeoff for each colourway. The strikeoff should include a full repeat of the pattern. The lab dips (or strikeoffs) are attached to the **lab dip approval sheet** (step 30).

Finally, where the same colour or colourway is required for different fabrics, as in the case of matching silk blouses and wool skirts, special precautions are required. The most important goal is that the silk blouse colour and the wool skirt colour be as near identical as possible. The factories making garments should not match lab dips against the designer's colour standard. It is not uncommon that both fabrics will appear to be identical to the designer standard, but will not match each other. In this instance, a different series of operations occurs:

- ❑ The factory producing the garment using the fabric with the slowest delivery submits lab dips for approval – in this case the wool skirt.
- ❑ Once the lab dip has been approved, the skirt factory orders the stock wool fabric.
- ❑ The blouse factory is sent a swatch of the stock wool.
- ❑ The blouse factory submits lab dips using the stock wool as the standard.
- ❑ The blouse factory dyes stock silk fabric.

This way, even if neither fabric matches the original colour standard, at least they will match each other.

The factory now **sends the sample fabric and lab dips for customer approval** (step 31). The customer hopefully approves the sample fabric (step 32) and the lab dips (step 33).

Stage II of the materials sourcing process requires a great deal of time, effort and cost. The factory's goal is to ensure the customer approves the trim (step 23) and the sample fabric and lab dips/strikeoffs (step 32 and 33). Failure at this point requires the work be repeated and almost inevitably results in late stock delivery.

Buyers will pay more to a good factory – a factory which almost always carries out Stage II operations successfully.

Lab dip approval card

Customer _____ Fabric group _____ Colour		_____ Colour
Colour		Colour

Chapter 6

The material sourcing process – stage III: salesperson samples

If your buyer is a retailer or a private label importer, you can skip this chapter. However, if your buyer is an importer selling to multiple retailers or selling the same styles in multiple markets, you are stuck.

Your buyer will require salesperson samples. Unlike previous duplicates, these must be produced in the correct fabric and in the correct colours or colourways, and therein lies the problem. To source fabric for this buyer, the factory must find a mill willing to produce one piece (50 yards) of each colour or colourway in advance of receiving an order for stock fabric.

Mills have minimums – the smallest quantity acceptable for an order. Most minimums are set by the mill sales department to avoid small and therefore unprofitable orders. However, some minimums are technical. Most modern dyeing machines operate on a batch dyeing principle. They are built to dye a specified weight of yarn or fabric. Dyeing 25 lb of fabric in a 250 lb machine is almost impossible. Yarn-dyed fabrics require warping and sizing before weaving can begin. Using standard warping/sizing machines for sample fabrics is simply not done.

If your buyer requires salesperson samples, you must find mills with sample dyeing and weaving equipment. The good news is that almost all modern mills have these sample fabric facilities. The bad news is that the mill will probably not want to use these facilities for your orders. Mills do not have sufficient sample-making facilities for all their customers.

Consequently, fabric sample making is reserved for either longstanding customers who provide orders every month, or the giants who provide giant-sized orders. The moderate-sized factory which requires one piece each of four patterns each in three colourways, and if all goes right might place a stock order for 9,000 yards (3,000 yards of each pattern) is greeted with all the joy reserved for the bearer of the bubonic plague. Be prepared for the inevitable lies and evasions:

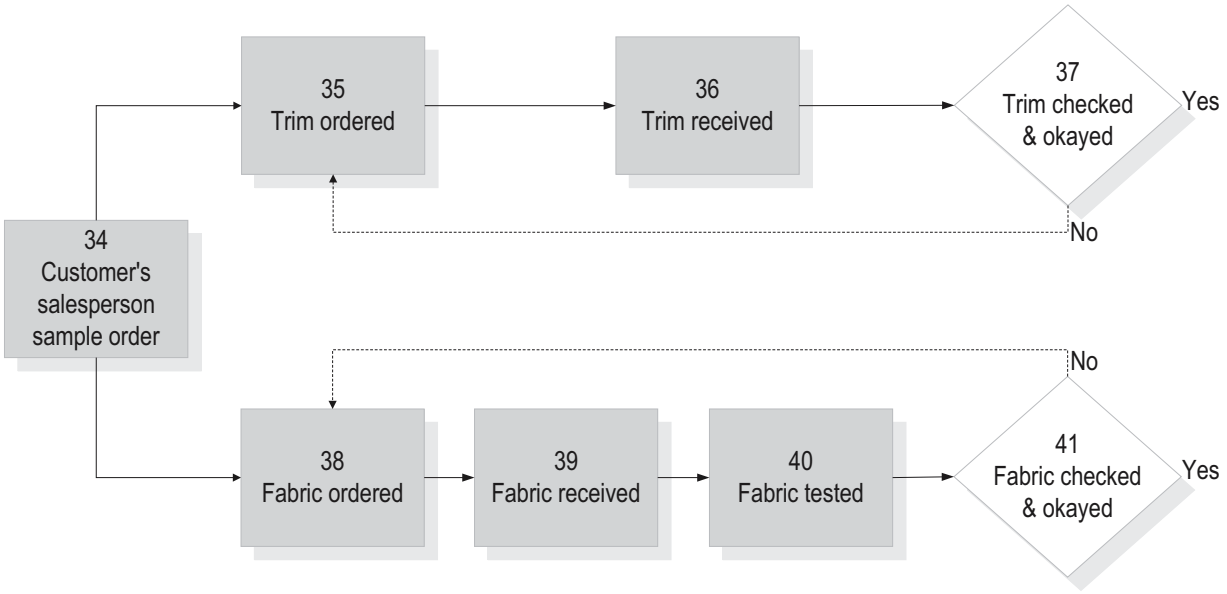
Sorry, we do not have any sample fabric-making facilities, says the mill salesperson while leaning against a sample warping machine.

We insist that all customers place a minimum order of 3,000 yards per pattern from which we will pull 50 yards. This statement is nonsense. Any mill operating under these restrictions would have bankrupted every one of its customers years ago. Without customers, the mill would have gone out of business.

We can provide 50 yards of each colourway, but we need three months' lead time. Another great piece of nonsense. No customer can wait that long for salesperson samples.

Either you have to convince the mill to provide salesperson sample fabric on a timely basis, or find another mill. So how do you convince the mill to produce your fabric? Chapter 13, The art of fabric sourcing, deals with this dilemma.

Stage III: Salesperson samples



Once you have convinced the mill, the steps required to source salesperson sample fabric and trim are deceptively easy. Getting the process right is more difficult.

Understand the problem from the buyer's side. At the point when the buyer receives your salesperson samples, it has no commitment to your styles. The buyer hasn't sold anything yet. The buyer can walk away from both you and your styles with no qualms whatsoever. As a matter of fact, if you are one of its new factory suppliers, the salesperson sample process is a final exam which you, the factory, may either pass or fail. Ship late or ship bad goods, you fail and the buyer walks away.

Understand the process from the buyer's side. Its selling season begins on a specified day. Usually the buyer's most important customers see the collection first. If your samples do not arrive on time, your samples cannot be shown to your buyer's most important customers. Your buyer will drop the style. Likewise, your buyer faces real competition. To satisfy its customer, every style must be a jewel. Samples that look only nice will be rejected from further consideration from day one.

Your buyer understands these realities and has taken them into consideration when placing sample orders. The buyer knows that some samples will arrive a day late and will therefore be discarded. It knows that some samples will not look good and will be discarded. In fact, the buyer knows that some suppliers will not perform as required and it is quite content to place those suppliers on the same discard heap as the other rejects.

Getting the salesperson samples right is more important than getting the stock order right. After all, by the time you are ready to ship the stock order, your buyer has taken orders for your styles. It has a commitment to you and your orders. If your buyer cancels, it loses existing sales.

Three points to remember:

- The salesperson sample fabric must be 100% correct in both quality and colour.

- ❑ The salesperson sample garments must be in the buyer's possession on or before the due date, even if your cousin Phil has to hand carry them from Phnom Penh to 1407 Broadway, New York.
- ❑ There is no room for error.

If you are not prepared to take responsibility, do not commit for salesperson samples, even if it means losing the buyer.

As far as the process is concerned, the steps are relatively easy.

The buyer is already aware how much time you need for the salesperson sample process. It has received your **factory material schedule** (step 17). The buyer in turn sends you its **customer's salesperson sample order** (step 34). Read this carefully. If for any reason you cannot meet the requirements or the delivery date, notify the buyer at once. Your buyer will almost certainly cancel, but it will respect you for your professionalism and will almost certainly come back again.

Assuming you can commit, you place your **salesperson sample trim orders** (step 35) and your **salesperson sample fabric orders** (step 38). Ensure that the mill and the trim suppliers understand precisely what you need.

Visit the mill if you can – particularly if this is a new and untried relationship. Visiting the mill may avoid your being introduced to mill excuse #146. *I am sorry, we did not think that you actually required your precise colour, sky blue. We substituted the closest colour available, gangrene yellow. I can assure you, philosophically they are nearly identical*.

The **salesperson sample trim is received** (step 36). The **salesperson sample fabric is received** (step 39).

Send the salesperson sample fabric out to be tested. **salesperson sample fabric testing** (step 40) is not a required step. It is also costly. However, it is also a great investment. You are testing for fabric flaws that are not immediately apparent, such as dimensional stability, crocking or pilling. This is a very complex subject and is covered in detail in chapter 8. Salesperson samples only have to look right. Your buyer does not care if the salesperson sample dissolves the first time it is washed. However, it will care if its stock dissolves in water. This is a good opportunity for you to anticipate problems and a great opportunity for you to show your buyer that you are a supplier who anticipates problems.

If the fabric does have problems, this is the time to either solve those problems or to recognize that some problems are insoluble. Nylon meshes such as organza will not pass slippage tests. Black spun silk fabrics will not pass tests for colourfastness. These and similar problems are without solution. In the first instance, the buyer must change either the mesh fibre content or weave; in the second case, the black silk broadcloth could be changed to midnight blue silk broadcloth.

At this point you carry out **salesperson sample trim inspection** (step 37). If the trim is wrong, you may have time to replace the incorrect item. You may just have enough time to have a zipper specially dyed or interlining replaced with another quality. In short, returning to **salesperson sample trim ordered** (step 35) is a possibility.

Unfortunately, the same will not be true for fabric.

Salesperson sample fabric inspection (step 41) is more like an autopsy – trying to understand why the patient died. There are exceptions. Fabric with excessive damages or width-to-width shading can be hand cut to avoid or at least minimize the problem. (In both cases, you the factory immediately notify

the buyer.) However, these are the exceptions. For the most part, if the salesperson sample fabric is wrong when it arrives, you have lost the order, and perhaps the buyer as well.

In the final analysis, working with customers requiring salesperson samples is not everyone's cup of tea. Those factories that have mastered the requirements are usually very professional and very much in demand by customers. They invariably charge a premium price and customers pay this premium because there are very few factories capable of meeting the necessary requirements.

Chapter 7

The material sourcing process – stage IV: ordering stock materials

You are now ready to order stock fabric and trim. Before placing the orders, check back to see that everything is ready:

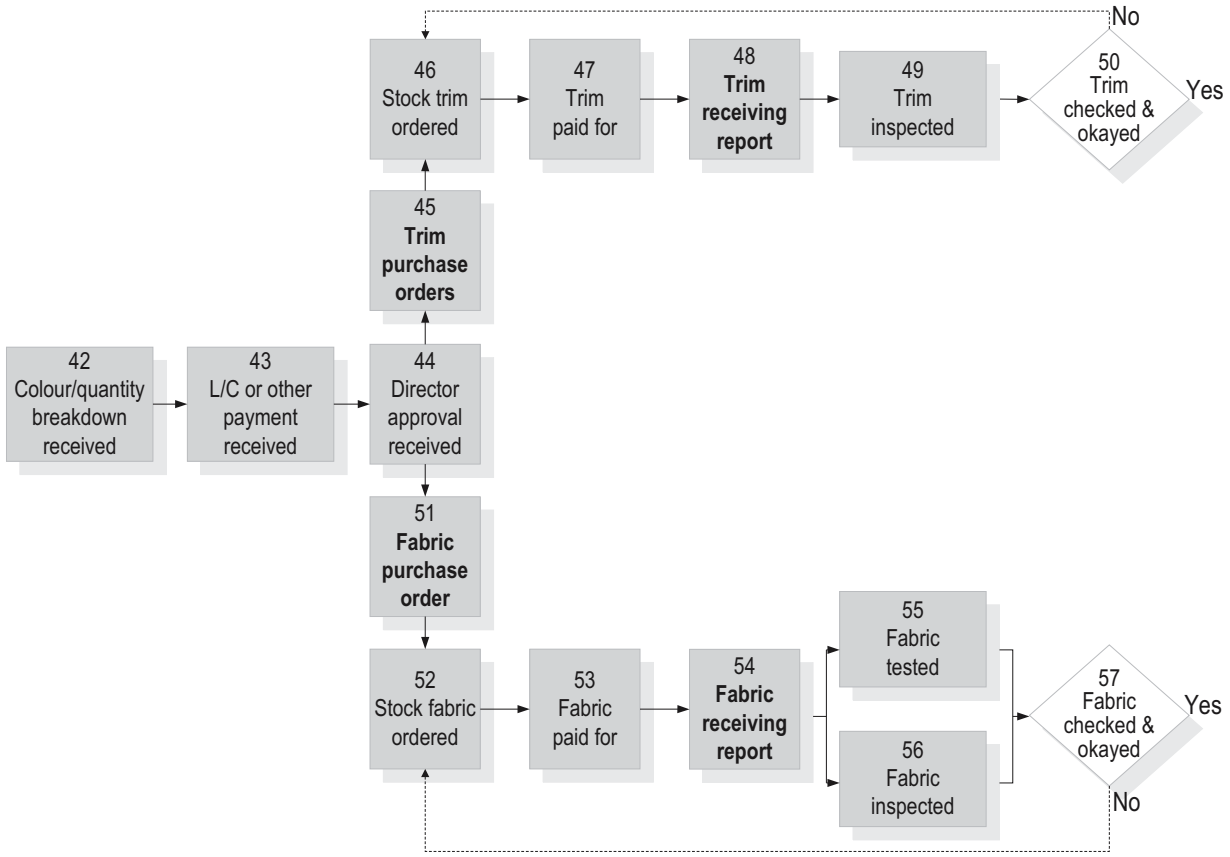
- ❑ **Sample trim approval sheet checked and okayed** (step 23);
- ❑ **Sample fabric checked and okayed** (step 32);
- ❑ **Lab dips checked and okayed** (step 33).

At the same time, staff members in other departments will have been responsible for ensuring that:

- ❑ The customer has received and approved the factory's duplicate pre-production garment sample;
- ❑ The customer has approved final fit corrections;
- ❑ The customer has agreed to the FOB price of the garment or garments;
- ❑ The customer has agreed to the quoted delivery date;
- ❑ The customer has provided a valid purchase contract or similar document.

While these are all necessary steps to the overall pre-production work, they do not directly concern the materials sourcing department. As far as this department is concerned, as soon as the customer carries out two final steps, fabric can be ordered.

Stage IV: ordering stock materials



First of all, your customer must send the quantities assorted by colour for each style in the fabric group. This is the **colour/quantity breakdown** (step 42). The data is entered into your **factory line plan** (step 16) which in turn allows you to calculate the number of yards (metres) required in total for each colour.

Let's say, for example, that your customer Schmidlap Mart has a fabric group named **fancy cotton twill** out of which four styles in four colours each is planned. The customer has given you its **importer's line plan** from which you have extracted the colour/quantity breakdown.

Colour/quantity breakdown						
Fabric name	Fancy cotton twill					
Fabric supplier	Greater universal					
Customer and season	Schmidlap Mart/Autumn 05					
Date	01-Aug-04					
Style	**Description**	**Dirty beige**	**Burnt orange**	**Aubergine**	**Poison green**	**Total pieces**
1001	Casual jacket	800	600	300	150	
1002	Trousers	1 200	1 450	890	700	
1003	Short skirts	650	490	870	2 107	
1004	Long skirt	1 250	1 100	800	630	
Total pieces		**3 900**	**3 640**	**2 860**	**3 587**	**13 987**

You now know the colours and quantities for each style in the group. You will also have already worked out the fabric yields for each style in your **fabric cost sheet**. With this information you can compute the total fabric requirements for each style and colour. This is all the data required for your **factory line plan**. Based on the sample **factory line plan** shown below, you will require 20,508 yards of fabric broken down as follows:

Colour name	Quantity (yards)
Dirty beige	6 045
Burnt orange	5 614
Aubergine	4 164
Poison green	4 686
Total	**20 508**

Factory line plan

Fabric name _____Fancy cotton twill
Fabric supplier _____Greater universal
Customer and season _____Schmidlap Mart/Autumn 05
Date _____01-Aug-04

Style	Yield (yards)
1001	1.80
1002	1.45
1003	1.10
1004	1.72

SKETCH OR PHOTO

Style # _____1001
Description _____Casual jacket

Colour name	Units	Quantity (yards)
Dirty beige	800	1 440
Burnt orange	600	1 080
Aubergine	300	540
Poison green	150	270

SKETCH OR PHOTO

Style # _____1002
Description _____Trousers

Colour name	Units	Quantity (yards)
Dirty beige	1 200	1 740
Burnt orange	1 450	2 103
Aubergine	890	1 291
Poison green	700	1 015

SKETCH OR PHOTO

Style # _____1003
Description _____Short skirt

Colour name	Units	Quantity (yards)
Dirty beige	650	715
Burnt orange	490	539
Aubergine	870	957
Poison green	2 107	2 318

SKETCH OR PHOTO

Style # _____1004
Description _____Long skirt

Colour name	Units	Quantity (yards)
Dirty beige	1 250	2 150
Burnt orange	1 100	1 892
Aubergine	800	1 376
Poison green	630	1 084

Colour name	Quantity (yards)
Dirty beige	6 045
Burnt orange	5 614
Aubergine	4 164
Poison green	4 686
TOTAL	**20 508**

Prudent factory managers will now notify the customer, in writing, of the total fabric colour/quantity breakdown and explain the following: ***Once fabric and trim have been ordered, further changes to the customer's line plan are still possible. However, these changes may result in added costs.***

In short, you are telling the customer: *You asked for it, you have to eat it*. The reasons for making this clear now will become evident in the last stage of the material ordering process. (See chapter 9.)

The final step is to ensure that your customer's **L/C has been received** (step 43). (In the event payment is by other means than L/C, it is only necessary that a director have agreed to that payment and that whatever mechanism required for that payment be in place.) You then go to your boss to **receive director's approval** (step 44). You are now ready to order your stock trim (see chapter 10) and stock fabric. Although the steps and procedures for ordering stock fabric and trim are similar and can occur concurrently, in fact, ordering stock fabric almost always occurs first as it takes more time to produce the fabric. For our purposes, we will deal with stock trim first. The steps involved are:

Stock trim purchase order issued	(step 45)
Stock trim is ordered	(step 46)
Stock trim is paid for	(step 47)
Stock trim is received	(step 48)
Stock trim is inspected	(step 49)

Trim inspection is not as rigorous as fabric inspection, but several procedures are nevertheless required:

- Where colour is a factor, you must ensure that the particular trim item – lining, thread, tapes, zippers, etc. – matches the fabric. Problems will occur even with the most reliable trim suppliers:
  - Your stock fabric may be of a slightly different shade than your lab dips. It is quite possible that while fabric colour may still be within the accepted range, it no longer matches your trim.
  - Dye lot variations do occur in linings and even occasionally in thread. The colour shown on your lining supplier's colour card may be identical to your fabric, but the lining colour received may have a different cast or shade, even though it is marked with the same colour number.
  - The supplier may simply have made a mistake.
- Ensure that trim qualities are the same as those on your trim approval sheet. Although leading international trim suppliers are very reliable, all too often their local agents fail to live up to the required standards.
  - You have access to a series of tools to assist you. For example, you should have a micrometre to ensure that polybag specifications are correct. If you have ordered 2.5 mm, you will need a micrometre to ensure you have not received 2.25 mm.
  - Items such as thread, zippers and interlining must be of international standard and produced by well-known companies. You will not be able to test thread or interlining standards in your factory, so your best guarantee of quality is in the name on the label. A universally recognized reputable supplier such as Freudenberg may charge fractionally more for its interlining than Schmidlap, but Freudenberg interlining will not bubble if correctly applied.
  - Beware of locally dyed trim. YKK, another undisputed reputable supplier, will dye your zippers to match your exotic fabric colours and you will sleep

soundly knowing that the zipper colour will not run, fade, or in some other way lead you to disaster. You cannot say the same for Schmidlap Zipper Dyers located down the block.

- ❑ Read every label, every hangtag, every item with writing. Misspelled words, missing letters or words, or letter transpositions, occur frequently. Often the mistakes go unnoticed. However, when errors do come to light, the consequences can be disastrous.
- ❑ When in doubt, confer with your customer. The customer always appreciates a careful supplier.

Stock trim checked and okayed (step 50) is the next procedure. This is different from the preceding **trim inspection** (step 49) and is crucial to your factory operation. Here you want to answer two questions:

- ❑ Have I received every trim item required for this style or fabric group?
- ❑ Have I received the quantity ordered for each trim item?

Without a resounding 'Yes' to both of these questions, at some point you risk hearing comments like these:

Sorry, we cannot begin production because we are missing the care label.

We must shortship 600 units because we have run out of tape.

Fabric purchases follow the same general rules as trim:

Stock fabric purchase order issued	(step 51)
Stock fabric ordered	(step 52)
Stock fabric paid for	(step 53)
Stock fabric received	(step 54)
Stock fabric inspected	(step 56)[6]

Fabric inspection is one of the single most important steps in the entire garment manufacturing process. Reliable factories will devote more time and effort to fabric inspection than to garment inspection because fabric problems are usually generic, rendering all garments rejects.

The process begins with a fixed percentage (usually 10%–15%) of the fabric examined on an inspection machine. This is usually a simple apparatus where a fabric piece (usually 50 yards or metres) is run from one roll at the top or back of the machine to a second roll located at the bottom. At the front is a flat lit surface where the actual fabric is examined as it passes over.

The inspector looks for common fabric flaws such as tears, holes, cuts, variations in yarn twist, and yarn deformities such as slubs and heavy yarns. The inspector will also look for more subtle but equally serious damages such as bowing, where weft yarns are arched rather than running straight from one selvage to another, as well as barre shading, where uneven weft yarns result in horizontal bars of lighter and darker colour.

Prints and yarn-dyed patterns have their own problems where the shape of the pattern may be deformed or the pattern poorly printed. The inspection machine will also automatically measure the length of the fabric. Knit fabrics, lightweight wovens or those produced of soft yarns should be inspected on a tension-free machine which ensures that the act of pulling the fabric from one roll to another does not stretch the fabric.

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6 Step 55, **Stock fabric tested** requires a chapter in itself. See chapter 8.

When a piece of fabric is found to have generic flaws such as barre shading, bowing or poor printing, the entire piece is rejected. When individual flaws are found, such as slubs or tears, the number of flaws and their position is marked by placing a thread or sticker at the selvage. If the number of such flaws is found to be excessive, the piece is rejected.

In the event that one piece has been rejected, the percentage of the fabric order to be inspected automatically rises to 25%, then 50% with the second rejected piece. If four pieces have been rejected, the entire order must be inspected.

This process will catch most but not all damages. A second stage inspection is carried out when the fabric is spread on the cutting table prior to cutting. The cutting table is an excellent surface for inspection. It is very long – 10 to 30 yards – and very well lit. Cutters will look not only for flaws missed by the fabric inspectors but also for other damages which are not visible during the first inspection process.

For example, edge-to-edge shading involves differences between the fabric colour closest to the left-hand selvage and the colour at the right-hand selvage. This is a serious fabric defect in that even small colour differences become very apparent when seen in the finished garment. End-to-end shading (in the length) is also a potential problem although not as serious as shading in the width.

End-to-end shading can be minimized if you are aware that it exists. In a normal marker, you might lay out 12 garments putting all the sleeves together, the shirt fronts together, the collars and cuffs together, and the shirt backs together. This marker may have the sleeves from one garment located 18 yards away from the garment back for the same garment. If you have end-to-end shading, the garment back will be a different shade than the sleeve. The solution is to make your marker of 12 garments but with each garment in turn laid out complete. The consumption may be more but the distance between pieces going in the same garment will be no more than 54" – not enough for end-to-end shading to become apparent.

Up to this point, excessive damages can be charged back to the mill, or if necessary, the entire fabric shipment can be returned to the mill. As the fabric has not been cut, the factory has no financial liability.

Third stage fabric inspection, also known as panel inspection, occurs after cutting. Some 10% of all cut-piece bundles are opened and garment panels are placed adjacent to each other as they would be when sewn together (for example, a shirt front is placed seam-to-seam next to the shirt back). Occasionally very subtle fabric damages become apparent at this stage. While it is now too late to penalize the mill, the factory can still avoid becoming involved in a lengthy and costly confrontation with its customer by absorbing the loss instead of going ahead and producing the finished garments which would inevitably be refused. In the end, keeping the customer is more important.

The advantages of panel inspection are clear. Problems found at the bundle stage are almost always costly. Often you will have to throw out at least part or even the entire cut lot. However, this is still less expensive than eventually throwing out the entire sewn lot (which is what will occur if you sew the damaged goods) and far less expensive than throwing out the buyer (which is what will occur if you ship the damaged goods).

You might even be lucky. The problem may be the result of poor sorting and bundling. Sometimes garment pieces from two plies (fabric layers) are mistakenly put into a single bundle, with the result that each successive bundle has one wrong piece. In theory, the head of bundling will find the error at the

end, along with the last bundling which is missing a left sleeve. The most cost-effective solution here is to re-sort the lot and throw out the department head.

Finally, the factory may carry out some basic tests in-house rather than using an outside testing lab. Most common is shrinkage inspection. Factories producing jeans and other heavy cotton twill trousers face special problems as denim and twill shrinkage is very difficult to control. Reasonable shrinkage of 2% will result in a loss of 3/4" in the trousers length, a substantial and unacceptable difference. The only solution is to inspect every fabric piece for shrinkage, to segregate fabric pieces into specific groups and to grade patterns to account for the shrinkage of each specific fabric group.

Once the inspection process is complete, all that remains is to decide on your conclusions for **stock fabric checked and okayed** (step 57). If the fabric is unacceptable, return it. If the fabric has excessive damages but can still be cut, notify the customer and the mill. Both must agree on the degree of damages and the mill must cover the loss. If the fabric is deemed acceptable, you are now ready for the final stages preceding actual garment production.

Chapter 8

Textile testing[7]

Consumers today, more than ever before, are better educated and more demanding regarding quality in all their purchases. Textiles, apparel and home furnishings are no exception. Appropriate testing is imperative in setting and maintaining quality levels of merchandise.

Testing allows us to verify that raw materials are the correct quality, and to measure the characteristics of materials and finished products so that they may perform satisfactorily for a particular end use. It is critical that a buyer be able to verify that the materials ordered are the materials that were actually used in garment production, and that the fabric and components selected will be suitable for a particular type of garment. The everyday stresses that are imposed on garments and home furnishings affect the choice of materials to be used.

Testing also allows us to see how well a product measures up to the competition. Testing particular properties of a known brand against a new product establishes a benchmark for comparison. This can be done through laboratory testing as well as user trials.

When making claims regarding properties or characteristics of a fabric or garment, testing is essential in supplying data to substantiate the claims being made. Before a manufacturer or retailer sells a garment that is 'waterproof', the garment must definitely be waterproof or risk facing customer dissatisfaction, in turn resulting in returns and financial loss. Buyers and sellers also rely on testing data when investigating causes of failure when settling disputes regarding quality or performance of goods.

One of the most important objectives of testing is to ensure compliance with regulatory and industry standards. There are federal and state regulations enforced in the United States and other countries around the world specifically relating to textiles and apparel. Retailers and manufacturers who fail to comply with government regulations face severe financial penalties, product recalls and liabilities. Retailers and manufacturers who fail to meet the expectations of their consumers face returns, loss of sales, loss of customers, and damage to their reputation. To avoid this, some large department stores, mass merchants, mail order companies and buying offices have established their own internal performance standards as a tool to provide merchandise acceptable to their customers.

For the most part, textile testing is performed in a laboratory using specialized machinery and equipment, utilizing test methods and standards developed by the textile industry. There are several technical and scientific organizations that are leaders in establishing and publishing test methods for testing textile materials. In the United States, the American Association of Textile Chemists and Colorists (AATCC) publishes a manual that deals mainly with testing dyed and chemically treated fabrics. The American Society for Testing and Materials (ASTM) specializes in physical properties of fibres, yarns and fabrics, such as tensile strength, pilling and abrasion. The International Organization for Standardization (ISO) deals with standards for the international market and is striving toward globally accepted standards.

7 Contributed by Lou Ann Spirito, Société générale de surveillance (SGS).

Currently, different countries each have their own standards, methods and regulations, which makes it difficult for global companies which are shipping to various countries around the world. These organizations are composed of committees of volunteer industry experts who propose and write new test methods as they are needed and who constantly review and update existing methods in order to be current with new developing textile technologies.

As production for a global market increases, the establishment of a unified world testing and regulations standard has become increasingly desirable. Depending on the destination country, and on the specific retail buyer, there are numerous different regulations and testing bodies that currently provide test methods. Technical performance regulations are generally established and enforced by the buyers, while the health and safety issues are generally mandated by government agencies.

The ISO methods are an attempt to globalize standards; however, countries continue to resist giving up their individual national standards. The following list contains national standard organizations in use today. Retailers selling across continents commonly adapt the standards and regulations of the country that has the most stringent requirements for each particular test. For example, a retailer selling the same garment in the United States and Japan would implement the Japanese formaldehyde requirements as they are higher than those of the United States.

Australia (AS); Canada (CAN/CGSB); Japan (JIS); Germany (DIN); United Kingdom (BS); European Union (EN, CEN); United States (AATCC, ASTM).

In order to demonstrate the scope of textile testing in a specific market, a broad and in-depth review of test methods commonly requested by United States retailers and manufacturers of merchandise for the United States market is presented on the following pages. (Flammability, fibre content and care labelling are mandatory requirements of the United States Government.)

Since quality is not something that can simply be added at the end of the process, it is essential that materials be tested at various stages throughout the production cycle. A manufacturer that buys fibre to spin yarn and then weaves or knits the yarns into fabrics, which are then cut and sewn into garments, must test in the following sequence:

- Fibre – dimensions, content, moisture, etc.
- Yarn – size or denier, twist per inch, evenness, strength, etc.
- Fabric construction – weight, thread count, weave type, etc.
- Fabric properties – dimensional stability, colourfastness, strength, pilling, abrasion, etc.
- Fabric inspection – visual examination for defects, damages, colour shading, etc.
- Garment – test in pre-production stage for measurements, dimensional stability, appearance after washing, seam strength, etc.
- Garment – test in early production to ensure that all sample components and operations are acceptable in mass production, before entire production is completed, etc.
- Garment – post-production testing can be done to confirm that corrections requested were actually made during production, etc.

If testing is prolonged to the post-production stage and shrinkage is high or colourfastness is poor, the opportunity to make corrections is lost. Therefore, it is critical to detect failures early in the cycle in order to take corrective action.

Most countries impose civil or criminal penalties, fines and recalls of merchandise when found in violation of the country's laws. Below is an example of mandatory regulations and requirements illustrating similarities and slight differences in requirements that apply to garment components sold in different countries.

General testing requirements for major apparel markets						
	Requirements					
Mandatory tests	**United States**	**Canada**	**United Kingdom**	**Europe**	**Australia**	**Japan**
Fibre labelling						
• Single fibre content	No tolerance	No tolerance	No tolerance	No tolerance		No tolerance
• Multiple fibre content	±3%	±3%	±3%	±3%	–	Comply with Japan fibre labelling rule
Flammability						
• Children's Sleepwear (United States and Canada)	CFR 1615/1616	Comply with Children's sleepwear reg.	–	–	Requirement based on AS/NZS 1249	–
• Wearing apparel	16 CFR 1610	Time of flame spread, plain surface >3.5 seconds. Raised surface >4.0 seconds	–	–	–	–
• Nightwear	–	–	Comply with nightwear (safety) regulations 1985	Sweden: time of flame spread more than 5 seconds	–	–
Care labelling						
Dimensional stability (shrinkage)						
(a) Washing (1)	After 3 or 5 washes	After 3 or 5 washes				
• Woven Warp and weft (2)	-3.5%/+3.0%	-3.5%/+3.0%	-4.0%/+3.0%	-4.0%/+3.0%	-3.5%/+3.0%	
• Knit Length and width (2)	±5.0%	±5.0%	±5.0%	±5.0%	±5.0%	
(b) Drycleaning						
• Woven Warp and weft (2)	±2.5%	±2.5%	±2.5%	±2.5%	±2.5%	±2.0%
• Knit Length and width (2)	±3.0%	±3.0%	±3.0%	±3.0%	±2.5%	±3.0%
Colourfastness						
• Washing						
Colour change	4	4	4	4	4	4
Colour staining	3	3	3-4	3-4	3-4	3-4
• Drycleaning						
Colour change	4	4	4	4	4	4
Colour staining	4					4
• Chlorine change Colour bleach	4	4	4	4	4	4
• Non-chlorine bleach Colour change (3)	4	–	–	–	–	–
Garment appearance						
• Retention after washing or dry cleaning	No noticeable shape distortion nor colour change	No noticeable shape distortion nor colour change	No noticeable shape distortion nor colour change	No noticeable shape distortion nor colour change	No noticeable shape distortion nor colour change	No noticeable shape distortion nor colour change
Durable press rating (4)	3.5	3.5	3.5	3.5	3.5	3.5

(1) The requirement may vary with different fabric structure and fibre content.
(2) (+) sign means extension, (-) sign means shrinkage.
(3) Non-chlorine bleach test is employed only for United States care labelling recommendation.
(4) Durable press rating is valid only when fabrics are treated with a chemical finish or wrinkle-free claims are made.

Component part test conditions comparison for United States/Europe/Canada				
Country		**United States**	**Europe**	**Canada**
Tests	Age (months)	CPSC 16 CFR Part 1500/ASTM F963-96a	EN71: Part 1: 1998	Canadian hazardous products (toys) regulations, CPC, c931
Small parts	0 to 36	Parts shall not fit within small part cylinder under its own weight before and after abuse tests	Parts shall not fit within small part cylinder under its own weight before and after abuse tests	Parts shall not fit within small part cylinder under its own weight before and after abuse tests
Sharp points and sharp edges	0 to 36	Must not include a hazardous point or edge	Must not include a hazardous point or edge	Must not include a hazardous point or edge
	>36 to ≤168	May contain a functional point or edge if labelled (ages 4 and up)	May contain a functional point or edge if labelled (ages 3 and up)	Must not include a hazardous point or edge
Tension test	0 to 18	10 lb (44.5 N) tension for 10 seconds	Dimension ≤6 mm, 50 N (11.2 lb); Dimension >6 mm, 90 N (20.2 lb); 70 N (15.7 lb) for seam of soft toy	10 lb (44.5 N) for all parts exclude eye/nose; 20 lb (90 N), 5 minutes for eye/nose pull; 11.2 lb (50 N) for rattle
	>18 to ≤36	15 lb (66.8 N) tension for 10 seconds	Dimension ≤6 mm, 50 N (11.2 lb); Dimension >6 mm, 90 N (20.2 lb); 70 N (15.7 lb) for seam of soft toy and protective tips	10 lb (44.5 N) for all parts exclude eye/nose; 20 lb (90 N), 5 minutes for eye/nose pull
	>36 to ≤96	15 lb (66.8 N) tension for 10 seconds	70 N (15.7 lb) for seam of soft toy and protective tips	10 lb (44.5 N) for all parts exclude eye/nose; 20 lb (90 N), 5 minutes for eye/nose pull
Compression test	0 to 18	20 lb (89 N)	110 N (24.7 lb)	10 lb (44.5 N)
	>18 to ≤36	25 lb (111.3 N)	110 N (24.7 lb)	10 lb (44.5 N)
	>36 to ≤96	30 lb (133.5 N)	–	10 lb (44.5 N)
Flexure test	0 to 96	Bend 30 cycles of 120º one cycle in 2 seconds, rest 60 seconds every 10 cycles, 15 lb bending force	Bend 30 cycles of 120º one cycle in 2 seconds, rest 60 seconds every 10 cycles, 70 N (15.7 lb) bending force	–

Chemical restrictions worldwide

In a world where people are becoming increasingly concerned about ecology, there is a growing demand for 'green textiles' in both European and other major world markets. Chemical restrictions are equally important in compliance with government regulations and maintaining the safety and welfare of consumers. There is a wide variance in the requirements between different countries, as illustrated below.

The EU has several different eco labels that are voluntarily used by manufacturers and are recognized by consumers as products that are ecologically safe. The EU Eco Label, German Blue Angel, Nordic Environmental Label, Oko-Tex Standard 100 Eco label, and the United States Green Seal are some examples of national green labels. These are voluntary schemes for compliance with banned or restricted chemicals.

It has been proposed to use the Oko-Tex Standard 100 Eco-label information as minimum performance standards for new European Commission proposals or EU directives on IPP (Integrated Product Policy) and EUP (Energy-Using Products). This implies that the Oko-Tex Eco-label requirement may become a minimum requirement in the new legislation and directives regarding environmental issues in Europe.

The European Commission has proposed a system called REACH (Registration, Evaluation and Authorization of Chemicals). If adopted by the EU countries, REACH legislation could oblige textile and clothing companies to undergo a procedure of registration, evaluation, authorization and restriction for a large number of chemical substances. In general, the United States has far fewer restrictions for chemical substances than Europe; however, those that are restricted are closely enforced.

Hazardous chemicals						
Hazardous chemicals	**Requirements**					
	United States	**Canada**	**United Kingdom**	**Europe**	**Australia**	**Japan**
Azo dyes	-	-	-	Banned in Germany and the Netherlands	-	-
Formaldehyde	-	-	-	Finland Children <2 years 30 mg/kg Underwear: 100 mg/kg Outerwear: 300 mg/kg	-	Infants – not detectable Others: 75 ppm
Lead (Pb)	0.06% T600 mg/kg T/90 S	0.5 S	-	90 S	90 S	-
Cadmium (Cd)	75 S	0.1 S	-	75 S	75 S	-
PCP	-	-	-	5 ppm max.	-	
Nickel release	-	-	-	EU 0.5 µg/cm^2 per week	-	-

United States market textile testing standards

In addition to the test methods published by ASTM, this organization also offers some product performance specifications related to end use. For example, fabric considered for use in men's woven dress shirts should have a minimum tensile strength of 25 pounds, when tested in accordance with method ASTM D5034. The performance specifications indicate requirements for a series of tests relevant to the end use of the fabric, which is often valuable to companies that do not have their own internal performance requirements.

Government agencies such as the Federal Trade Commission (FTC) and the Consumer Product Safety Commission (CPSC) enforce regulations requiring testing for merchandise sold in the United States. FTC protects producers and consumers alike in non-safety, fair trade matters such as labelling, advertising, warranties and price fixing. Care labelling and fibre content labelling are under the jurisdiction of FTC. Flammability and all product safety issues are regulated by CPSC. Health Canada regulates product safety in Canada, such as flammability of wearing apparel and toys, while Industry Canada regulates care labels and textile labelling.

Flammability of wearing apparel – Test method ASTM D1230 or title 16 CFR, part 1610

Flammability is the primary safety hazard associated with wearing apparel; therefore, all garments sold in the United States must meet government

regulations. Exemptions are hats, gloves, footwear (excluding hosiery) and interlinings. All fabrics will burn; however, it is the ease, speed and intensity of burning that determines whether a fabric is hazardous or not. Factors that directly affect burning characteristics are fibre content, weight and fabric construction. Lightweight fabrics (those weighing 2.6 oz per sq yd or less) made of natural fibres, cotton, rayon, silk, and brushed fabrics such as fleece or flannel, are particularly suspect for burning and must be tested to ensure compliance. This regulation is only a minimal standard and is relatively easy to pass. The test is designed to eliminate those fabrics that are highly flammable from the marketplace.

Specimens are conditioned in a drying oven to remove all moisture prior to testing. The test is conducted in an enclosed chamber with the sample held at a 45-degree angle, while a one-inch ignition source is impinged on the fabric for one second. A class determination is made on tested samples in original state and after one washing and drycleaning cycle.

- *Class 1 – Normal flammability* is considered commercially acceptable;
- *Class 2 – Intermediate flammability* refers only to textiles with a napped or raised surface;
- *Class 3 – Rapid and intense burning* is considered dangerously flammable. Textile and apparel are banned from sale.

Average burning rate criteria for determining flammability class			
	Textiles without pile, nap, tufting, flock, brushing or other type of raised fibre		**Textiles with pile, nap, tufting, flock, brushing or other type of raised fibre**
Class 3	Less than 3.5 seconds	Class 3	Less than 4 seconds and intensity of flame is such to ignite or fuse base fabric
Class 2	Does not apply	Class 2	4-7 seconds both inclusive and the base fabric ignites or fuses
Class 1	3.5 seconds or more	Class 1	7 seconds or more, or when sample burns with a rapid surface flash (0-7 seconds) but base fabric does not ignite or fuse

General characteristics of flammable goods:

- Low twist yarns ignite more readily than high twist;
- Loosely woven and lightweight fabrics burn more readily;
- Napped fabrics have an increased surface flammability;
- Some coated fabrics and plastic films burn rapidly;
- Fibre content is the most influential factor in determining fabric flammability.

In most cases, only the exposed parts of finished garments are subject to this standard. The exceptions are items that can be reversible or worn inside out, such as sweatshirts. Lining materials that can be exposed when worn, such as the inside of a jacket, are also subject to this standard.

Children's sleepwear flammability – Test method title 16 CFR, parts 1615 and 1616

Although a significant reduction in the number of burn injuries and deaths was seen following the implementation of the wearing apparel flammability regulation, the United States Government felt that the number could be further reduced with a regulation specific to children's sleepwear. This is a separate regulation, covering infant size 9 months through children's size 14, and is a much more stringent test and more difficult to pass than the general wearing apparel test for flammability. The test is done in the vertical position, with a larger ignition source and longer impingement time. The pass/fail criteria are based on char length rather than burn time. This test requires burning specimens of fabric in original state and after 50 home laundering and drying cycles. In addition to burning the fabric (fabric production unit – FPU), tests must be conducted on prototype seams, trims, and garment production units (GPU).

The CPSC defines children's sleepwear as:

… any product of wearing apparel such as nightgowns, pajamas or similar related items such as robes, intended to be worn primarily for sleeping or activities related to sleeping. Diapers and underwear are excluded from this definition. Garments labelled 'playwear' are not exempt from meeting the test criteria.

Some factors affecting children's sleepwear flammability:

- Construction and fibre content of fabric;
- Finish – flame retardant treatments or any softening or hand enhancing agents can dramatically affect burning characteristics;
- Seams – construction, stitch types, tension;
- Trim – screenprinting, embroidery, laces, etc. can affect burning.

Fibre content – AATCC Test method 20 and 20A

All apparel sold in the United States must be properly labelled to show fibre content using generic names of fibres and percentage of fibres by weight in descending order of predominance. There are very specific rules regarding how the information is displayed, which can be found on the FTC website at *www.ftc.gov*.

Accurate identification of fibres requires precise analysis and often more than one method of evaluation. There are four methods commonly used:

- Burning.
- Microscopic examination – cross section and longitudinal.
- Staining of fibres by dyes.
- Chemical separation.

If one is familiar with the different burning characteristics of fibres, burning can be a useful technique in a non-laboratory situation. Fibre identification, or qualitative analysis, simply identifies the fibre by name, not by percentage, while fibre composition, or quantitative analysis, quantifies the percentage of fibre by weight. In order to know the exact content by percentage, the fibres must be chemically separated or visually counted.

- Fibres viewed under magnification have distinct characteristics that distinguish them from other fibres. Fibres that have the same molecular

makeup cannot be separated chemically and in order to determine quantities, a microscope must be used to visually count the fibres. This is the case with cashmere/wool and with ramie/cotton.

- Fibres that are molecularly different can be separated with chemical reagents. For example, cotton and polyester.

Care labelling

The United States Government requires that all wearing apparel sold in the United States contain a permanently sewn-in label with proper care instructions for that garment. Words or symbols are acceptable and must contain the following:

- Washing method and temperature;
- Washing cycle (normal, gentle, etc.);
- Bleach instruction;
- Drying method and temperature;
- Ironing instruction;
- Warnings if necessary.

A manufacturer must have reasonable basis for selecting care instructions for a garment. In order to satisfy the Government that the care label on your garment is correct, you must have testing data as proof.

A series of different methods must be used in determining the proper care label, since there is no single test method that covers all the required testing. The tests required for establishing reasonable basis for a care label are:

- Dimensional stability (shrinkage);
- Appearance after laundering or drycleaning;
- Skewing (twisting);
- Colourfastness to laundering or drycleaning;
- Colourfastness to chlorine and non-chlorine bleaches;
- Effects of ironing.

Testing to develop accurate and practical instructions should proceed in a logical sequence. Experimental testing should be performed to determine minimum shrinkage and maximum colourfastness and appearance after home laundering or drycleaning. If a garment can be laundered successfully, it is not necessary to offer additional cleaning processes, such as drycleaning. On the other hand, if a garment can be laundered successfully, you should not label it 'Dry Clean Only'. Using the word 'only' implies that washing would be harmful to the garment. This practice is known as 'low labelling' and should be avoided. FTC has imposed very heavy fines on retailers for labelling cashmere sweaters 'Dry Clean Only', when test results indicated satisfactory results in hand washing.

Commonly used care label instructions			
For washing	**For drying**	**For ironing**	**For dry cleaning**
Machine Wash	Tumble Dry	Hot Iron	Professional Dry Clean Only
Machine Wash Warm Water	Tumble Dry Permanent Press Cycle	Warm Iron Dry Clean	
Machine Wash Cold Water	Tumble Dry Low	Cool Iron	Dry Clean Only
Machine Wash Gentle Cycle	Drip Dry	Warm Steam Iron	Do Not Dry Clean
Hand Wash Warm Water	Dry Flat	Iron Damp	Professional Leather Clean
Wash Separately	Remove Promptly	Do Not Iron	
Only Non-Chlorine Bleach When Needed		Iron On Reverse	

Most common methods used in determining a care label

Dimensional stability (shrinkage) – AATCC Test method 135

Excessive shrinkage in a garment will result in customer dissatisfaction. A tight, short or uncomfortable garment will most likely be returned for a refund and may result in lost future sales.

Fabric shrinkage test:

- ❑ Cut a 22-inch square of the fabric being tested.
- ❑ Indicate the warp (length) direction of the fabric.
- ❑ With indelible ink, mark 18-inch measurements in the length and width (weft) direction.
- ❑ Launder the fabric as per the suggested care label.
- ❑ Re-measure fabric.
- ❑ Calculate percentage of shrinkage.
- ❑ Warp and filling (weft) shrinkages are calculated and reported separately.

$$\% \text{ shrinkage} = \frac{\text{original measurement} - \text{final measurement}}{\text{original measurement}} \times 100$$

Garment shrinkage is conducted in a similar manner, by marking key critical fit measurement areas of the garment such as, for a shirt or top, front and back lengths, armhole, neck opening, chest, sweep, sleeve length and cuff opening. For trousers, critical areas of measurement would be inseam, outseam, front and back rises, waist, hip, seat, thigh and leg opening. All areas are measured, calculated and reported separately.

Durable press or wrinkle free – AATCC Test method 124

This test is suitable for fabrics or garments that have been treated with a durable press or wrinkle-free finish for the purpose of determining how effective the finish is after multiple launderings. Samples are laundered in accordance with

the test method using the suggested care instructions for the garment. After laundering five times, or the agreed-upon number of cycles, the fabrics or garments are visually evaluated under a specified light source by comparing replicas of wrinkled fabrics to the tested specimens and grading the degree of wrinkling or puckering. Because of the subjectivity of the evaluation process, a panel of three raters is used.

Appearance after laundering

Fabric or garments are visually evaluated by comparing any changes in appearance before and after washing. Although not officially a part of test method 124, the technician looks for changes in surface texture, such as pilling or fuzzing, change in hand, bleeding or staining of one colour to another. Deterioration of seams, trims or any change that may be considered noticeable to a consumer is noted in the test report. Any significant change in appearance or function of the garment as a result of laundering would result in failure of the suggested care method.

Skewing – AATCC Test method 179

This method is used to determine the amount of twisting or spirality that may occur in fabrics or garments after washing. You may recall seeing the side seam of a T-shirt twisting towards the front of the garment, instead of lying at the natural side; this is referred to as skewing. This is a phenomenon that most often occurs in knits and is caused by multiple factors; yarn, knitting, and finishing. Skewing must be corrected during fabric production. It is not possible to correct skewing that occurs after washing. The seams will not go back in place and the garment will not lie flat. This is a major problem and any company importing or manufacturing knits should be testing for skewing prior to production.

Colourfastness to laundering – AATCC Test method 61

Colour fading or staining in laundering is unacceptable. This test measures the loss of colour in a fabric or garment due to washing. It also measures staining or dye migration onto other fibres that may be present in the wash load.

Using this accelerated method, in only 45 minutes 20 different colours can be tested simultaneously, with results representative of five home laundering cycles. It requires only a small amount of fabric and a multifibre swatch. Multifibre swatches are special test fabrics containing six different fibres, representative of fabrics found in a wash load. Staining on any one of the fibres is an indicator that the tested specimen has poor fastness properties.

Colourfastness to non-chlorine bleach – AATCC Test method 172

This test method is used to determine whether the addition of non-chlorine bleach in the wash load will affect the overall colour or appearance of a fabric or garment. The test specimens are laundered in a home-type washing machine and are visually evaluated after five cycles. Based on the results, the appropriate wording must be used on the care label attached to the garment.

Colourfastness to sodium hypochlorite bleach (chlorine) – AATCC Test method 188

This test method is used to determine whether the addition of chlorine bleach in the wash load will affect the overall colour or appearance of a fabric or garment. The test specimens are laundered in a home-type washing machine and are visually evaluated after five cycles. Based on the results, the appropriate wording must be used on the care label attached to the garment.

At this time there is no officially published spot test method for testing colourfastness to bleach. Therefore many retailers and labs have developed their own methods. In order to expedite results, many have opted for a simple spot method described below as a quick indicator of the colourfastness effect of either chlorine or non-chlorine bleach on fabrics or garments.

- Chlorine bleach is diluted with water and dropped onto the test specimen;
- Powdered non-chlorine bleach is dissolved in hot water. A test specimen is soaked in the solution;
- Liquid non-chlorine bleach is used undiluted and dropped on the test specimen;
- Lab technicians then visually rate any change in colour using a standard known as the grey scale.

Samples that show no significant colour change from non-chlorine bleach, but show unsatisfactory results from chlorine bleach, must be labelled 'Only non-chlorine bleach when needed'. The phrase 'Do Not Bleach' may only be used on the care label with supporting test data indicating that all bleaches are unsafe.

In addition to tests that are required by law, there are many other tests that retailers and manufacturers voluntarily conduct in order to ensure quality merchandise. Some common ones are colourfastness tests. Dyes are generally considered 'fast' when they are able to resist deteriorating influences such as rubbing, light, perspiration, water, pool water or atmospheric contaminants.

Crocking – AATCC Test method 8

Crocking is the rub-off of colour from a fabric or garment onto another surface such as underwear, skin, or a white leather couch! Crocking is caused by poor dye penetration, fixation or wash-off resulting in excess dye on the surface of the fabric. With friction, this dye rubs off and re-deposits itself onto another surface. This test is important for both apparel and home furnishing items such as upholstery and bedding. Crocking is tested in the lab using a crockmeter and is tested on both wet and dry fabric.

Colourfastness to light – AATCC 16

Some dyestuffs are not stable to light. The original fabric colour will fade or change when exposed to light for varying periods of time. This can happen from store lighting or from sunlight. A fade-o-meter is used to conduct an accelerated test where the fabric samples are exposed to a xenon or carbon arc for a specific time period depending on what the end use of the fabric is. For underwear or pyjamas, where there is not a lot of exposure to light, usually a 10-hour test is conducted. For general wearing apparel usually 20 hours of exposure is sufficient. For outerwear and swimwear, 40-plus hours of testing is required, while curtain or drapery fabric requires 60 to 80 hours of exposure.

Colourfastness to perspiration – AATCC Test method 15

Perspiration can cause some dyestuffs to change colour or result in staining. This test is particularly important for apparel fabrics and lining fabrics. The test is conducted by soaking the fabric in a synthetic perspiration solution and subjecting it to conditions of heat and pressure for a specified time.

Colourfastness to water – AATCC Test method 107

Sometimes referred to as static wetting, this test method is particularly useful in measuring the possibility of staining or dye migration that may occur when fabrics or garments are left wet in a washing machine for extended periods.

Colourfastness to sea water – AATCC Test method 106
Colourfastness to chlorinated pool water – AATCC Test method 162

Exposure to natural sea water and chlorinated pool water can cause some dyestuffs to change colour. These tests must be included in protocols for swimwear, flags, outdoor wear and sporting goods.

All colourfastness tests are evaluated by visually comparing the difference in colour or the contrast between treated and untreated specimens with the differences represented by the grey scales. Since colour is influenced by different types of light, all assessments are made under controlled lighting conditions in the laboratory. The grey scales use a 5-grade system to assess the degree of fastness. A grade 5 indicates the best fastness, while a grade 1 is the poorest. A grade 4 (slight) colour change is generally acceptable.

The tests above listed are a sampling of the more common colourfastness tests used by the textile industry. For a complete list and full test methods, the AATCC Test Manual, which is issued yearly, can be referenced. In addition, there are many physical tests that are equally important in verifying and establishing quality fabrics and garments. Some of these are described below.

Thread count – ASTM D3775, ASTM D3887

Thread count, sometimes known as yarn count, is the number of yarns per inch in a woven fabric and the number of stitches per inch in knit fabrics. Generally, the higher the thread count, the better the quality. Count is critical in verifying fabric quality and is reported separately for warp and filling directions. Count is often used in marketing bedding where packaging for sheets will declare the total number of yarns by adding the warp and filling yarns together. This practice is unique to the bedding industry. Thread count is done visually under magnification.

Fabric weight – ASTM D3776, ASTM D3887

Fabric weight is generally designated by terms such as 'oz per sq yd, oz per linear yd, g per sq yd or g per m^2' and is an essential element in fabric construction. Fabric weight is critical in verifying that the fabric shipped is the same as the fabric ordered.

Tensile strength – ASTM D5034

Tensile strength measures the force required to break woven fabric. Elongation is the amount of stretch that occurs before the fabric breaks. A tensile testing machine is required to conduct these tests. Each specimen is grabbed and held in jaws which are separated until the fabric breaks. The most modern type of equipment today is a constant rate of extension (CRE) machine, where one end is fixed and the other end pulls. Five fabric specimens are cut in each warp and fill direction. The breaking strength and elongation results are calculated and the average for each direction is reported.

Bursting strength – ASTM D3786

The force required to rupture a knit fabric is known as bursting strength and is generally reported in pounds per square inch (psi). A hydraulic pressure system is used to apply pressure to the underside of the diaphragm until the specimen bursts.

Tear strength – ASTM D1424

Tear strength is the force required to continue a tear or rip already started in a woven fabric. Tear strength is not directly related to the force required to start the tear, meaning that a fabric with a high breaking strength can have lower tear strength than a fabric with a lower breaking strength.

Tests for determining strength can also be used in measuring fabric degradation caused by exposure to light, chemicals, atmospheric contaminants, etc.

Yarn slippage – ASTM D434

Yarn slippage is sometimes referred to as seam slippage, since it often occurs in seams at stress points. Yarns slip out of the seam, while the seam is still intact, creating a gap which cannot be repaired. This test is conducted in the laboratory using a tensile testing machine and a lab sewn seam, or an actual garment seam. The force required for the yarns to slip is reported in pounds. Sheer lightweight fabrics, fabrics constructed with long floats, such as satins and charmeuse, and slick slippery yarns such as silk, tend to exhibit slippage.

Pilling – ASTM D3512

Small balls of fibre that appear on fabrics are referred to as pills and are caused by rubbing or abrasive action on the surface of the fabric. During normal wear and tumble drying, these fibres tend to tangle and ball up on the surface of the fabric. ASTM D3512 specifies Random Tumble Pilling; however, there are several other test methods and types of equipment that simulate wear action which are able to predict fabrics susceptible to pilling. A visual assessment is made by comparing the tested specimens to photographs with varying degrees of pilling. Long staple fibre and yarns with high twist generally tend to pill less.

Abrasion resistance – ASTM D3884

Abrasion resistance is the resistance to wear when friction or rubbing occurs. This test in particular is difficult to correlate to end use because of the many variables in testing equipment and in the way the consumer will ultimately use the fabric. There are many different types of equipment, various abraders, and different forms of abrasion, such as flex, flat, and curved abrasion. This test is good for comparative evaluation of two or more fabrics.

Water repellency – AATCC 22 (good)
Water resistance – AATCC 35 (better)
Water proof – AATCC 127 (best)

Rainwear, snowsuits and skiwear should have water repellent properties since they are designed to be worn in inclement weather. Water repellency is achieved by chemical treatment of fibres and/or the use of fabrics that resist water penetration. Water repellency is tested using a light water spray on fabrics that have been treated with a water repellent finish. It measures how well water is repelled by visually comparing the tested specimen to a photograph.

Water repellency and *water resistance* refer to the ability of a fibre, yarn or fabric to resist wetting for a limited amount of time under a certain degree of water impact. Fabrics intended to withstand more severe outdoor conditions should be tested for water resistance. This test has increased water impact and time duration. Only coated fabrics will withstand the requirements.

Do not confuse *water repellency* or *resistance* with the term *waterproof*. Waterproof garments cannot have any pores or seams though which water can penetrate, and must be able to withstand a hydrostatic pressure test.

Other tests

Depending on the unique properties and intended function of a particular fabric or garment, there are a number of other tests that may be used to screen out undesirable merchandise. The ASTM Book of Standards can be referenced for additional tests, test methods and product specifications.

A testing programme is meaningful only if it is implemented and monitored. It is necessary that specifications be established for different types of fabrics and garments. The specifications must be reasonable and achievable for the desired quality level. For example, it is not reasonable to expect that silk organza fabric will have the same strength properties as cotton denim, or that pigments will achieve the same fastness ratings as reactive dyes.

Following are some examples of performance specifications for different types of fabrics and garments. Note that the requirements vary depending on fibre content, fabric construction, dyeing and finishing properties, and end-use.

Knit garments – 100% cotton Guideline care instructions: machine wash cold, tumble dry low		
Test performed	**Requirement**	**Regulation or test method**
Fabric qualities		
Thread count, wales and courses	As specified (+/- 5%)	ASTM D3887
Fabric weight	As specified (+/- 5%)	ASTM D3887
Yarn size	As specified (+/- 10%)	ASTM D1059, 1244
Fibre content		
Single fibre	No tolerance	AATCC 20A
Flammability	Class 1	Title 16 CFR 1610 or ASTM D1230
Dimensional stability		
Shrinkage		AATCC – 135
	% length % width	
Jersey, interlock, pique	7 X 5	
Ribs, spandex	7 X 7	
Thermal	8 X 7	
Skewing	5%	AATCC 179
Colourfastness		
Laundering		AATCC 61
Colour change	Grade 4	
Staining	Grade 3	
Self-staining	Grade 5	
Crocking		AATCC 8
Dry	Grade 4	Grade 3*
Wet	Grade 3	Grade 2* *Exception: pigment, indigo sulfur black, overdye, brushed or napped
Perspiration		AATCC 15
Shade change	Grade 4	
Staining	Grade 3	
Light		AATCC 16E
Activewear	Step 4	40 hours
Daywear/sportswear	Step 4	20 hours
Strength properties		
Bursting strength	45 lb	ASTM D3786
Seam strength	35 lb	ASTM D3940
Snap strength	Tension test	15 lb
ASTM PS79		
Zipper strength tension test	15 lb	ASTM D2061
Formaldehyde		
Children	75 ppm	
Adults	150 ppm	

Knit garments – Cotton and synthetic blends Guideline care instructions: machine wash cold, tumble dry low		
Test performed	**Requirement**	**Regulation or test method**
Fabric qualities		
Thread count, wales and courses	As specified (+/- 5%)	ASTM D3887
Fabric weight	As specified (+/- 5%)	ASTM D3887
Yarn size	As specified (+/- 10%)	ASTM D1059, 1244
Fibre content Blends	 3% tolerance	 FTC textile fibre ID Act
Flammability	Class 1 normal	AATCC 20A
Dimensional stability		Visual
Shrinkage		AATCC – 135
	% length % width	
Jersey, interlock, pique	5 X 5	
Ribs, spandex	5 X 7	
Thermal	7 X 7	
Fleece, French terry, velour	6 X 5	
Skewing	5%	AATCC 179
Colourfastness		
Laundering		AATCC 61
Colour change	Grade 4	
Staining	Grade 3	
Self-staining	Grade 5	
Crocking		AATCC 8
Dry	Grade 4	Grade 3*
Wet	Grade 3	Grade 2* *Exception: pigment, indigo sulfur black, overdye, brushed or napped
Perspiration		AATCC 15
Shade change	Grade 4	
Staining	Grade 3	
Light		AATCC 16E
Activewear	Step 4	40 Hours
Daywear/sportswear	Step 4	20 Hours
Strength properties		
Bursting strength	45 lb	ASTM D3786
Seam strength	35 lb	ASTM D3940
Snap strength tension test	15 lb	ASTM PS79
Zipper strength tension test	15 lb	ASTM D2061
Formaldehyde		
Children	75 ppm	
Adults	150 ppm	

Woven garments – Denim, madras, chambray and indigo dyed Guideline care instructions: machine wash cold, tumble dry low		
Test performed	**Requirement**	**Regulation or test method**
Fabric qualities		
Thread count, warp and filling	As specified (+/- 5%)	ASTM D3775
Fabric weight	As specified (+/- 5%)	ASTM D3776
Yarn size	As specified (+/- 10%)	ASTM D1059, 1244
Fibre content Blends Single fibre	 3% tolerance No tolerance	 FTC textile fibre ID Act FTC textile fibre ID Act
Flammability	Class 1 normal	Title16 CFR 1610 or ASTM D1230
Dimensional stability		Visual
Shrinkage		AATCC – 135, 150
	% length % width	
100% cotton, unwashed	5 X 5	
100% cotton, washed	3 X 3	
Colourfastness		
Laundering		AATCC 135, 150, 61
Colour change	Grade 3	
Staining	Grade 3	
Self-staining	Grade 5	
Crocking		AATCC 8
Dry	Grade 3	
Wet	Grade 2	
Perspiration		AATCC 15
Shade change	Grade 4	
Staining	Grade 3	
Light		AATCC 16E
Activewear	Step 4	40 hours
Daywear/sportswear	Step 4	20 hours
Ozone – bleached indigo only	Grade 3 – 1 cycle	AATCC 129
Strength properties		
Fabric strength Fabrics <8.0 oz/sq yd Fabrics >8.0 oz/sq yd	 60 lb 85 lb	ASTM D5034
Seam strength Fabrics <8.0 oz/sq yd Fabrics >8.0 oz/sq yd	 40 lb 40 lb	ASTM D1683
Yarn slippage	20 lb	ASTM D434
Snap strength tension test	15 lb	ASTM PS79
Zipper strength tension test	15 lb	ASTM D2061
Formaldehyde		
Children	75 ppm	
Adults	150 ppm	

Swimwear – knit Guideline care instructions: machine wash cold, tumble dry low		
Test performed	**Requirement**	**Regulation or test method**
Fabric qualities		
Thread count, warp and filling	As specified (+/- 5%)	ASTM D3775
Fabric weight	As specified (+/- 5%)	ASTM D3776
Yarn size	As specified (+/- 10%)	ASTM D1059, 1244
Fibre content Blends Single fibre	 3% Tolerance No tolerance	 FTC Textile Fibre ID Act FTC Textile Fibre ID Act
Flammability	Class 1 normal	Title 16 CFR 1610 or ASTM D1230
Dimensional stability		Visual
Shrinkage		AATCC – 135, 150
	% length % width	
Ribs	6 X 8	
Jersey, Interlock	6 X 6	
Colourfastness		
Laundering		AATCC 135, 150, 61
Colour change	Grade 4	Grade 3*
Staining	Grade 3	
Self-staining	Grade 5	
Crocking		AATCC 8
Dry	Grade 4	Grade 3*
Wet	Grade 3	Grade 2* *Exception: pigment, indigo sulfur black, overdye, brushed or napped
Pool water Shade change Staining Self-staining	 Grade 4 Grade 3 Grade 5	AATCC 162
Sea water Shade change Staining Self-staining	 Grade 4 Grade 3 Grade 5	AATCC 106
Perspiration Shade change Staining	 Grade 4 Grade 3	AATCC 15
Light		AATCC 16E
	Step 4	40 Hours
Strength properties		
Bursting strength Seam strength Snap strength tension test Zipper strength tension test	45 lb 35 lb 15 lb 15 lb	ASTM D3786 ASTM D 3940 16 CRF 1500.53F 16 CRF 1500.53
Formaldehyde		
Children Adults	75 ppm 150 ppm	

Children's apparel – Safety issues

Safety is an ever-increasing area of concern, particularly in children's merchandise; therefore safety must be considered in the development of performance standards and test programmes. Particular areas of importance in childrenswear are:

- Choking hazards such as snaps and buttons that detach from the garment.
- Sharp points, pins and hardware such as d-rings and hasps.

- Lead traces found in painted surfaces such as zipper tabs and snaps.
- Strangulation hazards such as drawstrings.

Below is an example of United States performance requirements specifically applicable to children's garments:

Test performed	Requirement	Regulation or test method
Flammability		
Wearing apparel Children's sleepwear – 9 months to children's size 14/years	Class 1 normal Must meet all requirements	Title 16 CFR 1610 or ASTM D1230 Title 16 CFR 1615 and CFR 1616
Formaldehyde		
Children	75 ppm	
Small parts tension test – Toddlers/infants	No detachment at 15 lb for 10 seconds	Visual
Sharp points and edges	No sharp points or edges after normal use	Visual
Drawstrings		ASTM F1816, CPSC, NY State, Wisconsin
Children's garments	No toggles or knots at ends Plastic tips or ends must withstand tension test Strings at neck and hood are not allowed Strings at waist and bottoms must have 3" maximum extended from garment when fully stretched	
Hats – Children	WARNING: The use of a continuous loop under the chin or strings longer than 5 ½" may cause strangulation	
Mittens/gloves – Children	WARNING: The use of a long string connecting gloves or mittens may cause strangulation. Drawstrings or ribbons must be tacked at exit points or at mid-point	
Lead content in coatings	Lead content of painted surfaces must not exceed 0.06% by weight	Title 16 CFR 1303

A successful testing programme ensures that products perform as intended and meet all safety and compliance requirements. Independent third-party testing laboratories specializing in textiles are located worldwide. Many mills and factories have in-house laboratories, and although it is commendable that early developmental and preliminary testing be conducted by the in-house laboratory, it is also recommended that testing be conducted by a reputable and widely recognized laboratory that works under standardized testing conditions and is unbiased to the results. Third-party laboratories should be accredited to laboratory standards such as ISO 17025, by local accreditation bodies such as A2LA, HOKLAS and others. This provides assurance that the laboratory is operating under the most stringent quality conditions, using correct equipment that is properly calibrated and maintained, and that testing is executed by well-trained technicians.

Quality in any product comes at a cost and part of the cost is in the testing. When the garment cost is calculated, testing should be part of the equation. Testing costs vary depending on the type of fabric, garment, the number of different colourways being offered, and the country of execution. In order to control testing costs, the laboratory can develop a customized testing programme to accommodate specific needs and budgets. When the testing cost is spread over hundreds or thousands of yards of fabric, and hundreds of garments, the testing cost per garment is minimal. Manufacturers and retailers who try to reduce cost by eliminating testing often pay more later in production delays, returns, lost sales and damaged reputations.

Chapter 9

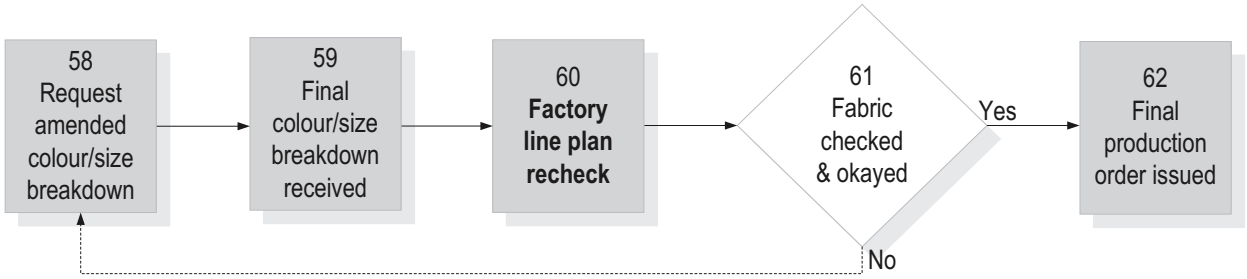
The material sourcing process – stage V: final stage

You have ordered your stock trim and fabric (steps 46 and 52). They have arrived safely (steps 48 and 54) and been inspected (steps 49 and 56). Fabric has been tested (step 55). Both trim and fabric have been checked and okayed (steps 50 and 57).

In short, you are ready to cut. Except for one small point: your buyer is entitled to change its mind, at least just a little. You now **Request amended colour/size breakdown** (step 58) and **Receive final colour/size breakdown** (step 59).

And now the trouble begins.

Stage V: final stage



Since you have not yet cut the fabric, the buyer does have the right to change their mind, provided there is no cost to you, the factory. After all, why should you insist on producing an assortment which is less saleable when you can produce the more saleable assortment with no risk or loss to yourself. At least that is the theory.

The reality goes something like this.

Case study IV: changing colour assortments

On 1 August 2004, before ordering your stock fabric and trim, you requested your customer Schmidlap Mart to provide an updated colour/quantity breakdown. This is what the buyer sent you – four styles totalling 13,987 garments.

Colour/quantity breakdown						
Fabric name	Fancy cotton twill					
Fabric supplier	Greater universal					
Customer and season	Schmidlap Mart/Autumn 05					
Date	01-Aug-04					
Style	**Description**	**Dirty beige**	**Burnt orange**	**Aubergine**	**Poison green**	**Total pieces**
1001	Casual jacket	800	600	300	150	1 850
1002	Trousers	1 200	1 450	890	700	4 240
1003	Short skirt	650	490	870	2107	4 117
1004	Long skirt	1 250	1 100	800	630	3 780
Total pieces		**3 900**	**3 640**	**2 860**	**3 587**	**13 987**

Based on this breakdown and using your factory line plan (see chapter 7), you ordered the following amounts of fancy cotton twill – four colours totalling 20,508 yards.

Colour name	Quantity (yards)
Dirty beige	6 045
Burnt orange	5 614
Aubergine	4 164
Poison green	4 686
Total	**20 508**

The fabric arrived and you are now ready to cut. However, before cutting you once again give Schmidlap Mart the opportunity to change the colour assortments, and this is what the buyer sends you – two styles totalling 13,987 garments.

Colour/quantity breakdown						
Fabric name	Fancy cotton twill					
Fabric supplier	Greater universal					
Customer and season	Schmidlap Mart/Autumn 05					
Date	28-Sep-2004					
Style	**Description**	**Dirty beige**	**Burnt orange**	**Aubergine**	**Poison green**	**Total pieces**
1001	Casual jacket					
1002	Trousers	1 600	1 750	1 040	775	5 156
1003	Short skirt	2 300	1 890	1 820	2 812	8 822
1004	Long skirt					
Total pieces		**3 900**	**3 640**	**2 860**	**3 587**	**13 987**

Well, you know how it is, the casual jacket simply did not sell, and long skirts are out this season, but no matter. The original commitment called for 13,987 pieces, and 13,987 pieces is what they are buying.

However, Schmidlap Mart may still be buying the same quantity but they have discarded the two most expensive styles. You, the factory, have just lost over $18,000 and you think the buyer can't do this to you.

Revised factory line plan

Fabric name _____Fancy cotton twill
Fabric supplier _____Greater universal
Customer and season _____Schmidlap Mart/Autumn 05
Date _____28-Sep-04

Style	Yield (yards)
1001	1.80
1002	1.45
1003	1.10
1004	1.72

SKETCH OR PHOTO

Style # _____1001
Description _____Casual jacket

Colour name	Units	Quantity (yards)
Dirty beige		0
Burnt orange		0
Aubergine		0
Poison green	0	

SKETCH OR PHOTO

Style # _____1002
Description _____Trousers

Colour name	Units	Quantity (yards)
Dirty beige	1 600	2 320
Burnt orange	1 750	2 538
Aubergine	1 040	1 508
Poison green	775	1 124

SKETCH OR PHOTO

Style # _____1003
Description _____Short skirt

Colour name	Units	Quantity (yards)
Dirty beige	2 300	2 530
Burnt orange	1 890	2 079
Aubergine	1 820	2 002
Poison green	2 812	3 093

SKETCH OR PHOTO

Style # _____1004
Description _____Long skirt

Colour name	Units	Quantity (yards)
Dirty beige		0
Burnt orange		0
Aubergine		0
Poison green	0	

Colour name	Quantity (yards)
Dirty beige	4 850
Burnt orange	4 617
Aubergine	3 510
Poison green	4 217
TOTAL	**17 193**

Style #	Description	FOB ($)	Original breakdown		Revised breakdown	
			Quantity	Amount ($)	Quantity	Amount ($)
1001	Casual jacket	14.40	1 850	26 640	0	0
1002	Trousers	7.20	4 240	30 528	5 165	37 188
1003	Short skirt	5.90	4 117	24 290	8 822	52 050
1004	Long skirt	6.85	3 780	25 893	0	0
Total				**107 351**		**89 238**
Loss						-18 114

Actually, it can do this to you. I do know factories that will not accept changes in assortment that lead to reduced order values, but these are not the factories that will keep customers and certainly not the factories that will survive in the post-2005 era. In today's increasingly competitive market, you cannot force customers to order poor-selling styles just because you want to keep the more profitable orders. Your only negotiating leverage comes from being able to prove that you will actually lose money.

Your first step is to determine just how this new garment assortment fits into your fabric assortment and to examine the results.

The initial examination results are not good. Of course you want to help your buyer Schmidlap Mart and its customers. Theatre tickets, expensive dinners – anything at all – **but this does not extend to getting stuck with 3,315 yards of its fabric.**

Colour name	Original	Revised	Difference (yards)
Dirty beige	6 045	4 850	-1 195
Burnt orange	5 614	4 617	-997
Aubergine	4 164	3 510	-654
Poison green	4 686	4 217	-469
Total	**20 508**	**17 193**	**-3 315**

If Schmidlap Mart wants to change its assortment, it must still use up the fabric. This is common business sense. Unfortunately, it is remarkable how buyers, when faced with unpalatable situations like the one we are describing, immediately lose the ability to solve problems of simple arithmetic or logic or even to communicate rationally.

Buyer's argument 1: *What do you mean, increase the order? I ordered 13,987 garments, I am still ordering 13,987 garments, how can you be stuck with fabric?*

Buyer's argument 2: *What does fabric have to do with garments?*

The ultimate buyer's argument: *I am ordering what I am ordering, you are producing what I am ordering you to produce and I do not want hear anything more about ordering production, producing orders, ordering orders, or producing products for any orders except the orders I am ordering you to produce. Just produce my order. Do you understand me?*

Eventually common sense prevails – provided you do not decide to agree with the buyer's logic and thus opt for eventual bankruptcy – and the buyer changes the assortment to use up all the fabric. In the new calculations below, the first thing you will notice is that the units have been increased from 13,987 to 16,525.

Final factory line plan

Fabric name _____Fancy cotton twill
Fabric supplier _____Greater universal
Customer and season _____Schmidlap Mart/Autumn 05
Date _____28-Sep-04

Style	Yield (yards)
1001	1.80
1002	1.45
1003	1.10
1004	1.72

SKETCH OR PHOTO

Style # _____1001
Description _____Casual jacket

Colour name	Units	Quantity (yards)
Dirty beige		0
Burnt orange		0
Aubergine		0
Poison green		0
Total	0	

SKETCH OR PHOTO

Style # _____1002
Description _____Trousers

Colour name	Units	Quantity (yards)
Dirty beige	2 250	3 263
Burnt orange	2 200	3 190
Aubergine	1 400	2 030
Poison green	800	1 160
Total	**6 650**	**9 643**

SKETCH OR PHOTO

Style # _____1003
Description _____Short skirt

Colour name	Units	Quantity (yards)
Dirty beige	2 530	2 783
Burnt orange	2 205	2 426
Aubergine	1 940	2 134
Poison green	3 200	3 520
Total	**9 875**	**10 863**

SKETCH OR PHOTO

Style # _____1004
Description _____Long skirt

Colour name	Units	Quantity (yards)
Dirty beige		0
Burnt orange		0
Aubergine		0
Poison green		0
Total	0	

Colour name	Quantity (yards)
Dirty beige	6 046
Burnt orange	5 616
Aubergine	4 164
Poison green	4 680
TOTAL	**20 505**

Final colour/quantity breakdown						
Fabric name	Fancy cotton twill					
Fabric supplier	Greater universal					
Customer and season	Schmidlap Mart/Autumn 05					
Date	12-Oct-04					
Style	**Description**	**Dirty beige**	**Burnt orange**	**Aubergine**	**Poison green**	**Total pieces**
1001	Casual jacket					0
1002	Trousers	2 250	2 200	1 400	800	6 650
1003	Short skirt	2 530	2 205	1 940	3 200	9 875
1004	Long skirt					0
Total pieces		**4 780**	**4 405**	**3 340**	**4 000**	**16 525**

At the same time, the value of the order has nearly returned to its original value.

Style #	**Description**	**FOB ($)**	**Original breakdown**		**Revised breakdown**	
			Quantity	**Amount ($)**	**Quantity**	**Amount ($)**
1001	Casual jacket	14.40	1 850	26 640	0	0
1002	Trousers	7.20	4 240	30 528	6 650	47 880
1003	Short skirt	5.90	4 117	24 290	9 875	58 263
1004	Long skirt	6.85	3 780	25 893	0	0
Total				**107 351**	**16 525**	**106 143**
Loss						-1 209

So far. so good. You now take the buyer's final colour/quantity assortment and run it through your factory line plan again.

The results are spectacular. The new fabric requirements are almost identical with your fabric order. Your greatest problem will be an excess of 6 yards for the poison green. Given the fact that your poison green order totalled 4,686 yards, this works out to 0.13% – a negligible quantity.

Colour name	**Original**	**Revised**	**2nd revised**	**Difference (yards)**
Dirty beige	6 045	4 850	6 046	-1
Burnt orange	5 614	4 617	5 616	-2
Aubergine	4 164	3 510	4 164	0
Poison green	4 686	4 217	4 680	6
Total	**20 508**	**17 193**	**20 505**	**3**

This is just too good to be true. In fact, it is too good be true. You have completely neglected so far to consider the trim. The fight with Schmidlap Mart is about to enter round 2.

You have already ordered and received stock trim against the original breakdown which included four styles. The cancellation of the long skirt is not a problem. The short skirt would require the same trim, with the possible exception of the polybag. However, style 1001 was a jacket. This style has now been cancelled and you are left with the jacket trim.

Now you must go back and compute the cost of jacket trim items and determine your loss. Go back to your jacket trim sheet.

Trim sheet

Date 01-Jun-04
Style # 1001
Description Casual jacket
Customer Schmidlap Mart/Autumn 05
Fabric group Fancy cotton twill

Sketch or photo

Item	Supplier	Quality	Unit	Quantity	Wastage (%)	Total	Price ($)	Amount ($)
Lining								
Interlining 1	Freudenberg	6215	Yard	1.4	5	1.47	0.90	1.32
Interlining 2								
Thread	Coats	Poly core	Cone	0.1	0	0.1	0.75	0.08
Button 32 ligne	ABC	116	Gross	0.027778	2	0.02833	12.50	0.35
Button 24 ligne	ABC	116	Gross	0.048611	2	0.04958	8.50	0.42
Snap								
Hook and eye								
Zipper								
Elastic								
Belt								
Shoulder pad	Zzyzzy	Special	Pair	1	2	1.02	0.75	0.77
Tape	Crompton	¼ DTM	Gross yd	0.013889	5	0.01458	1.25	0.02
Main label	Japan	Jacket	1 000	0.001	5	0.00105	200.00	0.21
Content label	Excellent		1 000	0.001	5	0.00105	25.00	0.03
Care label	Excellent		1 000	0.001	5	0.00105	25.00	0.03
Hangtag 1	Able		1 000	0.001	5	0.00105	80.00	0.08
Hangtag 2								
Hanger	A&E	VIC Jacket	1	1	2	1.02	0.25	0.26
Foam								
Tissue								
Polybag	Trumble	17X32X.03 PP	1 000	0.001	4	0.00104	200.00	0.21
Embroidery								
Total amount								3.77

The cost of trim for style 1001 is $3.77 per unit. You ordered trim for 1,850 units – the quantity provided by Schmidlap Mart in its original colour/quantity breakdown. You paid $6,974.50 for style 1001 trim. This is very large amount. To put this into perspective, the entire order now totals $106,143. If everything goes well, your net profit after all overheads may be 5% – $5,307. Unless you recover the cost of trims for style 1001, all you will have to show for your work is some labels, hangtags, interlining and polybags. In my experience, few banks accept polybags as loan repayments.

You have to get the money back somehow.

The first step is to go back to the trim sheet and, item by item, see where you can recover costs without going to your customer.

1. Interlining: $1.32 $2,447.55

Reputable interlining suppliers will take back unopened rolls and give you credit. If your supplier is one of the major producers, such as Freudenberg, it will solve this problem for you.

2. Thread: $0.08 $138.75

This is no problem at all. You still need the same thread for the order.

3. Main label $0.21 $388.50

Your buyer will have a standard jacket label which you have purchased from its designated label supplier. If you are a regular jacket supplier to this buyer, you can use these labels for the next order. The alternative is to send them back to the supplier. In either case, there is a solution.

4. Hanger $0.26 $476.75

This is a VIC (see chapter 10) hanger, a standard model for all jackets to most United States importers. Once again, you have purchased through the customer's designated supplier. As with the main labels, either hold on to the hangers until the next order, or send them back to the supplier.

You have now saved $3,446.75 – 50% of the total jacket trim cost.

In most cases, the balance, represented by the items and amounts listed below, must be recovered from Schmidlap Mart:

1. Buttons $0.77 $1,434.91

These may be dyed-to-match or else specially bought in. In most instances, they cannot be returned.

2. Shoulder pads $0.77 $1,415.25[8]

These are almost always made to spec. They are non-returnable.

3. Tape $0.02 $33.72

These are dyed-to-match and cannot be returned.

4. Content label, care label, hangtag $0.14 $252.53

These are all style and fabric-specific and cannot be returned.

5. Polybag $0.21 $384.80

Measurements are style-specific and the polybags cannot be returned.

Total loss: $3,521.21

8 Numbers rounded off depending on items.

Schmidlap Mart must bear this loss. In the final analysis, the buyer has a choice. It can deal with an inflexible factory which will not permit it to change its assortment once fabric has been ordered, in which case the buyer has no responsibility for leftover trim or fabric.

Conversely, it can deal with a flexible factory which will permit changes in assortment up to the point when the fabric is ready to be cut, in which case the buyer must be responsible for the trim left over as a result of these changes.

You, as a conscientious manufacturer, will do everything possible to minimize the loss arising from the buyer's changes in assortment, but in the end, the buyer must pay for the consequences of these changes.

The Schmidlap Mart buyer did not enter this industry last Monday. The buyer is aware of the rules of the trade. This does not mean the buyer will be happy to pay for the unused trim. You can expect moaning, crying, hair pulling, and histrionics. However, in the end, the buyer will pay.

Chapter 10

All about trim

Trim is often the forgotten category in the manufacturing process. Fabric accounts for 60%–70% of garment FOB cost while trim accounts for 10%. Designers and buyers rhapsodize over fabric – the hand, the feel, the texture. In the entire history of the garment industry, no designer has ever fondled a zipper and no buyer has ever spoken of a beautiful hook-and-bar.

For the factory, however, the zipper, the hook-and-bar and the care label are every bit as important as the fabric, because without each of these seemingly trivial items, the order cannot be produced. Furthermore, organizing trim is far more complex than buying fabric. A garment is usually made of a single fabric. That same garment will require a minimum of 10 and perhaps as many as 25 separate trim items.

Case study V: Ordering trim – from phase 1 to phase 0

Phase 1

In the beginning of a factory's operations, sourcing trim is relatively easy. Schmata Shirt Makers is a small factory of perhaps 30 machines. Only two or three styles are in production at any given time. Management consists of a closed group of four or five people, usually friends or family members. Everybody is having a good time. Job specifications overlap so that there is a natural follow-up and check on each production step, albeit in a very informal manner. Everybody sits around a table and everybody is responsible for everything.

'Hey, Steve, did you order the zippers for style 11973?'

'Yeah, Fred, I think so. But I had better check.'

'No problem, Steve. I'll be passing by the zipper supplier on the way home. I'll take care of it.'

Phase 2

Schmata Shirts Factory has grown from 30 machines to 100 machines and the 2 to 3 styles in production are now 4 to 8 styles. Now the five partners sitting around the table are not having such a good time. Mistakes and delays are becoming a problem.

'Steve, what's going on with the zippers for 11973? The customer is screaming for his stock. What am I going to tell him, "We cannot ship your order because my partner forgot to order the zippers?."'

'Fred, I don't know what you're complaining about. I told you last week that I couldn't follow up the zippers because Fred Junior was sick. And while we're on the subject, where are the buttons for 9491, and the labels for 6277?'

Phase 3

Schmata Shirt Manufacturers Ltd has now grown to 500 machines producing 40-60 styles per month. The five partners meet every Monday for the latest round of their ongoing fight.

➥

➦

'Steve, this is crazy. We have orders for 52 styles and do you know how many styles we can actually cut? I will tell you how many styles we can actually cut – 11 styles. That's right, 11 styles. We have fabric arriving every day. The warehouse is bulging and the cutters are standing around doing nothing. Wednesday, we will have to send the sewers home. This cannot go on.'

'Fred, are you blaming me? Who suggested we hire that idiot to order our trim? And while we're on the subject of idiots, whose brother-in-law was that idiot? I was here last night past midnight, working to undo the mistakes made by our new number-one-idiot -in-charge-of-trims. What sort of person orders a two-piece zipper for a pair of trousers?'

Phase 0

Somewhere around 1,200 machines producing 100 styles per month, Schmata Enterprises Ltd collapses. The company has orders for 230 styles, fabric in-house for 172 styles, and is ready to cut 0 styles.

Exit Steve, Fred and their three partners. End of factory business. Enter the Iron Law of Trim Purchase:

***As sales rise arithmetically, errors in trim purchase rise geometrically**.*

The logic here is simple and ineluctable:

- *Errors rise arithmetically with increasing amounts of work. If there is one error in every 100 operations, two errors will occur per 200 operations, 3 errors per 300 operations, etc.*
- *Errors rise arithmetically as the workload per hour increases. If a person makes one error per hour performing 20 operations, that same person will make two errors per hour if required to perform 40 operations and three errors per hour performing 60 operations.*

Put the two together and you inevitably have a geometric progression in which you eventually reach Phase 0, the point where every operation is done incorrectly.

Yet there are factories which routinely produce 100, 200 and even 500 styles per month. These factories have one thing in common – they all have trim ordering systems.

A factory making fashion garments (as opposed to commodities such as five-pocket jeans) may run 100 or more styles through stock production each month, requiring about 1,500 trim items. That same factory will begin the trim purchasing process three months before shipment. The trim department will therefore be dealing with 4,500 trim purchase orders at any given moment. This is excluding trim for samples.

All trim purchasing systems start with the **trim sheet**. We will use the example from chapter 9. Preparation of the trim sheet begins when the **factory receives sample and data** (step 15). Regardless of whether the customer provides all the trim and/or trim instructions, or trim selection is made by the factory, each item is listed on the Trim Sheet and includes information specific to the trim item. In the case of interlining, for example, the trim sheet specifies:

- The item is *interlining*. When several interlining qualities are required for the same style, each is listed separately, e.g. interlining 1, interlining 2, etc.;
- The supplier, in this case, *Freudenberg*;
- The supplier's quality number (or, if this is not available, a description);
- Unit: how the item is measured, in this case *yards*;

- ❑ Quantity required for one piece;
- ❑ Wastage estimated for this item;
- ❑ Total (quantity + wastage);
- ❑ Price per trim unit, in this case *price per yard*;
- ❑ Amount (total x price).

Item	Supplier	Quality	Unit	Quantity	Wastage (%)	Total	Price ($)	Amount ($)
Interlining 1	Freudenberg	6 215	Yard	1.4	5	1.47	0.90	1.32

Purchasing trim is a complex, multi-dimensional process. If the process is to yield the desired result, three specific goals must be achieved for every single trim item.

1. Quantity must be correct.
2. Quality must be correct.
3. Delivery must be correct.

There is a fourth goal, which, while not indispensable, is of great importance to the factory.

4. Cost should be competitive.

Regrettably, each of these goals brings its own problems, as we will see below.

Quantity must be correct.

Ordering the correct trim quantity may appear easy to the outsider, but to the professional, it is in fact very difficult.

Case study VI: How much interlining – the impossible question

You are the trim buyer for Schmata Enterprises Ltd (just before it closes). You have to buy interlining for an order (not the same order as used in previous chapters) of the same collection from Schmidlap Mart's Fancy Twill Group. There is an additional style, style 1005, for a coat.

You know that style 1001 requires 1.47 yards of interlining per piece. However, you do not buy interlining on a style-by-style basis. Trim items such as interlining, lining, and thread are purchased for the entire fabric group. This is the most efficient way of buying.

Here is an easy example: Schmidlap Mart's Fancy Twill Group requires only one interlining quality and only one colour. Adding the five styles, you conclude that the total 6,000 units require 4,942 yards – about 30 inches per unit.

Fancy twill interlining requirements

Style	*Description*	*Yards/unit*	*Units*	*Total yards*
1001	*Casual jacket*	*1.47*	*1,200*	*1,764*
1002	*Trousers*	*0.0833*	*1,200*	*100*
1003	*Short skirt*	*0.0556*	*1,800*	*100*
1004	*Long skirt*	*0.0833*	*600*	*50*
1005	*Coat*	*2.44*	*1,200*	*2,928*
Total			*6,000*	*4,942*

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However, as a clever trim buyer, you realize that you can save a great deal of money by combining all five styles into a single marker. This is relatively simple. By making a marker with two garments each of styles 1001, 1002 and 1005, plus three garments of style 1003, plus one garment of style 1004, you can combine all the styles in a single marker, cut 600 ply (fabric layers) and use only 4,600 yards. Based on 90¢ per yard, you have just saved your boss $308.

Fancy Twill interlining requirements – Combined marker

Style	*Units in marker*	*Ply cut*	*Total units cut*
1001	*2*	*600*	*1,200*
1002	*2*	*600*	*1,200*
1003	*3*	*600*	*1,800*
1004	*1*	*600*	*600*
1005	*2*	*600*	*1,200*

7.667 yards (combined marker length) x 600 ply = 4,600 yards (total yards)

You have the marker made and you cut the five styles. However, at the end of the day, you find you are short 30 yards . Perhaps the interlining fabric was damaged. Perhaps you received the incorrect quantity and failed to notice the shortage. The reason does not matter. What matters is that the goods are cut and you are short 30 yards .

Based on the rule ***You cut it, you own it****, you can no longer go back to the interlining supplier. You must add the cost to the product.*

The question now becomes: Which style has the incorrect yardage?

Here is the answer: There is no answer.

Fifty years ago leading mathematical economists in the oil industry discovered the joint cost problem. They wrote erudite – if incomprehensible – texts on the subject and after much argument, it was agreed that joint cost problems are insoluble. This same conclusion had been reached by every tailor from Minsk to Vladivostok some 200 years previously, but the reason seemed too obvious to write down.

In any case, the solution to the joint cost problem and the missing 30 yd is to fudge. Some experts will prorate the loss. Being lazy, I prefer charging the entire 30 yd to the most profitable style.

In fact, the joint cost problem is but one of several problems that you will come across in the interesting world of trim. To understand why these problems come about, you first have to consider that trim is purchased in three different ways:

- Trim purchased for each individual style, for example, buttons, shoulder pads and polybags. Purchasing trim on a style-by-style basis is the simplest way of dealing with trim.
- Trim purchased for the fabric group, for example, thread, linings and often interlining. We have already covered this category.
- Trim purchased generically, for example, main labels, packing tissue, strapping. This latter category leads to a variety of problems.

Packing materials such as strapping, tissue, etc. come outside of individual garment costing. Fortunately these are not costly items. Generally factories will calculate costs of polybags, cartons and hangers. Other items are grouped together and a fixed amount added to every unit shipped. Not the most accurate way, but it works.

Main labels (labels with the buyer's name) are in a different category altogether. Most buyers look at the label itself as a proprietary asset. Today almost all

require factories to buy only from designated suppliers. Some European customers place a serial number on each label. The factory is responsible for accounting every label. These restrictions should make ordering labels fairly easy. The designated label supplier keeps stock. The factory orders only what it needs. At such time as the customer ceases buying, the factory returns any unused labels to the supplier for a refund.

The difficulty is that a single buyer may have 6, 10 or even 20 different labels and be constantly introducing new ones. You can understand why each item in a suit, for example, must have a different main label. What you cannot understand is why many designers go to such extremes, as though the labels were as important as the garments themselves. The problem is that labels are expensive – part of the expense being the buyer's insistence that the factory deal only with its designated supplier who, like most monopolists, charges extortionately.

The factory finds itself in a bind. It must stock labels. On the other hand, if the buyer continually changes labels, the factory inevitably winds up with a useless inventory. One solution is to include the cost of dead labels in your overhead calculation. You may not be able to recover the cost in your negotiated prices, but at least this way you will know what the labels actually cost.

Quality must be correct

How do you test and inspect 1,500 trim materials each month? Remember, material damages are almost always generic. If the zipper dye fades or – even worse – runs, if the fusible interlining bubbles, or if the lining shrinks, every garment made of these materials is damaged.

The short answer – in fact, the only answer – is that, with very few exceptions, you do not inspect or test trim for quality. The job is too great, too costly and too time-consuming. Your only protection is the supplier's reputation and reliability.

Here is a new mantra:

I will buy my trim only from the best quality supplier.

Unfortunately, the best trim suppliers do charge a premium. The greatest and most common disasters in the garment industry invariably begin with the same statement. 'Why should I buy from Freudenberg when I can buy the same quality interlining from Schmidlap and save 25%? The buyer will never know the difference.' Once you have experienced a trim disaster, you will never forget the trim mantra.

The most reliable suppliers are generally the international suppliers. YKK zippers are colourfast. Kiyohara lining will pass all required colour and dimensional stability tests. Coats Paton thread lives up to all specifications.[9] However, the same quality guarantees may not hold true for the local agents of these international suppliers.

So what do you do when the YKK or Kiyohara colour card does not feature gangrene green? Clearly the lining, zippers and thread must be **dyed-to-match (DTM)**.

If the zipper tape is being dyed in the YKK factory, you can rest easy. If, however, the local zipper supplier is doing the job, chances are that you will not be getting a YKK zipper. That is because YKK zipper tapes cannot be dyed in a local dye house and the zipper tab cannot be enamelled in a one-room operation.

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9 For the purposes of illustration, the author has chosen to use the names of several indisputably reliable global trim suppliers. This does not imply that there are no other equally reliable suppliers in each trim category.

If you have to buy locally produced DTM, have the item tested. Don't take the risk.

Delivery must be correct

You never want to find yourself in the situation where fabric is in-house and you are ready to cut, but you are missing the zippers. Always make sure your trim is on hand well in advance. Also remember that trim lead times change from item to item and, where colour is a factor, often from colour to colour.

Some lead time differences are apparent. Shoulderpads must be produced separately for each style. You must know your shoulderpad supplier and what lead time is comfortable when working with it. Most thread is available for spot (immediate) delivery.

Ideally, trim should be ordered simultaneously with the fabric. This will almost always result in the happy situation where you have all your trim in-house when the fabric finally arrives. Unfortunately, this is not always advisable. This is particularly true of dyed-to-match trims. Very often the stock fabric colour will be ever-so-slightly different than the lab dip or strikeoff. The fabric colour will still be within tolerance but will no longer match the original colour selected for lining, thread, and/or zippers. For DTM you have to wait for the stock fabric.

Smart trim buyers have special tricks. For example, they give themselves a head start by asking the fabric supplier to send one yard of each colour or colourway in advance via courier. Depending on circumstances, this may provide as much as a two-week advantage. Another trick is to ask the mill to arrange for the lining. This works best when the fabric has been ordered from one of the major fabric exporting countries such as the Republic of Korea, Taiwan Province (China) or China.

Smart trim buyers trust no one. This is one instance where it pays to be paranoid. Smart trim buyers do not accept 'yes' for an answer. When the local zipper agent says, 'The zippers were sent out yesterday', the smart trim buyer knows that the local agent is lying. In fact, to the smart trim buyer, everybody is a liar, until the package of zippers is physically resting in their hands, and even then, they will often count or weigh the zippers to ensure that the zipper people have not short-shipped.

Costs must be competitive

Case study VII: Following up the zipper chain

The smart trim buyer knows not only their trim supplier, but also their supplier's supplier right up to the actual trim factory. When tracking those urgently required zippers, the smart trim buyer will use the following procedure:

Step 1: *Telephone good friend Jorge at the local zipper supplier in downtown Dzitbalche who confirms the zippers were sent out yesterday morning.*

If true, this is very good news. However, it is a well-known fact that all zipper suppliers are unreliable. Did not good friend Jorge lie only eight months ago, when he claimed that the zippers were in transit when in fact they didn't leave the warehouse in Puebla until two days later?

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Step 2: *Telephone Señor Gonzalez at head office in Puebla, who verifies that the specially dyed zippers arrived two days ago from the factory and were sent out yesterday to the local supplier.*

This is excellent news. Verification really puts one's mind at ease. Of course, this could still be a conspiracy where Jorge and Senor Gonzalez are working together to give the buyer a false sense of security. Better be safe and go to Step 3.

Step 3: *Telephone Tanaka-San at the North America zipper factory who verifies, after checking with his shipping department, that the zippers were in fact sent out three days ago to Puebla.*

The smart trim buyer can finally relax. Smart trim buyers have no friends, but they are beloved by all factory managers.

Amateurs believe that the best way to ensure competitive trim costs is to fight for every penny when negotiating every trim price. Professionals know better. The greatest source of high trim costs results from the zipper two-step.

Material purchase systems

Case study VIII: Trim cost control problem – the zipper two-step

The greatest area for trim cost savings is to ensure that the trim ordered is the trim required.

Step 1: The zipper in the drawer

Your trim buyer was supposed to buy 1,200 7-inch zippers for Schmidlap Mart's fancy twill style 1002. What would happen if your trim buyer made a mistake and ordered 1,200 6-inch zippers? What is the probability that your trim buyer would come to you and, in a straightforward manner, admit the mistake? How does that compare with the probability that your trim buyer puts the useless trim in his or her desk drawer and simply reorders the 7-inch zipper? After all, how would you know? Even if you personally sign every trim purchase order, do you really believe you would a catch a double order?

Regrettably, there are no studies of zippers in drawers. However, I would estimate that since 1938 the number of instances where trim buyers came to their boss admitting they bought the wrong zipper would be a figure approaching zero. On the other hand, if all those zippers-in-the-drawers were laid end-to-end, my guess is that they would reach the planet Neptune.

You save money by eliminating those zippers-in-the-drawer.

Step 2: The rising price of zippers

It does not matter what you pay for the zipper. It matters only how long you can maintain this price. A high price today is a competitive price six months from now and a very low price next year. If you want to keep trim prices low, ensure that prices do not rise until the bitter end.

Up to now, you have read about the problems. Let us talk now about the solution. How does Schmata Universal Galactic Ltd keep track of its 12,000 trim material purchase orders? How does it ensure that the correct trim has been ordered from the correct supplier, in the correct quantity, and at the correct price? How does it ensure that each trim item arrives on time?

First and foremost, you need a trim database. Do not stop reading. Database is not a dirty word, nor are databases in the realm of science fiction or available only to large automobile companies. A database is simply a large file cabinet in your computer. No matter where you are located, you can find someone to build you a database. All you have to do is tell this someone what you want, and what you want is this:

Case study IX: The Birnbaum Guaranteed-to-Work Trim Database

Start with your trim sheet and list the following:

- *The name of every trim supplier.*
- *The address of every trim supplier.*
- *The telephone number of every trim supplier.*
- *The e-mail address of every trim supplier.*
- *Every trim item.*
- *Every quality for each trim item.*
- *The unit for each trim item.*
- *The wastage for every trim item.*
- *The price for every trim item.*

You will require four computer-generated reports:

*1. **Trim sheet** (step 19)*

The trim sheet has been described (see page 43).

*2. **Material purchase orders (PO)** (steps 45 and 51)*

A purchase order is the basic form used to purchase any item whether it be a zipper, a buttonhole machine, or a Rolls Royce for the managing director. In many cases, a director's signature is required. Clearly it would be impossible for a senior executive to deal with the myriad purchase orders required to buy fabric and trim.

*The factory requires a totally computerized trim system to ensure that each trim item is ordered only once, at a predetermined price and in the right quantity, and that all the items required for the order are purchased on a timely basis. All reports pertaining to each style are in the computer system. The system has the trim sheet which specifies what trim items are required for each order, including quality, quantity and supplier. The system has the factory line plan which indicates the garment quantity by colour for the style. And the system has the **manufacturing order (MO)** (step 62) which contains the size breakdown (this is important because some trim quantities will change with size), and the contracted garment shipping date.*

The system automatically generates each purchase order and ensures that trims are not double ordered.

*3. **Material receiving reports** (steps 48 and 54)*

This report is filled by the warehouse and lists the actual quantities of fabrics and trims received.

*4. **Material job costings** (steps 63 and 64)*

*This computer-generated report tells you just what you paid for fabric and trim for each unit and compares this with your **Trim sheet** (step 19) and **Fabric cost sheet** (step 25).*

Birnbaum's Guaranteed-to-Work Trim Database actually works. It is simple to operate and virtually fool-proof.

Schmata Garment Factory Limited

Purchase order

Supplier	
Address	
Telephone number	
E-mail address	

Date

PO number

Item No.	Description	Units	Quantity	Price ($)	Amount ($)

MO numbers _____

Delivery date _____

Authorized signature

Schmata Garment Factory Limited

Material receiving report

Supplier	
Address	
Telephone number	
E-mail address	

Date
RR number
PO number

Item No.	Description	Units	Ordered	Received	Difference

MO numbers _____

PO date _____

Authorized signature

Trim job costing

Date _____
Style # _____
MO number _____
Description _____
Customer _____
Fabric group _____

Sketch or photo

Item	Supplier	Quality	Unit	Trim sheet quantity	Quantity received	Price ($)	Trim sheet amount ($)	Actual Amount	Difference
Lining									
Interlining 1									
Interlining 2									
Thread									
Button 1									
Button 2									
Snap									
Hook and eye									
Zipper									
Elastic									
Belt									
Shoulder pad									
Tape									
Main label									
Content label									
Care label									
Hangtag 1									
Hangtag 2									
Hanger									
Foam									
Tissue									
Polybag									
Embroidery									
Carton									
Total									

Chapter 11

Paying for materials

In every how-to book there is a 'yes-but' chapter. This is ours.

It is all very nice explaining how I can source fabric and trim – moving from a CM sewing plant to a full package factory – but I do not have the money to buy materials and my bank will not lend me the money. What do I do?

This is a real problem and it occurs in almost every garment exporting country in the developing world. The failure of banks to provide adequate credit to the garment industry is quite common. There are two main causes:

- Lending quotas. Banks worldwide have a national quota for each industry including garments. This means they have allocated a certain amount for total garment industry loans and will not go above that figure. Naturally, every bank wants to lend to Schmata Greater Universal Intergalactic which has branches in 88 countries, employs 88,000 workers and has annual sales exceeding 88 gazillion dollars. Nobody wants to lend to Schmata Shirts which employs just 100 workers and which this year hopes to reach gross sales of $1 million.
- Past disasters. In many countries, the entire garment industry has been red-lined – banks will not lend any money at all. It is tempting to blame this on greedy bankers refusing to support local industry. However, in all fairness, we have to admit that since their profit comes from lending money, bankers do want to believe that eventually the loans will be repaid. This leads us to that unfortunate incident when the bank discovered that money lent to Schmata Enterprises for the purpose of buying fancy twill fabric was actually spent on a Porsche for a friend of Schmata's managing director. A few similar instances and the entire industry has been blacklisted.

So what do we do? The answer is that we must make the garment industry bankable.

There are two methods, both of which will be discussed below. Whichever is chosen, the first step is to create a national garment manufacturers association. One factory alone can do nothing. The industry must speak with one voice.

The association has two heads:

- An elected chairman, who is always a member, usually the owner of the most successful factory in the country;
- A director, who is a full-time employee. A qualified director is the key to a successful organization. The director should not be your cousin or someone's unemployable brother-in-law. The director should be a well-paid professional. He or she does not have to know anything about the garment industry. But he/she must know how to run an organization and how to lobby government ministers as well as professionals in international organizations such as the World Bank.

In short, the association chairman speaks for the industry but his or her words come from the director. Now that your industry has a voice, you are ready to talk to the people who can help.

Method I: the political route – government guarantees

This is the method preferred by many developing countries. The association lobbies the Government in the garment exporting country together with international lending institutions to create a fund to guarantee bank loans for export credits and bank facilities for material purchases.

Everybody is happy.

- The factories are happy. They have funds for material purchases.
- The banks are happy. Their loans are guaranteed.

The international lending institutions are happy. They are supporting not just industry, but export industry and very labour-intensive export industry at that. Furthermore, they are not even lending money. Their guarantees are only contingent liabilities – they have to pay only if the factory fails to repay its loans.

The downside to method I is that government guarantees mask the problems that red-lined the industry in the first place. They simply make these problems acceptable. Money from loans is still diverted for other purposes. The industry still remains irresponsible and uncompetitive.

Method II: the commercial route – create a responsible industry

Here the association begins with the banks. The plan is to ensure that every request for funds is backed up with a legitimate order from a recognized buyer who will pay and that any monies borrowed will be used only to finance product and material.

What does the bank want?

- *Export credit insurance.* The bank wants assurance that the factory's buyer can pay and will pay. The order must be insured. There are two recognized ways of obtaining insurance:
  - Commercial institutions. Lending institutions located in the importing country will guarantee payment via a process known as 'old line factoring'. Because the factory is not actually borrowing money, the charges are quite reasonable.
  - Government. In a process known as 'export credit insurance', the Government in the exporting country creates a state-owned company which will insure exports against payment default. If run properly, this cannot only represent a great service to the industry but also a source of income for Government. Garment exporting centres such as Hong Kong have operated very successfully for many years in this manner and would be an excellent source of advice.
- *Vetting orders.* Once they know the buyer is genuine and creditworthy, banks also want proof that the order is equally genuine. Every order must be confirmed by the buyer. Most importantly, the confirming institution to whom the buyer reports must be recognized as reliable. The local branches of the major international accounting firms would be best suited for this task.
- *Ensuring funds are used for designated purpose.* If the bank lends money for fabric, it does not simply give the money to the garment factory. The bank actually sends the money directly to the fabric supplier in a process known as 'trust receipts' which works in the following manner:

- The bank opens a letter of credit to the fabric supplier against specific garment export orders.
- The fabric is consigned to the bank which actually owns the fabric.
- On arrival of the fabric at the garment factory, the bank signs over the document of title (e.g. bill of lading, airwaybill, trucker's receipt), to the factory, which takes the material after signing off on a 'trust receipt' issued by the bank.
- When the order is shipped, the factory receives payment through the bank. The bank retires the debt.

Given the previous experience of banks with the local garment industry in most developing countries, we cannot expect them to immediately shower money on our industry, regardless of who guarantees what. Furthermore, the banks will continue to look at each factory separately. Prudent borrowers should expect better facilities than their profligate neighbours.

In order to overcome the banking industry's reticence, implementation of a national plan to make the export garment industry bankable must take place in phases. During the initial period, bankers will provide export facilities – the factory ships the order and receives immediate payment from the bank. Once banks see that everything is operating correctly and that factories are not shipping non-existent garments to themselves and collecting money fraudulently, banks will go further and actually finance materials.

Method I described above is clearly an easier option. There are many international lending organizations that will provide loan guarantees for export industries. Governments in the industrialized garment importing countries also have funds for these guarantees. A smart director of a local garment exporters association will find a way to push method I through.

The problem is that method I has a history of failure in the long run. Controls tend to be inadequate. The difference between commercial decisions and acts of charity become muddled. No differentiation is made between Ms Good-Factory who uses these facilities wisely and Mr Garbage-Pail who sees these facilities as one more get-rich-quick scheme. As a result, the lenders eventually find their contingent liabilities have become real losses. Their only recourse is to send in the accountants and pull the plug. The industry itself never becomes competitive.

Method II takes more time to set up but it is more effective in the long run. All potentially viable exporting countries are given an opportunity to compete. Method II is a relationship between equals and there is no charity. Not every factory will succeed, but at the end of the day a competitive national industry is created.

Chapter 12

Things go wrong

You have now read 11 chapters of how things work, what steps to take, and how to create workable systems to avoid problems. That is the theory. In the classroom, everything works, and for every problem there exists a solution. The reality, unfortunately, is somewhat different. In the real world, things go wrong and most problems have no solution. Often the only solution is to choose the best from a bunch of bad alternatives.

Fabric arrives late or in the wrong quality, in the wrong colour, or fails tests, or even never arrives. When disaster strikes, what do you do?

There are rules. Usually, factory professionals require about 1½ lifetimes to work out these rules, because for the first 20 years, the rules appear to be totally irrational. For the next 20 years, most professionals lack the courage to follow the rules. By the time the professional understands that the rules actually work and that these rules offer the only solution, he or she is 95 years old and no longer in a position to do anything about anything.

In any case, here are the 10 cardinal rules:

- Rule 1. **When disaster strikes, never think**. Thinking is bad. Thinking leads to conclusions, such as *'This is not too serious'*, or worse, '*The buyer might never see the problem'*. This is called living in denial.

  Good factories have standards. Either materials meet those standards, in which case life goes on, or materials do not meet those standards, in which case you have a disaster. Your only decision is whether the material conforms to the factory standards. This is like being pregnant. There are no degrees. Either you are or you are not.

- Rule 2. **Immediately notify the buyer**. The operative word here is *immediately*. Do not wait for tomorrow in the hope that things will look better the next day. Either things will not look better, which is not good because you will have lost a day, or things will look better which is worse because you are now moving into denial.

  Telephoning is good. Telephoning the buyer at 9 p.m. at their home is even better. It is immediate and therefore keeps everybody focused on reality. It also shows your buyer that you take the problem seriously.

  Remember, all problems are evidence of incompetence. You want to ensure that the buyer looks at this disaster as your once-in-a-lifetime lapse. The very worst possible case occurs when the buyer hears about the problem through a third party such as its agent and then notifies you of the problem. This is proof positive that you are incompetent and should not be trusted with any future orders.

- Rule 3. **Make the buyer your partner in the problem**. Remember, you may have caused the disaster, but your buyer does have a problem. It needs

its goods. Of course the buyer wants to blame you, but it also needs a solution. You want to be seen as more than part of the problem; you want to be seen as part of the solution.

Your opening words on the phone should be, '***We** have a problem*.'

- Rule 4. **Never minimize the problem. Always slightly exaggerate**. This rule requires some explaining. There are two reasons for this rule and they both begin with the same disaster. In this case, your fabric arrives late and this delay will result in late shipment by 14 days of the stock garments.

  As far as the buyer is concerned, late garment delivery means the factory is run incompetently. The one thing you do not want to do now is minimize the problem by telling the buyer that stock shipment will be delayed only 10 days (hoping to make back the lost days by working overtime.) Saving four days will not alter the buyer's perception that you are incompetent. In fact it only increases the probability that you will be late once again. By the same logic, telling the buyer that you will be 14 days late leaves you no leeway. You must do everything possible to ensure you are not late a second time. The easiest way to do this is to ask for more time. As far as the buyer is concerned, there are no degrees for 1-day late, 5-days late, 20-days late – you are just incompetent. Adding a further six days to your existing 14-day delay ensures that you will not be late a second time.

  The buyer does face real problems caused by your delay. Anything you can do to help solve the problem will at least partially compensate for the fact that you caused the problem in the first place. If you want to keep the buyer you must show real results. Telling the buyer that its goods will be delayed by 20 days but then saving 6 full days makes you, if not a miracle worker, then at least a magician. Of course, like all magic, this feat was accomplished by smoke and mirrors.

  By the way, slight exaggerations are good. Big exaggerations are risky. You do not want the buyer to cancel.

- Rule 5. **The customer is always right**. Every industry has this rule, but none takes it as far as the garment industry. We believe the customer is right even when the customer is wrong. In fact, we do not even care about right or wrong, we care only about customer or no customer. Others have the luxury of standing on principles. We in the garment industry lost that right the day we realized that none of us are indispensable. There is a very long line of factories just waiting to replace each and every one of us.

- Rule 6. **The factory is always wrong**. If the mill ships late, if the colour is not the same as the approved lab dip, if the mill substitutes the wrong quality, if the fabric fails testing, it is your fault. That is obvious. That is what sourcing is all about. Once you have agreed to source the materials, you are responsible.

  Furthermore, your responsibility extends beyond problems caused by the mill. They extend to problems caused by the buyer as well. If the fabric is late because the buyer locked your lab dips in a desk drawer and went on a two-month retreat before sending approvals and is inaccessible, this too is your fault. Insurance companies may have special clauses in their policies obviating all responsibility in the event of war or what are termed 'Acts of God' (*force majeure)*. Unfortunately, the garment industry has no such protection.

  Let's say the mill loaded your fabric aboard the MS *Titanic*. The ship hits an iceberg and sinks, carrying to the bottom of the sea 1,196 people plus

17,193 yards of fancy cotton twill. Schmidlap Mart will send you a note of condolence for the drowned passengers together with a claim for late delivery of its 16,525 garments.

Is this unfair? Definitely! Should you pay? Yes! Why? Because your competitor would pay and if you want to compete, you must offer the same, or better, service as your competitor.

- Rule 7. **The factory must completely solve the problem**. Telling the buyer that you will accept cancellation is not a solution. This does not help the buyer. You must overcome the problem. For example, late fabric delivery can usually be solved by shipping the stock garments by air. Poor fabric can often be solved by flying the replacement fabric to the factory and then shipping the stock garments by air. These solutions are so obvious that buyers often will not even suggest them. They already assume garments for late shipment will arrive by air.

- Rule 8. **If you cannot completely solve the problem, you pay a claim**. Remember, it does not matter who caused the problem. Your only question is: Do you want to keep the buyer? You have two options:

  – I want to keep the buyer; therefore I will pay the claim.
  – I do not want to keep the buyer; therefore I will not pay the claim.

  It is worth repeating here once again that right and wrong do not enter into the equation. Take that Schmidlap Mart buyer who went on a retreat. If you want to keep the buyer, you pay the late claim with a note telling the buyer that you well understand that their religious enlightenment is more important than lab dip approvals.

  If you do not want to keep the buyer, the situation is reversed. For example, if I had a buyer that I did not want to keep, and if through some inconceivable series of mishaps, I actually produced exploding T-shirts that detonated upon contact with human skin, I would not pay a claim. More likely I would put in for a supplemental debit note charging the buyer for special finishing.

- Rule 9. **You do not pay consequential losses**. Finally, here is a rule that favours the factory. Losses arise whenever the buyer is unable to sell the garments at full price because of errors on the part of the factory. Late delivery, poor quality and poor fit can all result in real losses.

  Real loss is the difference between the amount the buyer paid for the garments and the amount received when the garments were finally sold. The worst case scenario occurs when the buyer is unable to sell the garments at any price and therefore the loss equals 100% of the garment cost. In these circumstances, late delivery might result in real losses, but, ironically, failure to deliver at all results in zero real loss as the buyer neither receives nor pays for the garments.

  This situation gives rise to what are known as *consequential losses,* the indirect losses which occur because the buyer did not have the right goods at the right time. This includes lost profit.

  Because gross profits in the apparel industry are so large, being charged for consequential losses can kill a factory. Take the case of the casual trousers shown in the costing below. In this instance, the garments were ordered by a private label importer who in turn shipped the garments to a retailer.

  The factory was paid $6.75 FOB per unit. The agent took a 10% commission on the FOB price; then the private label importer paid the sea freight, the import duty, the customs broker's fee and local transportation. At this point the garment cost $9.05 per unit.

Now the private label importer adds a 30% markup (markup percentage can be higher or lower). This is not the same as adding 30% to its cost which would work out to $2.72 per unit. Rather, the gross profit or markup is 30% of the price for which they sell the garment (30% of $12.93 = $3.88). The retailer now adds its 65% markup (65% of $36.95 = $24.01). The trousers, which cost FOB $6.75, now retail for $36.95.

The potential loss of profit, for both the importer and the retailer, is therefore $27.89 ($36.95 less $9.05 rounded off), a little over four times the FOB price.

Casual cotton trousers			
FOB			$6.75
Agent commission			$0.68
Duty			$1.13
Freight			$0.35
Clearance and inland freight			$0.14
Subtotal delivered duty paid			$9.05
Private label importer markup	30.0%	$3.88	
Subtotal whole sale price			$12.93
Retail markup	65.0%		
Full retail price		$24.01	$36.94
Consequential loss of profit		$27.89	

Fortunately, in our industry, in most cases consequential losses are not charged. As a rule of thumb, a factory will go so far as to give the buyer the garments free of charge. That is the normal limit.

There are two important exceptions where consequential losses are accepted.

Deadly garments. Ours is a serious industry and the people in our industry are serious people. We speak of late delivery and poor quality as disasters and cancelled orders as tragedies. We also have a tendency to exaggerate. In an industry where a company may deal with thousands of styles in any given year, mishaps such as an ill-fitting garment or an incorrect colour are expected and accepted as a normal part of doing business.

However, occasionally a garment goes beyond the limits of normal defects and is a danger to the wearer. This includes cases of excessive flammability or use of caustic chemicals, of particular importance in children's and infantswear as well as specialized clothing for firefighters and other related fields. In instances involving dangerous garments, consequential losses are the least of the factory's problems. Many cases can deservedly result in criminal action.

Factories producing these types of garments simply cannot afford to take risks or cut corners. The factory professional must make full use of internationally recognized testing laboratories, such as Société général de surveillance (SGS, see chapter 8), which employ specialists to ensure that all materials conform to international standards and those local to the importing country and the buyer's own requirements. Often the testing laboratory is more aware of relevant product legislation and any health and safety regulations than either the buyer or the factory.

Advertised garments. A retail store advertises a particular style in the local newspaper – not an uncommon occurrence. Factories producing these garments take pride that one of their garments appeared in an international publication and often hang copies of the advertisements around the factory to impress customers and to motivate their sewing lines.

All factories recognize that those advertised styles must be shipped on time. They are also aware that if the garments are not in the store on the day the advertisement appears, the buyer will never do business with the factory again. However, few factories are aware that if an end consumer arrives at the store looking to buy the advertised garment and the goods are not on sale, each and every end consumer has the right to sue the store. In the United States, litigation is almost a national pastime; there are very few factories today that can survive a class action suit.

- Rule 10: **Keep the customer**. Successful factories recognize that continued profit and long-term success is not about the order or the FOB price. What is important is the relationship. In our business, the relationship with the buyer is everything. Once you recognize this, the other nine rules become rational, reasonable and obvious.

Case study X: False claims by unknown people

You cut the wrong style! 1,200 jackets of good quality Scottish tweed and you cut style 1946 instead of 1943.

What's worse, you weren't even aware of the problem until the buyer telephoned you at home to notify you about your problem. What can you say? It is 1 a.m. 'I will get to the bottom of this first thing in the morning. Whatever the problem, we will solve it.'

This is an important customer. You produce all its tailored garments, worth $7.5 million at FOB last year. It always pay its bills on time and allows you to make a reasonable profit.

At 7 a.m. the following morning, you are in the factory checking the Style Master. This is the file which has every piece of information, every correction, every fax, every e-mail, every everything about that style. As far as you can determine, the style shipped was the style ordered. You have a copy of the fax stating 'style 1946' in your hand. You immediately e-mail the customer quoting the fax number with the order for 1946.

'We cancelled that order and replaced it with 1943. Don't you people read your faxes? Don't you keep records?' is the immediate reply.

You ask to see a copy of the relevant fax. When you receive the fax, you immediately understand the problem. The fax reference number SM16244 clearly cancels style 1946 and substitutes 1943. However your files copy of SM16244 is about button shipments. Your fax SM16244 has no reference to either style 1946 or 1943. You are being lied to. There was no fax, no cancellation, and definitely no new order. But why should the buyer lie?

Obviously, this is what really occurred:

- *The buyer made the change;*
- *The buyer instructed someone to notify you by fax that the order had been changed from style 1946 to 1943;*
- *For some reason, that person failed to send the fax;*
- *When the problem came to light, the person in the buyer's office checked the records and discovering no fax had been sent, simply made one up then and there.*

Having determined that you are absolutely in the right and that the fault lies 100% with the buyer, what do you do? Amateurs, the searchers-after-truth, the soon-to-be-bankrupt, use this opportunity to prove they are right and the customer is wrong.

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Professionals, those who have read and grasped the 10 cardinal rules, use this opportunity to form a closer relationship with the customer. The professional telephones the customer:

'I feel terrible about this. We have been working together for six years. In all that time, we have never made a mistake. Please accept my most humble apology. I have personally telephoned the mill. They have additional fabric in stock. Today is Friday. They promise to fly the fabric out on Monday. One week after I receive the fabric, I will have the new jackets in the correct style on a plane to you. Please do me a favour. Try to sell the style 1946. Whatever the net loss, I will pay.'

That is how a professional acts when Things Go Wrong.

Chapter 13

The art of fabric sourcing

Case study XI: The dream comes true or the nightmare begins

Scenario A

You are the head of Schmata Garments, a moderate-sized shirt/blouse factory located in Viet Nam. You walk into the head office of Gap in San Francisco to meet with the head of Gap adult garment sourcing. You have never met this woman and she has never met you. You are naturally a little nervous. She sources over $2 billion worth of garments annually from 21 countries. You operate 500 machines.

You introduce yourself, reach into your bag and take out 50 fabric hanger samples. The buyer starts looking. At first she moves quickly through the hanger samples, but then slows down and finally stops and returns to the top of the pile and begins looking at the fabrics anew. This time very slowly. After about ten minutes she stops, looks up and asks, 'Where did you find these fabrics?'

'These are all produced in Viet Nam. I have been working with some mills now to put together items which I thought might be of interest.'

'Might be of interest? You thought these might be of interest to us and you went ahead and put these together with local mills? Unbelievable! Please wait a moment. I want to call in my entire sourcing section to look at these swatches. Can you stay over a few days in San Francisco? We are going to have to fly in some of our New York designers. I can tell you right now, Schmata Garments has a great future with Gap.'

Or

Scenario B

You introduce yourself, reach into your bag and take out 50 fabric hanger samples. The buyer starts looking and moves quickly through the hanger samples. 'Not interesting, last year's, not interesting, did this in China, not interesting, problems with slippage, two years ago, not for us, not for us, not interesting, not interesting, not interesting,' she comments tersely. 'Look, Gap is always interested in meeting its suppliers. I really thank you for your effort. Perhaps next time you can show your ideas to our local Viet Nam office. They will pass anything interesting on to us. It was a pleasure meeting you. Goodbye.'

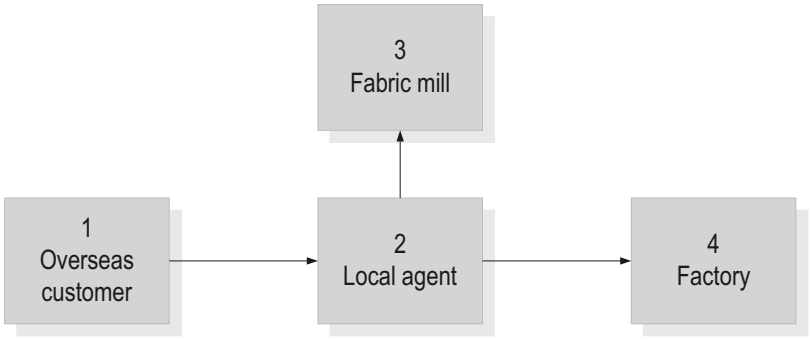
So how do you get Scenario A and avoid Scenario B? One of the oldest jokes in the world tells of a tourist, visiting New York for the first time, who is going to a classical music concert. Having lost his way, he stops the first person he sees and asks, 'How do I get to Carnegie Hall?' To which the New Yorker replies, 'Practice, a lot of practice.'

How do you get to the Gap San Francisco head office? There are no shortcuts. It involves work. A lot of work and a lot of time.

Changing the paradigm

For the past 50 years, garments have been sourced the same way – the Standard Garment Sourcing Model (SGSM). The buyer gave instructions to its local agent (or wholly owned or independent local buying office), who selected which factory to work with and passed the buyer's instructions on to that factory.

Fabric sourcing was carried out by either the buyer or the agent. With the exception of special fabrics such as silk, the factory was always excluded from the fabric sourcing process.



Customers had good reasons for using SGSM:

- The customer knew the actual cost of the fabric;
- The customer located in New York or London had greater understanding of its current fabric needs than a factory located in Phnom Penh or Jogyakarta.

However widespread the model became, through the years SGSM developed several inherent fabric sourcing problems, especially for factories attempting to move from CM to full package services:

- Most local buying offices lack the product-specific skills necessary to source fabric. Knowing the cost of the fabric is only of value if a suitable fabric supplier has been identified. Knowing the fabric trends in New York or London is of little value if similar fabric cannot be sourced in Asia or the country where the factory is located.
- The flexibility of independent local buying offices or agents in selecting factories does not necessarily work to the customer's advantage. Outside agents with fabric sourcing skills normally add profit on each yard of fabric sourced. The agent ideally wants to work with as few factories as possible in order to keep its overheads down. Adding a new factory because the factory is able to source fabric, while undoubtedly an asset to the customer, is simply an additional overhead expense to the agent as the factory will expect to be paid more for the finished goods.

Whatever the historical precedents, as we have discussed in earlier chapters, once quotas have been phased out, buyers will be in the driver's seat making ever greater demands on their factories, including providing design assists, speed to market and credit facilities. Many of these demands will involve taking over responsibilities previously held by the local buying office or agent and one of the first priorities will be fabric sourcing.

Remember, as we discussed in chapter 3, fabric sourcing is far more complex than simply paying for fabric which the customer has already ordered. Fabric sourcing in fact develops over two stages:

- Sourcing against customer's request. The customer has selected a fabric and provides you with a swatch. You are responsible for finding a mill and duplicating the customer's fabric.
- Sourcing independently. You gather interesting fabric from the mills where you have special relationships and show the swatches to the customer's designer who in turn makes a selection.

Each stage requires special skills. Sourcing against customer's requests requires greater technical skills. Sourcing independently requires greater understanding of the customer, as well as fashion trends in the customer's home market. For the factory just beginning the fabric sourcing process, sourcing against customers' requests makes more sense simply because it is a good way to establish a direct relationship with the customer and the designer. Once that relationship is in place, independent sourcing would naturally follow.

The new Full Value Sourcing Model (FVSM) is both simpler and more open than SGSM. The essence of FVSM is that everybody involved in the process both supplies and receives information. Fabric ideas flow freely between the buyer, the factory and the mill.

As shown in the case study above, the goal of garment factories will be getting to see the senior sourcing executive at Gap who is willing to meet with any factory that has new fabric ideas. The challenge is to ensure that when you do meet, you have something of interest to show the executive.

Admittedly, it is not going to be easy to overcome the old SGSM and the traditional roles of all the parties involved. Furthermore, I am not suggesting that you immediately bypass your buyer's local representative. However, it is important for you, the factory, to understand the relationship between the buyer and its local representative as well as the local representative and yourself, and to act accordingly.

Local buying office management is interested in securing more business for its country. If the buyer's local representative is its wholly owned buying office, it can, in fact, be very helpful in your efforts to enhance your direct relationship with your customer if management views your efforts as coinciding with their own goals. The more business you do with the buyer, the better the local buying office looks.

For example, Liz Claiborne's buying office in Sri Lanka is a prime example of what a well-managed office should be. This office will actually set up appointments for local factories to meet with Liz Claiborne designers and division heads in New York. What more can you ask for?

However, not all buying office management is as competent as this. Many still cling to the outmoded belief that they must retain total control of buyer–factory relationships. As for outside agents, finding a win-win solution will be next to impossible. Independent agents see the competent factory as potential competition. In fact, most agents prefer dealing with second, third, and even tenth-class factories incapable of offering any advanced services or facilities. This way, the buyer is forced to continue using the agent's services to ensure acceptable production.

For the factory aspiring to form a direct relationship with its overseas buyer, the first step is to attempt to work through the local buying office (if the customer has a local wholly owned buying office). If that effort leads nowhere, or if the customer has no local wholly owned buying office, the next step is to e-mail or fax the buyer directly and to begin planning your trip.

Developing skills and acquiring knowledge

If you are a factory and you want to source fabric for Gap, Next or Schmidlap Mart, you must first meet three challenges:

- Find someone who understands fabric both technically and from a fashion and style standpoint as well;
- Find out what Gap, Next or Schmidlap Mart is looking for;
- Find the mills that can fill the customer's needs.

Finding a qualified fabric sourcing specialist is, unfortunately, not always easy. In countries with university-level institutions specializing in garments and textiles such as Hong Kong, China, India, Korea and soon Thailand, there should be no problem. The local industry has a reservoir of educated and experienced fabric sourcing specialists. The factory places an advertisement in the local paper or telephones the university graduate placement service.

Where the relevant tertiary education does not exist, however, the task becomes more difficult. If you are lucky, you may be able to find someone in your area with a specialized university degree. If no such person exists, the next step is to look for someone without a degree but with experience. This is, however, a risky road to take, mostly because the qualified person you are looking for should know a great deal more about sourcing fabric than you.

The interview process becomes very important. The suitable candidate should have both technical and fashion knowledge. A good solution would be to enlist the help of individuals with specialized knowledge, such as someone from a mill, to either be present at the interviews or at least to provide a simple list of questions and answers.

For example, on the technical side, if you are a men's tailored shirt maker, the following would be a suitable list of queries:

- Can you explain the difference between oxford, poplin, chambray?
- Can you explain the difference between carded, semi-combed and combed?
- What is mercerized?
- *You might also show the candidate various swatches and ask them to estimate the yarn count and construction (or tex number).*

Questions to determine the candidate's knowledge of fashion are more difficult to frame. You must determine whether the candidate has a professional interest and knowledge of fashion, rather than simply 'knowing what they like'. Questions should be aimed directly at the customer's needs. Again, bringing in a knowledgeable outsider would be a very good idea. In this case, your customer will be able to offer suggestions. Remember, your goal is to provide greater service to your customer. As a result, your customer has a real interest in ensuring that you have the right people on your team.

For example, for a T-shirt maker, the following would be suitable 'fashion' questions:

- What is the difference between a Gap customer and a Banana Republic customer (or a Per Una customer and the regular Marks and Spencer customer)?
- Do you think fancy yarns will be important next season and, if so, which yarns?
- What colours and patterns were important last season?

Training your own fabric sourcing specialist might appear a good idea in theory, but in practice rarely works, simply because the position is so specialized. Many factories make the mistake of looking for a well-dressed, well-travelled young person, fluent in colloquial English, who is 'interested in fashion'. The candidate is hired with the expectation that he or she can work with the customer. Often that person is someone's niece or nephew. I have nothing against nepotism. In many countries somebody's niece or nephew is the only person who is well-dressed, well-travelled, and has fluent English. But all things considered, you would be doing everyone a favour if instead of hiring your niece or nephew, you and your brother sent the young person to Hong Kong for a three-year specialized education.

Whoever you end up hiring, one skill is required above all others – an eye. This translates as the ability to:

- Look at a swatch of fabric;
- Envision that fabric transformed into a finished garment;
- Calculate the approximate cost of that garment;
- Relate that information to previous knowledge of the customer's fashion needs and price points;
- Determine whether the customer would be interested in that fabric.

All things considered, you are looking for someone with a very rare array of skills and talents.

Finally, different products require different skill levels. Sourcing fabric for men's suits or ladies' tailored dresses requires considerably greater skills than those required for T-shirts or jeans.

The following is a very basic chart outlining the relative levels of skills required for various products.[10]

10 This is a very general and simplified analysis. The level of skills required to source material for any garment product varies greatly depending on price level, fashion level and customer requirements.

Comparative skill set requirements by product							
Description	**Yarn and fibre**	**Stitch or weave**	**Gauge or construction**	**Fabric**	**Trim**	**Costing**	**Customer's requirements**
Knit							
Basic T-shirts	Limited range	Limited range	Limited range	Limited range	Limited range	Simple	Basic
Fashion T-shirts	Wide range	Limited range	Limited range	Wide range	Limited range	Simple	Basic
Fleece	Limited range	Limited range	Limited range	Limited range	Limited range	Simple	Basic
Sweaters (jumper)	Very wide range	Wide range	Very wide range	Not available	Limited range	Complex	Basic
Underwear	Limited range	Limited range	Limited range	Limited range	Limited range	Simple	Basic
Hosiery	Limited range	Limited range	Limited range	Not available	Limited range	Simple	Basic
Woven							
Jeans and other casual trousers	Limited range	Limited range	Limited range	Limited range	Limited range	Simple	Basic
Dress shirts	Limited range	Limited range	Limited range	Limited range	Limited range	Simple	Basic
Sport shirts	Wide range	Limited range	Limited range	Limited range	Limited range	Simple	Basic
Blouses	Very wide range	Wide range	Limited range	Wide range	Wide range	Simple	Complex
Tailored jackets	Very wide range	Very wide range	Very wide range	Very wide range	Very wide range	Very complex	Very complex
Tailored trousers	Wide range	Limited range	Limited range	Very wide range	Limited range	Simple	Complex
Pajamas	Limited range	Limited range	Limited range	Limited range	Limited range	Simple	Simple
Lingerie	Wide range	Limited range	Limited range	Wide range	Very wide range	Complex	Complex
Brassieres	Limited range	Limited range	Limited range	Limited range	Very wide range	Complex	Complex
Anoraks	Limited range	Limited range	Limited range	Limited range	Very wide range	Very complex	Very complex
Casual dresses	Wide range	Wide range	Wide range	Wide range	Limited range	Simple	Simple
Tailored dresses	Very wide range	Very wide range	Very wide range	Very wide range	Very wide range	Very complex	Very complex
Evening and bridal	Very wide range	Very wide range	Very wide range	Very wide range	Very wide range	Very complex	Very complex
Casual skirts	Limited range	Limited range	Limited range	Limited range	Wide range	Simple	Basic
Tailored skirts	Very wide range	Very wide range	Very wide range	Very wide range	Very wide range	Very complex	Very complex

The ability to determine what Gap, Next or Schmidlap Mart will be looking for is a long-term task that requires a good deal of travel. Roughly this is what will be involved:

- The fabric sourcing specialist begins by travelling to Schmidlap Mart's home country. He or she looks at the stores – all the stores. What is Schmidlap Mart featuring? How is that different from what other brands/buyers are showing? Everybody will be showing what is currently 'in', yet everybody will have their own interpretation of those trends.
- The fabric sourcing specialist must attend fabric and/or yarn shows to see what is out there. Once again, the goal is to determine how what is being shown differs from what Schmidlap Mart is showing.
- This process must be repeated for several seasons. The goal now becomes trying to predict what Schmidlap Mart will be showing in its latest collection.
- Finally, the fabric sourcing specialist makes direct contact with Schmidlap Mart's designer. There is no need to feel intimidated. Ultimately, both the factory and the buyer have the same objective and the designer is there to help. The sourcing person explains that the factory is attempting to source fabrics locally (or regionally) and shows the designer samples of locally made fabrics. The designer will explain why they are not right, how to make them right, or what fabrics of this type would be right.

Armed with this information, the fabric sourcing specialist visits mills in its home country and puts together a portfolio of swatches. Generally mills are limited to the home country because the customer usually prefers to manufacture garments in the country where the fabric is produced. Buying Chinese fabric is good only if the factory is located in China. If your factory has to import basic fabrics, it will be very difficult to compete in the post-2005 open market. However, if your factory is quite specialized and adds significant value to the product, the customer will often expect fabric to be imported.

Other exceptions to this general rule include Jordan, the African Growth and Opportunity Act (AGOA) countries, and soon Egypt, which all enjoy some level of duty-free access to the United States market even with imported fabric, or other countries which enjoy similar privileges to other major markets. (This is why analysis and country of origin rules are important, see chapters 14 and 15 and the Country of Origin appendices.)

You or your fabric sourcing specialist must develop a relationship with the mills in your home country. Remember, you may be only a small factory, but Schmidlap Mart is an enormous buyer. Any factory with a direct relationship with Schmidlap Mart is worth talking to. Besides taking the mill's specific fabrics (which will invariably be offered to the mill's other factory customers), give them your own ideas for upcoming seasons.

The skills required to source materials independently require substantial investments of time, effort and money to develop and inevitably it is the large-scale suppliers who make the move first. However, that doesn't mean that smaller factories cannot also join in. Gap, Next and Schmidlap Mart will all talk to you and, if you have something to offer that they are looking for, they will take you seriously. This process may take well over a year. However, if you successfully complete the course, the day will come when you walk into the head office of Gap in San Francisco to meet with the head of Gap garment sourcing.

Chapter 14

The mechanics of fabric sourcing

The previous chapter addressed the skills, knowledge and talents required to source material. This chapter gives the nitty-gritty on how to start: you and/or your fabric sourcing specialist need to find out what is happening in the world of fabric.

As a general rule, the customer wants the factory to source materials locally rather than regionally, and regionally rather than globally, whenever possible. Ideally the customer would like the factory to act like a virtual vertical operation, with in-country fabric sourcing to garment production in a seamless process. To satisfy its buyers, the factory must have both knowledge of and relationships with the important local mills. The customer certainly expects its garment supplier in Viet Nam to be an expert in sourcing fabric in Viet Nam.

However, this is not a hard-and-fast rule. Proximity to the mill is undeniably an important factor; however, there are two other factors to consider.

- Product complexity. If you are shipping basic T-shirts from Peru, you must source your cotton single jersey knit fabric in Peru. T-shirts are a very simple and therefore highly competitive garment product. In the absence of special exceptions, such as a free trade agreement, the buyer will always source this product in the country producing the fabric. On the other hand, if you are producing men's high quality suits, the customer would expect you to source fabric globally. Men's tailored suits are an extremely complex product which relatively few factories worldwide are capable of making. The best fabrics come from mills located almost everywhere. Your customer would expect you to buy fine blends from Italy, quality tropical worsteds at reasonable prices in Mexico, and more basic flannels in China. And, the customer would expect you to have close relationships with mills in all three areas.
- Customer size and price level. At last count, Gap had 22 gazillion suppliers worldwide. Granted, this is an exaggeration. However, I am indeed beginning to think that if I were dropped in any city anywhere in the world and walked three blocks, I would find a garment factory supplying Gap. Gap has blanketed the entire garment producing world to the point where if a textile mill were located at Land's End, Prince Patrick Island, 200 km from the North Pole, Gap would have three garment factories located two blocks away. With coverage like that, Gap garment suppliers must source fabric locally. On the other hand, if your factory is supplying Harvey Nichols in London, Barneys in New York, or Issey Miyake in Paris with fine sweaters (83 pieces of an average style) and you find a great yarn supplier on the planet Neptune, go for it. Your customer will support you 100%.

In fact, the truly developed garment industries are mixed, relying on local fabrics for products which are either basic or in which they specialize, and imported fabrics for the balance. The best example of a mixed supply base is China. China is not only the world's largest fabric producer, it is also the first or second-largest fabric importer (see chapter 2).

This country produces not only basic fabrics of all types but also special items such as silk where Chinese garment factories hold a dominant position worldwide. On the other hand, China has one of the easiest fabric import systems in the world. As a result, the Chinese factory will source Chinese fabric only if the local fabric best suits the customer's needs. If local fabric is not available, if the quality is not up to the customer's standard or if the price is uncompetitive, the factory will simply import the fabric.

China's system should be the model for all countries planning to develop world class garment exporting industries. However, until your country reaches that goal, if you are a garment maker located in a small country with no textile industry, you must survive. What does a basic T-shirt supplier in the Lao Democratic People's Republic do to satisfy its giant, mass-market customer?

Unfortunately, there is no simple answer. The country with the local textile industry has the advantage. Up to the end of 2004, that advantage was offset by quota restrictions. In the post-2005 era, countries with access to raw materials and well-developed textile industries, such as Pakistan and India, will move quickly to increase garment production.

Clearly, suppliers in countries with no local textile industry have no choice but to learn to source material overseas, and I suggest they need to become very knowledgeable, very quickly. At the same time, these suppliers must move their operations from basic production to becoming one of those exceptions where customers expect regional fabric sourcing. I am not suggesting that existing mass-market customers be changed for low volume, high fashion customers. However, a move from basic men's cotton T-shirts to women's synthetic fashion T-shirts is both feasible and very advantageous. The factory would still be producing T-shirts. It would retain its present customer base. The only difference is that it would now be able to compete without a local textile base. I also urge that these suppliers rapidly develop a solid reputation for perfect garments shipped quickly at low cost.

Material shows

If your customer wants you to source fabric as close to home as possible, why go to a fabric show in Paris to locate fabric?

You are not going to Première Vision or Pitti Immagine Filati to source fabrics or yarns. You are going for research. Whether you are **sourcing independently** or **sourcing against customer's request**, you must first understand what the customer wants. All too often, what the customer wants is not obvious, even when the customer gives you a swatch. To understand the customer's requirements, you must see the swatch in the context of the season and the fashion. You go to the show to see the range of what is new, so that when your customer gives you a swatch you can relate its fabric to the current fabric trends.

The first step is to visit the material shows. There are countless material shows. Like some unstoppable epidemic, industry shows are popping up everywhere. Clearly you cannot go everywhere and equally clearly you do not want to go everywhere.

On the other hand, there are three events which every material sourcing specialist must attend regularly:

- Première Vision, Paris: *www.premierevision.fr*

  This is still the most important fabric show in the world. It is held biannually (autumn/winter and spring/summer). Every major European textile mill is present, each with a complete line. You can see the new fabric trends.

- Pitti Immagine Filati, Florence: *www.pittiimmagine.com.*

  This is the show for anyone interested in yarn for flat knits. Italy is the centre of the world fashion sweater industry and this show is the centre of Italian knitting. Not only do the suppliers show their yarns, they also exhibit knit-downs of what can be done with those yarns based on different gauges, stitches and machines. The show is also biannual.

- Canton Fair, Guangzhou (southern China): *www.cantonfair.org.cn*

  This show is not about the latest fashion trends. This show is about China – by far the largest textile exporter in the world. In order to understand what is happening in the apparel sourcing world and to stay competitive, any knowledgeable material buyer needs to see what China is producing and its prices. In fact, the Canton Fair, also known as the Chinese Export Commodities Fair, is about much more than fabric or even yarn. It's about everything that China produces for export. Held in spring and autumn.

Some words of warning:

- Book a hotel room well in advance. Professionals tend to book their hotel room for the next show as they are checking out after visiting the current show.
- Be prepared for a gruelling time. These three shows are enormous. I doubt if anyone has actually ever seen the entire Première Vision show. It is just too large. On the other hand, no one would ever want to see the entire Canton Fair. Let's face it. If your profession is fabric, you would have less than a passing interest in artificial manure.
- Employ a local agent to visit the show with you and to follow up after you leave. Communicate with your agent before coming to the show on what types of fabric you are interested in. You can be as general as you want, for example, 'I do shirts'. You can be as specific as you need be, for example, 'I want to see fine count mercerized yarn-dyed novelties.'

Other events worth visiting include:

- Interstoff Asia, Hong Kong: *http://interstoff.messefrankfurt.com*

  This is an important fabric and trim show bringing together Asian suppliers as well as a good selection of European suppliers with global networks. Held in spring and autumn.

- Expofil, Paris: *www.expofil.com*

  Italy doesn't have a monopoly on fashion sweaters. This is the French yarn show.

- Texworld, Paris: *http://interstoff.messefrankfurt.com*

  France also features its own fabric show, held in conjunction with Première Vision dates. Not as large as Première Vision, but still interesting.

- Intertex, Milan: *www.intertexmilano.it/*

  Italy also has several textile shows. This is the most important.

- TMC Fashion Square, Zurich: *www.tmc.ch*

  TMC Fashion Square is the first contact for all activities of the wholesale Zurich Textile and Fashion Center, which organizes specialized fairs with dates adjusted to international events. Worth a visit.

- Taiwan International Textile and Apparel Show, Taipei: *www.titas.com.tw*

  As a major textile exporter, Taiwan Province (China) has its own show. Particularly good for developments in manmade fibre and other high-tech materials.

- Intertextile Shanghai: *http://interstoff.messefrankfurt.com*

  The Shanghai show is new but is a good place to see Chinese fabrics and trim.

- Istanbul International Textile and Accessories Sourcing Exhibition: *www.fibre2fashion.com/itse*

  Turkey is the second-largest fabric exporter to the European Union. It has a remarkable industry – something of a cross between China and Italy, showing both basic fabrics with huge minimums and more fashionable fabrics where minimums are as low as 500 m per colourway.

The United States has several major material shows, reflecting the importance of the United States as a market rather than as a source of fabric. Three shows are important:

- MAGIC, Las Vegas: *www.magiconline.com/*

  MAGIC is the most important textile/garment show in the United States. The show will give you an idea of not only which fabrics are important, but the garments they go with.

- International Fashion Fabric Exhibition (IFFE), New York: *http://ny.fabricshow.com/*

- Los Angeles International Textile Show: *www.californiamart.com*

  Both the New York and Los Angeles shows are quite comprehensive.

Remember, the shows are important not for today's offerings but to see trends. Trends cannot be seen with a single event. If any of these shows are to be of value, the material sourcing specialist must return season after season and note the changes. Only this way will the specialist learn to predict what styles and new ideas will be coming next.

Colour–fabric–fashion services

Our industry has spawned an entire sub industry filled with people whose only purpose in life is to tell you what style, what fabric, and what colour will be next season's killer colour–fabric–style. In recent years, these services have gone high-tech with combinations of hard copy, soft copy and no copy. You subscribe, push a button on your computer, and zoom in on the window of a boutique in London, a fashion show in Milan, or a commentary on the vital importance of earth-tone colours. These services cost anywhere from $1,500 to $15,000 per year.

The best are very good indeed. The not-so-best are simply awful. These are useful tools, but for the fabric sourcing specialist, they are only tools. They do not replace visiting the shows, visiting the stores, or visiting the customer and the customer's designer.

Most importantly, the customer wants to hear from you, not some garbled rendition of the latest on-line report from Schmidlap Fabric Service. In fact, your customer and its designer know all about Schmidlap Fabric Service. They probably subscribe to Schmidlap Fabric Service and, more than likely, think Schmidlap and its fabric service are both a load of fanciful rubbish.

If you or your sourcing specialist feel you must receive secondhand information, then I suggest the next time you are at Première Vision, Pitti Immagine Filati or MAGIC, you go to the many booths selling these services and decide for yourself whether what they have to offer is appropriate to your needs. As there will be a variety of such companies at the show, you can also compare their services and costs.

Shopping the stores

All garment professionals shop the stores. We do not buy anything. We just look. What is selling? What is not selling? How do our customers' garments compare with the competition? How does the merchandise reflect what we saw at the latest fabric show?

The more civilized among us just look. Some, the more unscrupulous, actually take garments into the dressing room and photograph them. The completely dishonest will go even further but these are practices not to be described here or condoned.

Besides contacts established during shows and trade fairs, the best way to identify mills is through global, regional, or national textile and yarn associations. A listing giving information contacts for some of the more important textile associations is provided in a table at the end of this chapter. There are also supplier directories compiled by private companies and other organizations; unfortunately, these tend to be quite hit-and-miss for accuracy or industry-specific information and are rarely kept up-to-date. Many large-scale suppliers will also have their own websites.

In the final analysis, the only way to locate good mills is to visit the mills. You can gain a head start by working through one of the more reliable Japanese trading companies or Korean chaebols which operate offices in almost every country with textile mills, but even then you must still visit the mills.

Meeting the mills

For many factories attempting to offer material sourcing services to their buyers, this is the most difficult process to carry out. The number of mills a factory chooses to work with and the importance of the mills to the sourcing process is based on a number of variables, most importantly, what the factory produces and where it is located.

For example, if you produce basic T-shirts or fleece apparel, the entire sourcing process is of less importance than if you produce synthetic sweaters. There are only a limited variety of T-shirt fabrics and for this product, the knitting machinery is more important than the fabric design. As a result, the preferred

mill does not even require a large collection of fabrics, just a wide variety of circular knitting machinery. Consequently, T-shirt makers need have relationships with only two or thee mills.

However, if you produce ladies' synthetic sweaters, you will need relationships with a large number of mills located both in your home country and overseas. With the exception of Italy, no country produces the complete range of yarns. A successful synthetic sweater maker will need relationships with perhaps 10 or more mills worldwide and very close relationships with 4 or 5.

If you are located in a country with a well-developed textile industry, such as India, Pakistan or Indonesia, your customer will expect you to have relationships with a relatively large number of local mills. If, on the other hand, you are located in Cambodia or Nepal, a solid relationship with even one or two reliable local mills will be enough to catapult you into the Class A factory category in your country.

Supplier evaluation: determining which is the right mill

You visit the mill and are shown a bunch of swatches and some machines. If you happen to be an expert, you might ask why the mill decided to buy the Frümgreidinger model 8725W, when the entire world knows that 8725W was superceded by 1126M. However, for those of us who have not yet received our copies of the latest Frümgreidinger catalogue, other evaluation methods are necessary.

To carry out effective supply mill analysis, a detailed mill questionnaire (samples included below) will allow you to compare one mill with another. If the questions appear unduly technical, accept their necessity on faith. Once you have completed your first 100 mill visits, you will find that every question is vital if you are truly to understand the mill's operations, both technical and commercial.

Questionnaire 1 – Woven fabric

Company name:_____

Marketing address: _____

Year established: _____

Tel.: _____ Fax: _____

E-mail: _____ Website address: _____

Contact name: _____ Dept/title: _____

_____ Dept/title: _____

Vertical integration – Related and branch companies

	Company name	Location	Year established
Spinning facility			
Weaving facility			
Printing/dyeing/finishing facility			
Sourcing/sales offices (esp. offshore)			
Parent/group			

Operations type (check one):

Weaving subcontractor _____ Greige goods _____ Commodity finished goods _____
Moderate fashion mill _____ Own-collection fashion mill _____ High-end designer mill _____

Fibre specialization: Cotton _____ Acrylic _____ Nylon _____ Polyester _____ Rayon _____
Wool _____ Silk _____ Linen/Ramie _____ Tencel _____ Other (specify) _____

Size and sales turnover
Average monthly production _____ (specify unit) Size _____
(Small/medium/large)
Annual weaving sales _____ ($) Group sales _____ ($)
(indicate year) _____ (indicate year) _____

Principal raw materials sourcing

Fibre group (cotton, wool, silk, etc.)	Fibre type	Country

Principal product type

Fibre	Weave type	Sub-type	Special processes

Questionnaire 1 – Woven fabric

Company name _____

Selected pricing

Fabric type	Greige/ finish	Composition	Count	Construction	Width (cm/in.)	Price/ unit	Minimum order

Machinery

Item	Type	Brand	Country of make	Width (cm/in.)	No. sets
Warping					
Sizing					
Weaving	Shuttle				
	Projectile				
	Rapier				
	Air jet				
	Water jet				
	Gripper				
Other					

Special processes/facilities

Facility	Machinery/other technical information	In-house facility	Outside service
Yarn-dyeing			
Piece-dyeing			
All-over printing			
Finishing			

Major customers

Country/location	Client name	Comments

Pre-production information
Able to produce fabrics to customer's specifications _____
Lead times: Lab dips _____ to _____ days Strikeoffs _____ to _____ days
Salesperson sample fabric:
Available in customer colours/colourways/patterns __ Lead time ___ to ___ days
Available with bulk production order only __ Lead time ___ to ___ days
Available in solid-dyed colours only __ Lead time ___ to ___ days
Available in mill stock colours/patterns only __ Lead time ___ to ___ days

Bulk production information: Lead times (from receipt of L/C or purchase)
Greige goods _____ to _____ days Yarn-dyed or printed goods _____ to _____ days
Piece-dyed goods _____ to _____ days Other (specify) _____ _____ to _____ days
Smaller than normal minimums available with surcharge _____
Minimum quantity per roll _____ (specify yards/metres/other unit)

Inspection facilities: In-house lab _____ Outside services (specify) _____
ISO or other accreditation (specify) _____
Compliance specify auditing organization _____
Payment terms: L/C _____ Open account _____ Credit terms _____ (No. of days) _____

Questionnaire 2 – Knit fabric

Company name:_____
Marketing address: _____
Year established: _____
Tel.: _____ Fax: _____
E-mail: _____ Website address: _____
Contact name: _____ Dept/title: _____
_____ Dept/title: _____

Vertical integration – Related and branch companies

	Company name	Location	Year established
Spinning facility			
Weaving facility			
Printing/dyeing/finishing facility			
Garment facility			
Sourcing/sales offices (esp. offshore)			
Parent/group			

Operations type (check one):
Knitting subcontractor _____ Greige goods _____ Commodity finished goods _____
Moderate fashion mill _____ Own-collection fashion mill _____ High-end designer mill _____

Fibre specialization: Cotton _____ Acrylic _____ Nylon _____ Polyester _____ Rayon _____
Wool _____ Silk _____ Linen/Ramie _____Tencel _____Other (specify) _____

Size and sales turnover
Average monthly production _____ (specify unit) Size _____
(Small/medium/large)
Annual knitting sales _____ ($) Group sales _____ ($)
(indicate year) _____ (indicate year) _____

Principal raw materials sourcing

Fibre group (cotton, wool, silk, etc.)	Fibre type	Country

Principal product type – Knit

Knit classification	Gauge range	Stitch	Fibre type	Sub-type

Principal product type – Lace

Lace classification	Lace name	Fibre type	Sub-type

Special facilities: Spandex _____ Popcorn _____ Embroidery _____ Beading _____

Questionnaire 2 – Knit fabric

Company name _____ **Pin No.** _____

Selected pricing

Fabric name/composition/gauge/width or diameter/dye state	Price ($) specify volume unit	Minimums/colour or colourway	Minimum order

Machinery

Type	Brand	Country	Gauge	Diameter or width (cm/in.)	No. sets

Special processes/facilities

	Machinery/other technical information	In-house facility	Outside service
Yarn-dyeing			
Piece-dyeing			
All-over printing			
Finishing			

Pre-production information

Able to produce fabrics to customer's specifications _____
Lead times: Analysis and price quotation _____ to _____ days
Lab dips _____ to _____ days
Strikeoffs _____ to _____ days
Salesperson sample fabric (small lots):
Available in customer colours/colourways/patterns __ Lead times ___ to ___ days
Available with bulk production order only __ Lead times ___ to ___ days
Available in solid-dyed colours only __ Lead times ___ to ___ days
Available in mill stock colours/patterns only __ Lead times ___ to ___ days

Bulk production information: Lead times (from receipt of L/C or confirmation purchase order)
Greige goods _____ to _____ days Yarn-dyed or printed goods _____ to _____ days
Piece-dyed goods _____ to _____ days Other (specify) _____ _____ to _____ days
Below normal minimums available with surcharge _____
Minimum quantity per roll _____ (kg/other units) Open width finish available _____

Major customers

Country/location	Client name	Comments

Inspection facilities: In-house lab _____ Outside services (specify) _____
Test/inspection method _____
ISO or other accreditation (specify) _____
Compliance specify auditing organization _____
Payment terms: L/C _____ Open account _____ Credit terms _____ (No. of days) _____

Questionnaire 3 – Yarn

Company name:_____

Marketing address: _____

Year established: _____

Tel.: _____ Fax: _____

E-mail: _____ Website address: _____

Contact name: _____ Dept/title: _____

_____ Dept/title: _____

Vertical integration – Related and branch companies

	Company name	Location/country	Year established
Spinning facility			
Weaving facility			
Knitting facility			
Printing/dyeing/finishing facility			
Sourcing/sales offices (esp. offshore)			
Parent/group			

Operations type (check one):
Weaving yarn: commodity greige yarn _____ Fine yarn _____ Fancy yarn
Knitting yarn: commodity greige yarn _____ Fine yarn _____ Fancy yarn

Principal raw materials sourcing

Fibre group (cotton, wool, silk, etc.)	Fibre type	Country

Size and sales turnover
Average monthly production _____ (specify unit) Size _____
(Small/medium/large)
Annual spinning sales _____ ($) Group sales _____ ($)
(indicate year) _____ (indicate year) _____

Major yarn markets

	% of total sales
Domestic market	
Indirect exports (export-oriented downstream manufacturers, local trading companies, etc)	
Direct export sales	
Major direct export markets	

Questionnaire 3 – Yarn

Company name _____

Major customers

Country/location	Client name	Comments

Principal yarn product type

Fibre	Sub-type	Count range	Spinning method	Special process

Selected pricing

Yarn description (composition/yarn type/count/ply)	Price ($) specify volume unit	Minimum order

Machinery (use extra lines to list any special machinery)

Spinning system OE, RS, air	Brand/type	Country of make	No. of sets	No. of spindles

Bulk production information: Lead times (from receipt of L/C or confirmation purchase order)
Greige goods _____ to _____ days Coloured goods _____ to _____ days
Other (specify) _____

Inspection facilities (fill in or check as applicable)

	Type	Inspection method	In-house facility	Outside service
Fibre				
Yarn				

ISO or other accreditation (specify) _____

Compliance specify auditing organization _____
Payment terms: L/C _____ Open account _____ Credit terms _____ (No. of days) _____

Developing relationships with the mill

The key to a good relationship is equality – both sides contribute and both sides benefit. For a small or medium-sized factory, creating and developing an equal relationship is very difficult. When all is said and done, your orders simply will not be as large as the giants in your country's garment industry. However, you do have three assets which are valuable to the mill:

- You are or employ a professional material sourcing specialist with knowledge of trends and an eye for what will be commercially successful in your buyer's marketplace. Even if you do not ultimately place orders for all the fabric samples that you show the mill, they will benefit by having access to your knowledge.
- You travel to the shows. You can offer to do favours for the mills or, if a mill is sending its own specialist to a show, you can go together and exchange information.
- You are building a direct relationship with your buyer. You may not be large, but your buyer is a giant.

In the final analysis, if you want to build a strong relationship with a mill, it is better to share all your information with the mill.

Finally, one more important rule: Never lie, never even exaggerate. Tell the mill at the outset, 'I can order only 3,000 metres of a fabric.'

If you exaggerate the first time you work with a mill, in the future, the mill will forever divide every one of your estimates by 10, 100 or even 1,000. If it turns out your first order is larger than what you initially expected, both you and the mill will at least be in a strong position to do something about it. You won't have let the mill down and your credibility won't be damaged.

Developing relationships with the buyer

Telling the mill the name of your buyer is usually risk-free. The relationship between a factory and a mill can be built on substantial levels of trust. Mills tend to place relatively high values on customer relationships, especially since you (their factory customer) are in a position to help them. The mill will not try to cut you out of the relationship.

The factory has a greater need to protect itself when dealing with the buyer. Whatever a factory does, the buyer can eventually find out where the fabric is being made and then deal direct with the mill and other factories. Certainly a factory has no protection when dealing with the buyer's agent, who will cut you out without giving the matter a second thought.

Aside from the tricky question of whether you should be supplying the mill name, in all other matters you must be completely open with your buyer. After all, at the end of the day, the ultimate end goal of the factory which offers material sourcing services is to strengthen its relationship with the buyer.

Some additional thoughts

The global garment industry is going through the greatest change in its history. The supply chain, which today consists of four links – the retail buyer, the private label importer, the local buying agent and the factory – will be reduced to two links. The importer and the local buying agent will be forced out of the manufacturing process, their roles being taken over by the factory.

As with all change, past success is no guarantee of future success or even future survival. Factories and entire industries which up to 31 December 2004 were held up as models for others to follow will find themselves no longer competitive, replaced by new factories more able to meet buyers' demands for new and greater services. In the post-2005 quota-free industry, buyers will classify their factories on the basis of service. Those that supply the important services will reduce the buyers' costs and become important suppliers. Those that do not will simply be relegated to the margins of the industry.

Great change offers great opportunity. As buyers look for factories to meet their new requirements, old relationships are discarded, providing an opening for new suppliers willing and able to develop and implement these new services. Of all the services that buyers will require, the most important will be the ability to source material because the factory able to source material can operate together with the buyer, without the need for importers or buying agents.

We are moving into an era when providing a quality product, on time and at a competitive price will not be an asset but a basic requirement. Assets will be the services factories can provide. The process to develop material sourcing capabilities requires a great investment in time, effort and money. Few factories are willing to make the effort. Fortunately, this in itself increases the value of that investment.

Material sourcing is not easy and few companies worldwide are currently competent in this area. However, it is just this present low level of competence that allows new factories to compete. The new factory willing to make the investment of time and effort will very quickly appear capable.

By the end of this decade, many factories will have developed sophisticated material sourcing facilities. They will be the leaders of the post-2005 industry. Those who start now will hold the advantage.

International and national textile industry associations and related websites

Global	Cashmere and Camel Hair Manufacturers Institute	*www.cashmere.org*
Global	International Rayon and Synthetic Fibres Committee	*www.cirfs.org*
Global	The Textile Institute	*www.texi.org*
Europe	European Flax and Linen Confederation	*www.masters-of-linen.com*
Australia	Council of Textile and Fashion Industries of Australia	*www.tfia.com.au*
Austria	Association of the Austrian Textile Industry	*www.textilindustrie.at*
Bangladesh	Bangladesh Textile Mills Association	btma@dhaka.agni.co
Belgium	Belgium Textile Federation	*www.febeltex.be*
Brazil	Brazilian Textile and Apparel Industry Association	*www.abit.org.br*
Bulgaria	Association of Apparel and Textiles Exporters in Bulgaria	*www.bgtextiles.org*
China	China National Textile Industry Council	*www.cnfti.org.cn/ecnfti.htm*
	China Wool Textile Association	Fax: (86) 10.85229423
	China Dyeing and Printing Association	Fax: (86) 10.85229422
	Beijing Fangshi Gongcheng Xiehui	Fax: (86) 10.85004271

Czech Republic	Association of Textile, Clothing and Leather Industry	*www.atok.cz*
Denmark	Federation of Danish Textile & Clothing	*www.textile.dk*
Estonia	Estonian Clothing and Textile Association	*www.textile.ee*
Finland	The Federation of Finish Textile and Clothing Industries	*www.finatex.fi*
France	Union of Textile Industries	*www.textile.fr*
Germany	Central Federation of Textile and Clothing Industries	*www.gesamttextil.de*
Greece	Greek Fashion and Textiles Sourcing Network	*www.greekfashion.gr*
Guatemala	Guatemala Apparel and Textile Industry	*www.vestex.com.gt*
Hong Kong	The Hong Kong Chinese Textile Mills Association	*www.textilecouncil.com/member_hkctm.html*
	The Hong Kong Weaving Mill Association	*www.textilecouncil.com/member_hkwm.html*
India	Ministry of Textiles	*Cabsec.nic.in/abr/abr34.htm* (for list of all textile-related bodies)
	Indian Silk Export Promotion Council	E-mail: isepc@bom2.vsnl.net; fax: (91) 22.2874606
	Cotton Textile Export Promotion Council	*www.texprocil.com*
	Synthetic and Rayon Textiles Export Promotion Council	Fax: (91) 22.2048358
	Wool and Woollen Export Promotion Council	Fax: (91) 11.3314626
Indonesia	Indonesian Textile Association (API)	Fax: (62) 21.5272165
Ireland	Irish Clothing & Textile Alliance	*www.ibec.ie/icata*
Israel	Textile and Fashion Industries Association	*www.industry.org.il*
Italy	Italian Textile Association	*www.asstex.it*
Korea, Republic of	Korea Textile Trade Association	*www.textra.or.kr/ENG*
Lithuania	Lithuanian Apparel and Textile Industry Association	*www.lpia.lt*
Macao (China)	Associação Comercial de Macau	*www.acm.org.mo*
Malaysia	Malaysian Textile Manufacturers Association	*www.fashion-asia.com*
Morocco	Association marocaine des industries du textile et de l'habillement	*www.amith.org.ma*
Netherlands	Association of the Netherlands Textile Industry	*www.textielnet.nl*
Nigeria	Nigerian Textile Manufacturers Association	Tel: (234) 1.4970499
Nicaragua	Nicaraguan Association of Textile and Apparel Industries	Fax: (505) 2632033
Pakistan	All Pakistan Textile Mills Association	*www.aptma.org.pk*
Philippines	Textile Mills Association of the Philippines	Fax: (63) 2.8183107
Poland	Polish Federation of Apparel & Textiles	*www.textiles.pl*
Portugal	Federação Intertextil Portuguesa	Fax: (351) 22.2050343
Romania	Romanian Textile Association	Fax: (40) 21.2550107
	Romanian Textiles Marketplace	*www.romtextiles.com*
Singapore	Textile & Fashion Federation Singapore	*www.taff.org.sg*
Slovakia	Association of Textile and Clothing Industry in the Slovak Republic	*www.merina.sk/atop*
Slovenia	Chamber of Commerce and Industry of Slovenia	*www.sloveniapartner.com*
South Africa	South African Textile Federation	*www.texfed.co.za*
Spain	Consejo Intertextil Español	*www.consejointertextil.com*
Sri Lanka	Ceylon Textile Manufacturers Association	Fax: (94) 1.500395; e-mail: srs@sltnet.lk
Sweden	Swedish Textile & Clothing Industries Association	*www.teko.se*
Switzerland	Swiss Textile Federation	*www.swisstextiles.ch/en*
Taiwan Province (China)	Taiwan Textile Federation	*ttf.textiles.org.tw*
Thailand	The Thai Textile Manufacturing Association	*www.thaitextile.org/ttma*
Turkey	Istanbul Textile & Apparel Exporters' Association	*www.itkib.org.tr*
United Kingdom	British Apparel and Textile Confederation	Fax: (44) 171.6367515
	Confederation of British Wool Textiles	*www.cbwt.co.uk*
Viet Nam	Vietnam Textile and Apparel Association	*www.vntextile.com*

Chapter 15

The politics of trade

The purpose of this book is to empower you, the factory, and to show you how, in the post-2005 quota-free market, you can succeed through your own efforts. The immediate subject – how to develop the capability of sourcing materials both locally and globally – is certainly one of the most important services you can provide to your customer. These and other skills that your clients will be demanding can be gained through your own efforts.

Unfortunately, however, there are limits beyond which you and your factory cannot move. Those limits start where politics begins. If your government bans fabric imports or places a prohibitive duty rate on imported fabric, you cannot source globally. Similarly, the ability to source fabric is all but worthless if garments produced from fabric sourced in third-party countries are denied duty advantages by the governments in your customers' countries.

Protectionism and favouritism are the two main obstacles to foreign trade. Therefore, before embarking on the substantial investment of time and resources which developing material sourcing capabilities will demand, you must first find out to what degree your government, or the governments in your customers' countries, limits the value of your acquiring those skills.

All politicians and bureaucrats agree that foreign trade is a good thing – provided their country is doing the exporting. As far as imports are concerned, these same foreign trade enthusiasts are likely to concur that imports are good for all other countries besides their own. Unfortunately, the world where everyone is a net exporter will arrive shortly after we begin exporting T-shirts to the planet Neptune. Until that time we must deal with earthly reality. As you will see in this chapter, the moment politicians and bureaucrats take over, foreign trade reality is unusual at best and often irrational at worst. This situation holds true for both importing and exporting countries.

Governments in garment exporting countries: the captive customer syndrome

The obstacles come from both sides. You can probably understand why the politicians and bureaucrats in many of the garment importing countries try their very best to limit garment imports. What is perhaps harder to understand is why politicians and bureaucrats in many garment exporting countries also try their very best, albeit unknowingly, to limit garment exports.

It works something like this. Your country wants to develop a garment export industry. Someone in government decides that in order to have a successful garment industry, you must have a local textile industry. The textile people – both local and foreigners who wish to invest locally – want to ensure a market

for their fabrics. They will therefore lobby your government to restrict textile imports, claiming that **they cannot compete with cheap Asian fabrics**. This is the beginning of what we will call The Captive Customer Syndrome.

The politicians and bureaucrats see the logic of the textile industry's claim. What they do not see is that to be of any value to the garment export industry, the local textile industry must be able to compete against imported fabrics. If local garment exporting factories are forced to buy local fabric, which will invariably be more expensive, possibly of inferior quality or less varied than the imported Asian fabric, the local garment export industry will simply not be able to compete. If they cannot compete, they will go out of business. If the garment factories go out of business, then so too will the fledgling local textile industry.

The Captive Customer Syndrome occurs in garment exporting countries all over the world, from the richest to the very poorest, and its focus always seems to centre around the textile industry. For example, in many countries the import duty for finished fabric is higher than the duty for finished garments. This effectively penalizes the local garment manufacturer, resulting in garments which are more expensive than those produced by overseas competitors.

In the United States, for example, the import duty for finished wool fabric is 25% while the duty for finished wool jackets is only 22%. This means that the United States Government in fact subsidizes garment exporters who ship wool jackets to the United States, a very strange situation indeed. Furthermore, import duty on fabric can be ridiculously prohibitive, as in the case of Mexico, which levies duty of 540% on made-in-China fabric.

To make matters worse, the moment the local textile industry is protected, local prices invariably rise. Now the local garment factory receives a double whammy. The factory is forced to buy local fabric which is often uncompetitive, while at the same time the local textile mill, no longer facing competition, arbitrarily raises prices even further. If the local garment factory complains, their friendly local fabric supplier will simply tell them to 'take it or leave it.' In many cases the factory 'leaves it' because it has been forced out of business. This conundrum, where no one wins, is the inevitable result of the Captive Customer Syndrome.

Sometimes the barriers on textile imports are more informal. Technically, duty rates are minimal and there may be no actual quota. However, for some reason which is never made clear, shipments of imported textiles do not make it through customs. They get stuck in some strange customs limbo. Everything is okay, and your fabric will be cleared as soon as you complete form 7575. However, 7575 may require 12 separate signatures, or maybe you need a previous form 7574, which in turn can only be obtained after completion of 7573…. In the end, anyone but the most dedicated masochists gives up.

At the end of the day, unless the local textile industry is kept in check by having to compete in global terms, having a local textile industry by no means ensures the survival of the local garment exporting sector. Export garment factories, particularly those located in the developing world, simply must have duty-free access to imported fabric in order to stay in business.

Some countries draw a distinction between fabric imported to produce garments for export and fabric imported for the local market. Provided customs is relatively corruption-free, this system works quite well and provides advantages to both textile and garment industries. Local textile mills have a protected market which permits them to develop. At the same time, the local garment export industry is not strangled by uncompetitive textile prices. If the local textile industry wants to sell to local garment export factories, they have to reduce costs to the point where they are competitive on an international level.

Further down the line, a free and vital garment industry will lead to a profitable and competitive local textile industry. As the number of garment factories increases, their demand for fabric eventually reaches the point where local mills acquire sufficient economies of scale to offer fabric at profitable and competitive prices.

Once again, governments in garment exporting countries need to look at China, where both textile and garment industries flourish independently and where garment exporters are free to chose either local or imported fabric. This freedom of choice is, in fact, the cornerstone of the simultaneous success of both the Chinese garment and textile industries.

Governments in garment importing countries

All governments everywhere believe that their citizens should buy locally made products. More liberal governments believe that it is acceptable for their citizens to buy some imported products provided they do not abuse the privilege. Local textile industries are the most conservative and, although few will admit to it, consider that purchasing imported garments is akin to committing a crime against the country.

For over four decades, governments and supporters of local textile industries have had their way and garment imports have been severely restricted. On 1 January 2005, the tables are finally turning and those restrictions will, for the most part, disappear. However, there is one important area where governments of garment importing countries continue to restrict free trade in garment exports. This is through what are known as country of origin regulations.

As a general rule, source of fabric is not a factor determining a garment's country of origin. The garment is said to be produced in the country where the garment was produced. That is the basic WTO rule. There is, however, an important exception. When a government grants a garment exporting country preferential access to its market, the importing country is able to impose almost any restriction it chooses. In the case of the United States or the European Union, these restrictions often concern the country of origin of the fabric.

These restrictive rules are extremely difficult to understand and much of the content below has been provided by specialist experts in this field. At best it is a general guide indicating the relationship between fabric and garment rules of origin for the United States and EU markets. (Further information is found in appendices I and II.) If you are a garment exporting factory, especially if you are exporting to markets besides the United States and EU, you are strongly advised to contact a local customs attorney for the specific rules governing your country and your customers' country.

Summary EU country of origin rules

(This section was contributed by Emma Ormond, International Trade Consultant, PricewaterhouseCoopers, London.)

The European Union's origin rules are not as complex as those for the United States, but they are still complicated enough to cause confusion for garment producers/exporters and EU importers alike. Although many of the concepts of

EU and United States origin rules are similar, the terminology is very different. This section will use the terminology used in the EU by the authorities and commercial companies.

Origin rules are imposed by EU legislation, which is directly applicable in all 25 members of the EU (Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom).

There are two types of origin rule, non-preference and preference rules. The non-preference rules are used for normal trade, including determining origin for trade defence purposes under the anti-dumping, anti-subsidy and safeguards provisions. They are also used to determine origin for labelling purposes and for trade statistics. The preference rules are used to determine preferential origin for the granting of tariff preferences.

The EU offers preference rates of duty on textiles and clothing to a very wide range of countries (see appendix I) and it is very important that producers and exporters in the export country understand these rules in order to ensure that the importers are fully compliant at importation. Under EU law, it is the responsibility of the importer to ensure that goods meet the rules under which they are declared and the importer is, therefore, liable for any errors made by the exporter.

Under most regimes, eligible garments enter the EU duty free and customs authorities are more likely to check these importations to ensure that claims to preference are valid. Under the EU's Generalized System of Preferences (GSP), LDCs have duty-free access to the EU, but the GSP rate for garments from most other countries is 80% of the full rate, although garments from the Republic of Moldova and Sri Lanka are at 60% of the full rate to reflect their compliance with international labour standards.

It should be noted, however, that during 2004 the EU initiated a consultation exercise with regard to preference rules of origin and it is possible that the rules will be simplified. However, any simplification is unlikely to be significant for clothing and will not be implemented until 2006 at the earliest.

Non-preference rules of origin

The EU non-preference rules of origin for clothing are relatively straightforward.

For knitted garments of chapter 61 manufactured by assembling two or more pieces of knitted or crocheted fabric that have either been cut to shape or knitted direct to shape, the rule is 'complete making up'. This is defined as all operations following cutting of the fabric or crocheting or knitting of the fabric directly to shape must be performed in the country of origin in order to obtain origin status of that country. In other words, the origin of the fabric is immaterial when determining the non-preferential origin of knitted garments.

For knitted garments and accessories of chapter 61 that do not involve the assembly of two or more pieces, such as socks, stockings, scarves, etc., the rule is 'manufacture from yarn'. This means that the knitting must take place in the country of origin, as well as the finishing involved. However, the origin of the yarn is immaterial.

For woven garments of chapter 62 the rule is also 'complete making up', defined as all operations following cutting of the fabric. Again, the origin of the fabric is immaterial. However, if the garment is unfinished or incomplete, the rule is 'manufacture from yarn' and it is, in effect, the country where the fabric is

woven that will determine the origin of the unfinished or incomplete garment. This means that it is not possible to do most of the assembly in country A, ship it to country B for finishing and then claim country B as the country of origin.

For woven accessories of headings 6213 and 6214, such as scarves and handkerchiefs, the rule is also 'manufacture from yarn'. However, there is a concession for embroidered accessories, whereby imported unembroidered fabric may be used, provided that the value of the unembroidered fabric does not exceed 40% of the ex-works price of the finished product.

Preference rules of origin

The basic preference rules for garments are actually relatively straightforward, provided that local fabric is used. However, if using fabric from other countries, the rules immediately become more complex and this is where most errors occur. There are derogations from the origin rules within certain regimes for certain countries, which allow different rules to be applied for exports of certain garments up to specific limits.

Basic preference rule for garments and accessories

For knitted garments of chapter 61 manufactured by assembling two or more pieces of knitted or crocheted fabric that have either been cut to shape or knitted direct to shape, the rule is 'manufacture from yarn'. This means that the knitting or crocheting of the fabric or pieces must take place in the same country as all the cutting, assembly and finishing. The origin of the yarn is immaterial.

For knitted garments and accessories of chapter 61 that do not involve the assembly of two or more pieces, such as socks and stockings, the rule is 'manufacture from natural fibres, manmade staple fibres not carded or combed or otherwise processed for spinning, chemical materials or textile pulp'. In other words, imported fibres may be used but they must be prepared for spinning, spun and the resulting yarn knitted and finished in the same country for that country to achieve preference origin.

For woven garments of chapter 62, the rule is 'manufacture from yarn', meaning that the yarn must be woven into fabric and the resulting fabric cut, assembled and finished in the same country in order to achieve preference origin. The origin of the yarn is immaterial.

For woven accessories of headings 6213 and 6214, the rule is 'manufacture from unbleached single yarn'.

There are concessions for certain woven embroidered women's, girls' and babies' clothing within chapter 62 and accessories of headings 6213 and 6214, whereby imported fabric can be used, provided that the value of the unembroidered fabric used does not exceed 40% of the ex-works price of the finished product.

It should be noted that there is a tolerance for the use of non-originating textile materials. Depending on the regime under which the garment is exported, this is either 8% by value, or 10% by weight of textiles, of the finished garment. However, this tolerance does *not* apply to linings or interlinings and the use of non-originating materials will render the garment ineligible, despite the fact that such materials are usually of very low value.

Unfortunately, there is no definition of either 'lining' or 'interlining' and interpretation of this rule is, therefore, difficult. Generally speaking, however, 'lining' is regarded as the sort of acetate or polyester fabric used to line more tailored garments. 'Interlining' is regarded as any one of the wide variety of

fabrics used between the inner and outer layers of a garment to improve shape retention or strength – these may be woven, knitted or non-woven and may be produced with or without a fusible adhesive coating. Pocketing fabric is not regarded as lining and many of the knitted fabrics used for linings of garments made of fleece or similar knitted fabrics are also not regarded as lining. Any manufacturer using imported lining or interlining should notify its customer and ask them to check whether the materials in question will invalidate the garments' eligibility for preference.

Non-originating non-textiles, such as zip fastenings, buttons, etc. can be used freely without implications for the origin status of the finished garment.

Cumulation of origin

Under all the EU's preference schemes, the use of EU materials is permitted, subject to certain conditions. This is known either as bilateral or diagonal cumulation or donor country content. The main condition is that textile materials must satisfy the rule of origin in their own right, i.e. if EU fabric is used in a GSP country, the fabric must satisfy the GSP rule for that fabric (see below for origin rules for fabric). The fabric should travel on an EUR1 certificate (documentary proof of preferential origin) or invoice declaration.

Cumulation of origin is also permitted within certain regional groupings and there are subtle differences to the rules, depending on the regime. Cumulation permits the use of materials from one member of a regional group in the further manufacture in another member of the same regional group. The main groups are as follows:

- Pan-European Cumulation Area;
- Maghreb countries;
- African, Caribbean and Pacific States (ACP) and Overseas Countries and Territories (OCT);[11]
- GSP – Association of South East Asian Nations (ASEAN);
- GSP – South Asian Agreement on Regional Cooperation (SAARC);
- GSP – Central American Common Market (CACM);
- GSP – Andean Group of Countries.

Pan-European Cumulation Area

This groups together countries of the EU, the European Free Trade Association, Bulgaria, Romania and Turkey. It permits the use of fabric or other textile materials from one member of the group in the further manufacture of any other member of the group. However, the materials used must satisfy the origin rules in their own right and travel on an EUR1 or invoice declaration. For example, eligible fabric from Turkey and eligible lace from Switzerland can be made up into garments in Romania and still be eligible for preference at importation to the EU.

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11 There are also provisions to cumulate between the ACP/OCT countries and 'neighbouring' countries such as South Africa and the northern African countries. However, this is on the basis of diagonal cumulation and any materials used from South Africa or the northern African countries must satisfy the rules in their own right, i.e. cumulation of processing is not permitted. There are additional rules relating to such cumulation and, in some cases, advance permission is required before materials can be used from certain countries. It should also be noted that the EU plans a series of bilateral and/or regional agreements with individual ACP countries or groups of ACP countries, which will eventually take the place of the Cotonou Agreement governing ACP, but none of these are likely to be implemented in the near future.

It should be noted that this area is due to be extended to countries around the southern shores of the Mediterranean, specifically to the Maghreb countries (Algeria, Morocco and Tunisia), the Mashraq countries (Egypt, Jordan, Lebanon and Syrian Arab Republic), Israel and Palestine. The EU has to amend its legislation before this can be implemented and then each country has to have a bilateral agreement with each other country before they can benefit from the cumulation rules. It is possible that this will enter force from January 2005, but it has already been delayed and could be further delayed. Under a concept known as 'variable geometry', once the EU legislation has been amended, as soon as two countries implement a bilateral agreement, cumulation will apply between those two countries and the EU (the EU already has agreements with all parties). Morocco and Turkey, for example, now have a bilateral agreement in place and, as soon as the new EU legislation enters force, this will permit garments made in Morocco from Turkish fabric to benefit from preference.

Maghreb countries

The Maghreb countries benefit from a form of cumulation known as cumulation of processing. This effectively treats Algeria, Morocco, Tunisia and the EU as one territory for the purpose of determining preference origin. If EU fabric is used in the manufacture of garments in Morocco, for example, it needs only to have been knitted, crocheted or woven in the EU and then cut and made in Morocco for the finished garment to qualify for preference, i.e. the fabric does not need to meet the full preference rule in its own right.

This can cause confusion as a fabric woven in the EU from, say, Japanese yarn can be made into garments in Morocco and the finished garments are eligible for preference. Garments made from the same EU fabric in Romania, for example, would not be eligible for preference.

ACP/OCT countries

Cumulation of processing is also permitted between the ACP, OCT and EU countries.

Generalized System of Preferences (GSP)

Under GSP, there is a system of regional cumulation whereby cumulation is permitted within certain regional groupings, but not between them. The normal diagonal rule applies, whereby fabric from one member of a regional group used in the manufacture of garments in another member of the same regional group must satisfy the appropriate rule of origin for the fabric. It should also travel to the country of manufacture on a GSP Form A (documentary proof of GSP preferential origin) or invoice declaration.

There is currently an additional rule under GSP regional cumulation which states that the value added in the country of manufacture must exceed the highest customs value of the materials used from any one member of the same regional group. This makes it very difficult for garments to meet the origin rule, as the fabric often accounts for more than 50% of the ex-works value of the finished garment. However, a new GSP scheme for 2006 is currently under discussion and it is likely that the value-added rule will be abolished. There is also discussion regarding the extension of regional cumulation, but agreement has yet to be reached as to what this might mean in practice.

Preference rule for fabric

It is important that garment manufacturers understand the EU's rules for fabrics, particularly if they are using imported fabric.

The basic preference rule for woven fabric is 'manufacture from coir yarn, natural fibres, manmade staple fibres not carded or combed or otherwise processed for spinning, chemical materials, textile pulp or paper'. In other words, the fibres have to be prepared and spun into yarn and the resulting yarn woven into fabric in the same country. For fabrics made of two or more fibres, up to 10% of the total weight of the textile materials used may be of imported yarn or fibre.

There is a concession for printed woven fabrics, which permits the use of imported fabric, provided that the printing is accompanied by at least two preparatory or finishing operations (e.g. scouring, bleaching, mercerizing) and that the value of the unprinted fabric does not exceed 47.5% of the value of the finished fabric. It should be noted that this concession does *not* apply to dyed fabric. Whilst dyeing or printing confer non-preference origin, only printing gives preference origin and many importers have been caught out by this rule and ended up having to pay duty that they were not expecting to pay and had not, therefore, costed in. EU customs authorities also undertake post-importation audits and any origin irregularities will lead to the importer having to pay duty retrospectively on goods where preference was claimed and possibly a fine in addition.

The preference rule of origin for knitted fabrics is 'manufacture from natural fibres, manmade staple fibres not carded or combed or otherwise processed for spinning, chemical materials or textile pulp'. In other words, the fibres have to be prepared and spun into yarn and the resulting yarn knitted into fabric in the same country. For fabrics made of two or more fibres, up to 10% of the total weight of the textile materials used may be of imported yarn or fibre. There are no concessions for printed knitted fabrics.

The preference rule of origin for embroideries of chapter 58 is 'manufacture in which all the materials used are classified within a heading other than that of the [finished] products; and the value of all the materials used does not exceed 50% of the ex-works price of that product'. Imported fabric may be used, whether knitted, crocheted or woven, provided that the embroidery is sufficient for the finished fabric to be classified within chapter 58.

As previously noted, the responsibility for ensuring that the origin rules are met rests with the importer. However, manufacturers should not assume that their customers necessarily understand the rules and should provide preference certificates only for garments that they know satisfy the appropriate rule of origin. If there is any doubt, the manufacturer should ask its customer to check the rule with the appropriate authority in the country of importation.

Summary United States country of origin rules

United States country of origin regulations are extremely complex and tend to be not only product-specific but country-specific as well. For example, the country of origin for sweaters is defined as the place where the sweater parts have been knitted to shape, except for other vegetable fibres (OVF) produced in Hong Kong (China) where country of origin may be defined as the place where the parts are linked together.

Things are further complicated by the fact that country of origin rules are open to interpretation by the United States Customs Service and these interpretations can often appear arbitrary. For example, under the African Growth and Opportunity Act (AGOA) all qualifying sub-Saharan African countries (with the exception of South Africa and Mauritius) are entitled to duty-free access for garment exports to the United States market regardless of

the origin of the fabric. Under AGOA, knit polo shirts became an important export item. As local fabric supplies were inadequate, circular knit fabric for the body and flat knit fabric for the collar and cuffs was imported and the garments produced locally. United States Customs initially declared that all such garments were ineligible for duty-free access. Their decision was based on the fact that the flat knit portion was knit to shape (collars and cuffs) and therefore not fabric but rather garment parts. This resulted in substantial direct losses to importers as well as businesses losses to the AGOA countries. Fortunately this ruling has since been changed.

One point is clear from these examples. What appears obvious is often not obvious. When dealing with the United States market, do not take chances. Having said that, what follows below is an attempt to simplify the general rules. As with the EU, United States country of origin regulations can be divided between non-preference and preference rules of origin.

Non-preference rules of origin

The United States non-preference rules of origin for clothing are relatively straightforward and do not involve fabric origin. When the garment is completely produced in a single country the regulation is simple and obvious: the country where the garment is produced is the country of origin.

When part of the garment is produced in one country and part in another country, the problems begin. For example, a garment might be sent to a second country for embroidery or a factory might decide to save costs by doing time-consuming work such as hand knitting in a low-labour-cost country, while carrying out more sophisticated but less time-consuming linking and looping in a second country. In those instances, the regulations to determine rules of origin are guided by the concept known as 'substantial transformation'. Substantial transformation takes place, for example, when fabric is cut and becomes garment parts. The overall concept appears simple. However, in practice, there are many grey areas.

Take, for example, the difficult case of a group known as 'Made-up Goods' under which items such as luggage fall. Let's say you want to produce a fabric suitcase shaped by an internal wire skeleton. The metal skeleton is produced in one country and sent to a second country where the fabric skin is cut, sewn and attached. Under United States regulations, 'substantial transformation' occurred where the wire frame was made. In this instance fabric isn't even an issue. In fact the duty rate for the luggage is based on metal, not fabric. Lucky importer.

Not so lucky is the importer of solid colour silk scarves from France who is told that the made-in-France scarf is actually made in China because the fabric was woven in China. In this case, substantial transformation is deemed to have taken place where the fabric was made and not where the scarves were sewn.

Preference rules of origin

This area is very complicated. Where the United States either has special trade treaties or has, by law, granted certain trade privileges, previous or other rules of origin definitions are simply suspended. If the United States is offering trade advantages and the exporting country wants those advantages, the United States Government can and will redefine country of origin in whatever way it wants. Each agreement is different. Each agreement has its own specific exceptions. As far as garment imports are concerned, in some free trade agreements, such as with Israel, everything is allowed: there are no limitations. In others, such as Australia, nothing is allowed because garments have been excluded from preferential trade status altogether.

Very simply, United States free trade agreements fall into two categories, one relating to restrictions on yarn and fabric, the other to third-party fabric.

Fabric and yarn restricted

The North American Free Trade Agreement (NAFTA), the Caribbean Free Trade Agreement (CAFTA) and the Andean Trade Preference Act (ATPA) are all yarn-forward. For garments to qualify for duty-free access, the following must take place:

- The garment must be produced in a qualifying country;
- The fabric used to produce the garment must be woven (or knitted) in the qualifying country (sometimes country group);
- The yarn used to produce the fabric must likewise be spun in the qualifying country (sometimes country group);
- Where the garment is produced directly from yarn (sweaters, hosiery, etc.), the yarn must be spun from fibre produced in the qualifying country (sometimes country group).

There are numerous exceptions to the above, both by product and country:

Third-party fabric

This grouping includes AGOA, Jordan, Israel, Egypt and Morocco. These countries and country groups are able to use fabric imported from anywhere and still enjoy duty-free access for garments. Once again there are exceptions. Two AGOA members – South Africa and Mauritius – do not have this privilege. Morocco's privilege is limited to 30 million m^2 annually and will be phased out over a period of time.

In addition, there are other general exceptions to these rules:

Trade preference levels (TPLs)

Many free trade agreements with yarn-forward rules allow for a limited number of garments to be exported to the United States duty-free provided the garments have been produced in a qualifying country using third-party fabric. Which countries are granted TPLs and the quantity of those TPLs are based solely on bilateral negotiations. In NAFTA, Canada negotiated very well, while Mexico did not. In CAFTA, Nicaragua is the big winner. Furthermore, in some agreements, TPLs are scheduled to be phased out over a period of time.

Short supply fabrics

Where a particular fabric is unavailable in the United States, a general waiver is sometimes granted for third-party fabric. For example, fine count poplin (for shirts only) can be imported from any source. Another example is narrow width hand loomed Scottish wool tweed with the word 'Harris' woven on the selvage.

Special exceptions

Because United States agreements are negotiated separately, there are numerous special exceptions. For example, under CAFTA, bras require only single transformation locally to qualify for duty-free access. The list here is effectively limitless.

United States possessions

The United States considers all United States possessions and trusteeships to be United States territory for the purpose of trade. Territories such as Guam, Saipan and Puerto Rico all enjoy duty-free access.

In conclusion, the most important thing to remember about United States country of origin regulations is that they are inconsistent. Garment exporters must check and recheck everything. If your country is a member of a free trade group, do not think for one second that the regulations covering your neighbour will be the same as those covering you. Do not assume that just because fine count poplin for shirts is a short supply item that fine count poplin for blouses is also a short supply item. Do not assume that just because a rule existed last year that it will exist next year or even right now. In fact do not assume anything.

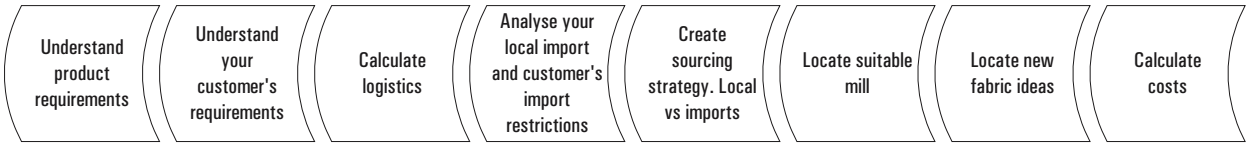
For relatively simple questions, go to your customs broker. For more complicated issues, consult a United States customs attorney.

Chapter 16

From theory to practice

You are the owner of Schmata Shirt Factory in Kenya. You want to trade up to a greater value-added product by sourcing fabric for your customers. What steps do you need to take?

Planning



Understand product requirements

You must locate a mill or mills capable of fulfilling all your needs. As you are in the shirt business, your fabrics all depend on the following:

- **Fibre.** Shirts are sold in all fibres including cotton, cotton blends, artificial (rayon), synthetic and wool. To simplify this exercise, we will assume that Schmata specializes in cotton shirts.
- The higher the quality of the fabric, the longer the fibre staple. If you want to produce fine quality dress shirts, you will require a mill with access to Pima or other long staple cottons.
- **Yarn quality.** This refers to a variety of items, including yarn count (tex number), yarn process (carded or combed) and yarn finish (e.g. mercerized).
- **Weave.** This is normally not a factor determining mill selection. Cotton shirts are produced in all standard weave types including plain weave (poplin), twill weave (broadcloth) and satin weave (polished cotton). Fortunately all these weaves are produced by the same machinery. Occasionally, jacquard or dobby designs become fashionable and this requires special looms. Again, for our purposes, we will assume you require no jacquard or dobby weave fabric.
- **Dyeing, printing and finishing:** This is an important factor for shirting fabric. Yarn dyed, piece dyed and prints are all important fabrics for shirtings. So too are special finishes such as fabric mercerization or special washing.

Understand your customer's requirements

The range of fabrics you require will depend on your customer's needs and your success depends on your ability to fulfil those needs. The more difficult your customer's needs, the more difficult they are to fulfil, but if you are able to fulfil those needs, the more important you become to the customer.

However, before looking for the best mill or for the most interesting fabrics, you first need to know your customer's general requirements. Take the example of Sea Island cotton shirting, the finest shirting fabric available which may have as many as 200 threads to the inch. This is a poplin weave so fine that a pin prick will result in a hole. Very few mills are capable of or interested in producing this quality. Furthermore, there are very few customers for shirts retailing for $200. Therefore, Sea Island cotton shirting is most likely not something that a shirt factory in Kenya would be looking to source.

Calculate the logistics

You have two alternatives – work with local mills or import the fabric from another country. Ideally you want both options. However, the choice of mill and particularly its location is based on several factors. Among the most important is logistics – moving fabric out of the exporting country and moving it into your country. Fortunately, you have relatively good local port facilities at Mombasa and importing is physically feasible. If, for example, you were located in Cambodia or Nepal, importing fabric from overseas would be far more difficult, either because of poor port facilities or because you are landlocked. In that case you would be more closely restricted to either local fabric suppliers or mills located in nearby countries. With good port facilities, you have at least solved half your logistic problems.

Getting the fabric into your country is good, but you must also be able to get the fabric out of the exporting country. For example, Bangladesh is a major producer of cotton shirting at very reasonable prices. Unfortunately, given the existing overtaxed facilities at the port of Chittagong, exporting (or importing) fabric is very difficult. In fact, Bangladesh apparel factories often resort to bringing fabric in by air. Before selecting your mill, you must be sure that it is possible to export the fabric within a reasonable length of time.

Analyse your local import and customer's import restrictions

Good logistics make importing possible; however, if on arrival you discover that your import tariff is 540% (as in the case of Chinese fabric imported to Mexico), the process becomes impractical. In some cases, tariff rates may be reasonable, but informal restrictions render importing impossible. A good way to check is to compare statistics for garment exports with those for fabric imports.

In a developing country, most imported fabric is used to produce garments for export. As a very general rule, fabric equals about 60% of garment FOB costs. Therefore, if a developing country exports $1,000 worth of garments and its textile imports for the same year total $300, you can roughly calculate that 50% of all garment exports were produced from imported fabric.

For example, in 2002, Chinese garment exports totalled $41.3 billion while textile imports totalled $13 billion. Based on the '60% rule', we can calculate that 52% of all garment exports were produced from imported fabric and that China allows unrestricted textile imports. India, on the other hand, exported garments totalling $5.4 billion against which the country imported textiles valued at $691 million. Using the '60% rule', we can calculate that only 21% of

Indian garment exports were produced from imported fabric. From this we have to conclude that India does restrict textile imports.[12] Although reliable data are unavailable, based on reports that there are substantial made-in-China textile imports in the country, it appears that at least for the present, Kenya permits textile imports.

You also want to analyse the duty rebate systems. Many importing countries will charge a tariff on all imported fabric, but return payment when the fabric has been re-exported as garments. Find out if Kenya operates such a system and how it works. What paperwork is required? How much time elapses before reimbursement? How efficient is the system?

Your customer's country may have its own restrictions. As a part of AGOA, Kenyan garments are entitled to enter the United States duty free. Furthermore, as an LDC, Kenya is entitled to duty-free access, regardless of the source of the fabric. Therefore, if your customer is located in the United States, you are definitely a winner.

However, if your customer is located in the European Union, the rules are different. You are entitled to duty-free access under the Generalized System of Preferences (GSP) and also as an African, Caribbean and Pacific States (ACP), but only if you conform to GSP and ACP regulations and conditions. (See chapter 15.)

Create sourcing strategy

Consider your two possibilities:

- **Import fabric from foreign mills.** If your customer is located in the United States, a good shortlist of supplier countries would consist of China, India, Malaysia, Thailand and Turkey. All have well-developed textile industries producing quality cotton shirtings. All have good logistics. However, for the European Union market, if you want duty-free access, you are more or less restricted to mills located in the EU.
- **Develop local mills.** If your country has a strong local textile industry, using local mills is a great advantage. However, even where the country does not have a major textile industry, it still may be an advantage to use local mills even if the upstream materials must be imported. Importing yarn is much easier than importing fabric, just as importing greige (ready for printing/dyeing/finishing) fabric is much easier than importing finished goods.

Now consider that Kenya suffers from a somewhat poor textile industry which is currently shrinking. Local mills are not well capitalized and few have modern equipment. Finally, although acceptable under AGOA, using imported yarn in your shirting fabric would disqualify you for duty-free access under the yarn-forward rule under GSP or ACP.

Given the EU restrictions, Schmata should be giving priority to the United States market. Schmata Shirts might still do well to find a local mill to work with; however, in the end, you might have to rely totally on imported fabric.

Locate suitable mills

Follow these steps:

12 Chinese data are taken from WTO International Trade Statistics 2003. Indian data are from 2001, the latest year for which such statistics are available.

- ❑ Determine which countries are the major exporters for cotton shirtings. The United States Government Office of Textile and Apparel (OTEXA, *www.otexa.ita.doc.gov*) publishes detailed statistics of United States imports on a monthly basis at no cost. The EU statistics are available from Global Trade International (*www.gtis.com*) by subscription only.[13]
- ❑ Contact the local textile organization in each country for a list of mills producing cotton shirtings (see chapter 14). Begin communication by e-mail. Plan a trip to each important country.
- ❑ Visit the mills. Explain your needs. Fill out the appropriate mill questionnaire (see chapter 14). Pay particular attention to answers relating to samples and minimums.

Locate new fabric ideas

This is when you go to the shows (see chapter 14). Study the trends. Collect swatches. Order small quantities of sample fabric. Put together the best ideas.

Calculate the costs

Here you must work with your chosen mills to determine:

a Cost of each fabric

b Freight charges

c Import duty payments in your home country

d Finance costs

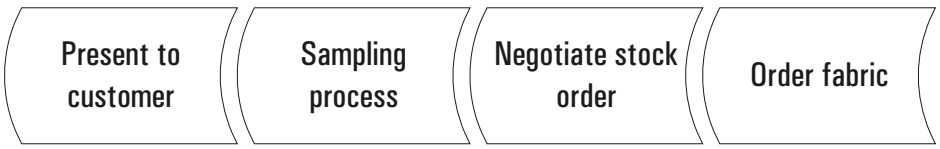
e Inland shipping costs

Final price delivered to your factory (a + b + c + d + e)

You are finally ready to do business.

Working with the customer

Present to customer



Travel to the customer and show your swatches to their designer. Be prepared with costings and lead times.

13 Statistics are listed by Harmonized System (HS) numbers. For example, piece dyed, yarn dyed and printed lightweight (under 200 g/m^2 plain weave shirting fabrics are listed under 5208.31 – 5208.59. Heavier weights are listed under 5208.31 – 5208.59.

Sampling process

If the customer is a retailer, it requires a sample for quality which need not be in the correct colour or correct pattern. However, it must be the correct fabric with the correct finish and feel. At a later date, before confirming the order, the customer will insist on approving lab dips and/or strikeoffs in the exact colours and patterns as the bulk production order.

If the customer is an importer, it may require salesperson samples. It is imperative that you have discussed this service in advance with the mill. Salesperson sample orders are every bit as important as stock orders, with delivery dates even more exacting.

Negotiate the stock order

There are several particularly important considerations here:

- Allow for all manner of delays when dealing with imported fabric lead times. Besides the normal production delays (10 days is a prudent margin), there will be logistical delays. Perhaps shipping service from the exporting country to Kenya is infrequent. Perhaps the fabric was delayed at the exporting country's customs. Perhaps the fabric was delayed by Kenyan Customs. These are all foreseeable delays and you must allow for them.
- Before confirming any garment order and certainly before ordering stock fabric, always reconfirm fabric delivery dates with the mill.
- Garment costings for imported fabrics must be accurate. You have more items and more variables. Be careful. Be prudent. Be accurate. Ordering fabric from a mill located 5,000 miles away is very different than ordering fabric from the mill down the block. With imported fabric, you seldom get a second chance.

Order the fabric

You are now in business.

Chapter 17

The road to the future

'In the future, if customers demand that I source fabric locally, in my home country, I am dead. Other than a few second-rate circular knitters and poor quality cotton sheeting weavers, we have nothing. What do you suggest I do, move my factory to China?'

From the very beginning of this project, the International Trade Centre and I have both been wrestling with this irrefutable reality.

Unless your name is Brioni, producing the finest men's made-in-Italy suits, or John Smedley, producing Sea Island cotton T-shirts selling in Selfridge's for £85, your customer expects you to source the bulk of your fabric in-country. After 2005, if you are importing low quality cotton shirting from Bangladesh or high quality shirting from Malaysia, you will lose your customer. Why should they travel to your country to buy shirts made from imported fabrics when they can go directly to the place where the fabric is made and buy the same item in a factory located three blocks from the weaving mill?

The problem

If your factory has 2000+ sewing machines and you have a spare $20 million – $40 million in capital or bank facilities, the solution is easy. You build. First you would need a weaving facility, cost $10 million–$20 million, and a dyeing and finishing house, cost another $10 million–$20 million. And, if you feel particularly rich, you might throw in your own spinning operation for a mere $25 million–$100 million – depending on the nature of your product, the depth of your pockets, and the scale of your delusions of grandeur.

The rest of you, those without the spare cash or a rich benefactor, need another solution. If you cannot go elsewhere for your material and if you cannot afford to build the mills yourselves, the only solution is to bring the mills to your country.

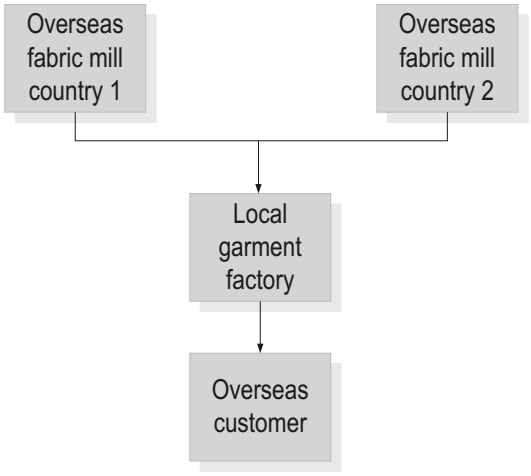
Importing fabric solution

We all agree that the current sourcing model involving imported fabric has serious deficiencies:

- The textile mill and the garment factory are located in different countries, resulting in added expense and longer lead times.
- The mill's customer is the garment factory. Information must flow from the importer to the garment factory and then to the mill. Questions from the mill will also pass first to the factory and then to the importer, resulting in further delays as well increasing the possibility of communication errors.

- The garment factory is not a preferred customer as, for the most part, it is too small to be considered a Class A factory. This results in higher prices and Class B service for both the factory and its garment importing customer.
- The garment factory is afraid to bring its customer into direct relationship with the mill. Once the customer knows the mill and can establish its own relationship, the customer can cut the factory out.

Current model: importing fabric



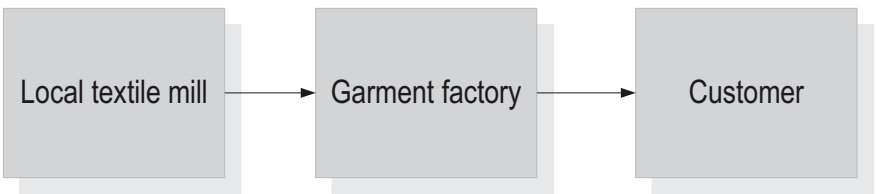
Local fabric solution

For the country which exports $5 billion in garments annually, creating a local textile industry or attracting foreign textile investors is relatively simple. However, for countries where textile exports are below $2 billion, attracting foreign direct investment is very hard indeed. Building a local textile industry or persuading foreign textile mills to invest in your country is difficult and costly.

If your garment factory is located in Kenya, persuading a Korean or Hong Kong textile mill to come to your country is not easy. Why should the mill come to Kenya when:

- AGOA allows for third-party fabric. A Kenyan garment factory does not require a textile industry for duty-free access to the United States.
- Your local textile industry is not successful. Why should foreigners do any better?
- Given the relatively small size of your factory, you will still not be a preferred mill customer even if the mill is local.
- You still have no guarantee that the customer will stay with you.

Current model: local textile mill



The vertical factory

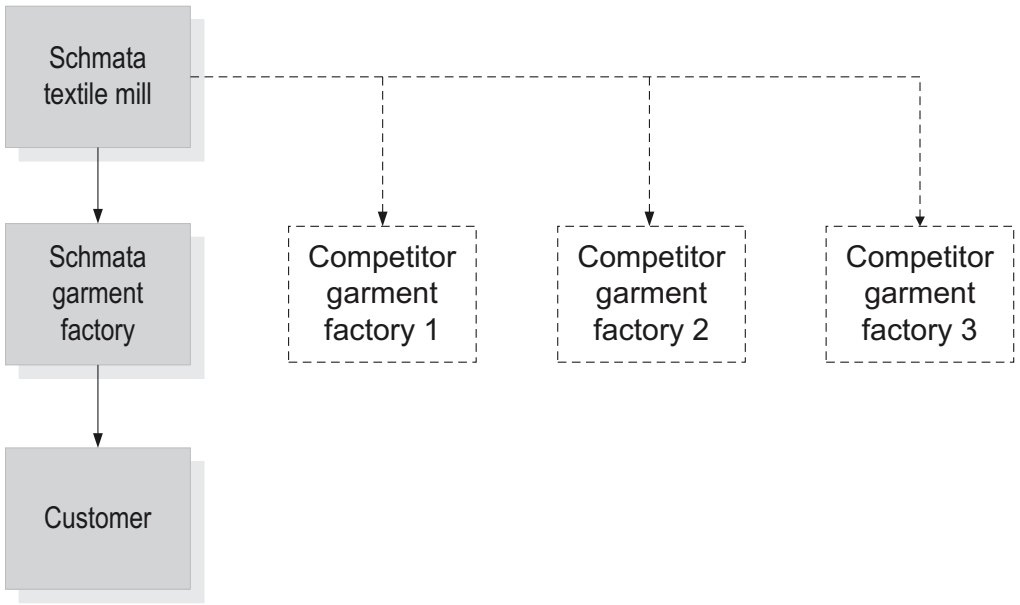
Imagine you did have $40 million and you decided to solve the problem by building your own mill. This would solve all your problems. You would have unlimited access to inexpensive materials. You would definitely be able to satisfy your customer. This would be a guaranteed success – if only you had $40 million.

Not so fast!

Haven't you noticed that when the textile industry moves towards vertical integration, that is, combining weaving (or circular knitting) and dyeing and finishing in a single operation, that very few vertical companies include the garment stage? The reason is found in economies of scale. Textiles require a much larger economy of scale than garments. A single textile mill should serve the needs of many garment factories.

To be profitable, your new mill, Schmata Textiles Ltd, would have to sell fabric not only to your own Schmata Garments Ltd, but also to Schmata Garments' competitors. This may be good for the industry. It may also be good for your textile mill. But it is not so good for Schmata Garments.

Current model: importing fabric



A third solution

In 2004 the Government of El Salvador recognized the need to reorganize the Salvadorian garment industry.

El Salvador's annual garment exports have never passed the $2 billion mark and are now shrinking. Product mix has been terrible – mostly men's cotton

T-shirts, cotton knit underwear and some denim trousers. Local fabric accounted for less than 12% of garment industry requirements. The country offered only two advantages to buyers:

- Proximity to the United States, El Salvador's most important garment market;
- CBI and CAFTA membership.

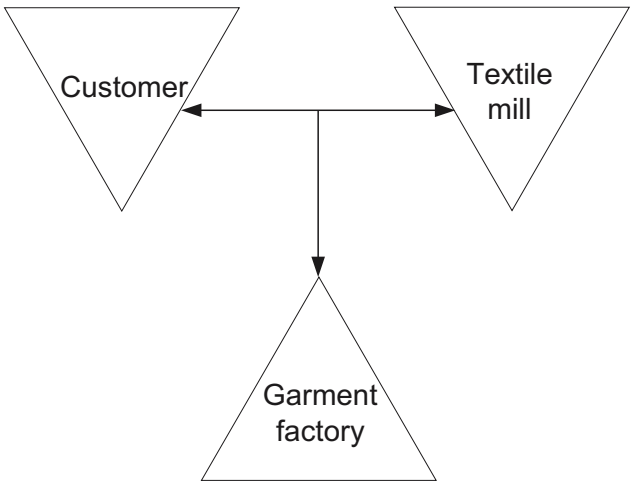
Historically, these are two less than clear-cut advantages. The Dominican Republic, Costa Rica and Mexico are but three of a growing group of countries with the same or similar 'advantages' which are all garment exporting failures.

To avoid joining that group, the Salvadorian garment industry must completely reorganize both its structure and its product mix. For example, proximity to the United States is a valuable asset provided factories ship products where speed-to-market is important. White men's cotton T-shirts are a commodity that does not require speed-to-market. Women's T-shirts, on the other hand, are a fashion item where speed-to-market is a valuable asset. Similarly, duty-free access under CBI and CAFTA membership are also great advantages provided the products exported have the highest duty rates. Cotton T-shirts, with a 16.7% duty rate, are a good item but synthetic T-shirts with a 32% duty rate are much better.

The problem facing El Salvador is the same problem facing every developing country with a small garment exporting industry – how to build a local textile industry. Here is the solution we have proposed:

The Virtual Vertical Company (VVC)

Virtual Vertical Company



There are five steps (steps 1–4 do not necessarily have to follow the order listed below):

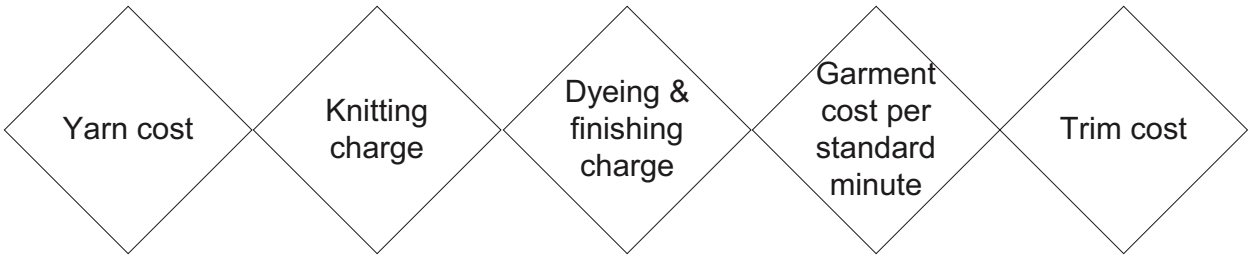
1. Pick the product(s), those that maximize the garment exporting country's advantages;
2. Pick the customer(s), who must have a reputation for reliability and be interested in long-term strategic relationships;

3. Pick the textile mill, which must have a first-class reputation, be well-capitalized and possess a solid customer base;
4. Pick the local garment factory(ies), which must be 100% reliable for quality and delivery, well-capitalized and with strong management;
5. Put all players together in a virtual partnership of equals.

In a sense, the Virtual Vertical Company is a 50-year step back in time to the days of true product sourcing. The customer breaks down the garment to a series of materials and processes. Each has a known value. Everyone's books are open. Everyone knows the costs. In fact, for the VVC to remain viable, the customer not only must have access to its own suppliers' costs, but must also have independent knowledge of those costs.

Prices are not negotiated with each order. Rather a set pricing formula is fixed at the time the various companies enter into the strategic relationship. In the case of polyester knit garments, the series of costs would look something like this:

VVC garment cost structure



In the VVC relationship, both buyer and supplier should be able to calculate the cost of each garment independently and reach the same total. In fact, the VVC begins to resemble a joint venture between the buyer and supplier. Some importers, in a move designed to demonstrate the importance being placed on such strategic relationships with core suppliers, are now planning to invest in factory operations. While these more progressive importers are not really interested in owning factories, they realize that a 10%–20% ownership of factory facilities increases their credibility with the supplier. (Usually the supplier agrees to purchase the buyer's shares over a period of time through a buy-back scheme.)

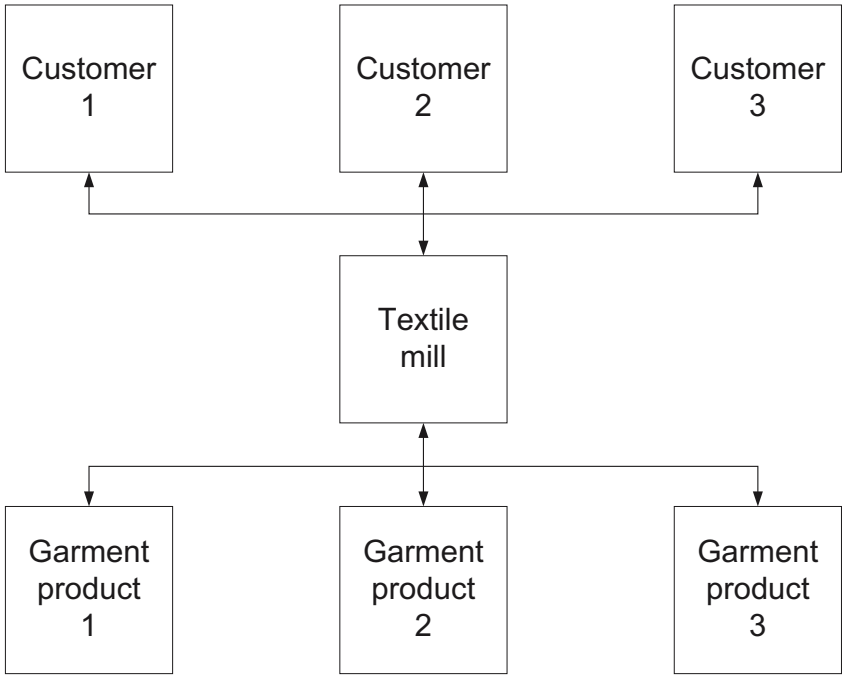
Finally, as you will see from the case study below, neither the number of customers nor the total number of garments produced is fixed. Success depends on everyone working together plus the VVC reaching a level which makes the required economies of scale viable.

Salvadorian case study

The following is an example taken from the Salvadorian project. A United States-based company producing fine gauge synthetic polyester circular knit fabric for export to Central America to be made into garments for re-export to the United States under CBI is concerned that its business would collapse under newer CAFTA regulations. (In most cases CBI production in the past required United States fabric while CAFTA permits made-in-CAFTA fabric.)

The company has an excellent reputation with its customers which include Vanity Fair, Jockey International, and Nike – all reliable importers looking for long-term strategic relationships. Fine gauge polyester is used for a number of fashion products, ranging from lingerie to active sportswear. This allows the VVC to include a number of non-competing garment factories thus ensuring sufficient volume for the mill to achieve optimum economies of scale.

VVC structure



The resulting cluster maximizes both El Salvador's proximity to the United States and its duty-free advantage. Speed-to-market will provide far lower costs by reducing markdown rates than any customer can achieve by pressuring factories for lower CMT prices. The 32% duty savings is more than substantial.

There is yet another potential savings. Under CAFTA, El Salvador enjoys duty-free access to the United States market on a yarn-forward basis, thus allowing for local spinning. CAFTA allows for fibre import from any source. United States costs for polyester chips are the highest in the world. This VVC cluster with three major customers and three garment products allows for expansion to the point where filament extrusion and spinning become viable. The first stage calls for United States yarn. The later stage calls for importing polyester chips, producing filament and spinning

The VVC scenario is not for everybody. Few garment factories anywhere in the world have the resources to create a VVC structure. They simply lack the capital, the relationships and the credibility to bring together major importers, foreign mills and local factories into a viable structure. Local government participation and leadership is an absolute requirement.

Unfortunately, in many developing countries, government is the problem. Corruption, favoritism and bureaucratic inefficiencies combined with ignorance will render any effort invalid. However, if a government recognizes the need to rebuild its industry and is willing to make the necessary effort to support development, the Virtual Vertical Company is a viable strategy for the future.

VVC and regional groupings

The VVC structure has one other great advantage: not only will the concept work within single countries, it will also work within regional free trade groups. The Salvadorian case study involving the polyester circular knitter and an array of garment factories works even if the factories are located in other CAFTA countries. As long as free trade agreements permit materials to be imported from within the group and still enjoy duty-free access, the VVC works just as efficiently regionally as it does locally.

As the world moves towards regional free trade, the VVC model takes on increasing relevance. Many countries exporting to the United States would benefit, including:

- Sub-Saharan-African countries of AGOA;
- Caribbean countries of CAFTA;
- Andean countries of ATPA;
- Canada and Mexico in NAFTA;

Countries exporting to the EU which could benefit include:

- Bulgaria, Romania, Turkey and EFTA countries as part of the Pan European Group;
- North African members of Maghreb;[14]
- Countries with bilateral agreements with the EU.[15]

14 Special restrictions apply to this group.
15 Special restrictions apply to this group as well.

Appendix I

Preferential access to the EU[1]

The EU has a number of preferential trade arrangements with certain individual countries or groups of countries outside the EU. These provide for particular goods from the countries concerned to be imported and entered to free circulation at reduced or zero rates of customs duty subject to strict origin rules. The following tables list specific preference country groupings and individual bilateral agreements. All preference agreements listed here give duty-free access to the EU, except for GSP and the transitional arrangements for Mexico and South Africa.

In essence, to be admissible to a preference, imported goods must:

- Satisfy the origin rules for the preference regime under which preference is being claimed (except for Turkey – see below);
- Have been transported direct from the preference country to the EU; and
- Have documentary evidence of preferential origin accompanying the shipment as specified in the preference agreement e.g. GSP Form A for goods imported to the EU from GSP countries, EUR1 for goods from other countries.

Turkey has duty-free access to the EU under the terms of its Customs Union agreement with the EU. Preference for goods from Turkey is on the basis of free circulation (all imported formalities completed and duties paid), rather than origin and must be supported by an ATR document.

Countries with bilateral or association agreements with the EU

European Union			EFTA countries	Europe agreements
Austria	Greece	Poland	Iceland	Bulgaria
Belgium	Hungary	Portugal	Liechtenstein	Romania
Cyprus	Ireland	Slovakia	Norway	
Czech Republic	Italy	Slovenia	Switzerland	
Denmark	Latvia	Spain		
Estonia	Lithuania	Sweden		
Finland	Luxembourg	United Kingdom		
France	Malta			
Germany	Netherlands			

Countries eligible for preference under Pan-European Cumulation System = European Union + EFTA countries + Bulgaria and Romania + Turkey (proposals to extend this to other countries still under discussion)

Countries eligible for preference as part of the European Economic Area countries = European Union + Iceland, Liechtenstein and Norway

1 Contributed by Emma Ormond, PWC, London.

Mashraq	Maghreb	Individual bilateral agreements	
Egypt	Algeria	Albania	Israel
Jordan	Morocco	Andorra	Kosovo
Lebanon	Tunisia	Bosnia and Herzegovina	Macedonia
Syrian Arab Republic		Ceuta and Melilla	Mexico
		Chile	South Africa
		Croatia	The Faroe Islands
		Federal Republic of Yugoslavia (Serbia and Montenegro)	Turkey (Customs Union)
			West Bank and Gaza Strip

Under the terms of the individual agreements between the EU and the Maghreb countries, cumulation of processing is permitted, subject to strict conditions.

Under the terms of the individual bilateral agreements with other countries, diagonal cumulation is permitted, subject to strict conditions.

Countries eligible for preferential duty rates on imports into the EU under the Generalized System of Preferences regime[2]

Afghanistan[a/]
Algeria
American Samoa
Angola[a/d/]
Anguilla[e/]
Antarctica[e/]
Antigua and Barbuda[d/]
Argentina
Armenia
Aruba[e/]
Azerbaijan
Bahamas[d/]
Bahrain
Bangladesh[a/]
Barbados[d/]
Belarus
Belize[d/]
Benin[a/d/]
Bermuda
Bhutan[a/]
Bolivia[b/]
Botswana[d/]
Bouvet Island
Brazil
British Indian Ocean Territory
Brunei Darussalam
Burkina Faso[a/d/]
Burundi[a/d/]
Cambodia[a/]
Cameroon[d/]
Cape Verde[a/d/]
Cayman Islands[e/]
Central African Republic[a/d/]
Chad[a/d/]
Chile
China (Peoples Republic of)
Christmas Islands
Cocos Islands (or Keeling Islands)
Colombia[b/]
Comoros[a/d/]
Cook Islands[e/]
Congo
Costa Rica[b/]
Côte d'Ivoire[d/]
Cuba
Cyprus
Democratic Republic of Congo[a/d/]
Djibouti[a/d/]
Dominica[d/]
Dominican Republic[d/]
East Timor
Ecuador[b/]
Egypt
El Salvador[b/]
Equatorial Guinea[a/d/]
Eritrea[a/d/]
Ethiopia[a/d/]
Fiji[d/]
Falkland Islands (Malvinas)[e/]
French Polynesia[e/]
French Southern territories
Gabon[d/]
Gambia[a/d/]
Georgia
Ghana[d/]
Gibraltar
Greenland[e/]
Grenada[d/]
Guam
Guatemala[b/]
Guinea[a/d/]
Guinea-Bissau[a/d/]
Guyana[d/]
Haiti[a/d/]
Heard Islands and McDonald Islands
Honduras[b/]
India
Indonesia
Iran, Islamic Republic of
Iraq
Jamaica[d/]
Jordan
Kazakhstan
Kenya[d/]
Kiribati[a/d/]
Kuwait
Kyrgyzstan
Laos[a/]
Lebanon
Lesotho[a/d/]
Liberia[a/d/]
Libya
Macao (China)
Madagascar[a/d/]
Malawi[a/d/]
Malaysia
Maldives[a/]
Mali[a/d/]
Marshall Islands[e/]
Mauritania[a/d/]
Mauritius[d/]
Mayotte[e/]
Mexico
Micronesia, Federated States of[e/]
Moldova[c/]
Mongolia
Montserrat[e/]
Morocco
Mozambique[a/d/]
Myanmar[a/f/]
Namibia[d/]
Nauru[e/]
New Caledonia[e/]
Nepal[a/]
Netherlands Antilles[e/]
Nicaragua[b/]
Niger[a/d/]
Nigeria[d/]
Niue Island[e/]
Norfolk Island
Northern Mariana Islands
Oman
Pakistan[b/]
Palau[e/]
Panama[b/]
Papua New Guinea[d/]
Paraguay
Peru[b/]
Philippines
Pitcairn
Qatar
Russian Federation
Rwanda[a/d/]
Samoa[a/d/]
Sao Tome and Principe[a/d/]
Santa Helena
Saudi Arabia
St Kitts and Nevis
St Lucia[d/]
St Pierre and Miquelon[e/]
St Vincent and the Grenadines[d/]
Senegal[a/d/]
Seychelles[d/]
Sierra Leone[a/d/]
Solomon Islands[a/d/]
Somalia[a/d/]
South Africa
South Georgia and South Sandwich Islands[e/]
Sri Lanka[c/]
Sudan[a/d/]
Suriname[d/]
Swaziland[d/]
Syrian Arab Republic
Tajikistan
Tanzania, United Republic of[a/d/]
Thailand
Tokelau Islands
Togo[a/d/]
Tonga[d/]
Trinidad and Tobago[d/]
Tunisia
Turkmenistan
Turks and Caicos Islands[e/]
Tuvalu[a/]
Uganda[a/d/]

2 Some GSP countries also have a bilateral agreement with the EU. Usually the duty rates under the bilateral agreement will be more favourable than the duty rates under the GSP regime.

Ukraine	Vanuatu[a/d/]	Wallis and Futuna Islands[e/]	
United Arab Emirates	Venezuela[b/]	Yemen[a/]	
United States Minor outlying islands	Viet Nam	Zambia[a/d/]	
Uruguay	Virgin Islands (British)[e/]	Zimbabwe[d/]	
Uzbekistan	Virgin Islands (USA)		

a/ LDC (least developed country) – duty free for eligible goods.
b/ Special preference in place to increase efforts to stamp out narcotics trade – duty free for eligible goods.
c/ Additional preference under the special incentives clause.
d/ Also an ACP state[1].
e/ Also an OCT state[1].
f/ Myanmar is suspended from EU GSP preference.
g/ Singapore is no longer eligible for GSP in its own right; however, its goods can be used under the ASEAN regional cumulation rules.

Generalized System of Preferences – Regional cumulation

ASEAN	SAARC	ANDEAN	CACM
Brunei Darussalam	Bangladesh[a/]	Bolivia[b/]	Costa Rica[b/]
Cambodia[a/]	Bhutan[a/]	Columbia[b/]	El Salvador[b/]
Indonesia	India	Ecuador[b/]	Guatemala[b/]
Lao People's Democratic Republic[a/]	Maldives[a/]	Peru[b/]	Honduras[b/]
Malaysia	Nepal[a/]	Venezuela[b/]	Nicaragua[b/]
Myanmar[c/]	Pakistan[b/]		Panama[b/]
Philippines	Sri Lanka		
Singapore[d/]			
Thailand			
Viet Nam			

a/ LDC (least developed country) – duty free for eligible goods.
b/ Special preference in place to increase efforts to stamp out narcotics trade - duty free for eligible goods.
c/ Myanmar is suspended from EU GSP preference.
d/ Singapore is no longer eligible for GSP in its own right but its goods can be used under the regional cumulation rules.
NB: Regional cumulation is permitted subject to strict origin and value-added criteria.

Countries eligible for duty-free access for imports into the EU under the ACP–EU Partnership Agreement (Cotonou Agreement)[34]

African, Caribbean and Pacific States (ACP)

Angola	Dominica	Malawi	Samoa
Antigua and Barbuda	Dominican Republic	Mali	Senegal
Bahamas	Equatorial Guinea	Marshall Islands	Seychelles
Barbados	Eritrea	Mauritania	Sierra Leone
Belize	Ethiopia	Mauritius	Solomon Islands
Benin	Fiji	Micronesia	Somalia
Botswana	Gabon	Mozambique	Sudan
Burkina Faso	Gambia	Namibia	Surinam
Burundi	Ghana	Nauru	Swaziland
Cameroon	Grenada	Niger	Tanzania, United Republic of
Cape Verde	Guinea	Nigeria	Togo
Central African Republic	Guinea Bissau	Nuie	Tonga
Chad	Guyana	Palau	Trinidad and Tobago
Comoros	Haiti	Papua New Guinea	Tuvalu
Congo	Jamaica	Rwanda	Uganda
Cook Islands	Kenya	Saint Kitts and Nevis	Vanuatu
Côte d'Ivoire	Kiribati	Saint Lucia	Zambia
Democratic Republic of the Congo	Lesotho	Saint Vincent and the Grenadines	Zimbabwe
Djibouti	Liberia	Sao Tome and Principe	
	Madagascar		

3 Under the terms of the ACP and OCT Agreements, cumulation of processing is permitted between member countries of ACP, OCT and EU subject to strict origin rules.
4 All ACP and OCT beneficiaries are also GSP beneficiaries but preference should be claimed under ACP/OCT.

Countries eligible for duty-free access for imports into the EU under the OCT–EU Agreement

Overseas countries and territories (OCT)

Anguilla
Aruba
British Virgin Islands
Cayman Islands
Cook Islands
Falkland Islands (Malvinas)
French Polynesia
Greenland
Marshall Islands
Mayotte
Micronesia
Montserrat
Nauru
Netherlands Antilles:
- Bonaire
- Curaçao
- Saba
- St Eustatius
- St Maarten (South)

New Caledonia and Dependencies
Nuie
Palau
Polar regions
Samoa
St Helena and dependencies
St Pierre and Miquelon
South Georgia and South Sandwich Islands
Turks and Caicos Islands
Wallis and Futuna Islands

Appendix II

Summary of United States rules of origin[1]

Introduction

The country of origin of merchandise imported into the customs territory of the United States (the fifty states, the District of Columbia and Puerto Rico) is important for several reasons. The country of origin of merchandise can affect, among other things, the rate of duty, the eligibility for special programmes, admissibility, quota, procurement by government agencies and marking requirements. The 'preferential' rules are those that apply to merchandise to determine eligibility for special treatment under various trade agreements or special legislation. Some of the rules use a 'tariff-shift' (or 'change in tariff classification') method, which is based on the Harmonized Commodity Description and Coding System (HS). The Harmonized System forms the core of the United States tariff system, the Harmonized Tariff Schedule of the United States (HTSUS). The rules of origin discussed below are administered by the United States Bureau of Customs and Border Protection (CBP) of the United States Department of Homeland Security.

Non-preferential rules of origin

United States non-preferential rules of origin schemes are used for several purposes:

- Most-favoured nation or normal trade relations treatment;
- Country of origin marking;
- Government procurement;
- Textile and textile products.

All United States non-preferential rules of origin schemes employ the 'wholly obtained' criterion for goods that are wholly the growth, product, or manufacture of a particular country.

However, all United States non-preferential rules of origin schemes also employ the 'substantial transformation' criterion for goods that consist in whole or in part of materials from more than one country. In the majority of the non-preferential schemes, the substantial transformation criterion is applied on a case-by-case basis, and it is based on a change in name/character/use method (i.e. an article that consists in whole or in part of materials from more than one country is a product of the country in which it has been substantially

1 Contributed by Frank Kelly, head of international relations, Liz Claiborne.

transformed into a new and different article of commerce with a name, character, and use distinct from that of the article or articles from which it was so transformed).

A rules of origin scheme for textiles and textile products exists that employs the substantial transformation criterion. It is based on a tariff-shift method. Another rules of origin scheme (also based on a tariff-shift method) for products imported from Canada or Mexico exists that also employs the substantial transformation criterion. A brief discussion of the United States non-preferential rules of origin schemes is set forth below.

Most favoured nation or normal trade relations treatment

There is a rules of origin scheme that is used to determine the country of origin of a product for purposes of most favoured nation or normal trade relations (NTR) duty treatment. It employs the 'wholly obtained' criterion for goods that are wholly the growth, product, or manufacture of a particular country. On the other hand, it employs the 'substantial transformation' criterion for goods that consist in whole or in part of materials from more than one country.

Country of origin marking

There are two sets of rules of origin schemes for country of origin marking purposes. The first scheme is used to determine the country of origin of a product for all countries except Canada and Mexico. It employs a rules of origin approach similar to that discussed above for NTR duty treatment. The second scheme is based on Annex 311 to the North American Free Trade Agreement (NAFTA). It is used for products imported into the United States from Canada or Mexico, and it is set forth in Part 102, Customs Regulations (19 CFR Part 102). For goods that consist in whole or in part of materials from more than one country, this scheme employs the substantial transformation criterion, which is expressed or based exclusively on a tariff-shift method. This scheme includes the following general rules:

- A *de minimis* test of 7% of the value of a good except for goods of chapter 22 wherein the test is 10% of the value of a good and, except for textile and apparel goods wherein the test is 7% of the total weight of the good (goods of chapter 1-4, 7, 8, 11, 12, 15, 17, and 20 are excluded from the *de minimis* test);
- A chemical reaction origin rule for the goods of chapters 28, 29, 31, 32 or 38; and
- Provisions relating to the treatment of certain packaging materials, accessories, spare parts, tools, indirect materials in determining origin, and certain non-qualifying operations (e.g. mere dilution with water).

Government procurement

There is a rules of origin scheme that is used to determine the country of origin for government procurement for the purpose of granting waivers of certain 'Buy American' restrictions in United States laws or practice for products for eligible countries. For purposes of this scheme, an article is a product of a country or instrumentality only if:

- It is wholly the growth, product, or manufacture of that country or instrumentality; or

- In the case of an article which consists in whole or in part of materials from another country or instrumentality, it has been substantially transformed into a new and different article of commerce with a name, character, or use distinct from which it was so transformed.

Textile and textile products

There is a rules of origin scheme that is used to determine the country of origin for textiles and textile products for, among other things, the application of quotas. It employs the substantial transformation criterion which is expressed or based exclusively on a tariff-shift method and covers the headings and chapters of the Harmonized System relevant to textile and textile products. A detailed discussion of these rules may be found in the CBP informed compliance publication entitled, 'What Every Member of the Trade Community Should Know About: Textile and Apparel Rules of Origin', which is available on the CBP website: *www.cbp.gov*.

Preferential rules of origin

United States preferential rules of origin schemes are used for several special tariff programmes:

- African Growth and Opportunity Act
- Andean Trade Preference Act
- Andean Trade Promotion and Drug Eradication Act
- Caribbean Basin Economic Recovery Act
- Compact of Free Association Act
- Generalized System of Preferences
- Insular Possessions of the United States
- North American Free Trade Agreement Implementation Act
- Products of the West Bank, the Gaza Strip or a Qualifying Industrial Zone
- United States–Caribbean Basin Trade Partnership Act
- United States–Chile Free Trade Agreement Implementation Act
- United States–Israel Free Trade Area Implementation Act
- United States–Jordan Free Trade Area Implementation Act
- United States–Singapore Free Trade Agreement Implementation Act

Most of the above-mentioned rules of origin schemes are set forth in the General Notes of the Harmonized Tariff Schedule of the United States (HTSUS). United States preferential rules of origin schemes employ the 'wholly obtained' criterion for goods that are wholly the growth, product, or manufacture of a particular country. On the other hand, for goods that consist in whole or in part of materials from more than one country, the majority of United States preferential rules of origin schemes are based:

- On a change in name, character, and use (substantial transformation); and
- On a required minimum local value content; unless specified otherwise, the cost of foreign materials may not be included in local value content unless they undergo a double substantial transformation.

Other preferential rules of origin (e.g. NAFTA preferential rules of origin) are based on a tariff-shift method and/or regional value-content method for goods that are not wholly obtained from the applicable region or country.

Under these preferential programmes, qualifying goods may enter the customs territory of the United States free of duty or at reduced rates of duty. A brief discussion of the United States preferential rules of origin schemes is set forth below.

African Growth and Opportunity Act

The African Growth and Opportunity Act (AGOA) provides for the duty-free entry of certain non-textile articles previously excluded from preferential treatment under the Generalized System of Preferences programme as well as the duty- and quota-free entry of certain textile and apparel articles that meet certain specific production requirements, as set forth in subchapter XIX, chapter 98, HTSUS. AGOA provides this special treatment to certain articles from the designated beneficiary sub-Saharan African countries. It is intended to encourage economic growth in those countries.

With respect to the non-textile articles to which AGOA extends duty-free treatment, such treatment is granted under AGOA to any eligible article that is the growth, product or manufacture of a designated beneficiary country if:

- That article is imported directly from a designated beneficiary country into the United States customs territory and
- The sum of (1) the cost or value of the materials produced in one or more designated beneficiary countries, plus (2) the direct costs of processing operations performed in the designated beneficiary country, or in one or more members of an association of countries which is treated as one country under section 507(2) of the Trade Act of 1974, is at least 35% of the appraised value of the article. Up to 15% of the 35% local value content requirement may be attributable to the cost or value of materials produced in the United States.

Andean Trade Preference Act

The Andean Trade Preference Act (ATPA) provides for the duty-free entry of all but a few classes of merchandise from the following designated beneficiary countries: Bolivia, Ecuador, Colombia, and Peru. It is intended to encourage economic growth in those countries. Duty-free treatment is granted under ATPA to any otherwise eligible article that is the growth, product, or manufacture of a designated beneficiary country if:

- That article is imported directly from a beneficiary country into the United States customs territory and
- The sum of (1) the cost or value of materials produced in one or more Andean beneficiary countries or one or more Caribbean Basin beneficiary countries, plus (2) the direct costs of processing operations performed in one or more Andean or Caribbean Basin beneficiary countries, is at least 35% of the appraised value of the article.
- Puerto Rico and the Virgin Islands are considered 'beneficiary countries' for purposes of 35% local value content.

Up to 15% of the 35% local value content requirement may be attributable to the cost or value of materials produced in the United States.

Andean Trade Promotion and Drug Eradication Act

The Andean Trade Promotion and Drug Eradication Act (ATPDEA) extends and enhances trade benefits available under ATPA as a way to create additional alternatives to illicit drug production in order to enhance political security in the Andean region and the hemisphere. The expanded trade benefits under ATPDEA include the duty-free entry of certain non-textile articles previously excluded from preferential treatment under ATPA, as well as the duty- and quota-free treatment of certain textile and apparel articles that meet certain specific production requirements, as set forth in subchapter XXI, chapter 98, HTSUS. The non-textile articles to which ATPDEA extends duty-free treatment must satisfy ATPA rules of origin.

Caribbean Basin Economic Recovery Act

The Caribbean Basin Economic Recovery Act (CBERA) is a programme that provides for the duty-free entry of all but a few classes of merchandise from the designated beneficiary countries or territories surrounding the Caribbean Sea. It is intended to encourage economic growth in those countries. Duty-free treatment is granted under CBERA to any otherwise eligible article that is the growth, product, or manufacture of a designated beneficiary country if:

- That article is imported directly from a beneficiary country into the United States customs territory and
- The sum of (1) the cost or value of materials produced in one or more Caribbean Basin beneficiary countries, plus (2) the direct costs of processing operations performed in one or more Caribbean Basin beneficiary countries, is at least 35% of the appraised value of the article.
- Puerto Rico and the Virgin Islands are considered 'beneficiary countries' for purposes of 35% local value content.
- Up to 15% of the 35% local value content requirement may be attributable to the cost or value of materials produced in the United States.

Compact of Free Association Act

The Compact of Free Association Act (FAS) provides for the duty-free entry of all but a few classes of merchandise from the following freely associated states: Marshall Islands, the Federated States of Micronesia, and the Republic of Palau. It is intended to encourage economic growth and development in those countries. Duty-free treatment is granted under FAS to any otherwise eligible article that is the growth, product, or manufacture of a freely associated state if:

- That article is imported directly from a freely associated state into the United States customs territory and
- The sum of (1) the cost or value of materials produced in that freely associated state plus (2) the direct costs of processing operations performed in that freely associated state is at least 35% of the appraised value of the article.
- Up to 15% of the 35% local value content requirement may be attributable to the cost or value of materials produced in the United States.

Generalized System of Preferences

The Generalized System of Preferences (GSP) is a programme that provides for the duty-free entry of all but a few classes of merchandise from the designated beneficiary developing countries or territories around the world. It is intended

to encourage economic growth and development in those countries. Duty-free treatment is granted under GSP to any otherwise eligible article that is the growth, product, or manufacture of a designated beneficiary developing country if:

- That article is imported directly from a beneficiary developing country into the United States customs territory and
- The sum of (1) the cost or value of materials produced in that beneficiary developing country (or produced in one or more members of an association of countries treated as one country under the GSP), plus (2) the direct costs of processing operations performed in that beneficiary developing country (or in one or members of an association of countries treated as one country under the GSP), is at least 35% of the appraised value of the article.

Insular possessions of the United States

The United States Harmonized Tariff Schedule of the United States (general note 3(a)(iv)) provides for the duty-free entry of merchandise from the insular possessions of the United States that are outside the customs territory of the United States: United States Virgin Islands, Guam, American Samoa, Wake Island, Midway Islands, and Johnston Atoll. (For purpose of this provision, merchandise from the Commonwealth of the Northern Mariana Islands is given the same tariff treatment as merchandise from Guam.) Duty-free treatment is granted under general note 3(a)(iv) to any article which is the growth, product, or manufacture of an insular possession of the United States if:

- That article is imported directly from the insular possession into the United States customs territory; and
- That article does not contain foreign materials (i.e. materials produced in other than an insular possession or the United States) valued at more than 70% of the appraised value of the imported article, or in the case of certain articles such as textiles subject to textile agreements, 50% of the appraised value of such articles.

North American Free Trade Agreement Implementation Act

The North American Free Trade Agreement Implementation Act implements into United States law the North American Free Trade Agreement (NAFTA). NAFTA eliminates tariffs on most goods originating in Canada, Mexico, and the United States over a maximum transition period of 15 years. There are NAFTA rules of origin for preferential tariff purposes. The rules of origin for goods that are not wholly obtained from the NAFTA region are based on a tariff-shift method and/or regional value-content method. For the United States, these rules can be found in general note 12 to the HTSUS. Detailed regulations implementing NAFTA rules of origin may be found in the appendix to Part 181 of the Customs Regulations (19 CFR Part 181, appendix).

Products of the West Bank, the Gaza Strip or a Qualifying Industrial Zone

General note 3(a)(v) provides for duty-free entry of merchandise imported into the United States from the West Bank, Gaza Strip, or a Qualifying Industrial Zone. This provision is intended to promote peace within that region by stimulating economic growth and trade between those areas and the United States and Israel. Reduced or duty-free treatment is granted under this programme to any article that is the growth, product, or manufacture of the West Bank, Gaza Strip, or a Qualifying Industrial Zone if:

- That article is imported directly from the West Bank, Gaza Strip, or a Qualifying Industrial Zone or Israel into the United States customs territory; and
- The sum of (1) the cost or value of materials produced in the West Bank, Gaza Strip, or a Qualifying Industrial Zone or Israel, plus (2) the direct costs of processing operations performed in the West Bank, Gaza Strip, or a Qualifying Industrial Zone or Israel, is at least 35% of the appraised value of the article.
- Up to 15% of the 35% local value content requirement may be attributable to the cost or value of materials produced in the United States.

United States–Caribbean Basin Trade Partnership Act

The United States–Caribbean Basin Trade Partnership Act (CBTPA) builds on CBERA and extends additional trade benefits to designated countries in the Caribbean Basin from 1 October 2002, and ending on the earlier of 30 September 2008, or on the date on which a free trade agreement enters into force between the United States and CBTPA beneficiary countries. The expanded trade benefits under CBTPA include the duty-free entry of certain non-textile articles previously excluded from preferential treatment under CBERA, as well as the duty- and quota-free treatment of certain textile and apparel articles that meet certain specific production requirements, as set forth in subchapter XX, chapter 98, HTSUS.

With respect to the non-textile articles to which the CBTPA extends preferential treatment, such treatment is granted under the CBTPA to any otherwise eligible good that is the growth, product or manufacture of a designated beneficiary country if:

- That article is imported directly from a beneficiary country into the United States customs territory; and
- The article meets the rules of origin for a good as set forth in general note 12, HTSUS.

United States–Chile Free Trade Agreement Implementation Act

The United States–Chile Free Trade Agreement Implementation Act implements into United States law the United States–Chile Free Trade Agreement (UCFTA). UCFTA eliminates tariffs on most goods originating in the United States and Chile over a maximum transition period of 12 years. There are UCFTA rules of origin for preferential tariff purposes. The rules of origin for goods that are not wholly obtained from the United States or Chile are based on a tariff-shift method and/or regional value-content method. For the United States, these rules can be found in general note 26 to HTSUS.

United States–Israel Free Trade Area Implementation Act

The United States–Israel Free Trade Area Implementation Act implements into United States law the United States–Israel Free Trade Area Agreement (IFTA). IFTA provides for free or reduced rates of duty for merchandise imported into the United States from Israel. IFTA is intended to stimulate trade between the United States and Israel. Reduced or duty-free treatment is granted under IFTA to any article which is the growth, product, or manufacture of Israel if:

- That article is imported directly from Israel, West Bank, Gaza Strip, or a Qualifying Industrial Zone into the United States customs territory; and

- The sum of (1) the cost or value of materials produced in Israel, West Bank, Gaza Strip, or a Qualifying Industrial Zone, plus (2) the direct costs of processing operations performed in Israel, West Bank, Gaza Strip, or a Qualifying Industrial Zone, is at least 35% of the appraised value of the article.
- Up to 15% of the 35% local value content requirement may be attributable to the cost or value of materials produced in the United States.

United States–Jordan Free Trade Area Implementation Act

The United States–Jordan Free Trade Area Implementation Act implements into United States law the 'Agreement between the United States of America and the Hashemite Kingdom of Jordan on the Establishment of a Free Trade Area' (United States–Jordan Free Trade Area Agreement). The Agreement eliminates tariffs on most goods originating in Jordan and the United States over a maximum transition period of 10 years.

Duty-free treatment is granted under the Act to any otherwise eligible article that is imported directly from Jordan into the United States customs territory and:

- That is wholly the growth, product or manufacture of Jordan or a new or different article of commerce that has been grown, produced or manufactured in Jordan; and
- The sum of (1) the cost or value of the materials produced in Jordan, plus (2) the direct costs of processing operations performed in Jordan is not less than 35% of the appraised value of such article. Up to 15% of the 35% local value content requirement may be attributable to the cost or value of materials produced in the United States.

United States–Singapore Free Trade Agreement Implementation Act

The United States–Singapore Free Trade Agreement Implementation Act implements into United States law the United States–Singapore Free Trade Agreement (SFTA). SFTA eliminates tariffs on most goods originating in the United States and Singapore over a maximum transition period of 10 years. There are SFTA rules of origin for preferential tariff purposes. The rules of origin for goods that are not wholly obtained from the United States or Singapore are based on a tariff-shift method and/or regional value-content method. For the United States, these rules can be found in general note 25 to HTSUS.

Preferential duty trade initiatives		
Initiative	**Status**	**Preference flow**
African Growth and Opportunity Act	Unilateral	Non-reciprocal
Andean Trade Preference Act	Unilateral	Non-reciprocal
Andean Trade Promotion and Drug Eradication Act	Unilateral	Non-reciprocal
Caribbean Basin Economic Recovery Act	Unilateral	Non-reciprocal
Compact of Free Association Act	Unilateral	Non-reciprocal
Generalized System of Preferences	Unilateral	Non-reciprocal
North American Free Trade Agreement	Trilateral	Reciprocal
Products of Insular Possessions	Unilateral	Non-reciprocal
Products of the West Bank, Gaza Strip or a Qualifying Industrial Zone	Unilateral	Non-reciprocal
United States–Caribbean Basin Trade Partnership Act	Unilateral	Non-reciprocal
United States–Chile Free Trade Agreement	Bilateral	Reciprocal
United States–Israel Free Trade Agreement	Bilateral	Reciprocal
United States–Jordan Free Trade Agreement	Bilateral	Reciprocal
United States–Singapore Free Trade Agreement	Bilateral	Reciprocal

Eligible products and preferential rates of duty in the HTSUS

HTSUS lists the eligible products and preferential rates of duty throughout the schedule for particular special tariff programmes. The rates of duty for the preferential tariff programmes are generally found in the column 1 sub-column entitled 'Special'. A summary of the symbols used in the 'Special' sub-column and a list of the programmes they represent may be found in general note 3(c) to HTSUS. Some articles may be subject to temporary modifications found in chapter 99, HTSUS. As indicated above, the goods must meet the requirements for the particular special tariff programme in order to be eligible for the applicable preferential rate of duty.

Appendix III

Measures and conversions

Term	United States	Metric
Momme Japanese unit of weight used for silk fabric 1 momme = a strip 1.5" X 25 yards weighing 3.75 grams	1 momme = weight of 116.36 yd/lb (approx.)	1 momme = weight of 48.37 m/kg (approx.)
Inch/centimetre	2.54 cm = 1 in.	0.039 in. = 1 cm (approx.)
Foot/metre	12 in. = .3048 m	3.3 ft = 1 m (approx.)
Yard/metre	3 ft = 36 in. = 0.9144 m	39.37 in. = 1 m (approx.)
Mile/kilometre	5 280 ft = 1760 yd = 1.609 km (approx.)	1 000 m = 0.6214 mi (approx.)
Square inch/square centimetre	6.45 cm^2 (approx.)	0.155 sq in. (approx.)
Square yard/square metre	9 sq ft = 1296 sq in. = 0.836 m^2 (approx.)	10,000 cm^2 = 10.76 sq ft = 1.196 sq yd (approx.)
Fluid ounce/millilitre	29.573 ml (approx.)	0.034 fluid oz (approx.)
Pint/litre	16 oz = 0.473 l (approx.)	0.503 pt (approx.)
Gallon/litre	4 qts = 3.785 l (approx)	0.2642 gal (approx.)
Pound/kilogram	16 oz = 453.5 g (approx.) = .4535 kg	2.205 lb
Ounce/gram	28.41 g (approx.)	.03527 oz (approx.)
Hank, cotton	840 yd	768 m
Hank, spun silk	840 yd	768 m
Hank, worsted	560 yd	512 m
Hank, wool or linen	300 yd	274 m
Lea, cotton or spun silk	120 yd	110 m
Lea, worsted	80 yd	73 m
Ligne (button diameters)	0.125 in.	0.3175 cm
Denier (measure of filiment lineal density)	Oz per 233 802 yd (approx.)	G per 9 000 m
Knit fabric count	Number of wales then number of courses per square inch	
Woven fabric construction	Number of warp yarns per inch, then number of weft yarns per inch; e.g. 100X60	
Yarn count, cotton	Number of 840 yd lengths per pound	
Yarn count, spun silk	Number of 840 yd lengths per pound	
Yarn count, asbestos or glass	Number of 100 yd lengths per pound	
Yarn count, linen (lea) or wool	Number of 300 yd lengths per pound	
Yarn count, worsted	Number of 560 yd lengths per pound	
Yarn count, linen (tow) or jute	Number of 14 400 yd lengths per pound	
Tex system		Number of g per 1 km length
Conversion denier to tex number	Divide denier number by 9: e.g. 150 denier = tex number 17	

Appendix IV

Shipping terms – Incoterms*

Incoterms	Main duties of the seller	Main duties of the buyer	Transfer of risks	Transfer of costs	Means of transportation
EXW – Ex works Named place	Goods available at his own premises	Get goods from the sellers's premises; Bear all costs and risks involved in taking the goods from the seller's premises to the desired destination.	At departure, when goods are not loaded		All transportation means
FCA – Free Carrier Named place	Hand over the goods into the charge of the carrier named by the buyer at the named place; Bear export costs; Provide evidence of the delivery to the carrier.	Designate a carrier; conclude a transportation contract and bear transportation costs	When delivered to the carrier		All transportation means
FAS- Free Alongside Ship Named port of shipment	Deliver the goods along side the vessel on the quay or in lighters at the named port of shipment; Provide a «alongside ship…» receipt.	Designate a carrier; Conclude a transportation contract and bear transportation costs; Clear the goods for export.	At loading place		Sea or inland waterway transport
FOB – Free on Board Named port of shipment	Deliver goods on board; Provide export licence and pay taxes and duties when required; Provide a «net on board» receipt; Bear costs related to the loading of goods.	Designate a carrier; Conclude a transportation contract and bear all costs from the point that the goods have passed over the ship 's rail at the named port of shipment.	On board, at embarkation		Sea or inland waterway transport
CFR- Cost and Freight Named port of destination	Conclude transportation contract, bear freight costs until named delivery point; Deliver goods on board the vessel; Provide export licence and pay taxes and duties when required; Provide the invoice and the loading documentation to the buyer; Cover loading costs.	Accept the delivery of goods upon receipt of the invoice and the loading documentation; Cover costs related to the unloading if not included in freight charges.	On board, when uploading		Sea or inland waterway transport
CIF – Cost, Insurance and Freight Named port of destination	As per CFR. On top, subscribe a marine insurance and bear its cost for the transportation of goods; Provide a marine certificate to the buyer.	As per CFR	On board at loading	On board at unloading	Sea or inland waterway transport

* Incoterms 2000 = International Commercial Terms; these are regularly updated trade terms that are established by the International Chamber of Commerce in Paris since 1936; Incoterms define the obligations of buyers and sellers in the framework of international purchase/sales contracts.

Incoterms	Main duties of the seller	Main duties of the buyer	Transfer of risks	Transfer of costs	Means of transportation
CPT – Carriage paid to Named place of destination	Conclude a freight contract, bear the cost of transportation until the named arrival place; Deliver goods to the first carrier; Obtain an export licence and pay export taxes/duties required; Provide the invoice.	Accept the delivery of goods when they reach the first carrier and when invoice and eventually transportation documentation are provided.	When delivered to carrier	Arrival point	All transportation means
CIP – Carriage and insurance paid to Named place of destination	As per CPT. On top, subscribe an insurance contract covering the transportation of goods and pay premium. Provide the buyer with the transportation insurance documentation.	As per CPT	When delivered to carrier	Arrival point	All transportation means
DAF – Delivered at Frontier Named place	Deliver goods, cleared for export, at the named place at the frontier; Provide the buyer with the necessary documentation so that goods can be delivered at the frontier; Bear transportation costs up to the frontier.	Get goods at the named place at the frontier, Cover transportation cost from that point onward; Obtain import clearance when required.	Named frontier		Road transportation
DES – Delivered Ex Ship Named port of destination	Deliver goods on board the ship at the named port of destination; Provide the buyer with documentation allowing goods to be delivered on board; Conclude a contract and bear the cost involved in bringing the goods to the named port of destination.	Get goods on board of the ship at the port of destination; Cover unloading costs; Obtain import clearance when required.	On board When unloading goods		Sea or inland waterway transport
DEQ – Delivered Ex Quay Named port of destination	Make goods available to the buyer on the quay at the named port of destination; Provide the buyer with the documentation required to get the goods delivered on the quay; Conclude contract and bear transportation costs involved until named port of destination and unloading of the goods; Obtain import clearance	Get goods on the quay, at the named port of destination	On the quay, at the named port of destination		Sea or inland waterway transport
DDP – Delivered duty paid Named place of destination	Make goods available to the buyer at a named place of destination; Obtain import clearance; Conclude a transportation contract and bear transportation costs until a named point of destination; Provide documentation required for the buyer to get the goods delivered.	Get goods at the named place of destination	Goods unloaded at the named place of destination		All transportation means
DDU – Delivered duty unpaid Named place of destination	As per DDP apart from import customs clearance.	As per DDP Obtain import clearance if required	Uploaded goods, at the named place of destination		All transportation means

Glossaries

Yarn

Acrylic and modacrylic	Generic fibre category whose properties are soft wool-like hand and brilliant colours. Used for sweaters, blankets, carpets, socks.
Air-jet spinning	Type of open end spinning where air is forced through a fixed tube causing fibres to twist.
Alpaca	Member of camel family with soft downy fleece with strands 8–16 inches (20–40 cm) long. Directly related to the llama native to Peru, Ecuador and Bolivia, although without the llama's coarse brittle fibres.
Angora goat	See Mohair.
Angora rabbit	Originally from North Africa and France, now found in other parts of Europe and the United States, characterized by soft fine hair 3–5 inches (7.5–12.7 cm) long used in sweaters, dresses and sportswear. Not to be confused with rabbit hair which comes from ordinary rabbits.
Average (regular) twist	Term denoting yarn with normal number of twists per inch (less than high twist but more than low).
Bare elastic	Rubber core without textile filament covering.
Bouclé (curl)	Fancy yarn produced by wrapping a thick hard-twist yarn around two finer foundation yarns. The wrapper is delivered at a quicker rate than the foundation resulting in a rough, curly, knotted effect. From the French for 'buckled, curled'. (See Loop.)
Camel hair	Hair from the Asian Bactrian camel, available in three grades. Best grade from the soft undercoat which in turn can be divided into soft oil and heavier top. Most fine clothes are produced from oil.
Carded yarn	Uneven cotton or cotton blend yarn from which impurities have been removed by carding.
Carding	Early process in spun yarn manufacture where fibres are separated, distributed and equalized to form a thin web of continuous untwisted fibres called a sliver.
Cashmere	Fine soft downy wool from the undergrowth of the cashmere goat indigenous to the Kashmir region, also Mongolia, Tibet, China and Iraq.
Cellulose acetate	Basic substance contained in all vegetable fibres. In the form of cellulose acetate, it comprises acetate fibre. Fabrics from this fibre are characterized by crisp hand and high lustre.
Cellulose triacetate	Type of acetate fibre which has undergone an additional chemical process where, according to FTC definition, 'not less than 92% of the hydroxyl groups have been acetylated'. Has higher heat resistance and better ease of care than regular acetate.

Chenille	From the French word for 'caterpillar', specialty yarn with pile protruding from all sides produced in silk, wool, cotton or synthetic but most commonly in rayon.
Coated yarn	Yarn which has been coated with lacquer, varnish, plastic resin or other chemicals.
Combed yarn	Yarn that has undergone the combing process; characterized by being more even, compact and with fewer projecting fibres.
Combing	Process following carding in both cotton and worsted yarn manufacture to straighten and line up fibres, as well as removing all foreign matter. The resulting yarn is finer, cleaner and more lustrous.
Complex (composite) yarn	Yarn composed of two or more staple fibres and/or components
Cord yarn (or cable)	Yarn made with a cabled twist where two or more plied yarns are twisted together to form a stronger, more regular yarn.
Core-spun yarn	Yarn made by winding one yarn around another to give the appearance of a yarn made solely from the outer material. Most common in sewing threads where cotton yarn is wrapped around a polyester core.
Cotton	From the Arabic *qutun*. Vegetable seed fibre consisting of unicellular hairs attached to the seed. Fibre lengths can vary from less than 0.5 inches to 2 inches (1.3–5 cm) Diameters are quite fine.
Crêpe twist	Yarn with considerably larger number of turns per inch than ordinary or voile twist. The resulting fabric has a grained or crinkled crêpe appearance.
Denier	Measurement of density for filament yarn equalling number of grams per 9,000 m of filament.
Felting	Production process for wool or wool-blend yarns where yarns are impregnated with water, then agitated, causing fibres to entangle and cling together. Used in carpet production.
Fibre	Basic component for all yarn divided into natural and manmade. Natural fibres include wool and fine animal hair (cashmere, angora, mohair, etc.), protein-based (silk, tussah, etc.) and plant or vegetable fibres (flax/linen, hemp, jute, ramie, etc.) Manmade fibre divided into two subgroups: synthetic filament (nylon, polyester) or artificially produced from cellulose (rayon, acetate).
Filament	Generally synthetic fibre of indefinite or extreme length. However, silk is a natural filament often exceeding 1,400 yd (1,240 m) in length.
Flax (linen)	Perhaps oldest known textile fibre. An annual plant whose fibres are used for fabrics ranging from fine handkerchiefs to rough butcher qualities.
Gimp yarn	One or more plied yarn spun around a central core at a faster rate to produce a spiral effect. Originally silk twisted around fine wire to use in trimming or lace; also fishing lines.
Grandrelle	A ply yarn consisting of two or more single yarns of different colours.
High (voile) twist	Hard twist yarn with more turns than regular twist but fewer than crêpe twist. Used for voile fabrics, generally produced in high counts between 50s and 100/2.
Jute	Bast fibre indigenous to Bangladesh, India, China and Thailand. Used extensively for burlap sacks and bales. Also used in carpets and occasionally to give interest to tweeds and other fabrics. From Sanskrit *jata* for braid of hair.

Knitting yarn	General term for yarn used for knitting. More specifically for low twist, high bulk cotton yarn.
Knot, spot, nub, knob	Knob or lump formed by interlacing portions of one or more fibre strands.
Line yarn	Linen yarn made of longer flax fibres differentiated by tow yarn made of shorter fibres.
Llama	Member of camel family, native to Peru, Ecuador, and Bolivia with soft downy fleece with strands 8–16 inches (20–40 cm) long. Has coarser fibres than alpaca (see Alpaca).
Loop yarn	Rough knotted fancy yarn usually made with three strands. A thin strand is stretched taut; a second ply is twisted around it with a third ply twisting the two plies in the opposite direction. (See Bouclé.)
Low (napping) twist	Loosely twisted yarn used often in low count wefts.
Lyocell (tencel)	Generic fibre category for solvent-spun cellulosic fibre. Trademarked by Courtaulds as Tencel.
Mélange	Fancy yarn spun from slivers or tops of the same fibre predyed in various tones and colours as distinct from a mixed yarn spun from a blend of fibres having different colours or dyeing properties
Mercerization	Process for cotton yarn or fabric where material is first swelled in a strong alkali solution and later neutralized in acid resulting in increased lustre.
Merino wool	Strong fine elastic wool from sheep of the same name. Staple is short (1.5 to 3 inches) but very dense. Used in high quality, high count (60 s–90 s) fabrics; also fine sweater yarns.
Metallic yarn	Fancy yarn, originally made by sandwiching aluminium foil between two layers of cellulose acetate butyrate film, now produced with foil in slit plastic film.
Microfibre	Very fine filament or staple fibre. Used extensively for ski clothes and other outerwear.
Mohair	Long, white, lustrous, comparatively coarse hair from angora goat originally indigenous to Turkey, now in Texas and South Africa as well. Fibre lengths vary from 4–12 inches. Lacks natural crimp.
Napping	Finishing process in manufacture of some woollens, cottons, spun silks, and spun rayons where fabric or yarn is passed through revolving cylinders covered with fine wire brushes. Fibres from loosely twisted yarns are lifted from the surface creating the nap.
Noil	Short fibres removed during cotton, spun silk or worsted combing process.
Noil silk (bourette)	Coarse yarn (or fabric) produced from silk waste.
Nub yarn	Fancy yarn containing knobs or lumps formed by interlacing portions of one or more fibre strands.
Nylon (Polyamide)	Generic fibre category first developed by the DuPont Co. in 1938 characterized by high strength, elasticity, low water absorption, quick drying, and resistance to chemicals, mildew abrasion and rot.
Open end spinning	One of two methods of yarn spinning characterized by creation of yarn by transferring twist from the end of previously formed yarn to fibres continuously fed from the sliver to the spinning area.
Pima cotton	Fine variety of American or Egyptian cotton with average fibre staple length of 19/16 in. (4 cm) used for fine shirtings and dress fabrics. Named after Pima County, Arizona.

Ply yarn (or thread)	Yarn formed by twisting together two or more single yarns or strands in a single operation.
Polyester	Generic fibre category characterised as crease resistant, quick drying, shape retaining in garments, high strength and resistant to abrasion.
Polypropylene	Fibre characterized as good strength, low specific gravity, excellent elastic recovery, good resilience, stain resistant. Made of olefin fibre, manufactured from addition of polymer propylene.
Ramie	Bast fibrous plant grown mainly in the Philippines, Brazil and China. Chiefly used as cotton substitute for quota purposes.
Ring spinning	Form of spinning where twist is inserted into yarn after emerging from the front drafting rolls by passing it first through a traveller, then to a rapidly rotating bobbin. Slower than open end spinning but better for high count and worsted yarns.
Roving	Loose assemblage of fibres drawn or rubbed into a single strand with very little twist. In cotton spinning, the step between sliver and yarn.
Sea Island	Finest grade of cotton with high strength and lustre used for very fine shirtings. Average staple length 1.75 inches (4.4 cm) although can reach 2.25 inches (5.7 cm). Name comes from island group off the coast of Charleston, South Carolina.
Seed and splash	Fancy yarn with elongated nubs tightly twisted around a base yarn.
Self-twist yarn	Stable two-ply yarn produced when two rovings are fed into a pair of rollers rotating in opposite directions. When the yarns exit side by side they are allowed to untwist around each other.
Semi-combed yarn	Cotton combed yarn which still retains most of the noil.
Semi-worsted yarn	Yarn spun on worsted spinning system but which has not been combed.
SIRO spun yarn	Worsted ply yarn produced directly from two rovings eliminating the need to form two single yarns. First developed in Australia.
Sisal	Fibre prepared from the leaves of the agave plant used in cordage, rope, and coarse rugs. From the Spanish name for the port of Yucatan in southeastern Mexico.
Sliver or slub	Continuous rope-like strand of loosely assembled fibres with no twist and uniform density. Also thick, uneven twisted place in a yarn.
Smooth filament	Fibre which has not been texturized.
Spandex	Generic fibre category characterized by excellent elongation and elastic recovery similar to rubber.
Spike or snarl	Fancy ply yarn related to nub yarn made by twisting two single yarns with different twists. The higher twist yarn is delivered at a faster rate producing tightly projected twisted loops or kinks.
Spun silk	Silk yarn made of short lengths of fibre obtained from silk waste or broken cocoons which has been spun in a manner similar to worsted yarn. Used in cheaper fabrics such as habitae and shantung but also in silk fuji and surah (fine twill).
Staple	1. Denoting manufactured fibres which have been cut to a short length. 2. Average length of a sample or bale of cotton fibre usually measured to the nearest 1/16 inch.

Synthetic manmade fibres	Term denoting any manufactured fibre other than rayons, acetates, etc. which are classed as 'artificial' fibres.
Teflon	Trademark of DuPont Co. for stain-resistant, water-repellent fluorocarbon which can be produced in filament, staple, tow and monofilament forms. Also made as microporous membranes which when laminated to fabric produces Gore-Tex.
Tex system	Measurement for all yarns, fibres and textile strands developed to replace diverse systems now used such as count, denier, etc. The tex number of a yarn, fibre or strand equals the weight in grams of one kilometre length of yarn.
Thrown silk	Raw silk made from coarser silk filament strands.
Top	Strand of longer wool fibres which have been straightened and lined up and from which short fibres have been removed. Similar to the cotton sliver. From the Anglo-Saxon meaning *clump*.
Top dyeing	Process of dyeing wool while still in the form of a top as opposed to yarn dyeing or fabric piece dyeing. Often used to produce heather (mélange) tones for flannel.
Tow yarn	Linen yarn made of shorter flax fibres, under 10 inches (25 cm). See Line yarn.
Tussah silk	Strong coarse light brown silk which unlike regular silk is produced by undomesticated silk worms. Used to produce pongee and heavy shantungs. Most suitable as a furnishing fabric.
Vicuna	Member of camel family, directly related to the llama, with soft downy fleece producing most expensive wool in the world. Each animal yields 8–9 oz (230 g–250 g) of fleece and was traditionally killed to obtain it. As a result, sales of vicuna were banned internationally. Recently techniques have been devised to obtain the fleece without injury to the animal.
Viscose rayon	Most widely produced of three types of rayon.
Warp yarn	Yarn adapted for use as warp ends. Usually stronger and more highly twisted than weft yarns.
Weft yarn (filling yarn)	Yarn adapted for use as weft ends. Often coarser and with fewer twists than warp yarns.
Worsted	Term referred to yarn of longer wool and other animal fibres which has undergone worsted spinning process whereby a more compact, smoother, more even and stronger yarn than in normal wool spinning is produced.
Yak	Large ox found in Tibet and adjacent areas of Asia. Hair used for fabrics, rope and tent coverings.
Yarn construction	Description of number of strands and twists in each stage of production of plied and cord yarns.
Yarn count	Measure of fineness or linear density of yarn. These measures are traditional (many dating back centuries) resulting in a number of methods often contradictory and confusing. All can be either categorized as indirect units (length per unit of weight) or direct units (weight per unit of length).
Yarn dyed	Yarn which has been dyed after spinning but before weaving or knitting. Principal methods are beam, cake, chain, warp and hank.

Woven fabric

4-ply crêpe	Heavy flat crêpe with very soft drape made with two sets of 2-ply warp yarns against one filling (weft) yarn. Used for expensive evening and bridal wear. Usually of silk, but also produced in rayons and silk/rayon, wool and silk/wool.
Alpaca crêpe	Soft, dull 2-ply crêpe usually of rayon/acetate with a wool-like appearance.
Antique taffeta	Stiff plain weave made to resemble 18th century taffetas produced of slubbed silk or synthetic yarn. Often with iridescent effect achieved by cross dyeing.
Astrakhan	Heavy, curly pile fabric made to imitate fleece of young lambs from Astrakhan. Used for coats.
Batiste	Sheer fine plain weave fabric originally linen, now combed cotton or poly/cotton, characterized by lengthwise streaks caused by 2-ply yarns. Usually printed. Normally 3 oz/sq yd (70–100 g/m^2). Usually mercerized when produced from 100% cotton. Used in fine shirts, infantswear, handkerchiefs and lingerie.
Bedford cord	Strong warp-faced corded fabric with cords running up and down. Usually of cotton but also produced in other spun staples and wool. Used for riding clothes, upholstery and military uniforms.
Broadcloth	Fine closely woven plain weave shirting produced from lustrous cotton or poly/cotton characterized by fine rib running in weft direction. Best qualities are combed yarns with standard construction 144 x 76. Originally produced on wide looms, i.e. greater than 27 inches (67.5 cm).
Brocade	Rich heavy jacquard fabric with raised pattern. Usually satin or twill figures on plain background and often with gold thread. Originally a Chinese fabric of silk, now produced worldwide in many fibres. Used for eveningwear and home furnishings.
Burlap	Originally coarse plain weave jute fabric used for sacking and upholstery lining, now extended to include lightweight fabrics of wool and other fibres with 'burlap' feel.
Burn-out velvet	Velvet fabric where part of the pile is destroyed by the use of chemicals during the printing process to leave a pattern.
Butcher cloth	Generic term for a heavy, coarse, strong plain weave originally of linen (butcher linen), later of uneven rayon yarns to simulate butcher linen.
Calico	Originally plain weave lightweight plain or printed cotton cloth, now generic term for any balanced weight plain weave cotton or blended fabric usually with small, busy printed pattern.
Cambric	Soft plain weave cotton or linen fabric which has been calendared to have a slight lustre on the face. Used in handkerchiefs, shirts and underwear.
Canvas	Generic term for strong, firm closely woven cotton fabrics. Originally made of hemp or flax. Canvas and duck are sometimes used interchangeably but canvas usually refers to heavier weights. Canvas from Latin *cannabis* for hemp.
Cavalry twill	Strong rugged twill weave with double twill line at 63 degrees. Produced of wool, worsted, cotton, spun rayon and synthetics. First used for equestrian uniforms.
Challis	Soft, supple, lightweight plain weave wool, rayon or cotton fabric suitable for printing. From French name *challis* or possibly Anglo/Indian *shalee* for soft.

Chambray	Plain weave yarn-dyed fabric belonging to denim family characterized by coloured warps and white wefts, usually made of cotton but can be from manmade fibres or blends. Fine qualities usually in combed 40s–50s yarn with nearly square construction such as 80 x 76. Lower counts and blended chambrays produced from carded yarns used for work clothing and childrenswear. From Cambray, town in France.
Charmeuse	Satin weave silk with satin face and crêpe-de-chine back. Less likely to pull than twill-back satins but hygroscopic (attracts moisture). Used for evening wear and home furnishings.
Cheesecloth	Loosely woven carded cotton plain weave fabric originally used as wrapping (hence the name). Now used for theatrical gauze, surgical dressings and book binding.
Cheviot	Generic term for rough surfaced wool or worsted fabric with hairy nap, similar to serge but without shine caused by wear. Originally of Cheviot wool but now produced in other wool, wool blends and reprocessed wool.
Cheviot tweed	One of main types of classic tweed fabric, characterized by loose weave and shaggy texture. Best qualities still produced of Cheviot wool.
Chiffon	Very sheer, lightweight plain weave silk or synthetic fabric with dull and soft finish. Used in eveningwear, scarves and veils. Serious slippage problems.
Chiffon velvet	Lightweight, somewhat translucent, soft, short pile velvet with silk, synthetic or cotton back. Used mostly for home furnishings and some dresses but crushes badly.
Chino	Shiny twill weave cotton fabric constructed of combed 2-ply yarns which are woven, vat dyed and finally mercerized. Originally used for United States military, now for men's trousers.
Chintz	Glazed cotton or blended plain weave, either solid or printed, for home furnishings and some apparel.
Cord	Broad category of fabric characterized by surface-ribbed effect in the length direction. Examples include Bedford cord, bengaline, ottoman, whipcord.
Corduroy	Strong durable plain or twill weave with vertical cut pile. Said to be derived from cord-du-roi silk fabric specially created for Louis XIV.
Crêpe	Generic term for crinkled or grained surface silk, wool, rayon, acetate, and synthetic fabrics. Crêpe effect traditionally came from crêpe twist (hard twist) yarns, but now also from textured yarns (mostly in knitted crêpe), chemical treatments and embossing. Common crêpes include bark crêpe, blister crêpe, chiffon crêpe, cotton crêpe.
Crêpe de Chine	Fine lightweight plain weave with regular twist warps and crêpe twist wefts.
Crêpe-back satin	Reversible satin weave silk, rayon or synthetic fibre fabric made with crêpe-twist filling.
Crimp fabric	Generic term loosely applied to all fabrics with this effect, such as blister cloth and seersucker.
Crushed velvet	Piled fabric finished with irregular surface. Used for shawls, dresses and home furnishings.
Cut velvet	Patterned fabric where pattern is in velvet and background in sheer fabric such as chiffon or georgette. Used for ladies' eveningwear.
Damask	Broad group of jacquard woven fabrics similar to brocade but flatter with lustrous pattern and flat ground which is reversed on back side. Originally silk imported from China through Damascus (hence its name). More recently refers

	to cotton fabric but also incorrectly includes linen, wool, worsted, rayon and synthetic fabric. Used for home furnishings, particularly table linen, but also in some clothes.
Denim	Yarn-dyed cotton fabric usually woven in either 2/1 or 3/1 warp-faced right hand twill weave. Originally warp was dyed dark blue but now available in many colours and all weights from 8–16 oz/m^2. From French *de Nîme* after name of French town.
Dobby	General term for fabrics characterized by small geometric raised figures.
Doeskin	Fine quality, medium weight smooth, short-napped, dress-faced finished woollen fabric woven with high counts and high twist yarns made to resemble natural doeskin.
Donegal	Coarse yarn tweed characterized by single colour warp and multicolour weft. Used for suits, jackets and coats. Also called Irish tweed.
Double-faced	Generic term used to describe any fabric that is reversible, where either side may be used as the face. Often with different colours or patterns on each side.
Drill	Smallest and simplest twill weave, usually annotated as 2/1 or 2 by 1, indicating two warp threads up and one down, produced of coarse carded cotton.
Duchesse	Highly lustrous, smooth, soft silk characterized by very wide floats.
Duck	Broad term for wide range of strong, firm, closely woven cotton plain weave fabrics. Although most duck has a hard hand, some are softer, lighter weight than canvas. Uses include sailcloth, fabric shoes and home furnishings.
Faille	Flat ribbed, light lustre, closely woven plain weave silk, cotton, wool or synthetic fabric used for women's coats, suits and dresses.
Felt	Generic term for nonwoven fabric produced by rolling and pressing fibres into a matted material. Originally produced of wool, hair or fur, cotton is now used by adding adhesive to the fibres. Fine felt used for hats and pool table coverings.
Flannel	Light to medium weight plain or twill weave with slightly napped surface. Usually wool, worsted, cotton and/or rayon. Wool and worsted usually top dyed, rayon usually yarn-dyed plaids or cross dyed. Used for shirts, sleepwear, trousers, and constructed jackets.
Flat crêpe	Smooth, flat silk, synthetic or blended plain weave produced by weaving twice as many warp yarns as weft yarns. Smoothest of all crêpes. Used for dresses.
Foulard	Thin, soft, 2 x 2 twill weave fabric originally produced of silk but now also made in rayon, synthetic, cotton and worsted yarns. Often printed. Used for ties, robes and scarves.
Fuji	Lightweight plain weave dull spun silk fabric used for blouses and dresses. First produced in Japan where name was a trademark.
Fujiette	Name sometimes given to fuji fabrics of rayon, acetate or blends.
Gabardine	Tightly woven warp-faced twill weave fabric with ribs set at either 45 or 63 degrees. Warp usually has twice the number of yarns as weft. Made of carded or combed, single or plied, wool, worsted, cotton, silk or manmade fibre. Used in raincoats, skiwear and fabric shoes.
Gauze	Thin sheer open plain weave (usually leno weave) fabric usually made of cotton silk or synthetic fibres. Cotton is used for blouses and surgical dressings. Other compositions used for trim. May also refer to fine very sheer knitted fabrics.

Georgette	Sheer lightweight plain weave, usually silk or polyester, with fine crêpe surface. Used for eveningwear, blouses and scarves. Good substitute for chiffon because of yarn stability. Name derives from early 20th century trademark.
Gingham	Medium or lightweight yarn-dyed plain weave cotton often in checked (two colours) or plain patterns (more than two colours).
Grass cloth	Broad category for lustrous linen-type plain weave fabrics produced with vegetable fibres, such as ramie, hemp, nettle or sisal.
Handkerchief linen	Fine, sheer plain weave linen used for handkerchiefs.
Harris tweed	Tweed defined by FTC as handwoven wool fabric made in Outer Hebrides Islands including Harris, Lewis, Barra and others, either from hand spun or machine spun yarn. Used for jackets and coats. Harris tweed comes in 27-inch width.
High Pile	Pile with surface loops, cut or uncut, more than ¼ inch high, most often used for fake fur.
Hopsacking	General term used for coarse, loosely woven plain weave fabric made with hopsack (basket weave). Originally made of jute or hemp for sacking hops. Now refers to heavy wool cheviot with same basket weave. Used for jackets, suits and coats.
Ikat	Fabric made in India, Malaysia, Indonesia, Japan and Africa from spaced-dyed yarn where yarn is tied before dyeing. Either warp alone is tied (warp ikat), weft alone is tied (weft ikat), or both (double ikat, also called *gerinsing* or *katsura* in Japan). From Malay *mengikat* meaning to knot.
Jacquard	System of weaving which because of a special mechanism allows production of fabric with a wide range of woven patterned designs of considerable size. Name derives from J.M. Jacquard, French inventor d. 1834.
Lawn	Fine, relatively sheer, tightly woven plain weave cotton fabric, generally produced of fine combed singles. Has more body than voile; lawn with stiff finish known as organdy. Used for blouses, dresses and fine ladies' wear.
Lefthand twill	Twill weave that runs from lower right to upper left, especially used in denim production. Less common than righthand twill.
Leno	Open weave cotton, rayon or silk fabric in which warp threads are twisted in pairs before each pick is inserted producing a stronger, firmer open weave with reduced slippage. From French *linon* for linen.
Madras	Fine cotton handloomed plain weave, either natural colour or vegetable dyed. Dye will run, adding to fashion interest. Used for jackets and sportswear. NB: According to United States International Trade Commission regulations, if fabric has not been imported from Chennai (formerly Madras), India, it may not be labelled Madras.
Marquisette	Broad group of open mesh, lightweight, sheer fabrics in cotton, silk or synthetic yarns, produced either in leno or gauze weave, either piece or yarn dyed. Used for curtains, dresses and mosquito nets.
Matelassé	Double fabric with raised patterns produced on dobby or jacquard loom. First produced in cotton and used for men's vests, now made from cotton, wool or synthetic yarns often with tinsel yarns to produce metallic effect. From French *matelassé* meaning padded.
Melton	Short, napped, heavy wool plain weave fabric used for overcoats. Made with tight construction to conceal all trace of warp and weft. Name from Melton Mowbray in south of England.
Mesh	Generic term for any fabric (including knit, woven, crochet, lace or knotted) with open spaces between the yarns.

Mogador	Fine ribbed silk or synthetic plain weave fabric, similar to faille, usually in colourful stripes. Used for ties. From Moroccan seaport where native dress has similar stripes.
Moiré	Finishing process using engraved rollers that press a pattern on fabric resulting in wavy or rippling effect. Also known as watered silk.
Momme	Measure of silk fabric weight. 1 momme weight defined as a strip 25 yd by 1.5 inches equalling 3.75 g. For simple computation, 100 sq yd = 0.8 lb = 1 momme. Georgettes run from 8–10 momme. Crêpe de Chine usually 12–16 momme but can be as high as 28–32.
Mousseline	Broad category for lightweight, sheer, crisp cotton, silk or wool fabrics. Also known as French muslin although in fact lighter than muslin.
Mull	Soft, thin plain weave fabric produced from fine count cotton, silk, and/or blended yarns. Fabric usually dyed in pastel shades and used for dresses.
Muslin	Broad category containing all cotton or cotton blend plain weave sheetings. During medieval period applied to fabrics imported from Mosul (ancient Mesopotamia, now modern Iraq).
Noil	Fabric made from short waste fibres removed during combing process. Includes wool and silk where it is called bourette silk. From Old French *noel* for knot.
Nonwoven	Generic term for fabric produced by means other than weaving or knotting including bonding or interlocking fibres whether by mechanical, chemical or thermal means. Includes felts and many types of interlinings.
Organdy	Lawn with stiff finish.
Organza	Lightweight, transparent, crisp plain weave fabric usually made of fine filament yarns. Most common are silk, nylon, polyester and rayon.
Ottoman	Firm, lustrous, plain weave fabric with horizontal cords wider and rounder than faille. Usually wool, silk or synthetic fibre. Used in evening coats, dresses and home furnishings.
Oxford	Cotton, synthetic or blended coarse count, soft, lustrous, plain weave shirting. Often with basket weave achieved by using twice the number of weft ends as warp ends. May be piece, yarn or cross dyed. Used for shirts and sleepwear. First produced in 19th century by a Scottish mill bearing the names of four universities: Oxford (hence the name), Cambridge, Harvard and Yale.
Panne velvet	Lightweight, lustrous velvet with pile pressed in one direction. Used for ladies' eveningwear and trim.
Paper taffeta	Lightweight, very crisp taffeta. So named because it drapes like paper.
Pashmina	Originally name given to cashmere in Pakistan and India. More recently a fine silk/cashmere blend used for scarves.
Peau de soie	Heavyweight soft silk or synthetic dull lustre, piece-dyed ribbed satin with eight harness weave. From French for silk skin.
Percale	Lightweight, firm, dull finished plain weave sheeting similar to calico, usually 80 x 80 construction, either piece dyed or printed, used for childrenswear, shirts, and sleepwear. Also refers to fabric for fine sheets and pillow cases, typically at least 180 x 180 in. carded and over 200 x 200 in. combed.
Pina cloth	Thin, transparent lustrous plain weave made of pineapple fibre. Used for garments and home furnishings.

Piqué	Stiff double cotton fabric with ribbed top and flat bottom, usually cotton but now also in synthetic. From French *piquer* meaning to irritate. Also name of common knit fabric.
Plain weave	Most common of three basic weaving types. Weave pattern is one up, one down for first end, then one down, one up for second end, forming checkerboard effect. Some 80% of all fabrics are plain weave. Other main weave types are twill weave and satin weave.
Plush	Warp pile fabric with pile cut higher than velvet, usually of silk or cotton.
Pongee	Light to medium weight wild silk (tussah) plain weave characterized by nubs and uneven yarns. Originally handloomed. From Chinese *punchi* meaning own loom or homespun.
Poplin	Durable plain weave characterized by fine cross ribs produced by using warp yarns considerably finer than weft yarns, similar to broadcloth but much finer. Produced from many fibres including wool, silk or blends but usually cotton. From *papelina,* feminine form of papal for Avignon where fabric was first produced.
Righthand twill	Twill weave running from lower right to upper left. More common than lefthand twill.
Sailcloth	Generic term for fabric used for sails, but also a lightweight duck used for sportswear and home furnishings.
Sateen	Strong lustrous usually combed and mercerized cotton satin weave fabric. Used for trousers. Also a satin weave shirting with bleached ground and fine stripes. Altered form of satin.
Satin	Generic term for satin weave fabric. Used for ladies' eveningwear, lingerie and home furnishings. From Arab transliteration of old name for Canton.
Satin weave	One of three basic weaving types where weft yarns, instead of intersecting every other warp, float over 5, 8 or 11 warp yarns before intersecting the warp, resulting in a smooth, glossy, flat face.
Saxony	Soft, lustrous, lightly napped woollen or worsted fabric produced from merino or botany sheep now made in England and Scotland. Used for fine men's suitings. First produced in Saxony (hence the name).
Scottish tweed	Broad term to describe very rough irregular tweed-type woollen fabric with white warps and coloured wefts (or vice versa). Reprocessed wool is often used.
Seersucker	Cotton or linen fabric with permanently woven crinkle stripes running in the length. Used for sleepwear, summer clothes and work uniforms. From Persian *sir o sakar* for milk and sugar.
Serge	Fine, flat wool, worsted, or blended 2 x 2 twill wave suiting. Fabric holds crease well but will shine with use. Traditionally dyed navy. From Old French *sarge* or *serge*.
Shaker flannel	Soft, white, two-sided napped flannel. Produced of cotton, wool or blends (frequently with cotton warp and wool weft). Used for diapers, infantswear and sleepwear. Said to be first produced by Shakers (fundamentalist religious sect in United States) and dyed grey.
Shantung	Rough, plain weave produced of nubby weft yarn. Originally made of tussah silk in Shandong. Province, China (hence its name), now made of spun silk. Also used to denote heavyweight *pongee.* Compare with Linshang which has nubby yarns both in warp and weft.

Sharkskin	Smooth, dull surfaced twill weave usually yarn dyed in a pepper-and-salt effect. Most often of worsted yarn but also in wool and other yarns. Used for both men's and women's suits and uniforms.
Sheeting	Broad category of lightweight plain weave cottons characterized by almost square construction; e.g. 40 x 38 and 64 x 68. Usually of low count and carded yarn but can be of high count combed yarn when used in bed linen. Used for industrial fabrics, home furnishing and backings for oil cloth and carpets.
Shetland	Generic term for fabrics produced of Shetland (group of islands off Scotland) wool. More particularly soft, lightweight fabric with raised finish. Used for coats and suits.
Shot cloth	Generic term for cross-dyed silk or synthetic fabrics. Also known as iridescent taffeta.
Slipper satin	Closely woven, strong satin weave fabric, often brocaded, used for evening shoes. Made of silk or synthetic yarns.
Spun linen	Finest handwoven linen. Used for neckwear and handkerchiefs.
Suiting	Generic term for fabrics which have body and tailor well, mostly wool and worsted, but also can be of cotton, linen, or blends. Used mostly for men's and ladies' suits but also for ladies' sportswear.
Super 100	Term given to high count tropical worsted gabardine. Super denotes highest quality wools and 100 indicates yarn count.
Surah	Soft, lightweight, lustrous silk twill, mostly printed. Used for blouses, mufflers and ties. From French pronunciation of Surat, town in India where first made.
Taffeta	Broad group of plain weave fabrics characterized by fine, smooth, crisp usually lustrous face with filament warps of silk or synthetic fibres but can also be cotton or wool. Often with fine rib running in the width. Used for womenswear, fine linings, and home furnishings including lampshades. From Persian *tafta*, past participle of taftan, meaning to twist.
Tapestry	Heavy handwoven fabric where design achieved by interlacing the warp yarns back and forth only where needed for the design. Weft yarns of different colours are often then dovetailed (although other methods are also used).
Technical fabrics	Generic term used to describe textile products used for their functional characteristics. Originally for industrial purposes now increasingly for high tech end use.
Terry	Looped pile produced in plush and velvet. Also any pile fabric with uncut loops. Used for beach robes, summer wear, towels and home furnishings.
Ticking	General term for strong, durable, closely woven fabric used for covering box springs, mattresses, etc. Can be plain, twill or satin weave. From Latin *theca* (tick) for case.
Tissue faille	Lightweight faille usually made with 75 denier acetate warps and two-ply 100 denier rayon cable spun wefts. Originally a trademark.
Tropical suiting	Lightweight summer suiting now used for all seasons. Weights range from 6–10 oz/ linear yd (186–310 g/linear m).
Tropical worsted	Lightweight, all-worsted suiting made of tightly twisted yarns woven to permit circulation of air. Weighs between 7.5–10 oz/linear yd (210–280 g/linear m). Used in fine men's suits.
Tulle	Fine net with hexagonal mesh. Originally silk but now produced in cotton or synthetic yarns. Used in millinery, dress trims and embroidered to form lace. Usually produced on warp knit machine. From *Tulle*, town in France.

Tussah	Strong coarse silk fabric produced by wild Asiatic silk worms of a different species than those producing normal silk. Used in ladieswear and home furnishings. From Sanskrit *tasara* for shuttle.
Tweed	Generic term for rough, often coarse wool fabric with wiry surface but soft flexible texture, usually heather or yarn dyed into herringbone, plaids and similar patterns. Today most tweeds are machine loomed with the exception of Harris tweed which is handwoven from machine spun yarns. Said to come from Tweed, a river in Scotland, but actually a misreading of the Scottish *Tweel* for twill.
Twill	Generic term for any fabric made of twill weave. From Old English *twili* (twi = double), after Latin *bilix* as *bilicium* for double thread.
Twill weave	One of the three basic weaving types (along with plain weave and satin weave) characterized by a diagonal rib (twill line) running from upper right to lower left. Twill is produced by running each weft end over or under at least two consecutive warp threads progressively to produce a diagonal line. The smallest and simplest twill weave is 2 x 1 (2/1) meaning two warp yarns up and one down which when produced of coarse carded cotton is called drill. 3/1 twill also common.
Velour	Broad group of fabrics including: 1. Woven fabrics furnished with a close, dense, one-way pile. 2. Knitted fabric made by shearing and brushing weft knit terry. 3. Warp knitted fabric made by shearing and brushing long underlaps. 4. Nonwoven felt with velvet-like texture. From French through Latin *villosus* for hairy.
Velvet	Closely woven warp-cut pile fabric with rich soft texture. Originally of silk but now also made from cotton synthetic and blends. Used for clothing and home furnishings. From French *veloute*, for velvety.
Velveteen	Cotton or blended fabric with short, close weft piles cut to resemble velvet.
Voile	Lightweight, sheer (semitransparent), crispy plain weave fabric made of hard twist, high-count yarn. Produced with nearly square construction and usually made of combed cotton but also of wool, worsted, silk, rayon or acetate. Used for dresses, blouses and home furnishings.
Worsted suiting	Fabric produced of worsted yarn suitable for men's tailored wear. Includes serge, tropical worsted and flannel, among others.
Woven	Generic term denoting fabric produced by interlacing two series of yarns, one vertical called the warp yarn, the horizontal known as the weft or filling yarn. Woven fabrics fall into three main categories: plain weave, twill weave and satin weave.

Knit fabric

Double knit	Generic name for weft knit fabric produced on a circular knit machine with two sets of needles which is more stable than single knit. Double knit can be differentiated from single knit by the fact that the front and back have different appearance. Main types include double piqué, eightlock, lacoste, Milano rib, punto di Roma, single piqué, texipiqué, plus various types of jacquards.
Circular knit	Fabric produced in tubular form on a circular knit machine where either one set of needles (single knit or jersey) or two sets of needles (double knit) ring the machine and perform the knit action as the machine rotates.
Eightlock	Classic knit stitch using a double knit machine to produce 2 x 2 rib. Can be made in solid colour, stripes or checks.
Engineered patterns	Generic term for special designs, jacquards, stripes, print patterns, embroideries, etc. which are positioned on fabric before garment cutting so as to fall in precise points on a garment. Examples include prints which form special hem or cuff borders; woven and knitted patterns which allow special stripe or check designs to fall only at the hem or sleeve cuff; Schiffli embroidery patterns which decrease in size and depth from the bottom of a blouse to the neck. Engineered patterns are particularly difficult and risky since the fabric process must coincide with the garment marker. The following are not engineered designs: panel printing, special sweater effects or special sweater jacquard.
Fleece	Circular knit fabric in which two yarns are fed into the machine together, one forming a plain knitted front and the other a looped knitted back which is then napped. Used for sweatshirts. Cut pile fabrics are not fleece.
French terry	Single knit with 'C'-shaped uncut loops on the back. If loops are cut, the resulting fabric is *knitted fleece*.
Gauge	Measure of fineness (wales) for knitted fabric. The higher the gauge, the finer the fabric. Gauge definition differs from one knit type to another as follows: 1. Circular knits and most warp knits gauge = number of needles per inch. 2. Raschel gauge = number of needles per 2 inches. 3. Flat bed and sweaters gauge = number of needles per 1.5 inches. Traditionally knitting needle shank thicknesses are listed by gauge.
High pile	Pile with surface loops (cut or uncut) more than 1/8 inches (0.32 cm) used in fake fur.
Jersey	Name given to all single knit fabric. Sometimes incorrectly used to denote any plain knit fabric without ribs.
Interlock	1 X 1 rib produced on a two-bed machine with alternating long and short needles. Thicker than single rib, it has the advantage of not curling at the edges. Unlike most other double knits, interlock looks identical on both sides.
Lacoste stitch	Single jersey produced with crosstuck construction alternated with single needle courses to produce a honeycomb effect similar to double piqué.
Low pile	Pile with surface loops (cut or uncut) less than 1/8 inches (0.32 cm).
Jacquard knit	1. Jacquard double knit: two layers of loops with pattern knitted in on the face side. 2. Jacquard jersey characterized by pattern on the front side with floats on the back. Pattern formed by knitting or missing at specific feeds.
Knit	Generic term for fabric produced by interlooping yarns, including flat, circular, warp and raschel knit.

Lace	Generic term for ornamented fabric produced without ground fabric. Three lace making processes are bobbin lace, needlepoint lace and hooked lace (also known as tatting) From Latin *laqueus* for noose.
Milano rib	Double knit characterized with one row (*course*) of 1 x 1 stitch knitted with both sets of needles, then one row plain knit on outer set (*cylinder*) needles only, then one row on inner set (*dial*) needles only.
Piqué	Broad category of both woven and knitted fabrics. Knit fabrics are also produced in two types of piqué: 1. Single piqué, a plain double knit produced on a circular knit machine where courses one and two are interlock, course three is knitted on the cylinder tucks every other dial needle, courses four and five are again knitted interlock and course six tucks the alternate dial needles. 2. Double piqué is characterized by a honeycomb pattern, similar to Lacoste stitch. From French *piquer* to prick.
Pointelle	Rib knit fabric with a pattern of openings. From Old French *pointel* meaning point of a spear.
Punto di Roma	Double knit fabric characterized with two courses knitted interlock, one course knitted only on cylinder needles and one row knitted only on dial needles, similar and often confused with Milano rib.
Popcorn	Broad term for textural effect in woven and knit fabrics produced with fancy yarn containing short, thick spots.
Raschel	Broad category of warp knit fabric produced on a special machine capable of producing jacquards, intricate eyelets and lace-type designs. Used predominantly for home furnishings and inexpensive laces.
Rib knit	Fabric characterized by ribs in the length formed by wales alternating on both sides of the fabric. 1 x 1, the simplest rib knit, is characterized by one wale alternating between face side and back side (also called plain rib). Other rib knits include 2 x 2 with two ribs are on the face side and two on the back side (also called Swiss rib). Rib knits may be more complicated; 4 x 8 rib is a 16-wale pattern. Ribs may be produced both on flat knit and circular knit machines.
Single knit	Also called single jersey or jersey, produced on machine with only one set of needles. Resulting fabric has a smooth appearance and appears to have a grain running in the length. Used for T-shirts, underwear.
Sliver knit	Single jersey with untwisted staple fibres knitted at each loop to form a high pile.
Terry	Woven or knitted looped pile fabric. Knitted terry can be either circular knit or warp knit fabric with loops only on one side.
Thermal	Name given to either woven or knitted fabrics designed to provide insulation to the wearer. Thermal knit is a waffle knit fabric which traps body heat.
Tricot	Broad category of warp knit fabric with fine wales produced by a warp knit machine with from one to four guide bars. Like all warp knits, tricot is elastic only in the width. The greater the number of bars the more yarn in the fabric. One-bar tricot is the lightest weight and generally unstable. Two-bar tricot is used mostly for lingerie. Three and four-bar tricot is often printed and used for dresses. From French *tricoter* meaning to knit.
Velour	Broad term loosely applied to all types of cut or napped pile fabric but more accurately divided into: 1. Woven velour is dense fabric with pile going in one direction. Originally produced in wool, now made in cotton as well.

	2. Knitted velour has similar hand to woven velour and is produced by cutting and then brushing terry. 3. Warp knit velour made with long underlaps that is first napped, then cut.
Wale	Raised lines on fabric. In knits, the series of loops produced by the action of one needle along the fabric length. In lace the distance between two pillars.
Warp knits	Generic term for fabric knitted from one or more sets of prepared warps and therefore elastic only in the weft direction. Examples include raschel knit and tricot.

Printing, dyeing and finishing

Absorbent finish	Chemical process designed to increase fabric water absorbency allowing greater penetration of water soluble finishing chemicals.
Abstract printing	Broad category of printing processes characterized by random designs.
Acid wash	Garment wash process used for denims to impart distressed look. Highly polluting.
Air brush printing	Mechanical abstract printing process where colour is blown on fabric. Used mostly in rayon and silk.
All-in-vat printing	Process allowing for allover colour to be printed on fabric in one step by adding alkali directly to the print paste while still in the vat, avoiding need to bathe printed fabric before steaming.
Antibacterial finish	Finish using chemical agents to either kill bacteria or inhibit bacterial growth.
Antislip finish	Chemical process to prevent smooth filament fibres, such as nylon and silk, from sliding during sewing. Particularly important in chiffons, mesh and other loosely woven fabrics. Silicon provides temporary relief; resin is more permanent.
Automatic screen printing	Mechanical flat screen printing process (as opposed to hand screen printing).
Azoic dye	Inexpensive dyestuff used for colouring cotton, viscose and rayon. Produces brilliant colours and offers superior colourfastness. Unfortunately also very polluting. EU bans imports of garments using azo dyes.
Back chroming	Process to improve fabric colour fixation.
Basic dye	Earliest produced synthetic dyestuff (1856) based on coal tar. Yields bright colours but subject to sun fading and wet and dry crocking (colour staining).
Batch dyeing	One of two broad categories of fabric dyeing, characterized by processing distinct quantities of fabric at a time as opposed to continuous dyeing.
Batik	Resist dyeing method employing wax to resist dye. Pattern is first covered with layer of wax before dyeing fabric. Fabric is then boiled to remove dyestuff.
Beam dyeing	Process for dyeing yarn on perforated spools (beams).
Beetling	Mechanical process to flatten cotton and linen fabric to give 'linen' look.
Black sulphur	Dyestuff used to produce black fabric, especially in denims. See Sulphur dye.
Bleaching	Chemical process to remove natural colour from yarn and fabrics rendering them white.
Block printing	Hand printing process where pattern is first cut on wood, linoleum, or similar materials then stamped on required surface.
Bonding	Mechanical process of adhering layers of fabric together.
Brushing	Mechanical process where naps are raised on fabric with brushes or other abrading materials.
Burn-out printing	Chemical process where design is formed on fabric with paired yarns of different fibres where one fibre is burnt out or destroyed to form the print pattern.
Calendaring	Mechanical fabric finishing process where fabric is placed between two metal rollers to produce a flat, smooth sheen.

Chain dyeing	Process used for dyeing fabrics that will not withstand high tension including crêpe, georgette and jerseys.
Coating	Broad category of chemical finishing processes where a substance is used to coat the fabric such as lacquer, varnish, rubber or resin.
Consolidation shrinkage	Dimensional damage of fabric or garments due to tumble drying in home or at laundromat.
Converted fabric	Generic term denoting all finished fabric. A *converter* was once used to denote any fabric finisher, later a finisher printing and dyeing fabric to make a collection; now includes anyone who sells a designed collection which they did not weave or knit.
Continuous dyeing	One of two broad categories of dyeing, characterized by processing fabric on a continuous basis as opposed to batch dyeing where dyeing is done in distinct quantities.
Crease resistance	Ability of a fabric to resist creasing, achieved either by use of special yarn or chemical process.
Crocking	Dyeing fault characterized by transfer of dye colour from one fabric, either wet or dry, to another by rubbing. This may be caused by poor dyeing technique, insufficient washing after dyeing, or poor quality dyestuff.
Cross dyeing	Dyeing of yarn or fabric in two different colours to achieve a multicolour or iridescent look. Warps are dyed one colour and wefts another as in cotton chambray or Thai or Indian sari silks. The same effect can be achieved when different fibres are in the same fabric and the fabric is dyed twice (one fibre will resist dyes used for other fibres).
Curing	Mechanical process to heat fabrics impregnated with resin to provide special properties such as crease retention, water repellency, wrinkle resistance, etc. Used extensively in manufacture of uniforms.
Decating	Mechanical method of processing wool and worsted fabrics to set width, control shrinkage, and add lustre either by water (crabbing) or by steam (blowing). In the higher quality apparel industry this process is often followed by sponging. A similar process is used in finishing rayon, synthetics and blends which improves hand, colour, lustre and may improve uneven dyeing; also for double knits which gives a crisper hand as well as controls shrinkage.
Dimensional stability	Term used to define fabric ability to retain shape and resist shrinkage.
Dip dyeing	Process in dyeing knitted garments (equivalent to garment dyeing for wovens)
Direct dye	Anionic dyestuff which can be applied directly to fibre in a neutral or alkaline solution. Used mostly with cotton, linen, rayon, silk and wool. Dyestuff is inexpensive, processing is fast and gives bright shades, but colourfastness is poor.
Discharge printing	Printing method for lighter coloured patterns over darker coloured ground where ground colour is first dyed using a special discharge dyestuff. Print pattern is then bleached out (*discharged*) and the resulting uncoloured sections are overprinted.
Distressing	Generic term generally applied to garment wash processes which impart an overly used or worn look achieved mechanically through *stone washing* or chemically through *acid washing or enzyme washing*.
Dry heat printing	Synonym for heat transfer printing.
Duplex printing	Mechanical process for printing different or the same pattern on front and back side of the fabric. Either fabric is printed twice or printed on a special duplex printing machine.

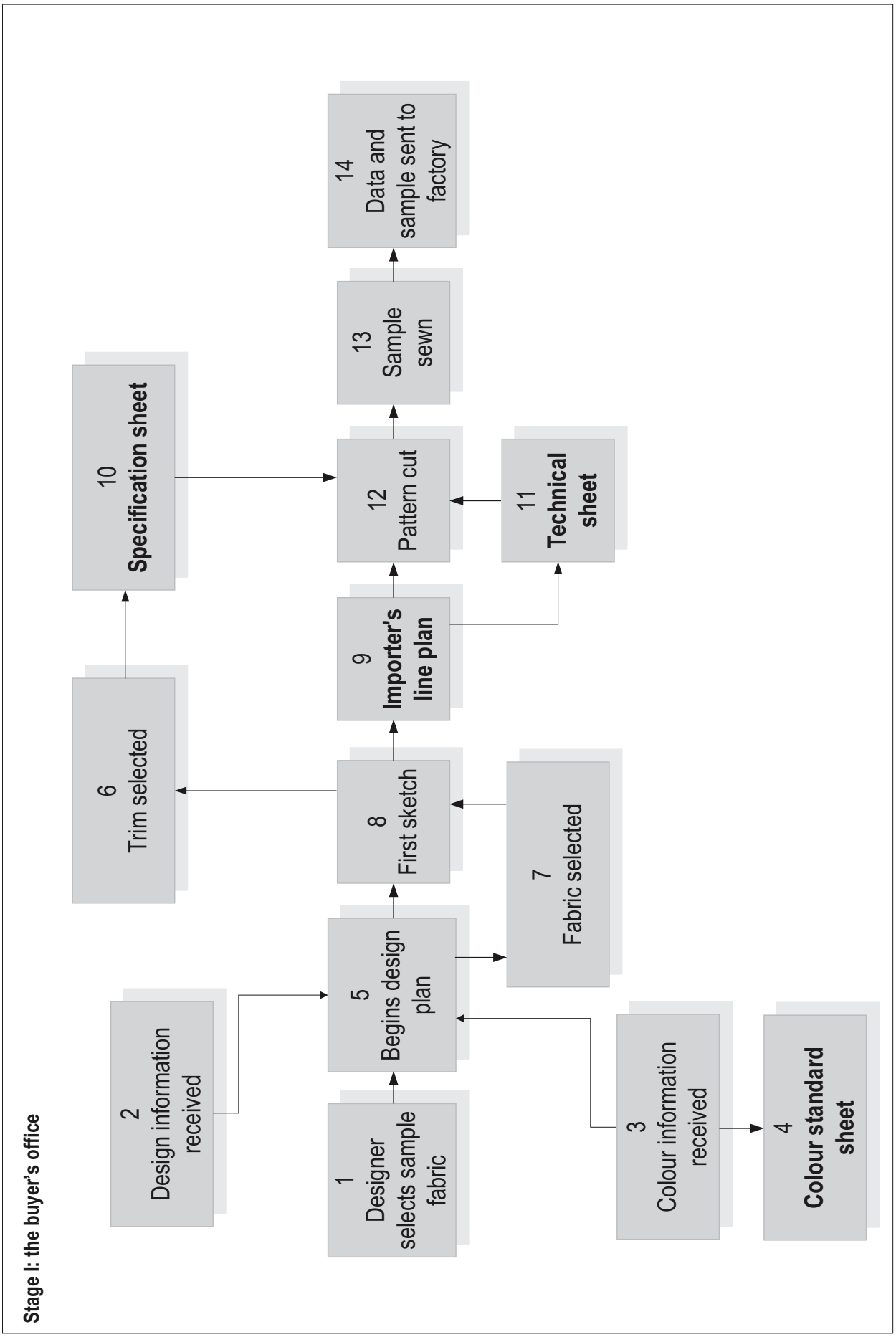
Durable crease	Mechanical or chemical process which results in crease impervious to wear or drycleaning. Used for pleating and dress trousers. Can be achieved either in the fabric (pre-cured technique) or in the garment (post-cured technique).
Dyeing	Process of applying colour to fibres, yarns, fabrics, garments, or garment parts through the use of dyestuff. There are two broad categories – batch dyeing and continuous dyeing.
Dyestuff	Colouring chemical which becomes dispersed at the molecular level. Divided into two broad categories, natural dyestuff and synthetic dyestuff.
Electrostatic printing	Mechanical process in which an electrostatically charged plate is placed under the fabric, a stencil cut in the print pattern and placed over the fabric, and powdered dye placed over the stencil. The charged plate moves the dyestuff into the cut portions of the stencil to give the print pattern.
Embo printing	Roller print process in which fabric is embossed and printed simultaneously.
Embossing	Mechanical process in which a design is raised on fabric surface by passing the fabric between two hot rollers.
Enzyme wash	Chemical finishing process in which a cellulase enzyme is used to create a stonewashed distressed look.
Flame resistant	Term given to fabric that burns but is self-extinguishing.
Flat bed screen printing	One of two screen printing methods where fabric is laid flat on a table and the screens, one for each colour, are laid flat on top of the fabric at which point the colour is squeezed through the porous portions of the screen mesh. Then each screen is lifted and fabric either mechanically advanced (automatic screen printing) or each screen is physically relocated to the next repeat (hand screen printing). The other method, rotary screen printing, is faster than flat bed but is limited in the size of the repeat.
Flock printing	Mechanical printing process where short fibres (flock) are applied to the fabric surface to form patterns. Flock may be attached and held erect adhesively or electrostatically. Used primarily in sheer dress weight fabrics to produce small dots or figures.
Garment dyeing	Dyeing of complete garments, traditionally limited to socks but more recently includes T-shirts and stonewashed denims. Important in Quick Response production, but dye fastness is often not good.
Glazing	Chemical finishing process which results in a smooth, highly polished fabric surface produced by treatment with various chemicals including starch, paraffin or shellac or in the case of mercerized cotton yarn with wax, starch or oil.
Greige	Generic term for loom state fabric. From Italian *greggio* meaning raw or crude.
Hand screen printing	One of two flat screen printing methods where each screen is laid on top of the fabric and colour applied manually with a squeegee after which each screen is physically relocated to the next repeat. Best method for very large repeats but very slow and requires great skill.
Heat setting	Mechanical finishing process used to make fabric shrink resistant, to retain shape (dimensional stability), and to improve dye fastness by limiting subsequent diffusion through the fabric fibres.
Heat transfer printing	Mechanical printing process where print designs are transferred from preprinted paper to fabric. Very effective on polyester and triacetate. Method has many advantages over conventional screen or roller printing as prints can have more colours, including ombré (shaded) tones). Also minimizes joint marks and other difficulties inherent in conventional printing.

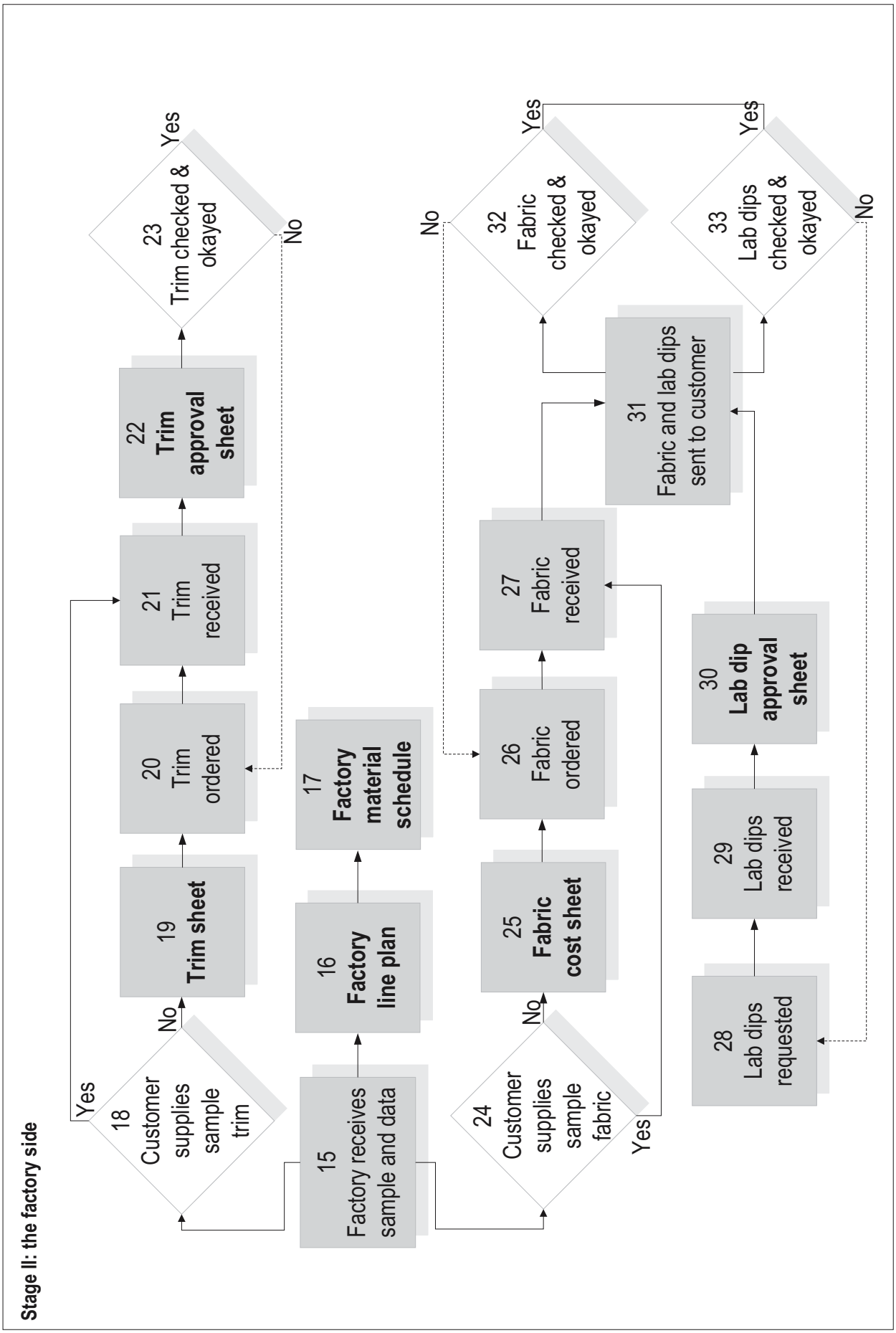
Indigo	Natural dyestuff used since prehistory for deep blue colours on cotton, wool and silk. Now synthesized and used most often in denim apparel. From Greek *indikon.*
Intaglio printing	Form of roller printing where rollers are engraved so that design is cut below the surface of the roller.
Jet dyeing	High speed, high temperature batch rope dyeing method.
Jet spray printing	Printing method similar to ink jet printing common in most offices. Instead of spraying ink droplets to form letters, computer sprays dye droplets to form print patterns.
Jig dyeing	Dyeing method where a roll of fabric is stretched to its full width, then run through a dye bath and wound on a second role, and repeated back and forth until the desired shade is achieved. Each repetition is called an end. Jig dyeing is not as exact as other batch dyeing methods.
Join mark	Flat screen printing damage characterized by a shadow line which appears between repeats caused by poor registering during printing or poor print or screen design.
Low-wet pickup	Generic term applied to methods of dye or chemical finishing materials aimed at reducing drying time.
Matte printing	Printing method where printed portion has lower lustre than background.
Metalizing	Application of metal film to fabric surface or laminating metal film between two fabric layers or piles.
Metallic printing	Printing method using fine bronze or aluminium powder.
Mildew resistant	Chemical finish applied to reduce fabric susceptibility to mildew. Since the fungicide is generally water soluble, it is not permanent.
Millitron	Registered trademark of Milliken & Co. for computerized injection-dyeing equipment for carpets, rugs and other decorative fabrics. The machine is capable of producing very complex multicoloured patterns such as those commonly found on Oriental carpets.
Molten metal dyeing	Continuous dyeing method which requires relatively little dyestuff.
Moth repellent	Chemical finish applied to either fabric or garments to resist attack by moths, carpet beetle and other insects.
Muff dyeing	Yarn dyeing method in the form of unsupported yarn skeins called muffs.
Natural dyestuff	Dyestuff obtained from vegetable and animal substances. The oldest form of dye, these were almost entirely replaced in 20th century with synthetics because of their greater colour variety and better colourfastness. Lately natural dye has enjoyed a resurgence for environmental reasons.
Ombré	Gradual change in colour shade from light to dark or from one hue to another. Generally achieved by arranging different tones in the warp or by printing. From French *omberer* meaning to shadow.
Ombré printing	Generic term for printing multi-coloured effect where one tone gradually shades into another. Also called fondu printing or rainbowing.
Overdye	Dyeing technique especially used in denim production whereby yarn-dyed denim is then piece dyed.
Package dyeing	Yarn-dyeing method where yarn is first loosely wound on perforated cylinders (or springs) called packages. A large number of packages are then placed on a spindle and a number of spindles loaded into a dyeing machine.

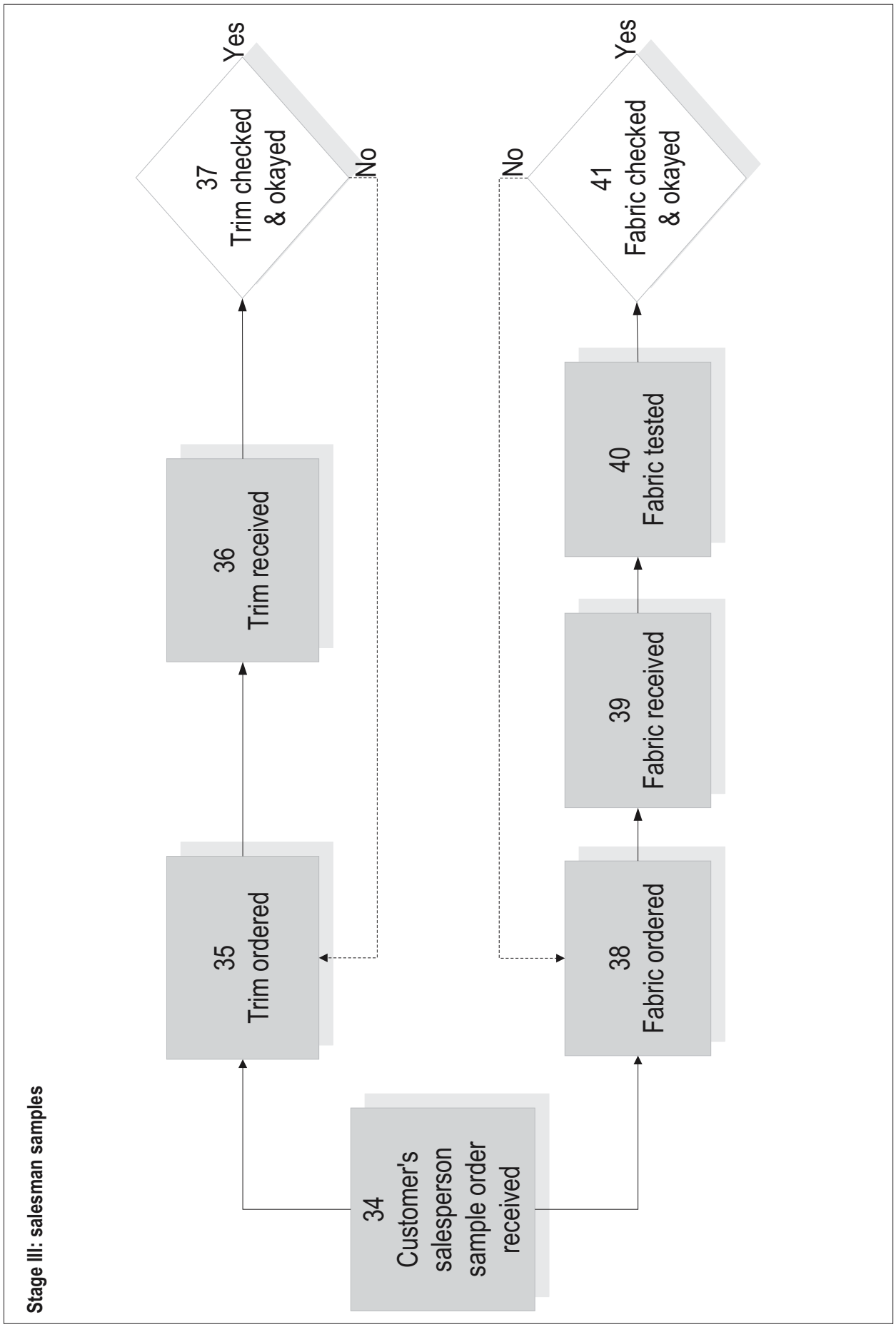
Pad dyeing	Fabric dyeing process in which open width fabric runs through a trough containing dye solution and then between heavy rollers that force the dyestuff evenly through the fabric. Very fast process used mostly with direct dye.
Paddle dyeing	Garment dyeing method in which garments are put loosely in a mesh bag, then placed in an open tank with revolving paddles.
Panel printing	Printing of garment panels with nonrepeating designs. Used for T-shirts and other casual garments, also for very expensive ladies' dresses. Usually hand screen printed.
Piece dyeing	Generic term for dyeing fabric as opposed to dyeing yarn, fibres or sewn garments.
Pigment	Chemical which is insoluble but can be dispersed in a fabric or fibre to modify its colour.
Pigment padding	Process of distributing pigment on to a fabric through dispersion by a pad, prior to dyeing.
Pigment printing	Process by which insoluble pigments are printed on to a fabric with adhesives.
Plissé	Fabric treated with sodium hydroxide to create a puckered or uneven pleated effect.
Polishing	Chemical yarn treatment resulting in a smooth glossy surface. Also mechanical fabric (particularly pile fabrics) finish resulting in increased lustre without crushing the fabric.
Pressure dyeing	Broad category of batch dyeing where both materials and dyestuff are placed under steam pressure allowing faster dyeing and at higher temperatures.
Printing	Application of colouring dyestuffs in definite patterns to slivers, tops, yarn, fabrics, as well as garments.
Progressive shrinkage	Garment damage where material continues to shrink during successive washing or drycleaning.
Relaxation	Fabric dimensional change (either shrinkage or length/width increase) resulting from relieving strain incurred in any fabric or garment production process. For example, fabric inspection unless on a specially designed machine or laying knit fabric on a cutting will both cause fabric elongations which, unless compensated, will result in smaller measurements when fabric or cut panels subsequently relax.
Relief printing	Form of roller printing where rollers are engraved so that only the high parts of the plates are printed as opposed to intaglio printing.
Residual shrinkage	Measure of shrinkage remaining after application of shrink-resistant finish.
Resist dyeing	Dyeing method to obtain two-tone effect on yarn or fabric. A chemical is added to the dyestuff so that the yarn or fabric resists further dyeing. Yarn with resist dye is combined with untreated yarn which is then woven and piece dyed resulting in a mélange or two-tone effect.
Roller printing	One of the major fabric printing methods. Fabric is passed over hollow engraved copper cylinders containing the dyestuff. Results are very exact and printing is very fast. Some machines have up to 16 rollers (allowing 16 colours). Rollers are very costly to make and method therefore suited for large runs which are also limited in the size of the repeat.
Rope dyeing	Process where fabric is bunched together in a rope form for dyeing. Used in *jet dye* and other systems. Rope dyeing is less expensive than openwidth dyeing and

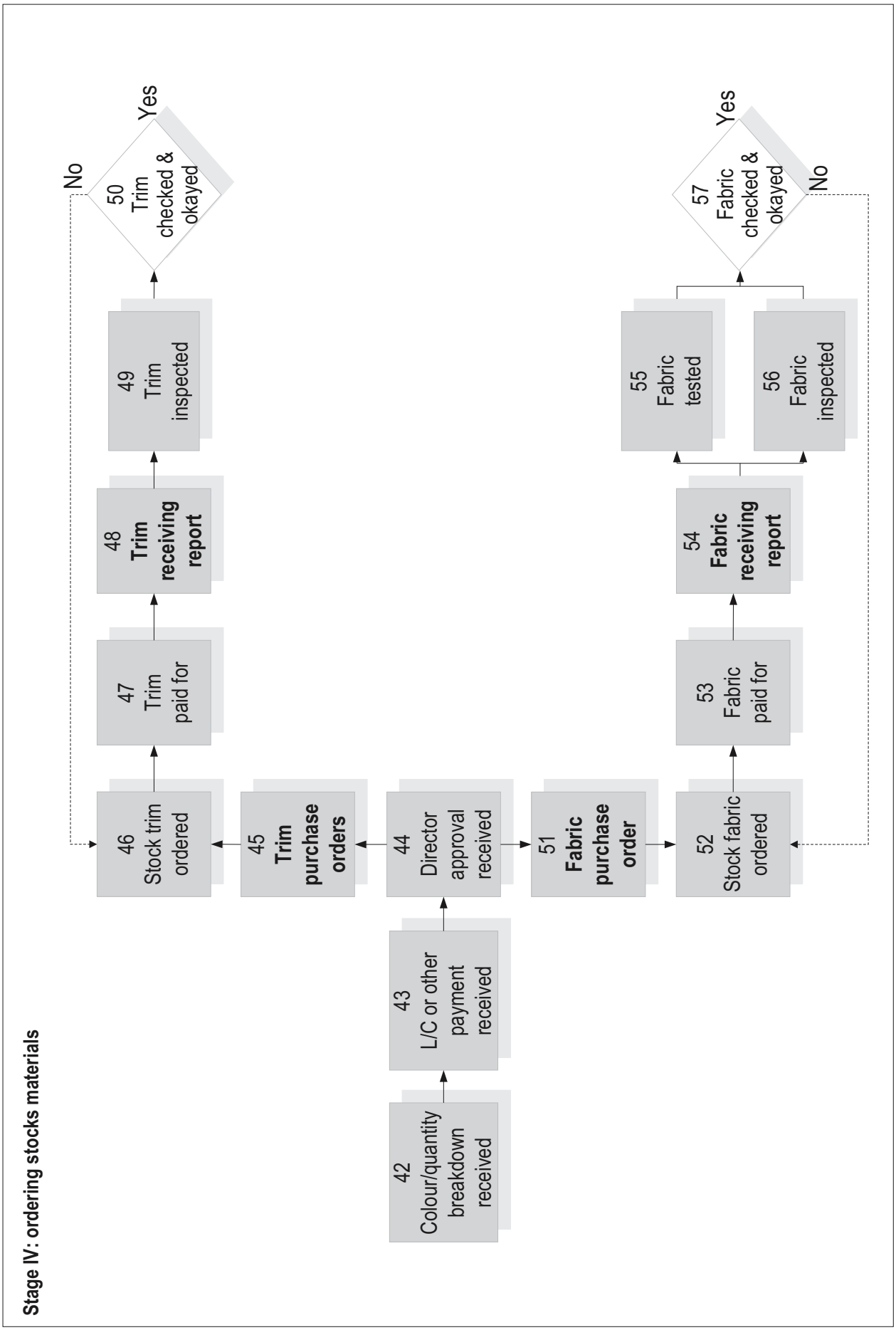
	works well provided that fabric will not damage when put under tension in a rope form. However, many fabrics will damage resulting in long irregular streaks called rope marks.
Rotary screen printing	Process which is a cross between roller and flat screen printing using perforated metal screens curved into a cylinder form. The pattern is formed by covering the perforations where the pattern does not appear. Much less expensive than rollers (with smaller minimums) and faster than flat screens.
Schreinering	Mechanical process to add high lustre to cotton fabric by passing fabric between rollers with fine diagonal engraved parallel lines producing ridges invisible to the eye which increase light reflection area.
Scouring	Chemical process to remove dirt, grease, perspiration, etc. from raw wool (greasy wool). Term also applied to cleaning of any greige fabric before dyeing or printing.
Screen printing	One of the major fabric printing methods using meshed fabric (flat screen) or perforated metal sheeting (rotary screen). Pattern is achieved by blocking the openings where the pattern does not appear and later forcing the colour paste through the mesh or perforated openings.
Shatnez	Biblical injunction against wearing fabric of mixed fibres, i.e. wool/linen.
Shearing	Mechanical wool and worsted finishing process to cut away uneven yarns and fibre ends. Also cutting away floats from jacquard and pattern fabrics.
Shrinkage control	Generic term for all methods for limiting fabric shrinkage either mechanical; e.g. compressive shrinkage, or chemical, e.g. chlorination.
Singeing	Finishing process where protruding fibres or yarn are burned off using gas flame or heated copper plate resulting in smooth surface. Used for better quality printing and/or finishing.
Sizing	Broad category of chemicals (or chemical processes) used to increase abrasion resistance, strength, weight and lustre primarily to yarns, particularly warp yarns, but also to fabrics. Originally including oils, wax, or gelatin, more recently resin.
Skein dyeing	Dyeing of flexible yarn coils (skeins) as opposed to package dyeing, used primarily for wool and silk sweater yarns.
Solvent dyeing	Broad category of dyeing methods using dyestuff soluble in liquids other than water.
Space dyeing	Yarn dyeing or printing method where individual yarn strands are coloured in one or more colours at irregular intervals.
Sponging	Mechanical process generally applied by the garment maker to wools and worsted fabrics to remove any residual shrinkage.
Stencil printing	Process where print design is either brushed or sprayed on by use of cut-out template.
Stock dyeing	Dyeing of fibre before spinning to achieve heather (mélange) effect, usually applied to wool or worsted.
Stonewash	Mechanical/chemical method to achieve colour effect or distressed look on textiles and garments by tumbling the materials with pumice or other abrasive stones often dipped in special chemicals.
Sublistatic tenter drying	Trade name for heat transfer printing process. Also finishing process to hold fabric to a specific width during drying by use of a tentering frame.

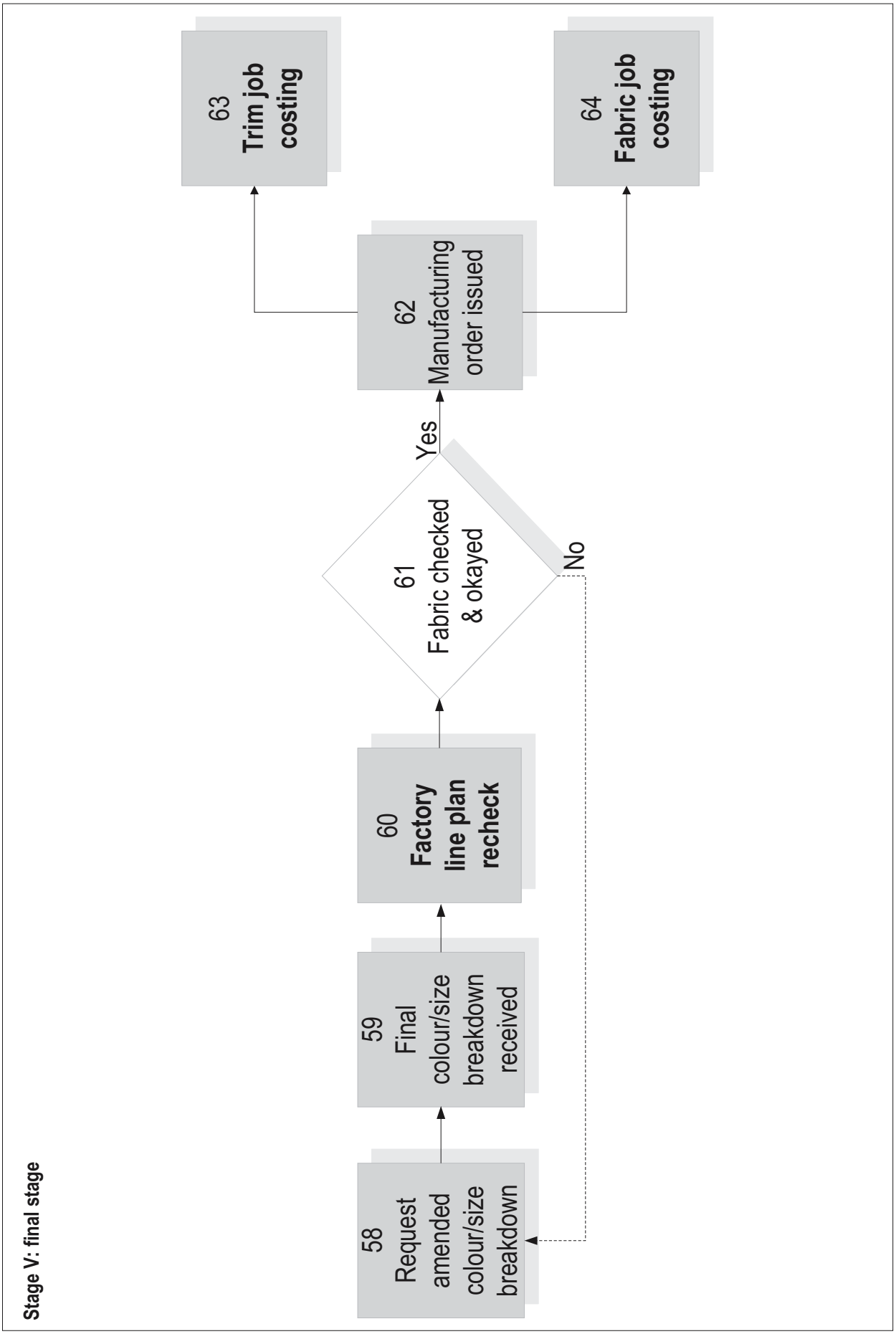
Sulphur dye	Dyestuff containing sulphur which is normally applied to cellulose-based fabrics such as cotton, viscose, rayon and linen to produce range of usually dull colours, including yellows, browns, tans, greens, maroons, blues, greys and blacks.
Tip printing	Embossing/printing technique where the embossed portions are printed.
Top dyeing	• Process of dyeing wool tops prior to spinning into yarn. Important in production of heather tones in flannel and other wool fabrics. • Dyeing previously dyed fabric. Also known as overdyeing.
Union dyeing	Method to obtain uniform colour where fabric is composed of different types of fibres which would normally require separate dyestuffs.
Vapour phase dyeing	Method where dyestuff molecules are delivered to fabric in gaseous form.
Vigoureaux printing	Method to produce blended colour effect usually in worsted yarns and fabrics by special printing of tops.
Warp printing	Method where warp yarns are printed before weaving resulting in watercolour effect.
Washing	Generic term for any cleansing operation of fibre, yarn, fabric or garments using water together with detergent or alkalis.
Waterproof	Fabric possessing ability to prevent water penetration. Usually closely woven then coated. First invented by Charles Macintosh in 1823, hence the generic term given by British to raincoats.
Water repellent	Fabric possessing ability to resist wetting as measured by AATCC standards. Most forms do not close off the interstices of the fabric as with waterproofing and finish is usually nonpermanent.











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ISBN 92-9137-299-4 **United Nations Sales No. E.05.III.T.3**