

Printing Today

Unveiling industry best practices

Screen to digital printing

January 2020

A Textile Today Initiative | Published with Volume 13, Issue 01 | Pages 97 to 106



The new keys to successful printing environments: Efficiency and sustainability

Factors constitute placement printing pricing

Prospect of 3D fabric in global fashion industry

Q-SUN

Xe-2 Xenon Test Chamber

Represented in Bangladesh by:

Dysin International Ltd.
Machinery Division

Corporate Head Office

Skylark Point (3rd Floor), 24/A Bijoy Nogar, 175 Shohid Syed Nazrul Islam Soronee, Dhaka-1000, Bangladesh.

Phone: 880-2-831 6729, 831 2049, 831 5504, 933 5060
Cell: +88 01713 375770, 01713 375755, 01755 512516

E-mail: machinery@dysin.com, Web: www.dysin.com



Q-SUN Xe-2 chamber interior



We make testing simple.



Q-Lab Corporation, USA

Complies with all international colorfastness to light test standards

Printing Today
November 2019

Complies with all international colorfastness to light test standards

Q-SUN

Xe-2 Xenon Test Chamber



Q-SUN Xe-2 chamber interior



 **Dysin**

Represented in Bangladesh by:

 **Dysin International Ltd.**

Machinery Division

Corporate Head Office

Skylark Point (3rd Floor), 24/A Bijoy Nogar, 175 Shohid Syed Nazrul Islam Soronee, Dhaka-1000. Bangladesh.

Phone: 880-2-831 6729, 831 2049, 831 5504, 933 5060

Cell: +88 01713 375770, 01713 375755, 01755 512516

E-mail: machinery@dysin.com, Web: www.dysin.com

We make testing simple.



Q-Lab Corporation, USA

Factors constitute placement printing pricing

Monirul Alam, Sr. General Manager-Printing, DYSIN-CHEM LTD

Printing is a value addition to basic garments. Embroidery, sequins, studs, high-frequency welding, laser etc. are also a valuable addition to basic garments. This value addition creates a gimmick appeals to viewers, which creates the needs of that particular garments, even it is not necessary to buy in some cases. On value, addition printing plays a major role.

Printing on fabrics is generally accomplished in 2 ways as AOP (All Over Printing) and the other is PP (Placement Printing). In both processes, modernization is added as well as conventional system prevails. In both processes' modern techniques as digital printing and sublimation are added. AOP generally is done with reactive dyes and pigment printing and in some cases, added some fashionable effects as pearl, glitter, metallic or foam.

Thus, it is having fewer varieties and particularly pricing is on per

yard or per kilogram basis. On the other hand, placement printing uses many types of chemicals thus having many varieties and costing also varies according to varieties. Here we will light up the inherent factors, which affect the pricing of placement printing.

Any placement printing price consists of 3 factors as, chemical cost, overhead cost and margin. Chemicals cost affects from 20 to 40% on the whole price. Because it depends on the size of the printing or actual measurement of the printing area, chemical type such as rubberized printing or plastisol printing, etc., any extraneous materials are added on to it or not such as foil, flock etc.

Nowadays, modern placement printing is having a high overhead cost. Because modern placement printing shop consists of modern machinery such as circular (Carousal), oval type printing press, pre-press machines such as image setters, coating, exposing

and wash up booths. Many post presses machines such as conveyor, heat-press, rotary press for sublimation, various cleaning equipment such as flock cleaning, etc. These actually consume a huge amount of electricity, which also a big factor of high overhead expenses, apart from the overall interest on capital and depreciation value of printing machinery.

In Bangladesh, the placement printing factories generally combines manual printing and machinery printing. In the manual printing segment, a considerable number of workers are needed to run that section, which also a substantial portion of overhead expenses. Generally, in placement printing, 30-40% is overhead expenses.

Back in the year 1986-87, when Placement Printing introduced into Bangladesh water-base pigment and elastic pigment printing (generally called rubberized printing) prevails in the market till the year 2000. After the year 2000, many kinds of chemicals came to the placement printing environment to cope up with the requirement of combination fabrics such as cotton-lycra, poly-cotton, or only polyester to match up the fashion requirement from brands.

From the year 2004 circular printing machine added to the conventional structure of placement printing (manual printing) environment, which also created to introduce new types of printing chemicals requirement such as plastisol printing.

Now in Bangladesh, 100% cotton t-shirts to lycra mix ladies garments to outerwear even tent also printed. Which creates the need to use various types of printing chemicals such as conventional water-base pigment printing, elastic pigment printing, dry discharge printing, plastisol base printing, solvent base

Editorial

printing, silicone base printing, printing in high acidic media such as burn out printing and many fashionable effects on each type of printing.

Considering the price of each chemical type, conventional water-based pigment and elastic pigment (rubberized) type printing has less price than all other chemical types. Discharge is another type of conventional water-base pigment printing, which uses an activator to destroy the colored portion of the fabrics and with a binder, the pigment is adhered to the destroyed portion of the color and makes it a different color than original fabric color.

Its chemical price is little higher than regular pigment or elastic pigment. For the betterment of the environment and meeting chemical restriction of brands now plastisol type printing requirements are all converted to PVC and phthalate-free plastisol printing requirement. Plastisol which meeting the environmental and brands' chemical restriction, resides at the higher price side of printing chemicals. Generally, twice to thrice than pigment and elastic pigment type price. But mileage is more than elastic pigment type.

Similarly, solvent base chemicals cost also high as like PVC and phthalate-free plastisol but mileage is more. As it is applied in water repellent or waterproof fabrics such as outer wears or tent, hence brand's price allocation for this type of print also high.

Silicone, another type of chemical which also high costly but uses to create a special effect or special characteristics requirements such as anti-slippery, high-frequency puff or create special density effect. If any extraneous materials are attached with some kind of



Figure: Manufacturers are having difficulties in modern placement printing due to a high overhead cost.

adhesive to garment to make the garments lucrative such as foils or flock, then these add up to the final cost of the price, even though the adhesive may be particular type-water base or plastisol base. If the size is bigger, then extraneous materials cost is much more than conventional water-base pigment or water base elastic printing chemicals.

There are a myriad number of special fashion requirements in placement printing. From Glass beads (these beads are actually made with glass), which is attached in the fabrics with special type adhesive or caviar beads (made with plastics) to rock type texture effect, from glitters to leather-like effect, from curved type jell to pin type high density, fashion effects are immense.

This is beyond the limit of the article to discuss the price of each type of fashion effect. We can summarize in this way that fashion effects can be produced with one category of chemical types such as plastisol or can be produced with a multi-category of printing chemicals such as discharge and plastisol type-together. These combinations not only restricted to only pigment or plastisol but also can be combined with others. Pricing is done on the basis of chemical type it has been used

to create the effect. If multi-type chemicals have been used then it needs to be calculated portion-wise. Then combining them to get the real costing of particular fashion effects.

In summary, generally placement printing pricing system, 1/3 expenses are considered as chemical costing, 1/3 as overhead, some portions are considered as a normal loss (Not more than 5%) and rest is operational earning. But the last couple of years' due to worldwide recessions, brands are always pressuring to the factories for reducing the price. As a result, many factories operational earnings reduced to 10% or less.

Author



Monirul Alam

Sr. General Manager-Printing,
DYSIN-CHEM LTD



Color Style Bangladesh Limited

Manufacturer, Importer, Indentor & Supplier of Dyes, Chemicals & Pigments

REPRINT RW

Solvent free ready made printing white paste with excellent white effect and very good coverage

OUR CREATION IS YOUR DESIRE...

Sister concern



Certified by:



Compliance with:



INDITEX

ZDHC

Corporate office:

Garib-E-Newaz Avenue,
House# 03 Naheyen (4th & 5th Floor)
Sector# 11, Uttara, Dhaka-1230.

☎ : +880248952957

☎ : +880248951473

✉ : info@colorstylebd.com

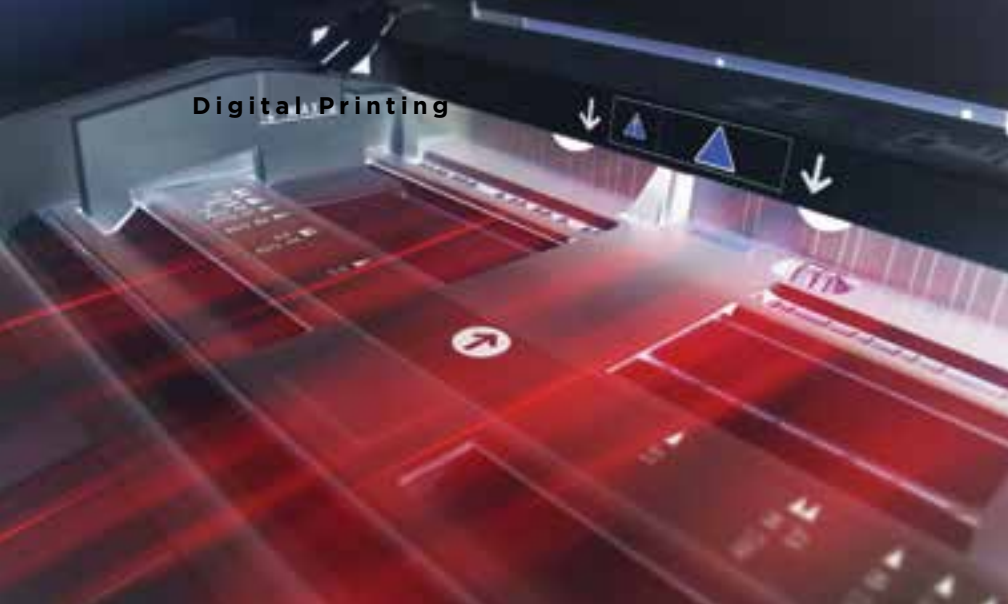
Chattogram office:

T. K Square
House# 22, Mirzapool, Shulok Bahar,
Panchlaish, Chattogram-4203.

Factory:

360-361, Bashaid, Ashulia
Savar, Dhaka-1341.

🌐 www.colorstylebd.com



Digital textile printing ink market to reach US \$2.1 bn by 2023

Desk Report

With the evolution of industry 4.0, the digital textile printing ink technology is constantly crossing new boundaries. According to alliedmarketresearch global digital textile printing inks market was valued at US\$698 million in 2016, and is expected to reach US\$2.1 billion by 2023, registering a CAGR of 17.2% from 2017 to 2023.

The report said that the reactive type of inks has occupied more than one-fourth of the market in 2016 and is expected to grow at a CAGR of 17.0% from 2017 to 2023.

The pigment type of inks is projected to grow at a CAGR of 18.8% during the forecast period.

By application, display and others segment occupied more than half share in 2016. The North America digital textile printing inks market is expected to grow at a CAGR of 17.6% during the forecast period.

In Europe, the direct disperse type of inks are expected to grow at a CAGR of 17.2% from 2017 to 2023.

In Asia-Pacific, the application of digital textile printing inks market in household segment is anticipated to grow at a CAGR of 20.7% during the forecast period.

The rapid growth in urbanization coupled with upsurge in demand for corporate branding and advertisement has propelled the market for digital textile inks.

The sublimation ink segment has observed major demand due to increase in demand for dye-sublimation printer in computer printing applications.

Furthermore, the demand for pigment-based inks is anticipated to growth due to its excellent

archival print life coupled with color stability. Based on application, the display segment has perceived major growth in 2016 owing to increase in demand for touch panels and special effects applications.

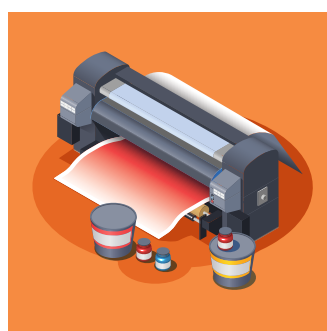
However, clothing and household segments are expected to create lucrative growth opportunities for digital printing inks market owing to increase in textile and household decorative applications.

The inks for digital textile printing market, which is highly competitive, consists of a few major players. Globally in terms of market share, some of the major players are dominating the market. Such as Dupont, Huntsman, JK Group, Kornit, DyStar, SPGprints, BASF, Jay Chemical, Marabu, Dow Corning, EFI, Sensient, Magna Colours, Anajet, Print-Rite, Lanyu, Hongsam, INKBANK, TrendVision, INKWIN.

Key players have economically invested majorly in R&D activities to develop advanced products to cater the requirements of the market. These players operating in the industry include AnaJet, BASF SE, DuPont, Huntsman Corporation, KIIAN Group, Hongsam, SPG Prints, LANYU Digital, Sawgrass, and Kornit Digital

Other prominent market players (not included in this report) are Marabu, Jay Chemicals, Dystar, Sensient Colors UK Ltd, JCD Digital Inkjet Technologies, Trendvision Technology, Magellan Corporation, and Print right Holdings.

Top market segmentation of digital textile printing market



By type	By application	By geography
Reactive	Clothing/garments	North
Acid	Household	America
Direct	Technical textiles	Europe
disperse	Display & others	Asia-Pacific
Sublimation		LAMEA
Pigments		
Others		

The new keys to successful printing environments: Efficiency and sustainability

Michael Mccoy, Regional Sales Manager, M&R Companies

There is an awakening in progress in the RMG sector of Bangladesh. According to Bangladesh Garment Manufacturers and Exporters Association (BGMEA) and Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA), the Bangladesh apparel sector, \$34 billion industry saw the closure of 133 factories in 2019, which made 62,582 workers jobless.

It was happened mainly due primarily to higher production costs. It has now become apparent that the low cost of labor and certain resources are no longer sufficient for maintaining a competitive advantage and profitability. In the current environment, as costs have risen the need for more efficiency has become paramount. Just as important, sustainability in all of its forms has become a key focus. For many of the International Fashion Brands it has become a marketing priority as well as a basic requirement for their suppliers. As a practical matter for the manufacturer, the result of increased sustainability can mean a reduction in costs.

Fortunately, a respectable effort is being made by many forward-thinking companies to address the issues of efficiency and sustainability. Unfortunately, in most operations, this effort is being focused on every department except printing. The result of

this lack of focus on the printing department is a potential bottleneck at this important link of the production chain.

The benefits of efficiency

According to the Asian Productivity Organization (APO) Database 2018, Bangladesh’s per hour productivity was valued at \$3.4 compared to \$4.1 and \$4.7 for Myanmar and Vietnam. Sri Lanka leads the region at \$15.9, a 460% higher efficiency rate than Bangladesh. Within a printing department efficiency is measured primarily by 2 variables which ultimately yield an output per labor hour.

- Capacity - the practical, potential output of equipment and labor.
- Net production - actual pieces completed within a given time period. Hourly, daily, weekly, or monthly.

Look at the Efficiency/Revenue Chart below to see the potential increases in revenue that are possible when you address the ‘Efficiency Factor’. Imagine the net positive effect this could have in your printing operation.

Local industry’s overall output efficiency is approximately 40% for the entire manufacturing

Press	Work	#Presses	Hourly net		Daily net		Weekly net		Annual net		Convert		Selling price
Hourly	Efficiency												Annual revenues
Cycles	Rate				(10 hrs)	(6 days)	48 weeks		To #DZ				@\$2 per dozen
500	50%	2	500	pcs	5000	pcs	30000	pcs	1440000	pcs	120000	dz	\$240000
500	55%	2	550	pcs	5500	pcs	33000	pcs	1584000	pcs	132000	dz	\$264000
500	60%	2	600	pcs	6000	pcs	36000	pcs	1728000	pcs	144000	dz	\$288000
500	65%	2	650	pcs	6500	pcs	39000	pcs	1872000	pcs	156000	dz	\$312000
500	70%	2	700	pcs	7000	pcs	42000	pcs	2016000	pcs	168000	dz	\$336000
500	75%	2	750	pcs	7500	pcs	45000	pcs	2160000	pcs	180000	dz	\$360000
500	80%	2	800	pcs	8000	pcs	48000	pcs	2304000	pcs	192000	dz	\$384000

Sustainable Printing

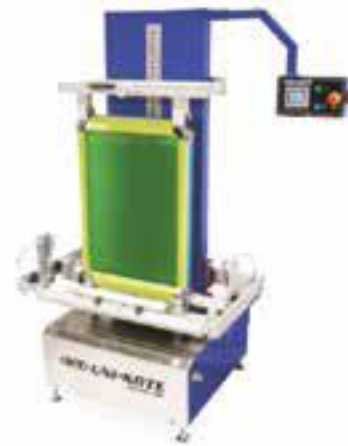
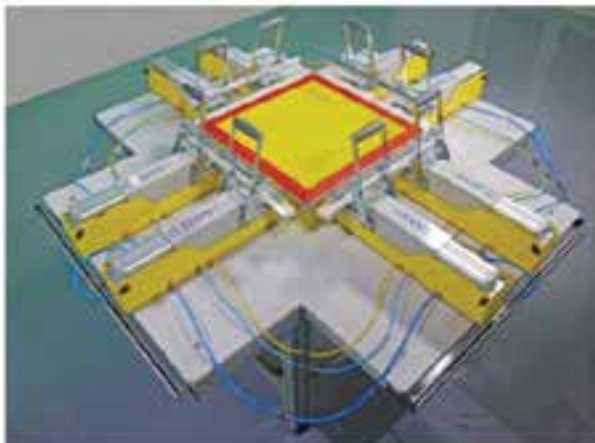
process. For the sake of this discussion regarding the printing department, let's assume a low-end efficiency rate of 50%, though it is probably below 40% in the BD market.

In the above example we'll assume 2 automatic presses working a single 10-hour shift with a selling price of \$2.00 per dozen for printing. An increase in efficiency from 50% to 70% would yield an additional \$96,000 in annual revenue. At a salary level of \$1500 annually, this increase would cover the labor cost for 64 of your current workers. As well, this additional revenue could be used for more capital purchases, further increasing capacity.

Keep in mind this is 2 machines/1 shift. The numbers at 5 machines/2 shifts? \$480,000 in additional annual revenue. This could be your results with a change of focus. Said another way, a change of focus from increasing capacity to increasing efficiency would result in dramatic increases in your output per labor hour. These levels of increase are only possible with a proper balance of effective management, the right equipment and standard procedures (Systems). At the end of the day it is your ability to identify opportunities for minimizing frictions in your workflow and reducing machine downtime that will yield the greatest returns.

After 5 years of close observation in dozens of local printing operations I've concluded that the typical solution for increasing output has been to increase capacity. This approach requires a minimal level of analysis or development of systems that address the core reasons for low output. The results of this approach are now becoming painfully obvious. A better solution is to effectively utilize available technology and develop SOPs that promote efficiency and minimize downtime. From Screen Room to Printing Press it is the introduction and utilization of technology within an integrated system that will have the greatest impact on your overall Output. It is within this context that we'll examine some of the available tools that can help to increase Efficiency and positively impact Sustainability.

Screen stretching



- **Screen mesh:** What is the average life of a screen? How often is it re-stretched? How is the used fabric disposed of? Proper stretching and gluing of quality mesh can significantly increase the working life of a screen and is only possible with the proper equipment, techniques and documentation procedures in practice. The traditional approach in the BD market is the practice of stretch, print and discard. There are 2 major problems with this approach. Increased costs because of waste and the negative impact on sustainability because of the excess amounts of material going to landfills.

Most fabric on the market is polyester and is biologically non-degradable. At the very least there should be a practice of reusing stretched screens as many times as possible before discarding. This practice alone could reduce the environmental impact of this element by a minimum of 50% with the right approach.

Screen coating

- The primary benefits of an Automatic Coating System such as the M&R Uni-Kote, are the ability to control costs, increase efficiency because of a hands-free process and realize consistent gains in quality because of automation and the ability to document and repeat a Standard Process.

DTS (Direct to Screen) imaging

- A machine such as the M&R I-Image creates a direct pipeline for artwork from the Designer's desk to the Screen Room and completely eliminates the need for film as well as being a nearly hands-free operation. In addition, LED exposure creates a huge savings in energy consumption for this part of the process. A 1-year study in Australia based on 100 screens per day demonstrated the elimination of 12,000 meters of film annually that would typically be destined for a landfill. An additional powerful benefit is its compatibility with a Screen Room to Auto Press Pre-Registration System that has the potential to reduce a typical 1 to 2-hour setup time (Downtime) down to 30 minutes or less when proper procedures are put into practice. Consider the 5-machine scenario above with 2 setups per machine per day.



That is an average of 15 machine hours per day reduced to 5 hours. A net gain of 10 machine hours/day X 350 pcs/hr X 6 days/wk. Based on 48 weeks/year, this could yield an additional 1,000,000 prints or \$166,666 using the same \$2 selling price. This is only 2 setups-1 shift. Calculate the numbers for yourself based on your reality. The potential gains are astronomical!

Automatic screen image washout:

- The same 1-year study referenced above with an average production of 100 screens per day concluded that 120,000 liters of water was consumed using a traditional image washout process. An Automatic Image Washout Unit such as the M&R Eco-Rinse reduced this water consumption to 3600 liters. A 97% reduction. Again, the hands-free operation maximizes efficiency and creates the ability to document and repeat a Standard Process.
- Ink and chemicals: Proper management of your Color Room should be a high priority. The mixing, distribution and in-screen maintenance of your mixed color requires a high level of detailed management to minimize cost and reduce waste. What are the quantities and value of mixed color in your storage area? There is a high probability that no one knows the answer to this question and after a certain amount of time, 100% of this inventory will become waste due to the absence of a comprehensive ink/color management system. What is the method of disposal? What is the true cost of this waste? How does this waste affect your Cost per Printed Unit? Within the context of this discussion, what is your Color Room's Impact on Profitability and Sustainability.
- Energy consumption- The largest consumers of this resource are:

Curing dryers. How efficient are yours? Low cost dryers are typically very inefficient with regards to Heat Loss and their ability to properly cure water-based inks. In addition, they contribute to the elevated temperatures in the working area.

wFlash curing units. How efficient are yours? A locally conducted comparison study documented a 40% difference in energy consumption.

In a market of this size, the cumulative effect of

every producer reducing their Environmental Impact is substantial. Beginning with Sampling and Development - documentation, detailed management and handling practices should be closely analyzed and appropriate SOPs developed that promote Efficiency, minimize Waste and address Sustainability.

These are just a few areas in your printing departments where opportunities for improvements in Efficiency and Sustainability can surely be identified. Finally, we'll take a brief look at the latest technology that promises the single largest positive impact in the history of the process. This latest advancement is poised to revolutionize the textile printing world in a dramatic way.

The impact of digital technology

From screen production to finished garments the digital revolution is having a substantial impact. With the incorporation of Digital into the printing process, a minimum number of screens is required for producing high quality prints that are out of the reach of 98% of printers in the world.

- High quality, complex prints are possible with as few as 3 screens as opposed to 10 to 15 screens. This does not even consider the number of screens necessary for Sampling and Development.
- The need for custom mixed colors is eliminated, minimizing the necessity of large inventories of product typically necessary for conventional printing.
- Mixed color inventory is nearly eliminated, reducing the possibility of large amounts of waste and lowering the actual cost of printed units.
- Reducing the number of screens automatically reduces the number of Flash stations necessary for high quality print production. This has a direct impact on energy consumption.
- Reducing the number of screens reduces consumption of water for screen processing.
- Reducing the total number of screens automatically lowers the cost of Screen Fabric.

The final results are consistent, production friendly quality and more importantly, a substantial reduction in resources, consumables and labor. In other words, efficient, sustainable productivity.

Prospect of 3D fabric in global fashion industry

Rafiul Islam

3D fabric is the latest invention of the textile sector. Nowadays 3D fabric playing a vital role in making spacesuits and other experiments going on for using this fabric. 3D fabrics are fabrics that can be measured in three dimensions while conventional fabrics measure in two dimensions. The fabric is defined as a single fabric system, the material of which is arranged in yarn that seems to have been folded into three interconnected layers. It is basically made of solid structure and solid with multiple layers.



Figure: The growth trend of 3D fabric will be continuing as demand for technical textile is increasing.

Reason for making 3D cloth

The technological use of textile products is currently playing an important role. Single and 2D textiles have been widely used. An important feature of 2D lamination is the direction of fiber and it has difficulty in processing. Skills are also required for the processes.

3D fabrications can be provided to overcome the disadvantages of 2D. As:

1. With 3D knitting net can produce its fabrics in flames greatly reducing material costs and time

2. The density of the medium can be adjusted by controlling the amount of Z-Yarn
3. 3D fabric has the ability to withstand damage
4. 3D blends provide better paste effect and mechanical properties than 2D layers
5. Shear rigidity of 3D woven fabrics has very low rigidity resulting in very good creativity

Classification of 3D fabric

Geometrically

- 3D solid
- Multilayer, orthogonal
- 3D hollow
- Flat surface, uneven surface
- 3D Shell
- Based on knitting
- 3D nodal

Production method

- 3D fabrics can be produced by the following methods/ principles:
- Stitching operation
- Multilayer principle
- Orthogonal principle
- Angle interlock principle
- Dual direction shedding method

Application of 3D fabric

3D Fabric has many uses and 3D woven fabrics are being used in many applications, like construction, automotive, ballistic and carbon fiber.

In treatment, technologies such as artificial veins, arteries, orthopedic tubes, scalp-folding, artificial joints and organs, etc.

It is used in lightweight construction such as the reinforced division of automotive engineering and aeronautics; construction of pipelines; shin guard for soccer,

defensive headgear for diving in the sky, high-speed water sports.

3D woven fabric composites are the ideal material for aircraft and aerospace applications. The weight ratio requires high-strength. They are used in space structures such as missiles, rockets and satellites. Structural components used in space include trusses, platforms, shells, ships and tanks.

Why Bangladesh should produce 3D fabric

In our country most of the textile industry produces a regular type of garments such as T-shirt, jeans, shirt etc. but they are not trying to produce technical textiles such as 3D fabric. For this type of phenomenon our textile sector losing our brand value that is made in Bangladesh. To cope up with the new era we can take major steps for producing 3D fabric that will take our textile sector in a new era.

Market value of 3D fabric

The global 3d fabric market was valued at US\$5 million in 2018 and it will reach US\$20 million by the end of 2025, according to MarketLine.

List of the top manufacturers of the 3D fabric market

- 3D Weaving
- Sigmatex
- Textum
- Cetriko
- Cristex

Industry experts are thinking that the growth trend will be continuing as demand for technical textile is increasing. So, Bangladesh can produce this type of high value-added fabrics and garments as well.