

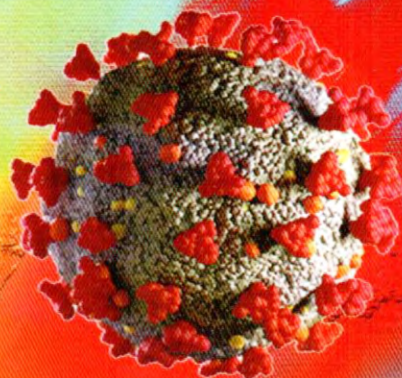
Bangladesh Textile & Garment Industries

From

Humble Beginner

to

World Leader



ECONOMIC REPORTERS' FORUM



Denim: The Empire of Tomorrow

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Dawn of the Denim

Genoa, one of the largest cities in Italy located on the shore of Gulf of Genoa in the Mediterranean Sea, will amaze anyone with its spectacular panorama of varying landscapes; from its cliffs to smooth hills soaring up to the blue skies over the alpine ranges. But speaking of



Figure 1: Jeans in City of Genoa then and now

blue, the colour is vibrantly noticeable not only up in the sky but also at every corner and boulevard of Genoa, a crossroad city of cultures and people since ancient times. For hundreds of years, Genoa has been famous for its blue jeans, which is now the most worn casual pants around the world. In fact, the term 'jeans' derives from the French name of the city itself- Gênes.

That was four centuries ago when 'bleu de Gênes' was a fabric used for sail-making around the ancient docks of Genoa. This was the beginning of blue jeans that spanned across the Atlantic and became a worldwide phenomenon. What is known today as 'jeans' is actually made of a fabric called 'denim.'

Denim is a fabric that has a tremendous business potential among garment and textile industries around the world. Denim itself was first manufactured in the French city of Nîmes under the name 'serge de Nîmes' which gave birth to the name 'denim.'

Jeans from Denim

The creation of Jeans from denim initiated in 1850, when the German Levi Strauss (Löb Strauß) arrived in San Francisco during the time of the Gold Rush. He used to sell dry goods to the miners. But as soon as he heard about the miners' need for durable pants, Strauss hired a tailor to make garments out of tent canvas. His company was called "Levi Strauss & Co." One of his customers was Jacob Davis, who was one of the inventors of riveted denim pants in 1871. He went into business with Strauss to produce blue jeans. They patented this style of work pants in 1873. The brand Levi's is still prevailing more than a century later.



Figure 2: Levi Strauss

Denim World

Denim is a fabric of robust cotton warp faced twill in which the weft (the thread that goes sideways) passes under two or more warp (the thread that goes longitudinal) threads. Most common denim is Indigo Denim, in which only warp threads are dyed, and weft threads are left plain white. As a result of the warp-faced twill weaving, one side of the textile is dominated by the blue warp threads and the other side is dominated by the white weft threads. This causes blue jeans to be white on the inside. In the initial years, only jeans pants were made from denim. But gradually denim fabric was used to create jackets, shirts, children's wear and many other things. Currently, the denim market has been categorized into jeans, jackets, shirts, dresses etc. Of the whole denim market, the worldwide jeans market held a share of more

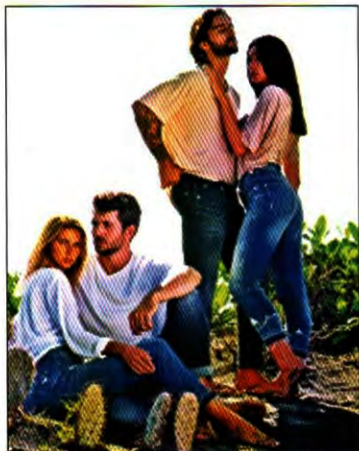


Figure 3: Classic Denim Jeans Pants

than 75% back in 2017, thanks to the trending styles in jeans such as cropped jeans, mom jeans, distressed and rugged jeans, globally. One might even wonder how ripped jeans became a fashion; but that trend has gotten into the fashion world. Stretch jeans are also totally invading the denim market. They started to become popular a few years ago and aren't going anywhere, no matter what "experts" are trying to tell you. Jeans being the leading denim product, no wonder many people erroneously think of denim and jeans to be synonymous. The reason behind the popularity of denim products is its mass usage by teenage and adult consumers. Apart from wide acceptance of trending styles, the traditional blue jeans of Genoa are witnessing considerable adoption across the whole world.

The Denim Market

The global denim jeans market was valued at \$58 billion in 2014, according to Technavio¹, a leading research and advisory company. In the U.S., more than 518 million



Figure 5: Jeans pants, the most popular Denim product

pairs of men's and women's jeans were sold in 2015. China is the largest exporter worldwide. In European market, the largest exporter is Bangladesh with a 27% market share. In the US market, top three denim exporters are Mexico, China and Bangladesh.

The world's 30% denim products are generally consumed by the North American market, making it the largest segment. But sales are projected to accelerate in Asia-Pacific during the forecasting period up to 2023. The denim growth in Asia-Pacific is led by several factors. Surge in automation of the apparel industry, advancement in new denim knitting technologies, growth in investment, the increasing adoption of casual gar-

ments from all segments of the society, ever increasing technological developments in brand marketing and customer management, varying demographics, rise in foreign direct investments (FDIs) etc. are some of the factors for the expansion of denim empire in this region. Denim market is projected² to reach \$79,211.0 million by 2023. Transformation of Asian retail clothing industry, cost-friendly labour resources, rising disposable income of people, expanding base of working-class population, availability of raw materials etc. as well as increasing government initiatives in countries like India, China, and Vietnam are the main impact factors owing to the acceleration of market in the region. Currently, the denim market is led by China, India, Europe and North America. The major manufacturers of denim fabric are concentrated in China, India and Bangladesh.

Production of Denim

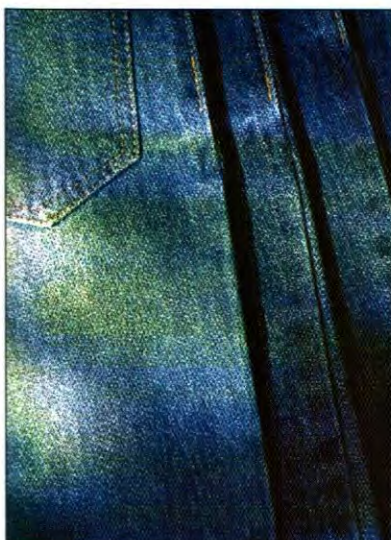
There are five production stages of denim fabric, namely: Cotton Processing, Spinning, Dyeing, Weaving and Fabric Finishing.

Cotton, polyester cotton and chemical fiber are the main raw ingredients for denim production. These materials' price can change from time to time, which affects the price of denim fabric. Also, the production cost influences the output product's price. Balancing the production cost, material cost and the finished product price is a classic challenge for the manufacturers around the world. To reduce the cost of mass market, many manufacturers have started replacing cotton with nylon, polyester, aramid, and other spun thermoplastics. Speaking of cotton farming, it requires warmth, sun, and moderate rainfall. These requirements are perfectly satisfied in places like India, West Africa, Egypt, southern states of the USA etc. Many factories use high quality cotton imported from the USA, West Africa, countries of the Commonwealth of Independent States (CIS)-



Figure 7: Rope Dyeing Process





Uzbekistan, Kazakhstan etc. It is mentionable that an embargo was slapped against Uzbekistan due to some child labour issues, resulting in some complications regarding usage of Uzbek cotton.

One of the major processes of denim production is dyeing. Denim fabrics

are prone to bleeding, so different kinds of washes are needed to produce different styles, which can result in reduction of indigo, other chemicals and even water. Usage of different reagent can accelerate the oxidation process, saving 30-40% of indigo, which can be used in liquid or powder format. Reactive dye can react with a fiber to form a covalent link, that is forming a permanent attachment in the fiber and could not be removed by repeated treatment with boiling water under neutral conditions, so it is a permanent absorption. Consequently, the dyes become part of the fiber, leading to outstanding colour fastness to wash.

Finishing is also a major step in denim production. Mercerization is a finishing process where the textile fibers are treated under tensile stress with caustic soda.

Final step of the production is washing. Dry wash is the cleaning process for clothing and textiles using a chemical

solvent other than water. Despite its name, dry cleaning is not a 'dry' process; clothes are soaked in a liquid solvent. In modern times, this dry wash is being replaced by more environment-friendly laser wash. Computer-driven laser technology can replicate localized wear, whiskers, and intricate lacelike patterns without water, chemicals or stones. Acid wash, stone wash, normal wash etc. types of washes are being replaced by all-in-one washing machine, i.e., sustainable wash. Tonello's all-in-one machine is an exquisite example of it.

Innovation and Denim

From my years of experience, I have learned that innovation of sustainable product or process is the key to maintain competitive advantage in denim market. For that I am always eager to introduce new technologies, try out different methods to accelerate and fine tune the product and production process.

Starting with higher quality yarns is the key to develop a better product. Introducing BCI (Better Cotton Initiative)



Figure 11: Effluent Treatment Plant

standards, using PCW (post-consumer waste) certified cotton, and reusing used cotton should be implemented to achieve the finest quality of yarn.

Another interesting innovation worth mentioning is lyocell fiber, better known as TENCEL™, which is a wood-based cellulose fiber, made from wood pulp. It is better known as Lyocell3 that is produced using a closed loop system which has minimal impact on the environment, maintaining economical use of energy and water. The end product turns out to be exquisitely attractive and glazy. Natural viscous fibers can be produced from bamboo as well, even from eucalyptus bark. TENCEL™ fabric is one of the best qualities of denim that can be produced.

Stretch jeans are probably the most popular type of jeans right now. Stretch jeans are made of stretch denim fabric,



Figure 9: ETL Research & Development Center

1. <https://sourcingjournal.com/topics/lifestyle-monitor/globally-denim-upswing-51346/>
2. <https://www.psmarketresearch.com/press-release/denim-market>



Figure 13: ETL Training Center-Outside Figure 12: ETL Training Center-Inside

which is a new type of cotton (or cotton/polyester blend) that incorporates a small amount of elastane, a stretchy, synthetic fiber, also known as Spandex, or Lycra, into the fabric. Jeans made of stretch denim material may look like regular jeans, but provide more flexibility. There are three types of stretch, based on their increase ability. Denims that can increase up to 20% are called "Comfort Stretch," up to 40% are called "Power Stretch," and any more increase ability is called "Super Stretch."

Dyeing is one of the major steps of textiles production that discharges large volumes of waste water. This water may be cleaned and reused to save fresh water. For that, every factory should have a proper and effective ETP (Effluent Treatment Plant). In addition, every plant should have a Caustic Recovery Plant (CRP). During finishing process, large quantities of diluted caustic soda is discharged from which CRP can recover almost 55-60%.

Also, introducing Ozone Finishing for denim production reduces environmental impact, processing costs and processing time. Ozone technology harnesses the natural bleaching capabilities of ozone gas to give a range of overall and specialty bleach effects with substantially reduced environmental impact. In this case, ozone is produced and recycled again. Jeanologia machines can be cited as one of the best examples of this ozone finishing. Aero finishing, the latest technology, should also be mentioned where air is used to thrash the fabric to make it softer, free of crease marks, maximize fabric stretchability, reduction of water consumption etc. And mostly, no chemical and no water is used for this process.

On top of it, developing human resources is another aspect that needs more attention to develop the textiles industry. It is said that "You are only as good as your team." Hence developing your team is an essential aspect success. Some industries like Envoy Textiles are already concentrating on HR development and more plants are following their footstep.

Bangladesh and Denim

We can proudly remark that all of these technologies are already adopted by a lot of factories and industries in Bangladesh, Envoy Textiles is one of them.

Envoy was the world's first textile mill to achieve LEED Platinum certification, from USGBC (The U.S. Green Building Council). USGBC is the highest authority to certify and confirm sustainability in building design, construction, and operation. And at present, among top ten LEED platinum certified garments in the world, only seven are from Bangladesh. This changed the apparel industry scenario and it started recovering from the aftermath of the unfortunate incidents of Rana Plaza and Tazreen Fashions. And every day more and more manufacturers are taking wonderful initiatives for creating a sustainable and environment friendly green factories. For example, Envoy Textiles is the only textile mill in Bangladesh to be awarded with National Environment Award.

Denim has come a long way in over a hundred years and I am sure, the harbor folks of Genoa or the people of Nimes never dreamed that their "bluest of the blues" will one day take over the world.

Denim made products are becoming more and more popular among all ages of people. I can confidently say that denim is the inevitable future of the apparel fashion industry. But we must work to create an environment friendly denim world through continuous innovation of sustainable manufacturing process. A world that will sustain future generations – yours and ours.

Acknowledgement: Mr. Abdullah Ibn Mahmud



Figure 14: World's first LEED Platinum certified denim mill

