The new innovation in Textile with Melange: Case Study

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Abstract: few years back the textile sector in Bangladesh uses the distinctive slogans against the ready made garments only fabrics & yarn dyeing for garments. That the professional body of textile sector knows only yarn and fabrics can dyeing but not fibers dyeing for make colorable yarn produce and reduce the process cost by partially use dyed fibers in yarn processing mills. For this reason it was highly unsatisfactory for the textile society and economical safety. This paper explores some of the important factors that affect to the textile sector in the present's scenario and the degree of knowledge. Finally this paper attempts to find out some technique for development the colorable textile sector (yarn manufacturing) in the ready made garments sector in Bangladesh.

Keywords: Cost effective, Time consumption, less wastage, more shades, higher strength, better performance, less fiber damage, more smooth and so on.

Introduction: not very long ago the JC Penny advises to the Pakistani textile professionals in Pakistany Textile sector to produce some shade by making colorable yarn with dyed fibers in deferent ratio but they fail to achieve make such shade and then it come to Bangladesh and a large company like BEXIMCO Group and became success and make more then fifty shade in deferent ratio with dyed fibers and gray fibers and named that

MELANGE

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BEXTEX LTD. (Yarn-1), Tatki, Taraboo, rupgonj, Narayangonj.

Mélange: n. mixture, medley. [French mêler mix]
melanin n. dark pigment in the hair, skin, etc., causing tanning in sunlight. [Greek melas black]

Definition:
makes a shade with the coloring structure of a fabric with coloring yarn form a deferent structure.
Composition:
White/gray yarn mix with color yarn or color cotton with gray cotton or color yarn with color yarn (deferent shade percentage of color) in a fabrics.

It is the new innovation in Bangladesh by Beximco group at BEXTEX LTD (yarn –1) former Padma textile mills Ltd. (Plant-1) with the help of Dr. Rana Implementation by some Textile Graduate/Expert in Bangladesh like Mr. Liakat Hossain (Sr. Mgr QCA), Bazlur Rashid (Mgr.Prod),

Cost effective: That this process is to make a simple percentage of fiber need to dyed so here less dyestuff using and major portion of fiber without dyed so partially it need to dyed cost like(10%color +90% grey, here only 10% fiber need to dyed and dyes cost only 10% and 90% safe)
Time consumption: that this process only a simple percentage of fiber need to dyed so it time required only that percentage rest of all without dyed so it need less time.

Less wastage: percentage of fiber needs to dye so waste of that portion is required so processing wastage is less

More shades: that it depend upon only color fiber mixing ratio so we can make more shade within only mixing deferent portion of color fiber to the composition. And make many shades.

Higher strength: that dyed fiber process at spinning mills so dyed fibers stronger then un dyed fiber processing time loosing strength is very low.

Better performance: melange that is dyed fiber is stronger then un dyed fiber because during dyeing time single fiber absorb dyes and make itself stronger

Less fiber damage: dyed fiber is heavier then un dyed fiber so during process time it sinlge fiber damage very small portion.

Properties of the Cotton:

Identity:- Cotton is the seeds fiber, comes from the plants. Cotton has become the most important fiber in the world. Cotton is the backbone of the world textile trade. Many of our everyday textile fabrics one made from cotton. Cotton fabrics our hard –weaving and capable of infinite verity of weave and coloring.

Cotton is chemically cellulose fiber. Cotton fiber is attached to the seeds of plants of the mallow family.

Cotton producing countries:-

1.USA	2.Rusisa	3.China	4.India	8. Pakistan	11.Argentina
12.Sudan	13.Syria	14.Iran	15.Spain	16.Nigeria	17.Tanzania
18.Estern Europe	19.South Africa	20.Koria	21.Australia and	22.Mayanmer	

1. **Formation of cotton fiber:-**

Cotton grows inside the seedpods of a wide verity of plant species. The cotton plant is annual crop and it reaches a height of 4- 6 of Cotton seeds is unusually sown is spring the young plants are thinned –out later into rows. Indue course, may creamy white flowers appear, which turn pink, towards the end of the first day. On the 3rd –day, The flower withers and dues to leave small green seedpod or boll.

The cotton fibers form on the plants as long hair attached to seeds inside the boll. As the plant grows the fibers are packed lightly into the boll, when it reaches maturity. The boll bursts and the cotton appears as- a soft-wad of fine fibers.

2. Fiber growth :- During the first week after the cotton plant has flowered. Hundreds of fobre appear from the seed coat. For several days more and more young fibers continue to thirst their weavy – out of the seed unit. Each seed is caring – out a 'Coop' of thousand of individual fibers. For 6 days the growth of young cotton fiber is sow .Then for the next 15 days it is more rapid. The fiber may reach a length equal to 2000 times its diameter during this those week growing period. Then for 3 days, it grows more slowly again until the lengthwise growth covers to a sudden stop. During its period of rapid elongation, the cotton fiber is in the form of a this, walled till of cellulose with one closed and the other attached to the seed. It is filled with protoplasn and liquid. Nutrients which vessels of the plant.

3. **Growth rings:-** When the cotton fiber stops its lengthwise growth, The cotton fibers begins to strength an it internal structure , layers of cellulose are added one after another to the thin cellulose membrane from inside the cell. Each day seen a new layer deposited, creating a structs similar is crones – section to the growth ring in a tree. In case of cotton fiber, the inner most layer are the youngest ones. Where as, the outer most layers are the young in the tree. Each grow thing – ring is the cotton fiber corresponds to a day of growth and cellulose- deposition. Every ring countries, in fast of, two layers, one solid and compact and the other porous.

   The cellulose is laid- down in the form spiral fibrils or ling threads some 1000 or more to each ring. The deposition of cellulose centaurs for about 24 days so far.

Primary wall

1. Wax/ pectin's
2. Outer Fibrils layer
3. Inner Fibrils layer

Secondary wall

1. Outer boundary
2. Fibrils tape
3. Fibrils bundle.
4. Single fibrils

4. Effect of growthing condition:-

In ordinary commercial cotton, about ¼ of the fibers will be immature. Sometimes pro portion of matter cotton reaches 90%, but such high "Maturity Cotton "are rare. In commercial upland cotton, Maturity counts of more then 84% are described an . Hard- bodical average maturity tie between 68% and 76% and cotton with maturity counts below about 67% are regerdel an immature or weak or soft- bodiead.

Micro structure of cotton:

Length : 1cm to 6.2 cm (.5 inch to 2 inch)
Diameter : 11μM to 22 μM
Conveolutions- sixty per centimeter
Colour –Generally white, may be creamy or brown
Length width ratio 6000 : 1 to 350:1
Light reflection – low luster, dull appearance.

Properties	Cotton	Jute	Polyester	Rayon	Silk		
Moisture	8.5%	13.5%					
Color	Wh,Cre	Y, Br, Gra					
Dia		.015-.002					
L : W		90 : 1					
Organic soluv.		Resist.					
Dye ability		Easy					
Heat		Burnt					
Conductivity		Moderate					
Strength		T 3.5–5 g/d					
Elasticity		1.8% rc nil					
Bot. Name		Capsularies And Oilitorious					
Nature		Bast					
Dyes							

Composition one

.Fibers	**Handle**	**Safe**	**Ironing Temp^{0}C**	**Groups**	**Dyes**	
Cotton	**Medium to hard**	**Crisp**	**218**	**--OH, -CH2OH**	**DIRECT, Vat, Sulpher,**	
Flax	**Hard**	**Very Crisp**	**232**		**BASIC**	

Wool	**Medium**	**Warm**	**149**	**-COOH, NH2, CONH2**	**Reactive, Acid**	
Silk	**Medium**	**Warm**	**120**	**-COOH, NH2, CONH2**	**Reactive, Vat, Acid**	
Viscose	**Medium**	**Limp**	**190**	**-OH**	**Reactive**	
Acetate	**Very Soft**	**Limp**	**177**	**-OH, -COOH**	**Disperse,**	
Acrylic	**Soft**	**Waxy**	**148 – 175**	**-SO3H, -COOH, -OSO3H**	**Azoic, Disperse**	
Nylon	**Medium to hard**	**Waxy**	**148 – 175**	**-COOH, NH2, CONH2**	**Azoic, Acid**	
Polyester	**Medium to hard**	**Waxy**	**148 – 175**	**-OH, -COOH**	**Azoic, Disperse**	
Elastomeric	**Medium**	**Waxy**	**130**			

Composition Two

Manufactured fibers	**Composition**
Acetate	**Cellulose with at least 92% weight of acetate hydroxyl groups.**
Acrylic	**At least 85% by weight of acrylonitrile**
Azion	**Regenerated protein e.g. casein, soya or groundnut**
Modacry	**Less then 85% but more then 35 % by weight of acrylonitrile**
Nylon	**Polyamides**
Nitrile	**At least 85% by weight of vinylidene dinitrile.**
Olefin	
Polyester	
Rayon	
Saran	
Spadex	
Triacetate	
Vinal	
Vinyon	
Aramid	
Novoloid	

Composition for Melange yarn:

Comp-1: lot 08/06 Light eye brown 40% Eye Brown 8% Grey Fiber 52 %	Comp-2: lot 09/06 Light green fiber 25 % Grey fiber 75 %	Comp-3: lot 10/06 Green 85% Grey 15%	Comp-4: lot 11/06 Denim 35% Grey fiber 65 %
Comp-5: lot 14/06 Chestnut Brown fiber 15% Grey fiber 85%	Comp-6: lot 12/06 Stone fiber 12% Grey fiber 88%	Copm-7: lot 13/06 Oatmeal Heather 5% Grey fiber 95%	Comp-8: lot 15/06 Black fiber 2% Red Fiber 75% Grey fiber 23%
Comp-9: lot 00/06 Royal fiber 60% Navy fiber 15% Grey fiber 25%	Comp-10: lot .. /06 Black fiber 8% Navy fiber 70% Grey fiber 22%	Comp-11: lot 26/06 Light eye brown 65% Eye Brown 10% Light Brown 5% Grey Fiber 20 %	Comp-12: lot 27/06 Light green fiber 70 % Light brown 5% Grey fiber 25 %
Comp-13: lot 22/06	Comp-14: lot 19/06	Comp-15: lot 20/06	Comp-16: lot 23/06

Green fiber 85% Light Green fiber 5% Grey Fiber 10%	Stone fiber 40% Eye Brown fiber 5% Grey fiber 55%	Chestnut Brown 10 % Light eye brown 35% Grey fiber 55%	Chestnut Brown 8 % Stone fiber 02% Grey fiber 90%
Comp-17: lot …/06 Roay fiber 15% Navy fiber 60% Grey 25%	Comp-18: lot 28/06 Royal fiber 5% Navy fiber 80% Black fiber 03 Grey fib 12%	Comp-19: lot 24/06 Green fiber 30% Light green 55% Grey fib 15%	Comp-20: lot 21/06 Orange fiber 85% Grey fiber 15%
Comp-21: lot 25/06 Black fib 50% Raddish Brown fib 30% Grey fib 20%	Comp-22: lot 15/06	Comp-5: lot 15/06	Comp-5: lot 15/06

 # <u>Cotton cultivation:-</u>

1. Formation of cotton fiber.
2. Fiber growth
3. Grow rings
4. Effect of growth condition.

<u>Commercial verities of cotton:-</u>

Commercial cotton may be classified into 3 categories with reference to staple length.

1.**<u>Staple length (1-1' 1/2''):-</u>** Includes the fine lustrous fibers which form the top quality of cotton the fibers are generally of 10-15μ in diameter (1.1-1.8 Tex), be a Island cotton. Egyptian and American Pima (American-Egyptian) are in its category.

Textile:

It is a very widely used term, which included al kinds of fibers, yarn, fabrics and Machinery to process them.

Textile —(often in pl.) fabric, cloth, or fibrous material, esp. woven. 2 fibre, yarn. —adj. 1 of weaving or cloth (textile industry). 2 woven (textile fabrics). [Latin: related to *text]

esp. transforming it from one format to another.

texture —n. 1 feel or appearance of a surface or substance. 2 arrangement of threads etc. in textile fabric. —v. (-ring) (usu. as textured adj.) 1 provide with a texture. 2 (of vegetable protein) provide with a texture resembling meat. textural

Textile fiber:

Fibers are viable hair like substances that are very small in diameter in relation to their length. They are the fundamental unit used in the making of textile yarn and fabrics

Which has the following properties can call textile fiber. Like that:

- Fineness
- Flexible
- Observance
- Shinning
- Adhering property

Etc.

Natural Fibers: Wool, Silk, and specially hair fibers
Cotton, flax, jute, hemp, pineapple, abaca, sisal, kapok, asbestos.

Man made fibers: Rayon , acetate, Nylon, Acrylic, Mod acrylic, polyester olefin, spandex, saran, glass, Vinyl, Vinyon, Azlon, Metallic, Lastrile, Nytril.

Properties: length, average length, effective length, staple length, short length =<2", medium length =2.4:, long length =>2.4"

a.) The effective length:
Strength:
Processing:
Appearance:

b) Strength and extension:
c) flexibility:
d) cohesiveness:
e) uniformoty:
f) finness:
g) cross section:
crimp:
h) Eleasticity:
i) Resiliency
j) Toughness
k) Work of rupture:
l) Appearance:
m) Density:

Chemical property:
a) water
b) absorbency:
c) acid:
d) alkai:
e) Heat
f) Sun light
g) Moisture:
Filament, Yarn

COUNT SYSTEMS

Tex - The Tex system is a direct system and express the fineness in grams per kilometer. Thus 1tex = 1g / km.

Millitex (Tex) = 0.001g/km.
Decitex (Tex) = 0.1 g/ km.
Kilotex (Tex) = 1000g/ km.

Den - This is the other direct system and the unit denier express the fineness in grams per 9000 meters It is often used to describe man-made fibers thus "1.4 den polyester".
NEC- perhaps the most widely used indirect system the English Cotton Count
(NEC) is defined as the number of lengths of 840 yards each that weight one pound.
Nm - Also an indirect system the metric count (Nm) is defined as the number of lengths of 1000 meters each that weigh one kilogram.
Nek - The English wool count is an indirect system used for worsted yarns and is defined as the number of lengths of 560 yards each that weight one pound.

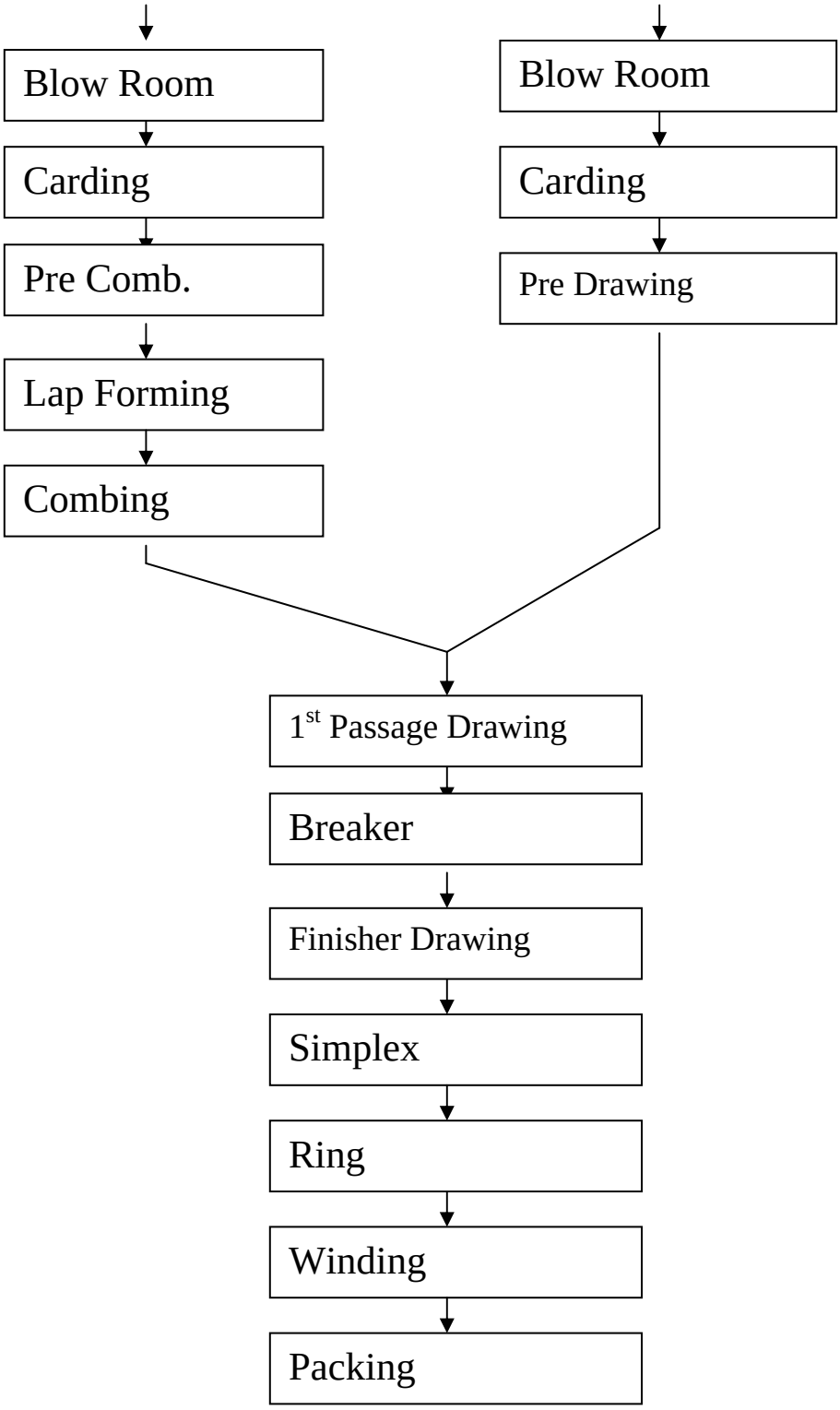
Spinning Process Flowchart

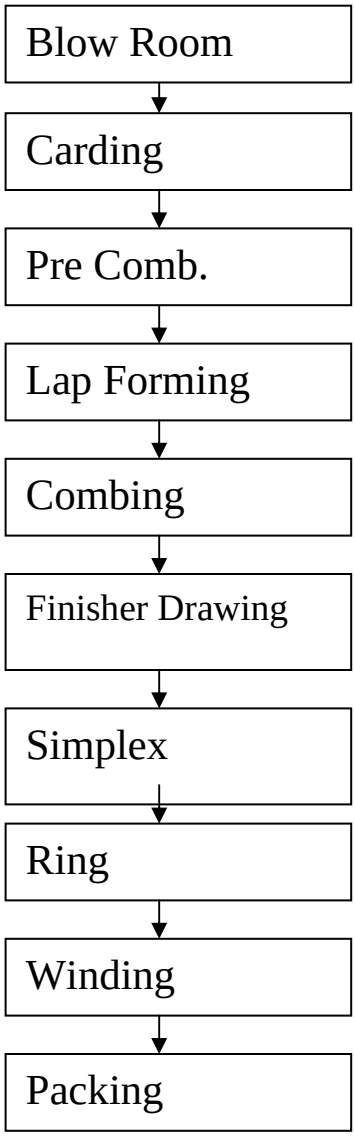
Cotton Polyester Blend Yarn (DB)

Cotton Mixing

Polyester Mixing

Cotton Combed Yarn




Blow Room
Carding
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Lap Forming
Combing
Finisher Drawing
Simplex
Ring
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