3 Denim Fabric Manufacturing in China

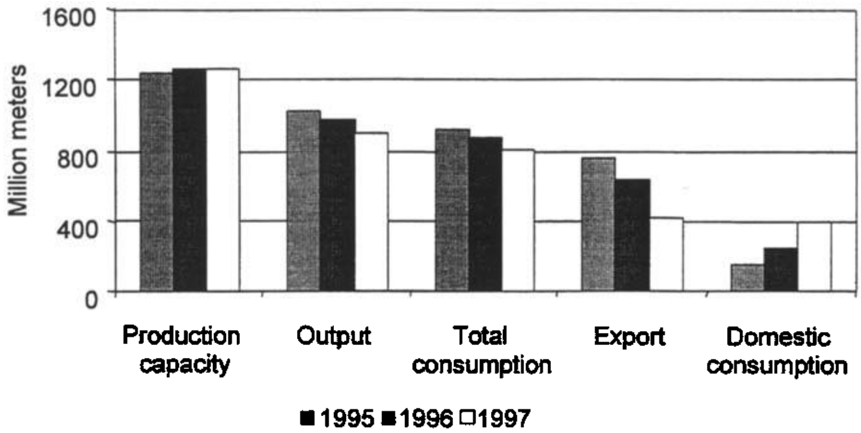
3.1 PRODUCTION CAPACITY

The Chinese denim fabric sector had developed since the end of the 1970s, when the first denim line was established in Guangdong province. The sector had more than 400 manufacturers in 1997 and is an important producer on a global scale. The capacity was 1.2 to 1.3 billion metres (1.8 to 1.95 billion square metres), accounting for 10 per cent of world total in 1997. Based on data in China Denim Market Research Report (1998), some overcapacity in denim fabric has developed in the past few years, as shown in Figure 3.1. The overcapacity was 220 million metres in 1995, and became more than 360 million metres in 1997. Production capacity grew, but the output produced fell sharply from 1995 to 1997.

The major type of machinery used in the production of denim fabric in China is the shuttleless loom. In 1997, there were 13600 shuttleless looms producing denim fabrics, accounted for 21 per cent of China's shuttleless looms. According to figures from the same year, about 70 per cent of denim fabrics were made on shuttleless looms. The proportion of shuttleless looms is expected to increase as 6,000 shuttle looms, currently producing thinner denim fabric below 12.5 ounces per yard, will be readjusted to become shuttleless looms.

3.2 PRODUCTION

More than 1 billion metres of denim fabric was produced in China in 1995. However, with a decreasing rate of 12.1% per annual, the figure fell to 879 million metres in 1996. From 1996 to 1997, the production decreased even further, with an 8.2 per cent fall during 1996-1997, giving an output of only 807 million metres in 1997. (See Fig. 3.1)



3.1 Denim fabric production in China and its market

3.3 THE MARKET

The market size (include domestic and overseas markets) for Chinese denim fabric was 915 million metres in 1995, but this fell by 4 per cent to 879 million metres in 1996, and was further reduced to 807 million metres in 1997. The reason for this decline was the depression of the export market: in 1995, 757 million metres of denim fabric were exported to overseas markets, accounting for 74.5 per cent of China's total denim fabric output; in 1997 the export market fell to 420 million metres, accounting for just 46.8 per cent of China's total output [1].

3.3.1 Overseas markets

The most important overseas markets for denim are found in the USA and Europe [1]. Our research has mainly focused on denim fabric produced in China for the EU and USA markets, in addition to Hong Kong, which is the most important textile-trading partner of China.

The export market for denim fabric declined after 1995. Exports were reduced from 757 million metres (83 per cent of national output) in 1995 to 420 million metres (52.0 per cent of national output) in 1997. The quantity of exports was thus reduced by 22.3 per cent each year.

US market

The US is the most important denim market in the world, and a powerful denim fabric producer which is a fabric exporter rather than an importer. The US denim fabric industry has been developed since the end of the eighteenth-century, and the US owns world famous denim manufacturers such as Cone Mill, and Swift Textiles Inc, which are generally regarded as the world's two largest denim fabric producers. US denim producers are good at applying new technology to their production. Moreover, US denim fabric manufacturers have developed a globalization strategy to gain competitiveness against stiff worldwide competition. In the past few years, many American denim fabric producers have shifted their manufacturing bases to South American countries, such as Mexico, Guatemala, Honduras, Chile, etc., to reduce costs in order to compete with Asian manufacturers. To get close to the EU market, US manufacturers also established manufacturing bases in European countries, Belgium, Turkey, Tunisia, and Turkey. Together with their sophisticated marketing skills, US denim fabric manufacturers thus tried to expand their share of the world market.

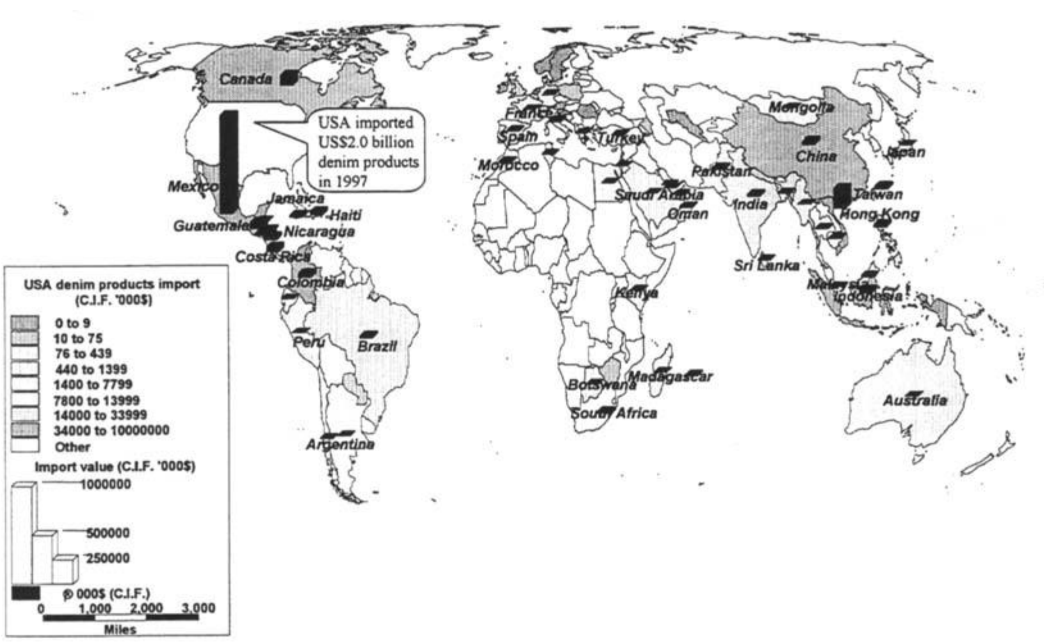
USA denim products imports

The USA is an important importer for denim yarn and denim apparel, but not denim fabric. About 16 per cent of USA total denim products imports was denim yarn in 1997, which was a reduction from 20 per cent in 1995. Denim apparel was the most important category of US import, accounting for more than 80 per cent in 1995 and 83 per cent of total imports in 1997. Denim fabric accounted for less than 1 per cent of USA import in the past few years. (See table 3.1)

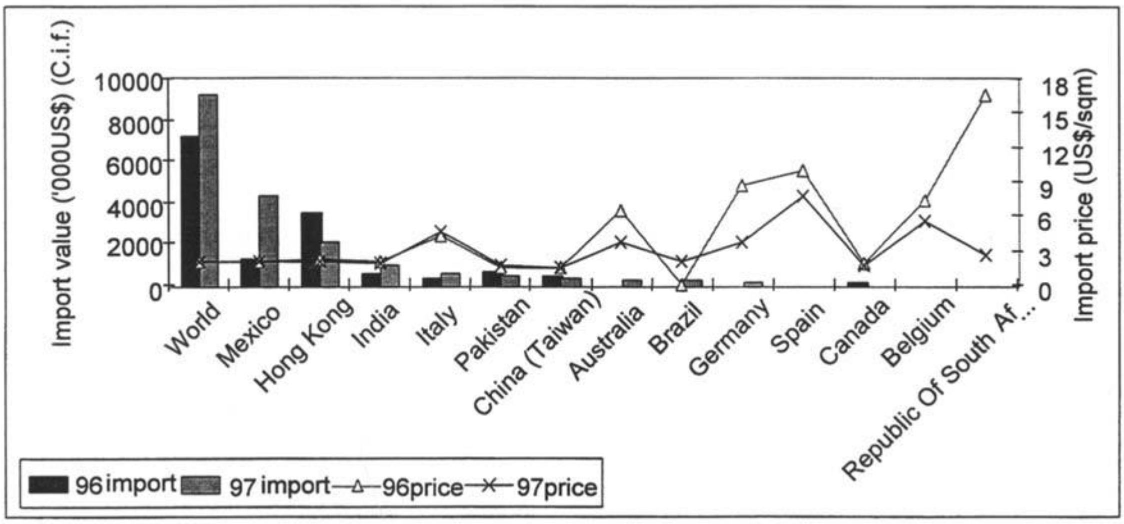
Mexico is the most important denim product supplier to the USA and contributed more than 50 per cent of the total USA imports of denim products in 1997. Hong Kong was the second most important exporter and accounted for 10 per cent of the USA total imports in 1997. They were followed by Canada, Guatemala, Costa Rica and China. (See Fig. 3.2 and Fig. 3.3)

Table 3.1 US denim product imports

US denim products imports (C.I.F., '000$)	1995	1996	1997
Denim Yarn	321011	351294	313557
Denim Fabric	6	7157	9137
Man's or boy's denim apparel	791747	928218	993132
Woman's or girl's denim apparel	492203	567005	687965
Total denim products	1604967	1853674	2003791



3.2 US denim product imports



3.3 US denim fabric imports value and price

USA denim fabric imports

The major denim fabric suppliers to the USA were Mexico, Hong Kong, India, Italy, Pakistan, China (Taiwan), Australia, Brazil and German. Mexico owned 47 per cent of the USA denim fabric import market in 1997, followed by Hong Kong, which has 23 per cent, India (10 per cent), Italy (5 per cent) and Pakistan (5 per cent), and China (Taiwan) (3 per cent).

The price difference of denim fabric from the different countries was significant. The average price of USA imported denim fabric (C.I.F) was US$2.0 per square metre in 1997. Among the major exporters, Mexico and Hong Kong exported denim fabric at a price close to the average. Italy exported high price denim fabric at above US$4.5 per metre, while Pakistan, China (Taiwan), and India exported denim fabric at a lower price.

China denim fabric in the USA market

China exported US$ 24 thousands worth of denim fabric to US in 1996, and did not export denim fabric to the USA in both 1995 and 1997.

EU market

The Treaty on European Union came into force on 1 November 1993, and signalled that another very important economy besides the USA appeared in the world. The Union consisted of 15 European countries. The Free Trade Agreement between EU members and the monetary union has an effect on the European and world economy, and profoundly affected the denim industry manufacturing distribution and trading in Europe.

Denim was born in a manufacturing center in southern France where the fabric was used for upholstery in the nineteen century. The manufacturing center was called Nimes, and the fabric was called "serge de Nimes" or "the cloth of Nimes", which is a twill cloth made from indigo dyed warp yarns and undyed (ecru) weft yarns. It spread to US after the Industrial Revolution in the nineteenth century. Historically, the textile industry development was one of the symbols of the Industrial Revolution in nineteen-century Europe, and drove the European economic development into a new stage. Based on the highly developed European textile industry, the denim producers in Europe are well-known for their stand-of-the-art technology and sophisticated engineering.

The EU market became the second most important denim market in the world after the USA. To identify the position of China's denim products in the EU import market, we surveyed denim apparel products trading in EU countries between 1994 and 1997, using data from Statistical Office of the Europe Communities.

EU denim products imports

EU countries imported 2,869, 2,785, 3,323, and 3,241 million Euro worth of denim products in 1994, 95, 96, and 97. More than one half of imported denim product was from the EU members.

Tunisia, USA, and Turkey were the three most important suppliers to the EU denim products market, followed by Hong Kong, Morocco, Malta, Mauritius, Pakistan, and Poland. These nine non-EU countries contributed 34 per cent of total EU imports of denim apparel, and 64 per cent of EU imports from non-EU countries. (See Fig. 3.4)

EU denim fabric imports

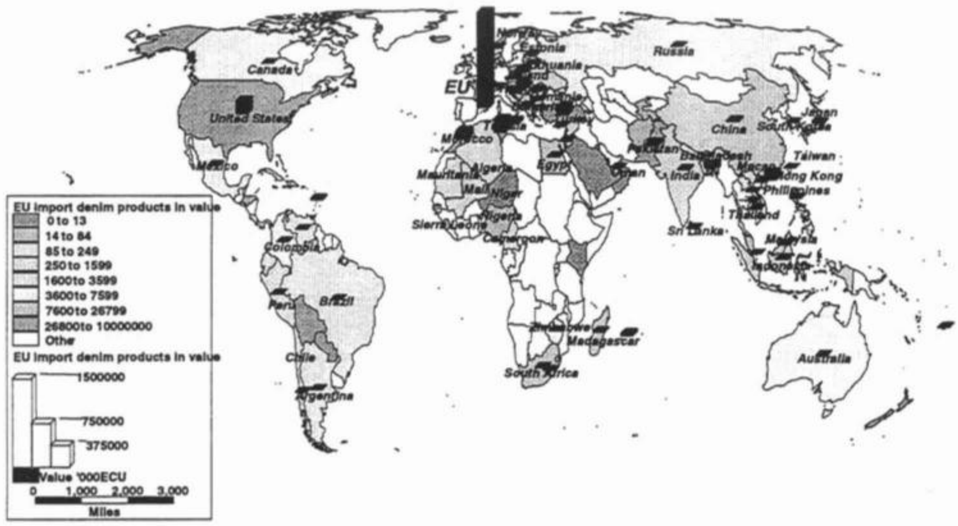
In general, denim fabric was not a very important category of denim products imported into the EU, contributing just less than 20 per cent of EU denim products imports. EU countries imported 484, 459, 543 and 461 million Euro worth of denim fabric in 1994, 95, 96 and 97, of which more than one half was within EU trading, Belgium-Luxembourg, Italy, Spain, and Greece being important denim fabric producers. (See Table 3.2)

The most important non-EU supplier was the USA, which supplied 31 per cent of total denim fabric imports from non-EU members in 1997. Turkey contributed 25 per cent, Tunisia 11 per cent, and India accounted for 7 per cent. Other countries, Australia, Indonesia, Mauritius, Ivory Coast, Japan, and Hong Kong contributed less than 3 per cent of EU imports of denim products. (See Fig. 3.4 and Fig. 3.5)

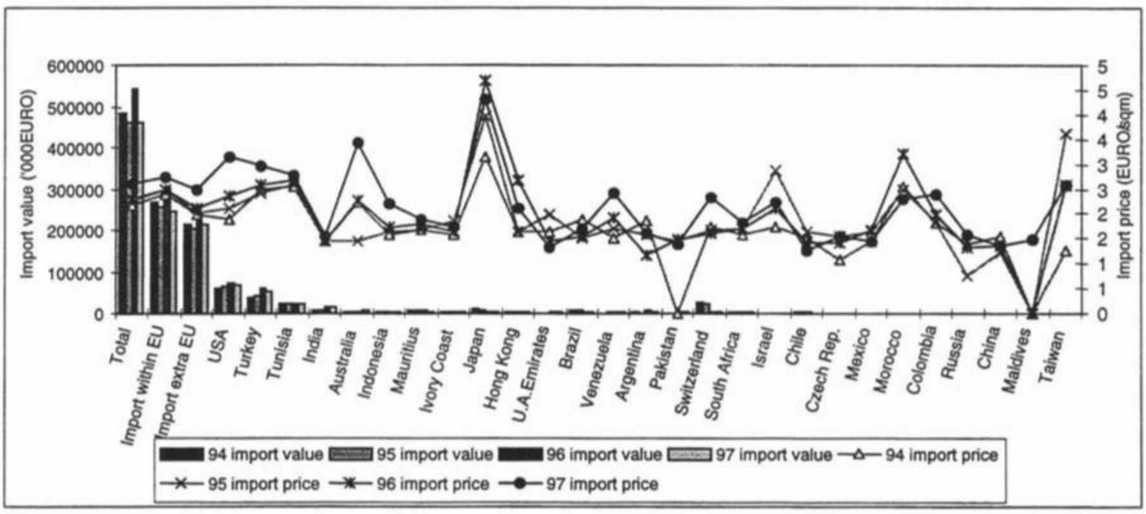
The average price of EU import of denim fabric was around 2.18~2.25 Euro per square metre. The average price of fabric from EU countries was higher than from non-EU members. However, in recent years, the price gap between fabric from EU members and non-EU members has narrowed. The rising average price of denim fabric from non-EU members has mainly been caused by the quickly increasing price of the fabric from the USA, which was the most important non-EU supplier. Meanwhile, the price of the fabric from other suppliers, Turkey and Tunisia, also was rising, though the growth rate was not as large as that of the US. (See Fig. 3.5)

Table 3.2 EU denim product imports

EU Denim Products Imports ('000Euro)				
	1994	**1995**	**1996**	**1997**
Total Import	2869416	2784736	3322892	3240675
Denim Apparel Imports	2385072	2325501	2780300	2779323
Denim Fabric Imports	484344	459235	542593	461352
Denim Apparel Contribution	83%	84%	84%	86%
Denim Fabric Contribution	17%	16%	16%	14%



3.4 Denim products exported to EU in 1997



3.5 EU denim fabric imports

China denim fabric in EU market

In 1997, China was the 25th in the list of non-EU exporter of denim products to the EU. She accounted for 0.1 per cent of denim products imported from non-EU country and only 0.04 per cent of all EU denim imports.

China exported 205, 155, 129 and 207 thousand Euro worth of denim fabric to EU countries in 1994, 1995, 1996 and 1997 respectively. Denim fabric was not an important export category of denim products for China, just accounting for less than 1 per cent of Chinese exports of denim products to EU countries.

China exported denim fabric to the EU market at a price between 1.5 to 1.2 Euro per square metre. Compared with the price of denim fabric from other countries in the EU market, such as USA (1.8-3.1 Euro per square metre), Turkey (2.4-2.9 Euro per square metre) and Tunisia (2.5-2.7 Euro per square metre), it was relatively low.

The highest price of denim fabric was from Japan with a price between 3.1 to 4.7 Euro per square metre.

Pure cotton denim fabric was an important category for China manufacturers. Little denim fabric exported from China contained less than 85 per cent cotton. 1998 is the first year that recorded China exporting to the EU market denim fabric containing less than 85 per cent cotton.

In recent years, new material denim fabric was widely used in the world denim fashion market, such as Tencel, Lycra Spandex, and Polyester. The new materials were blended in denim lines to make the fabric soft, easy care, and breathable to meet the modern consumer requirements.

Tencel[1] is high-tech and high fashion in the 1990s. It is regarded as a kind of environment-friends fabric because it is a natural fabric with an eco-friendly manufacturing process and most important, it is degradable. It is soft, durable and lightweight, has a nice smooth touch and blends well with other fabrics. The denim made from Tencel is fluid, soft and comfortable.

The Chinese denim fabric industry made little progress in new material development compared with its competitors in the developed countries. The core product of the China denim fabric still was pure cotton, which didn't meet the world denim fabric market trends.

Hong Kong market

According to the Hong Kong Special Administration Region (HKSAR) government statistics, out of Hong Kong's total re-exports (US$148.6billion in 1998), 95 per cent (US$141 billion) either originated from or were destined for China [3]. Furthermore, Hong Kong is the most important textile trade partner for China.

To find the position of Chinese denim fabric in Hong Kong's important and re-export market, we survey Hong Kong denim trading between 1992 and 1998. The trading data was obtained from Hong Kong Trade Development Council (HKTDC).

Hong Kong denim product imports

Hong Kong is not only an important market for Chinese denim products, but also a major trade channel to other countries, and China is the most important supplier of denim products to Hong Kong.

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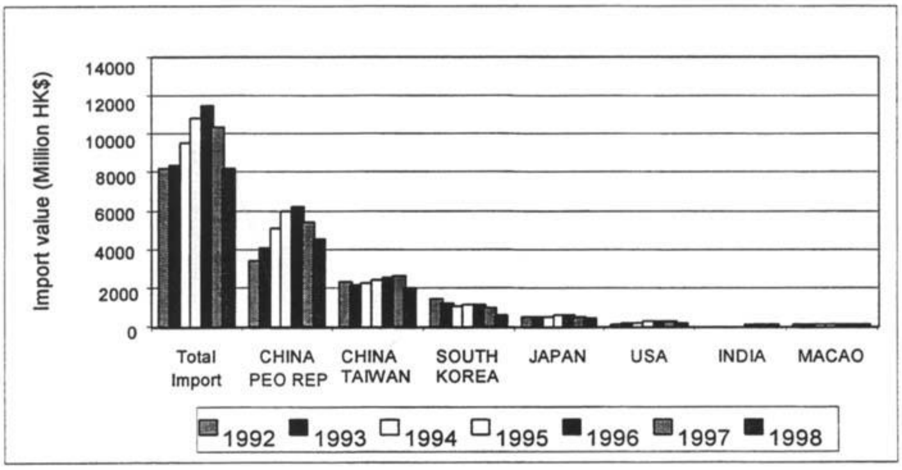
[1] Tencel is a kind of Lyocell, a type of washable rayon, produced from natural cellulose in wood pulp using a solvent spinning technique. Virtually all of the solvent--amine oxide--is recycled, minimizing pollution. 2. GELLENE, D., *THE CUTTING EDGE FIBER OPTIMISM The Fashion Industry's Excited Over a New Pollution-Free Rayon, but Its Price Could Be a Snag*, in?*Los Angeles Times*.03/24/1997.p.Page D-1.

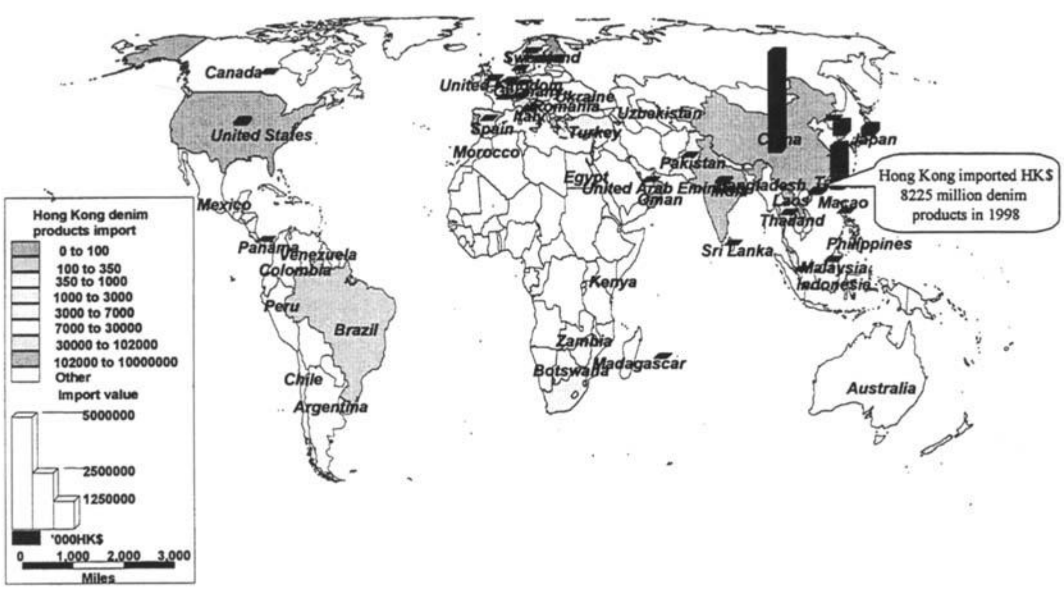
1. The wood pulp is mixed with amine oxide.
2. The mixture is heated, and the pulp dissolves.
3. The solution passes through filters to remove impurities.
4. The solution is forced under high pressure through small holes to form filaments, a process known as solvent spinning.
5. Strands of fiber are washed to remove amine oxide, dried and cut into pieces to be woven into fabric.
6. Water is evaporated from the amine oxide, which is reused to process more lyocell filaments.

Source: Courtaulds Fibers Inc.

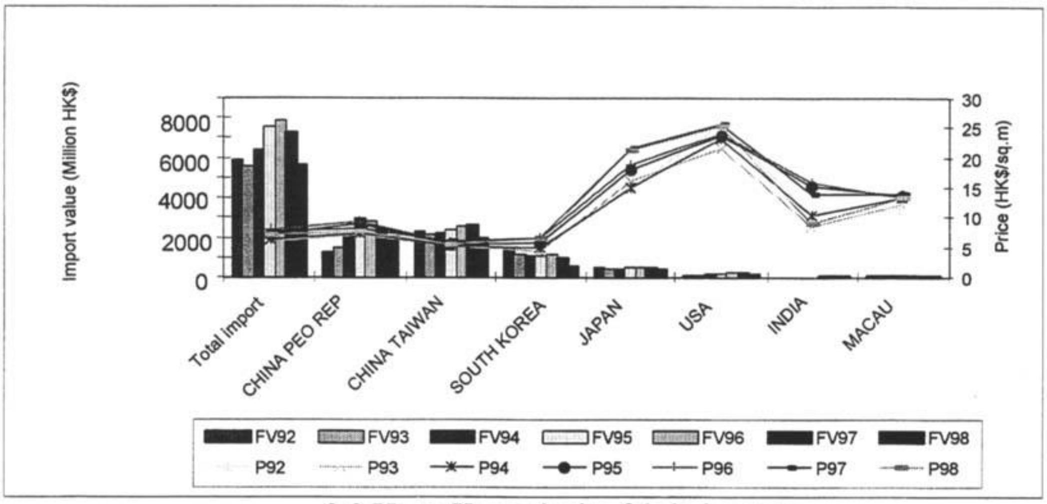
Hong Kong imported HK$ 8.2 billion worth of denim products in 1992, expanding by 10.2 per cent per year on average, and peaking in 1996 with HK$ 11.5 billion. However, both Hong Kong denim fabric and denim apparel imports declined between 1996 and 1998. After a 9.7 per cent decline in 1997, Hong Kong's total imports of denim products dropped by 20.6 per cent in 1998, a fall caused by weak demand and by the Asian Financial Crisis. (See Fig. 3.6)



3.6 Hong Kong denim product imports



3.7 Hong Kong denim product imports in 1998



3.8 Hong Kong denim fabric imports

Hong Kong denim fabric imports

Denim fabric imports contributed 28 to 34 per cent by value of Hong Kong total imports of denim products in value between 1992 and 1998. The recession in the Hong Kong economy and lackluster consumer spending between 1997 and 1998 caused Hong Kong's denim fabric imports to drop by 6.9 per cent in 1997 and 22.9 per cent in 1998, amounting to HK$ 7.3 billion and HK$ 5.6 billion in those years respectively.

The important sources of Hong Kong imports of denim fabric were the Asian countries, such as China, China Taiwan, South Korea, and Japan. They supplied more than 90.3 per cent of Hong Kong denim fabric imports every year. (See Fig. 3.8)

The average price of Hong Kong imported denim fabric was at HK$ 6.4 ~ 7.7 per square metre. The price from China Taiwan, and South Korea was around HK$ 4.5~6.6 per square metre. The highest price was from USA, which sold at about HK$ 25 per square metre. Denim fabric from Japan sold at HK$ 21 per square metre in 1998, while prices from India (HK$ 9.0 per square metre) and Macao (HK$ 13.30 per square metre) were lower. (See Fig. 3.8)

Chinese denim fabric in the Hong Kong market

Between 1992 and 1995, the exports of denim fabric from China to Hong Kong soared from HK$ 1.2 billion in 1992 to HK$ 2.9 billion in 1995. China became the most important supplier of Hong Kong denim fabric imports in 1995. From 1996 to 1998, the value reduced from HK$ 2.8 billion in 1996 to HK$ 2.1 billion in 1998, in which year China accounted for 36.8 per cent of Hong Kong total imports of denim fabric.

In terms of quantity, exports of denim fabric from China increased between 1992 and 1995 with a growth rate of 4.8 per cent per year on average. In the year 96/97, exports from China declined by 4.3 per cent, and in 97/98, the reduction reached 17.3 per cent. China exported 798 million square metres of denim fabric to Hong Kong in 1998.

The price of denim fabric from China suffered a turbulent period from 1992 to 1998. The price was around HK$ 7.4 ~7.2 per square metre in the years 1992 to 94. The price then grew to HK$ 9.0 ~ 9.2 per square metre in the next two years. However, the price didn't stay at this high level and fell to HK$ 8.1 per square metre in 1997, and to HK$ 7.6 per square metre in 1998. The price of denim fabric from

China was, however, higher than the average price of Hong Kong imports of denim fabric.

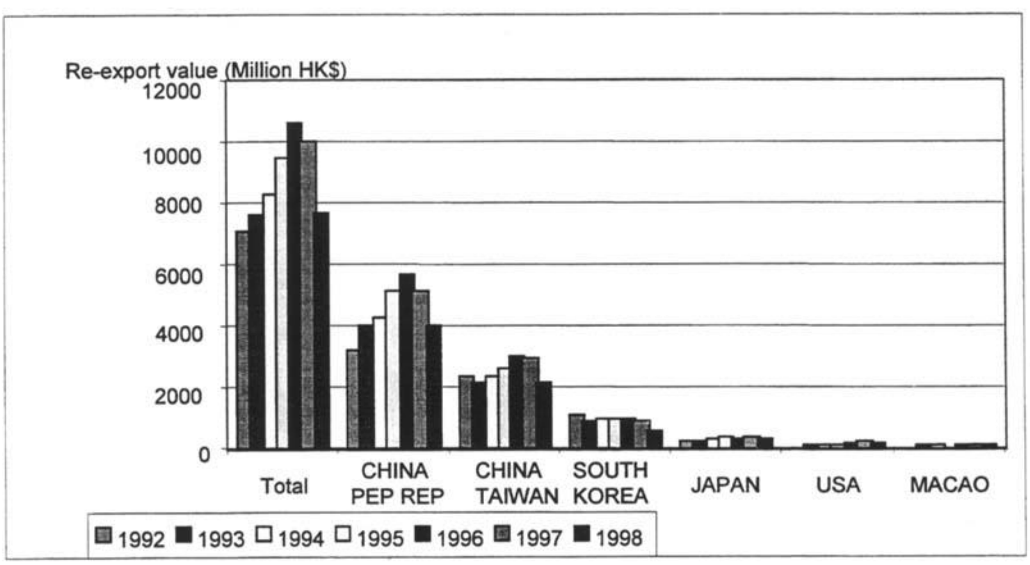
Re-exports via Hong Kong

Hong Kong is an important trade channel for Chinese denim products seeking access to overseas markets. The Chinese mainland exported HK$ 4.0 billion worth of denim products through Hong Kong in 1998, accounting for 52.5 per cent of Hong Kong's total re-exports in that year.

Hong Kong's re-exports of total denim products

The important origins of Hong Kong re-exported denim products were China, China Taiwan, South Korea, Japan, the USA and Macao. From 1992 to 1998, these countries (areas) supplied around 95 per cent of Hong Kong re-exported denim products. (See Fig. 3.9)

Among these suppliers, China was the most important supplying 52.5 per cent of Hong Kong re-exported denim products in 1998. China supplied HK$ 3.2 billion worth of denim products for Hong Kong re-export in 1992. With an average growth rate of 15.8 per cent per year, the value became HK$ 5.7 billion in 1996. After 1996, the value reduced by 16.3 per cent per year, becoming HK$ 4.0 billion in 1998. The second most important supplier, China Taiwan, supplied 28.3 per cent of Hong Kong re-exports in 1998. South Korea was the third most important source of Hong Kong denim products re-exports, followed by Japan, the USA and Macao. (See Fig. 3.9 and 3.10)



3.9 Hong Kong denim product re-exports by origin

3.10 Hong Kong denim product re-exports by origin

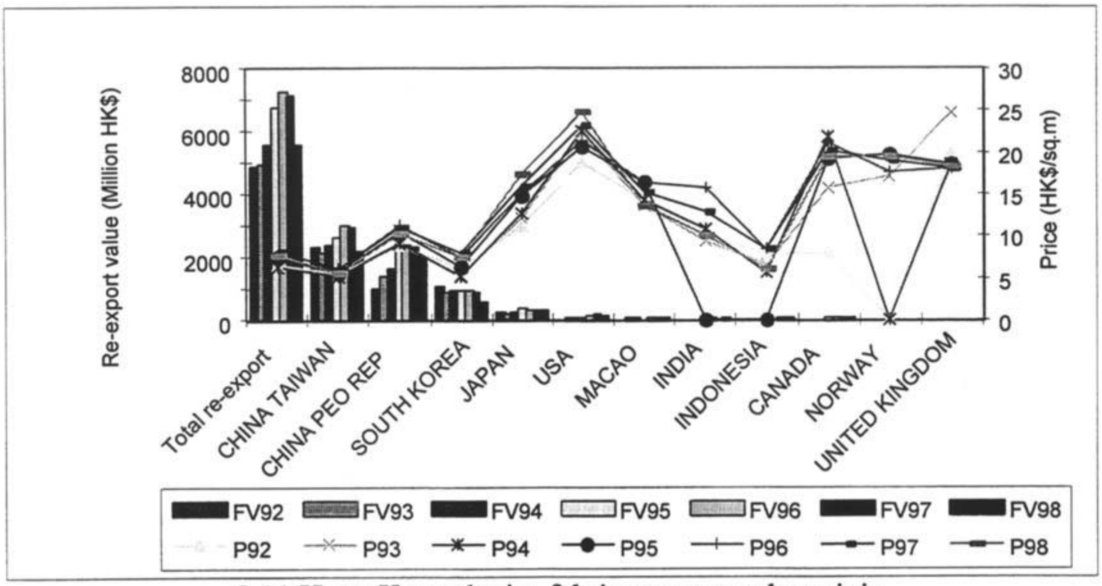
Hong Kong denim fabric re-exports by origin

Among the suppliers of denim fabric re-exports via Hong Kong, China Taiwan was the most important. China Taiwan supplied HK$ 3.0 billion worth of denim fabric to Hong Kong for re-export in 1996, which was the peak from 1992 to 1998. In 1998, HK$ 2.2 billion worth of denim fabric from China Taiwan, accounting for 38.9 per cent of Hong Kong denim fabric, was re-exported.

The denim fabric from China peaked in 1995 with HK$ 2.4 billion. China supplied HK$ 2.0 billion, accounting for 35.8 per cent of Hong Kong re-exported denim fabric in 1998, as the second most important supplier of Hong Kong re-exported denim fabric. (See Fig. 3.11)

South Korea, the third most important origin of Hong Kong re-exports, exported its denim fabric via Hong Kong, contributing about 9.6 per cent of Hong Kong re-exports denim fabric in 1998. Japan was the fourth important supplier that exported HK$ 291 million worth of denim fabric in 1998. 1.9 per cent of Hong Kong re-exported denim fabrics were from the USA, and 1.2 per cent were from Macao. (See Fig. 3.11)

The average price of Hong Kong re-exported denim fabric was around HK$ 6.3 to HK$ 8.1 per square metre between 1992 and 1998. The denim fabric from China Taiwan sold at HK$ 5.2 to HK$ 6.1 per square metre. The denim fabrics from Japan, USA, Canada, Norway and United Kingdom were at a higher price (more than HK$ 17 per square metre), while the denim fabrics from South Korea, India and Indonesia were at lower prices (less than HK$ 10 per square metre). (See Fig. 3.11)



3.11 Hong Kong denim fabric re-exports by origin

China denim fabric re-exports via Hong Kong

As discussed in the preceding paragraphs, China was the second most important denim fabric origin for Hong Kong re-exports in the recent years. HK$ 994 million worth of denim fabric was re-exported via Hong Kong from China in 1992, accounting for 20 per cent of total denim fabric re-exports via Hong Kong. The amount of denim fabric re-exported via Hong Kong from China decreased after 1995, after years of increase. 110 million square metres of denim fabric from China were re-exported via Hong Kong in 1992. In 1995, the volume became 230 million square metres, which was the peak of the denim fabric from China in our investigation period.

To gain some insight into the China denim fabric exported to Hong Kong and re-exported via Hong Kong between 1992 and 1998, we found that the amount of China denim fabric either exported to or re-exported via Hong Kong reduced from 1996. The first reason for this was the higher cotton price in China, which in 1997, was much higher than in the international market. This eroded the competitiveness of Chinese denim fabric in the markets. Second, the Asian financial turmoil that raged in many countries in 1997 caused their currency to be devalued. China and Hong Kong were the two countries or areas that succeeded in keeping their currency steady. The price of denim fabric from China and Hong Kong thus increased compared with that of fabric from the other countries. After the financial turmoil, Chinese denim fabric exports to Hong Kong will be resuscitated.

The denim fabric from China re-exported via Hong Kong was at higher price compared with the denim fabric directly exported to Hong Kong. The price was HK$ 9 per square metre in 1992, and peaked in 1996 with a price of HK$ 11.1 per square metre. The average price from China was HK$ 10.2 per square metre in 1998.

3.3.2 The domestic market

The domestic market for Chinese denim fabric has grown steadily in the past few years. Domestic consumption of denim fabric rose from 158 million metres in 1995 to

388 million metres in 1997, an expansion rate of 72.8 per cent per year. The domestic market was thus becoming more and more important for the Chinese denim fabric industry.

Despite this, in the years under investigation, denim fabric oversupply increased by around 1 million metres per year, becoming a major problem for the denim fabric industry. In 1998, the oversupply of denim fabric was reduced. However, when two thirds of the total textile production in China was superfluous during the second half of 1998, the producers of denim as well as that of 37 other kinds of textiles managed to keep a balance between supply and demand [16]. Furthermore, based on a study of the supply and demand of 610 major commodities in the latter half of 1998, the State Bureau for Internal Trade in China has forecast that the supply and demand of denim in 1999 will continue to be in balance [4].

3.4 MAJOR PRODUCTS

News from journal of Japan Textile News (JTN) indicated [5] that extra heavy & thick jeans (over 14.5 oz./sq. yard) were in great demand in European and American regions, While Japan and Taiwan were the major markets for ultra light & thin jeans (under 6.5 oz./sq. yard). The demand for newly developed fancy denim such as sand-washed denim, colored denim was tending upwards.

In the period, the major denim fabrics in China were $7^s \times 7^s$, 13.5-14 ounce per square yard, accounting for 60 per cent of Chinese output. $7^s \times 6^s$, heavier than 14.5 ounce per square yard, are thick denim fabric, and accounted for 18 per cent of China's output. Denim fabrics of $10^s \times 10^s$, $10^s \times 7^s$ and $12^s \times 12^s$ with weights between 8 oz./sq. yard and 11.75 oz./sq. yard accounted for 19 per cent of total output. Thin denim fabric from 16^s (6 ounce per square yard) accounted for just 3 per cent of Chinese output. China denim fabric products were mainly made from pure cotton rotor spun yarns.

Indigo remains the predominant color for denim, though other color denim fabrics, such as black, yellow, red and green, were also made in China. Denim fabrics were mainly made into 3/1 and 2/2 twill and finished by stone and snow washing.

China produced mainly extra heavy & thick denim fabric, at the time when ultra light & thin varieties were becoming fashionable in world markets. In China, most denim fabrics were still made of pure cotton yarn for the domestic market. China denim fabric production thus did not meet the demand of overseas markets, which was a problem that China denim fabric industry had to face.

3.5 THE MAIN USES OF DENIM FABRIC IN THE DOMESTIC MARKET

In the Chinese domestic market, about 90 per cent of denim fabric was used for denim apparel. Thus, about 42.7 per cent was used for jeans, 29 per cent for jackets, 10.5 per cent for Children's denim apparel and 7.8 per cent for denim skirts. The usage of denim fabric was concentrated on denim apparel.

About 10 per cent of denim fabric was used for accessories: about 6 per cent were used for travel products such as hats and bags, about 2.5 per cent for house-wear, and 1.5 per cent for toys and relevant goods.

In overseas countries, especially in the most important denim market (USA), denim fabric was used for bedspreads, solid denim pillows, denim rugs, window shades, place mats and so on from the family room to the kitchen. The use of denim fabric for non-apparel uses was becoming more popular.

3.6 PRODUCTION BY REGION

Figure 3.12 shows the geographic distribution of Chinese denim fabric production and sales in 1997. The denim fabric manufacturers were distributed in 27 provinces of China, concentrated mainly in the coastal areas. Three provinces, Guangdong, Jiangsu and Shandong were the most important denim fabric bases in China, accounting for more than 54.7 per cent of Chinese output in 1997.

Guangdong was the most important province, in which 210 million metres of denim fabric were produced, accounting for 23 per cent of Chinese total output in 1997. In the three years under investigation, the production of Guangdong peaked in 1996 with 228 million metres (23.4 per cent of Chinese total output). In 1995, denim fabric made in Guangdong accounted for 21.4 per cent of China's total output. Although the production of Guangdong fell in 1997, the province still was the most important denim fabric production base in China.

Jiangsu was the second largest denim production area in China, producing 212 million metres of denim fabric in 1995, although this fell to 186 million metres in 1997: a fall of 6.2 per cent per year. The production of Jiangsu accounted for 21 per cent of Chinese output in 1997.

Shandong was the third important production base, producing 116 million metres of denim fabric in 1995, but this fell to 96 million metres in 1997. About 11 per cent of China denim fabric was made in Shandong.

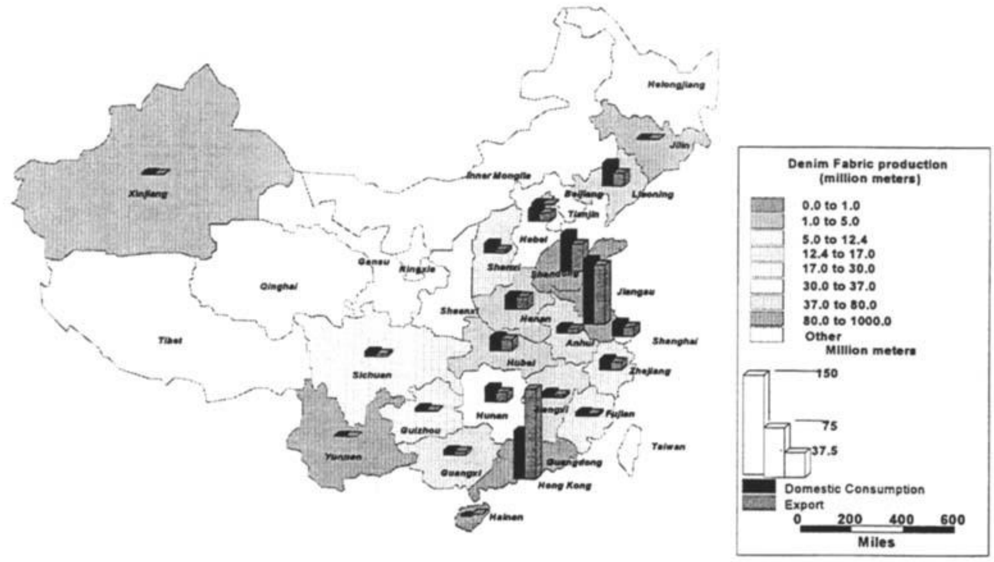
Among the rest of provinces, Liaoning produced 6 per cent of Chinese output, Hunan, Hubei, Henan, Shanghai and Hebei each produced about 4 per cent of Chinese denim fabric in 1997.

3.7 SALES BY REGION

Guangdong, Jiangsu and Shandong were the important exporters and domestic suppliers in China. (See Fig. 3.12)

Guangdong, accounting for 32.4 per cent of China denim fabric export in 1997, was a leader in China denim fabric exports. Its denim fabric exports reduced from 178 million metres in 1995 to 136 million metres in 1997 with a reduction rate of 7.9 per cent each year, which was lower than the reduction rate (14.8 per cent) of national denim fabric exports.

Guangdong was not only a leading exporter, but also an important domestic market supplier, after Jiangsu province. 39 million metres of denim fabric sales in the domestic market was from Guangdong in 1995, and the volume increased to 73 million metres in 1997 with a growth rate 10.1 per cent per year. In the domestic market, about 15.4 per cent of denim fabric came from Guangdong province in 1997. In total export and domestic sales, Guangdong province was the leader of denim fabric sales, and sold 20.7 per cent of China's denim fabric.



3.12 China denim fabric production, domestic consumption and exports by region

Jiangsu accounted for 21.2 per cent of China's denim fabric export in 1997, as the second most important exporter. From 1995 to 1997, its exports reduced from 138 million metres in 1995 to 89 million metres in 1997. Jiangsu was the leader of the domestic denim fabric suppliers, and sold 74 million metres of denim fabric in 1995 increasing to 97 million metres in 1997 with a growth rate of 28.2 per cent each year. In 1997, about 20.2 per cent of denim fabric in the China domestic market was from Jiangsu.

Shandong province was the third most important denim fabric exporter, and exported 79 million metres of denim fabric in 1995 but this fell sharply in the next two years to 40 million metres in 1997 with a reduction rate of 16.2 per cent per year.

Shandong also was the third most important denim fabric domestic supplier. Its share of the domestic market has increased in the past few years. 37 million metres of denim fabric came from Shandong in 1995. In 1997, it supplied 56 million metres of denim fabric to the Chinese domestic market, accounting for 11.7 per cent of Chinese total output.

Apart from these three provinces, other China provinces exported 251 million metres of denim fabric in 1997 and accounted for 52.8 per cent of China denim fabric exports. They have enlarged their domestic market share from 1995 to 1997, supplying 195 million metres for China's domestic market in 1997, accounting for about 36.7 per cent of it.

3.8 THE COSTS OF MACHINERY

In China's denim fabric industry, a large part of the machinery was imported. An imported production line would cost about UD$ 5 to 7 million. If the machine worked at full-capacity, the costs from machinery would be US$ 0.24 per metre, which was sum of the total costs from interest, depreciation and maintenance together. In general, manufacturers needed a loan from a bank for equipment purchase and would pay large amount of interest, as interest rates in China were of two digits in most years of the 1990s. The high costs on machinery eroded the profit margin for the Chinese denim manufacturers. We knew that the price of Chinese denim fabric exported to the EU market was less than US$ 1.2 per metre. Regarding to above information, we could estimate that machinery costs accounted for about one fifth of this price for most denim manufacturers.

3.9 RAW MATERIAL QUALITY CONTROL

Cotton and yarn are the raw material for denim fabric. The quality of the raw material was very important to the denim fabric quality. What kind of cotton used in the fabric influenced the quality of the denim: high quality denim fabric should use only high quality cotton. The quality of the denim fabric should be controlled from first step of production process—i.e. in the choice of cotton. In China, there were just a few denim fabric manufacturers who produced yarn themselves. Many producers buy yarn from factories that don't produce denim yarn professionally. Rotor spinning was widely used in China mainly because it can utilize cotton waste and lower grade cotton. Moreover, in the years when cotton demand exceeded supply, the cotton was adulterated and short fiber lengths appeared. This made it more difficult for the producer to adopt high quality cotton and yarn in denim fabric production, and consequently much denim fabric made in China has low quality and has lost it competitiveness in the world market.

3.10 TECHNOLOGY DEVELOPMENT

The technology in the China textile industry is not the most developed. Even though it is the leading textile exporter in the world, more than half of its export clothing used imported fabric. The undeveloped technology became a bottleneck for the China textile industry. To enhance its textile products' competitiveness in the world market, the countries textile industry Bureau announced the five most important key points for the country textile industry technology development in the following years [6].

The first key point focused on fiber manufacturing technology development, which will work on multi-function, high simulation and functional fiber technology development.

The second point was yarn manufacturing technology development. To improve the proportion of combed yarn in all yarn used, they will apply new rotor spinning, air-jet spinning, and so on. Machinery, such as new blowing-carding units (chute fed cards), auto-cone winding machines, and spinning–coning (winder) units will be widely used.

The third point was weaving technology development. Through weaving and electronic jacquard technology innovations, adopting the latest machinery, it is hoped to improve the national proportion of shuttleless looms.

The fourth point is dyeing and finishing technology development. This covers adopting computer pattern design, computer color separation, electronic stencil and electronic control system, developing & applying new dyestuffs, chemicals and additive, promoting new environment friendly technology.

The final point was design & innovative technology development. To follow fashion trends in the world, CAD/CAM (computer aid design and manufacture) and CAM (computer aid management) should be applied more widely, and digital technology also will be adopted in textile design and pattern design.

Combining these developing technologies, the status of the China denim industry will be changed profoundly. It will improve the grade of Chinese denim fabric, enhance its competitiveness in markets such as the USA and the EU, and will also improve denim fabric used in exported denim apparel.

SUMMARY

The Chinese denim fabric sector is an important producer on a global scale, and its manufacturing bases are mainly distributed in the coastland. The industry product belonged to a low level of quality so that the denim fabric was competitive in the lower price market. Pure cotton denim fabric was the most important kind of product, which didn't meet the world fashion trends.

To upgrade the whole textile industry's products in the world market, recent focus has been on the developing technology. This will significantly improve the quality of Chinese denim fabric, and enhance the competitiveness of fabric in international markets.

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