Printex
Your Printing Partners

evolve

Printex Monthly News Bulletin
February 2017 | Issue 49

Tips of the MONTH

Don't judge each day by the harvest you reap but by the seeds that you plant.
~ Robert Louis Stevenson

Forget about the consequences of failure. Failure is only a temporary change in direction to set you straight for your next success.
Denis Waitley

It is the province of knowledge to speak, and it is the privilege of wisdom to listen.
~ Oliver Wendell Holmes

Sometimes it is better to lose and do the right thing than to win and do the wrong thing.
~ Anthony Charles Lynton Blair

There are two primary choices in life: to accept conditions as they exist, or accept the responsibility for changing them.
~ Denis Waitley

MONOFILAMENT POLYESTER MESH (DP SERIES)

TECHNICAL DATA

Type	Color	Mesh Count		Weave	Thread Diameter	Mesh Opening	Open Area	Thickness	Theoretic Ink Volume	Weight
		/cm	/inch	(:)	(μm)	(μm)	(%)	(μm)	(cm3/m2)	(g/m2)
DP7S	W	7	18	1:1	250	1178	68	380	258.4	94.29
DP10S	W	10	25	1:1	250	748	56	383	214.48	134.73
DP15T	W	15	38	1:1	250	413	38	415	157.7	214.69
DP24T	W	24	60	1:1	120	293	49	200	98	77.6
DP32T	W	32	83	1:1	100	208	44	150	66	74.8
DP43T	W	43	110	1:1	80	148	40	120	48	64.52
DP54T	W	54	137	1:1	64	114	37	86	31.82	52.17
DP77T	W/Y	77	195	1:1	55	66	25	86	21.5	56.57
DP100T	W/Y	100	255	1:1	40	55	30	56	16.8	37.5
DP120T	W/Y	120	305	1:1	34	44	27	51	13.77	32.3

Calculation of Theoretical ink volume(TIV) /[cm^3/m^2]

Theoretical ink volume /[cm^3/m^2] = Open Area * Mesh Thickness / 100

Threads per cm	Open Area (%)	Mesh Thickness (μm)	Theoretical ink volume /[cm^3/m^2]
15T	38	415	157.7
32T	44	150	66
43T	40	120	48
54T	37	86	31.82
64T	28	95	26.6
77T	25	86	21.5
100T	30	56	16.8
120T	27	51	13.77

Theoretical Ink Consumption

=(Print Size in cm2 * TIV in cm3/m2)/10000 *(Stroke Factor*Count of Strokes -1)/(Stroke Factor-1)*Count of Prints/1000*Specific Weight of Inks in g/cm3

Stroke Factor = 0.6

ATTENTION:

This calculation is just a very theoretical calculation!

In reality the accurate ink consumption can be higher or lower than calculated!

The influence of: squeegee, stencil ….. is not considered!

DYE BLEEDING

In order to help for Screen Printing Printer to understand correctly about Bleeding related to the substrates of 100% Polyester, Polyester Blend, Polyester/Cotton, I am going to state why we can't avoid facing constantly serious Bleeding Problem

WHAT DOES DYE BLEEDING MEAN?

Exact Description of BLEEDING used in Textile Printing Industry is Thermo-migration.

Thermo-migration is a general term, used to describe the diffusion of Disperse Dyes out of Dyed or Printed fiber During Heat Treatment and their Accumulation on the fiber surface.

Thermo-migration is a complex phenomenon which can be governed by several factors, namely, Type of Fiber, Chemical Constitution of Disperse Dye, and Disperse Content in substrate and applied Finishing Agents.

WHAT ARE DISPERSE DYES?

Disperse Dyes are Dyes used to dye polyester fiber. Disperse Dyes are insoluble in water or slightly soluble in water It has good sublime ability due to stable electronic arrangement which causes Considerable thermo-migration problem to textile embellishment with printing Ink.

IS DISPERSE DYE SUBJECT TO GAS FADING?

Certain Blue and Violet dyes containing anthraquinone structure, which are medium energy dye are subject to fading in presence of nitrous oxide which is made in nature from various sources such as open gas fire, electric heat treatment.

WHAT CAUSE THERMO-MIGRATION OF DISPERSE DYES?

As explained, there are four major factors to consider.

1. Dye Energy Level.

1-1) Low Energy Dyes

Low Molecule Weight, Small Molecules, Low Polarity, Good Affinity to Crystalline and Hydrophobic Polyester Fiber, Rapid Dyeing Rate due to higher diffusion coefficients Poor Heat Resistance Low Energy Dyes are most commonly used to dye polyester fiber Due to many considerable factors.

It is possible to dye at water boiling temperature (212°F-100°C)

Maximum Temperature to Resist Thermo-migration (212°F-100°C)

1-2) Medium Energy Dyes.

Medium Molecule Weight, Medium Polarity, Moderate Affinity Moderate Heat Resistance Maximum Temperature to Resist Thermo-migration (290°F-140°C)

1-3) High Energy Dyes

High or Large Molecule Weight, High-Polarity, Poor-Affinity (Poor Migration during Dyeing)

Low Dyeing Rate Good Heat and Sublimation Fastness

Maximum Temperature to Resist Thermo-Migration (320-360°F-160-180°C)

2- Dye Concentration on Dyed Fiber

3- Temperature and Time of Thermal Heat Treatment.

3-1) Proper Temperature of Dye Energy Level

Low Energy Dye Dyed Fabric : 212°F(100°C) or lower

Medium Energy Dye Dyed Fabric 290°F(140°C) or lower

High Energy Dye Dyed Fabric 320-340°F (160-180°C)

3-2) Pronged Duration in Fusion Process encourages Thermo-migration effect.

With increase in Treatment time, Dyes get more time for Thermo-migration From Interior to the fiber surface.

In fact, during post dyeing heat treatment to Polyester,

Several Phenomena may take place simultaneously because dissolution of the Dye inside fiber, Sublimation of Dyes, Migration of dyes from interior to the surface.

It seems from test result that migration of the dyes from interior to surface Dominated over two others.

4. Type of Finishing Agent and Their Concentrates.

The Presence of Finishing Agent accelerate Migration of the Dyes on to surface.

The amount of Dye Migration on to the surface of fiber due to post dyeing Heat treatment not only depends on to the temperature but also depends on the type of finishing agents applied.

Mostly used Finishing Agents are Silicone Emulsion, Amino Silicone and Amino Acrylate.

The Finish itself also diffuse in to the fiber at the higher temperature of Heat Treatment.

Diffusion of the finish causes a change in the micro structure of the fiber which probably leads to higher free creation.

In such circumstance, Molecules in fiber will have great mobility to diffuse out of the fiber and into the finish to the surface.

Therefore, the thermo-migration is highly dependent on the type of finish applied to fabric.

The extent of migration is less in amino silicone compared to silicone emulsion finished fabrics because silicone finish contains up to 10% surface active agent whereas amino silicone contains very little.

Through the study of disperse dyes, disperse dye dyeing process and heat treatment, Conclusion reaches no efficient methods to prevent thermo-migration from

Manufacturers of disperse dye and disperse dye dyeing industry can be found in near future. Hence, even though preventive measure is very limited, printing ink remains as last resources to encounter textile thermo-migration(dye bleeding).

IS IT POSSIBLE FOR PLASTISOL INK TO PREVENT or BLOCK THE THERMO-MIGRATION OUT OF THE SUBSTRATES made with POLYESTER, POLYESTER BLEND & other MAN-MADE FIBERS?

As explained of several factors which cause bleeding of disperse dyes and finish As long as fiber is dyed with low energy dyes and finished with silicone emulsion finish agent, Printer always has to face and worry considerable bleeding problem when printing substrates, 100% Polyester, Polyester Blend, Polyester/Cotton and other man-made fiber fabrics because the fusion temperature of current Inks, which have been used is 320-340°F (160-170°C)

Whereas, the temperature of thermo-migration of disperse dye and finish is far lower than ink fusion temperature it was found from series of tests that Thermo-migration of substrate dye beganlower than 180°F (82°C)

There may be possibility to block Dye thermos-migration (bleeding) problemIf man-made fiber is dyed with high energy dyes and finished with amino silicon and Amino acrylate finish as well as printing ink can be developed to be completely

Fused/Cured lower than 212°F (100°C)

But Printing Ink fusible at lower than the temperature of thermo-migration of low Energy Dyes and Silicone Finish cannot be developed due to the high molecular weight of PVC Resins and Plasticizers ,which need very high temperature heat treatment for compete fusion.

Gel temperature of Phthalate Free Plasticizers, Specially Eastman 168 DOTP mostly used by Ink manufacturers is normally 10°F higher than Phthalate DINP Plasticizer.

This PVC Plastisol White showed outstanding and effective result to sustain thermo- Migration of substrates, 100% Polyester, Polyester Blends, and Polyester/Cotton.

PVC alternative Plastisol Ink designed to be completely fusible between 220 and 240°F(100°-115°C) has been created. However, Test results exhibited even this lowesttemperature fusible ink is not still fully exempt from thermo-migration problem with presence of very low energy dyes such as certain Black, Blue, Green, Reds (Red 2B) and Violet as well as most real low energy sublimation dyes used for water base digital ink. More than 200 disperse dyes are available on market, but no one component black and green disperse dye are available yet. Black and Green colors are made with the mixture of various color dyes.

Accordingly, It seems Completely Blocking Bleeding on disperse dye dyed man-made textile garments printed with current Ink which are highly priced Is still on certain

limitation.

IS THERE ANY BETTER INK AVAILABLE TO HOLD EFFECTIVELY DYE THERMO-MIGRATION FOR LONG PERIODS?

There are excellent answers to eliminate or sustain thermo-migration problem for longer periods In order to solve stinky and stridulous problem, different R & D was taken from current ink formulation So many plastisol Ink colors instead of grey ink recommended by many ink manufacturers were tested to find color which may be able to suppress dye bleeding.

WHY DOES PLASTISOL WHITE INK CHANGE TO YELLOWISH SHADE WITH THERMAL HEAT TREATMENT?

When PVC Plastisol Ink is heated to 320-340°F (160-170°C), Chlorine and Hydrogen In molecules (PVC RESIN) are eliminated and is formed in Hydro-Chloride Gas (HCI).

When Titanium Dioxide (White Pigment), Titanium Substitute and filler are exposed to Hydro-Chloride Gas (HCI), White Color changes to yellowish shade.

In order to stabilize Hydro-Chloride elimination, various heat stabilizers such Zinc Oxide, ESO and others are used in plastisol ink formulation, but HCI is not completely preventive because once such decomposition starts, unstable structures are formed, which further accelerate HCI elimination.

WHY IS LOW-TEMPERATURE FUSIBLE PLASTISOL SO IMPORTANT?

Beside the issues of color shade change and thermo-migration with current high temperature fusible plastisol ink, most important thing we have overlooked since about 1970 may be serious threat to both human and environmental health.

As discussed above, when PVC Plastisol is heated up to high temperature for heat treatment, Hydrogen and Chlorine atoms are eliminated from PVC resin and is formed in hydro chloride gas (HCI)-Unavoidable Byproducts of PVC, which is considered as Dioxin, categorized as a group 1 Carcinogen by The International Agency for Research on Cancer (IARC), a branch of World Health Organization (WHO).

Carcinogenicity of HCI to human being, has been known since about 1970 when Pier Luigi Viola of The Regina Elena Institute for cancer Research in Rome found the evidence of HCI-cancer link in research for SOLVAY plant in Italy.

Dioxin is created during all phases of PVC production as well as its disposal by incineration or accidental fire.

In order to prevent or minimize hydrogen and chlorine elimination from PVC Plastisol Ink during heat treatment, the fusible temperature should be much lower than 320°F (160°C).

| Dyeing Fabric/Yarn|

Dyeing Fabric/Yarn

When dyeing any fabric/yarn the amount of dye required is always determined by the dry weight of the fabric/yarn. The dry weight of the fabric/yarn is multiplied by the % of shade required, e.g.

0.1-.5%(gm)	For pale shades
0.5- 1% (gm)	For medium shades
1-2% (gms)	For deep shades

Higher the % the darker the shade. This figure is then divided by 100

e.g. $\frac{\text{Dry weight of Fabric/Yarn x \% of shade}}{100}$

i.e. $\frac{\text{300gms x 2\%}}{100}$ =6gms Dye for a deep shade

It is impossible to repeat a color if the dye is not accurately weighed out.
Not all fabrics are prepared for dyeing or printing, some cheaper fabrics still have oils, gums and finishes in them, which were added during or after the spinning and weaving processes. These gums can resist the dye and cause patchiness and reduce the effectiveness of their fastness to light and washing. The oils and gums can be removed by washing the fabric at 90°C with 100gms of washing soda crystals.

Dyeing with Procion Dyes

For Cotton, Linen Viscose and Rayon

There are two types of Procion Dyes suitable for dyeing fabrics:

Procion M (Cold water dyes)
Procion H (Hot water dyes)
Do not mix M's and H's together

Although the M range are known as cold water dyes, they can be heated gently to a maximum of 40°C. The H range can be heated to a maximum of 90°C Boiling Procions destroys the dye and if they are heated up too quickly the fabric will not take up all the dye and the results will be pale shades.

Dyeing is normally carried out using a liquor: goods ratio of 30:1
i.e. 100gms fabric in 3 liters of water.

1 Weigh dry fabric
2 Choose % of shade required i.e.

0.1-0.5% (gm)	For pale shades
0.5- 1% (gm)	For medium shades
1-2% (gms)	For deep shades

3 Calculate amount of dye required

e.g. $\frac{\text{Dry weight of Fabric/Yarn x \% of shade}}{100}$

i.e. $\frac{\text{100gms x 2\%}}{100}$ = 2gms Dye for a deep shade

4 Paste weighed dye with cold water.
5 Soak fabric thoroughly in cold water.
6 Make up dye bath using the liquor: goods ratio of 30:1
i.e. 100gms fabric in 3 liters water.
7 Add pasted dye. Stir thoroughly then add the soaked fabric and dye for 10-15 mins
8 Add 40gms of common salt for every 1 liter of water in the dye bath in gradual quantities over a 15 min period.
9 Heat slowly (if needed) to the correct temperature (20°C for M dyes and 80°C for H dyes)
10 Add 10gms of washing soda crystals or 4gms of Sodium Carbonate for every 1 liter of water in the dye bath. Turn the material well for 1 hour.
11 Remove fabric from dye bath and rinse thoroughly in cold or warm water until it becomes reasonably clear and then treat in a solution containing 1-2 parts liquid detergent per liter of water at 60°C for 15 minutes to remove any residual
un-reacted dyestuff, followed by a thorough rinse in cold water

Dyeing with Acid Dyes

For Wool and Silk

Acid dyes are a wide range of bright colors, which are fully inter-mixable

Dyeing is normally carried out using a liquor: goods ratio of 50:1
i.e. 100gms fabric in 5 liters of hot water.

1 Weigh dry fabric

2 Choose % of shade required i.e.

0.1-0.5% (gm)	For pale shades
0.5- 1% (gm)	For medium shades
1-2% (gms)	For deep shades

3 Calculate amount of dye required

e.g. $\frac{\text{Dry weight of Fabric/Yarn x \% of shade}}{100}$

i.e. $\frac{\text{100gms x 2\%}}{100}$ = 2gms Dye for a deep shade

4 Paste weighed dye with hot water from the tap.

5 Soak fabric thoroughly in warm water.

6 Make up dye bath using the liquor: goods ratio of 50:1
i.e. 100gms fabric in 5 liters water.

7 Add Glauber's salt (Sodium Sulphate) at 10gms for every 100gms of fiber.

8 Add pasted dye. Stir thoroughly then add the presoakedfiber.

9 Heat the dye bath slowly and steadily to reach boiling point in 20mins. Note however, that with silk the temperature should not rise above 80°C

10 Add Acetic Acid, equivalent of 50mls per 100 grams of dry fiber.

11 Simmer for 30mins

12 Remove fabric from dye bath and rinse thoroughly in cold or warm water until it becomes reasonably clear and then treat in a solution containing 1-2 parts liquid detergent per liter of water at 60°C for 15 minutes to remove any residual
un-reacted dyestuff, followed by a thorough rinse in cold water.

If you are dyeing fleece be careful not to boil it or it will felt. You must also cool down the water gradually when dyeing is complete.

Dyeing with Disperse Dyes

For Acrylic, Nylon & Polyester

Acid dyes are a wide range of bright colors, which are fully inter-mixable

Dyeing is normally carried out using a liquor: goods ratio of 50:1
i.e. 100gms fabric in 5 liters of hot water.

1 Weigh dry fabric

2 Choose % of shade required i.e.

0.1-1% (gm)	For pale shades
1-2% (gm)	For medium shades
2-4% (gms)	For deep shades

3 Calculate amount of dye required

e.g. $\frac{\text{Dry weight of Fabric/Yarn x \% of shade}}{100}$

i.e. $\frac{\text{100gms x 4\%}}{100}$ = 4gms Dye for a deep shade

4 The required amount of dyestuff is stirred into 15 times its own weight of water and allowed to stand for 10 – 15 minutes with occasional stirring.

5 Soak fabric thoroughly in warm water.

6 Make up dye bath @ 50°C using the liquor: goods ratio of 50:1
i.e. 100gms fabric in 5 liters of hot water

7 Make up dye bath @ 50°C using the liquor: goods ratio of 50:1
i.e. 100gms fabric in 5 liters of hot water

8 Add pasted dye. Stir thoroughly then add the presoakedfiber.

9 Heat the bath very slowly to reach boiling point in about 30mins, then reduce the temperature to simmering.

10 Simmer at or just under boiling for 30mins

11 When dyeing is complete, remove the dye bath from the heat and allow the fibers to cool naturally in the dye liquor until they can be handled comfortably.

12 Remove fabric from dye bath and rinse thoroughly in cold or warm water until it becomes reasonably clear and then treat in a solution containing 1-2 parts liquid detergent per liter of water at 60°C for 15 minutes to remove any residual
un-reacted dyestuff, followed by a thorough rinse in cold water.

| Steaming Fabrics |

There are two steamers in the department, a sample steamer and a large star steamer. The steamer you use depends on the size of fabric you wish to steam. For fabrics that are A3 or less, use the sample steamer for everything else use the star steamer.

Sample Steamer

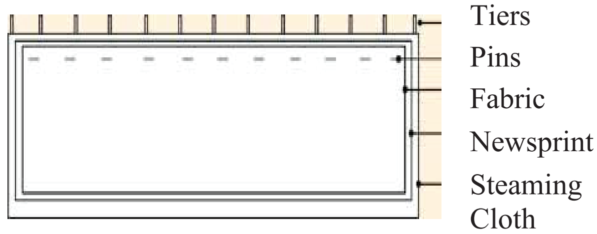
The sample steamer as the name suggests is for steaming small samples of fabric - A3 max only. Placement prints and lengths of fabric should be steamed in the Star steamer

1 Switch on ventilation fan. Switch on sample steamer. It will take approx. one hour to come up to temperature.
2 Loosely roll up your sample to be steamed in a clean sheet of newsprint. Place the rolled up fabric in the steaming basket and cover the steamer with four to six sheets of newsprint, this will help to trap the steam and stop condensation dripping back down onto your sample
3 Steam your fabric for the required time.
4 If steaming for more than 15 minutes, then replace the newsprint on top of the steamer with new dry sheets every 15 minutes
5 When finished switch off steamer and ventilation fan.

Star steamer

The star steamer is used for larger placement prints and lengths of fabric.

1 Switch on ventilation fan. Make sure all clamps on the steamer door are closed. Switch on star steamer. It will take approx. one and a half hours to come up to temperature.
2 Layout an appropriate length of steaming cloth on a table and cover it with a sheet of clean uncreased newsprint, so that the long edge of the newsprint is flush with the edge of the steaming cloth that have the tiers.
3 Lay your length of fabric to be steamed on top of the newsprint and cover it with another sheet of clean uncreased newsprint, making sure that both are flush with the edge of the steaming cloth that have the tiers.
4 With dress making pins, pin the sheets of newsprint, your fabric and the steaming cloth together along the edge of the steaming cloth that have the tiers. Pinning every 20cm. (See diagram below)



5 Trim off any excess newsprint that is out with the steaming cloth.
6 Loosely roll up the steaming cloth, making sure that none of the tiers are tucked inside.
7 Hang the steaming star on the pulley. With your left hand pick up the exposed end of the steaming cloth, with your right hand pick up the bulk of the steaming cloth. Start to hook the tiers onto the star with your left hand - starting in the center of the star then spiraling outwards.
8 Finally use some blue toweling and 'thread' them between all the tiers so there are no gaps where condensation from the steamer can fall into the steaming cloth and onto your fabric.
9 Open the door of the star steamer in the following sequence. Undo the bottom clamp. Undo the top clamp. Undo the middle clamp by pushing the door handle with your left hand and unclamping with your right. Opening the door in this manner will prevent you being scalded from steam escaping from the open door.
10 With a clean rag wipe away any condensation from the star hanger inside the door.
11 Hang the star on the star hanger, making sure it slots in and down into the star hanger.
12 Carefully close the steamer door, clamp it closed starting with the middle clamp then the top and bottom clamps
13 Leave your fabric to steam for the required time
14 Carefully open the door as in No 3 above. Using oven gloves, remove the star from the steamer and hang the star on its holding hook. Return to the steamer and close and clamp the door, remember to switch both the steamer and the ventilation fan off.
15 Unhook the steaming cloth from the star and place the star back on the window sill. Unroll the

steaming cloth and remove all pins. Remove the top sheet of newsprint.

16 Leave your print to air for 15 minutes before washing.

| Washing Digital Prints |

1 Over lock the cut edges, this will prevent your fabric from fraying during washing.

2 Wash in the twin tub machine with cold water for 15 minutes.

3 Then wash in the automatic machine for a full cycle at 30°C with a few drops of liquid detergent
(washing time is around 1 hour). During this wash, empty the twin tub machine and refill with
clean cold water.

4 Return you fabric to the twin tub machine and wash for a further 45 minutes in cold water.

5 Spin dry your fabric, empty and clean the twin tub machine.

6 Hang your fabric somewhere clean to dry.

7 Iron with a clean iron. If you can't find a clean iron - place a sheet of clean newsprint betweenthe iron and your fabric.

Generally, the auxiliaries used for printing are the same as those used in dyeing with a dye bath. These types of auxiliaries include:

Oxidizing agents (e.g. m-nitrobenzenesulphonate, sodium chlorate, hydrogen peroxide)
Reducing agents (e.g. sodium dithionite, formaldehyde sulphoxylates, thiourea dioxide, tin(II) chloride)
Wetting agents (nonionic, cationic, anionic)
Discharging agents for discharge printing (e.g. anthraquinone)
Humectants (urea, glycerin, glycols)

Carriers: (cresotinic acid methyl ester, trichlorobenzene, n-butylphthalimide in combination with other phthalimides, methylnaphthalene)
Retarders (derivatives of quaternary amines, leveling agents)
Resist agents (zinc oxide, alkalis, amines, complexing agents)
Metal complexes (copper or nickel salts of sarcosine or hydroxyethylsarcosine)
Softeners
Defoamers (e.g. silicon compounds, organic and inorganic esters, aliphatic esters, etc.)
Resins

Fiber Classification

Natural Fibers

Cellulosic Fibers	Protein Fibers
Seed Hairs e.g., Cotton Leaf fibers e.g., Sisal Bastfibers e.g. Linen Jute Ramie Hemp Fruit or Nut Fibers e.g., Coir	Wool and Silk Mohair Angora Cashmere

Semi Natural Fibers

From Regenerated Cellulosic (Wood Pulp)
Viscose Rayon Tencel Acetate Rayon Triacetate Rayon

Synthetic Fibers

Made from oil base
Polyester Terylene Nylon (Poly amide) Acrylic

Identifying Cellulosic Fibers

Burning Test

Name	Source	Near Flame	In Flame	Residue	Ordour	Type of Dye	Affinity
Cotton	Gossypium: Cotton boll	Scorches Catches fire	Burns quickly yellow flame	Grey Ash	Burnt paper	Procions	Good
Cotton (Mercerized)	As above	As above	As above	Black Ash	Burnt paper	As above	Very Good
Flax (Linen)	Linum: Flax Plant stem	Scorches catches fire	Burns quickly yellow flame	Smoulders grey ash	Burnt paper	As above but difficult to dye evenly	Poor

Jute	Jute plant steam	Scorches catches fire	Burns quickly yellow flame	Smoulders black ash	Burnt paper	Procions or Acid	Good but may fade
Sisal	Sisal plant leaf	Catches fire	Burns readily Orange	White Ash	Burnt paper	Procions or Acid	Very Good but apt to fade
			flame Blue smoke				
Ramie	Chinese nettle or Chinese grass stem	Catches fire	Burns readily Orange flame Blue smoke	Black or Grey Ash	Burnt paper	As for Cotton	Good
Hemp	Cannabis sativa or Cannabis indica stem	Begins to burn	Burns readily Yellow flame	White Ash	Burnt paper	Procions or Acid	Good

Identifying Protein Fibers
Burning Test

Name	Source	Near Flame	In Flame	Residue	Odor	Type of Dye	Affinity
Wool	Sheep	Smoulders	Burns steadily slight sizzle blue/grey smoke	Crisp Black inflated bead easily crushed	Burnt Hair	Acid dyes	Very Good
Mohair	Angora goat	As for Wool	As for Wool	As for Wool	As for Wool	Acid dyes	Excellent
Alpaca	South American camel, Llama family	As for Wool	As for Wool	As for Wool	As for Wool	As for Wool	Good
Cashmere	Tibetan or Kashmir goat	As for Wool	As for Wool	As for Wool	As for Wool	As for Wool	Very Good
Angora	Angora rabbit	As for Wool	As for Wool	As for Wool	As for Wool	As for Wool	Good
Samoyed, Huskeyetc	Dog	As for Wool	As for Wool	As for Wool	As for Wool	As for Wool	Good
Silk Bombyx	Cultivated silkworm	Smoulders	Burns readily slight sizzle	Crisp Black inflated mass	As for Wool	Acid dyes, Procions, Direct & Basics	Excellent
Silk	Wild Silkworm	As above	As above	As above	As for Wool	As above	Excellent

Identifying Man Made Fibers
Burning Test

Name	Source	Near Flame	In Flame	Residue	Odor	Type of Dye	Affinity
Rayon	Viscose: Wood pulp	Burns	Burns quickly yellow flame	Feathery Ash	Burnt paper	Disperse	Good
Acetate Rayon	Acetate: wood pulp	Melts	Splutters & burns quickly	Irregular charred bead	Burnt paper. Vinegar	Disperse	Fairly Good
TricelArnel	Tri-acetate: wood pulp acid	Shrinks & fuses	Burns quickly Melts & drips	As above	As above	Disperse	Fairly Good
Nylon	Poly amide: coal &petroleum	Shrinks	Melts, drips & froths	Hard greyish fawn bead	-------	Disperse	Good
Terylene	Polyester: petroleum& anti-freeze	Shrinks	Softens & melts, black smoke with fawn bead	Hard irregular bead	-------	Disperse	Needs high temperatures
Courtelle, Acrilan Orlon	Acrylic: Ammonia propylene & oxygen	Shrinks & melts	Splutters & burns rapidly	Hard Black irregular bead	-------	Disperse	Good

NEWS FROM PRINTEX

By The Grace of Allah Almighty, Printex achieved another Milestone in the Screen Printing by Introducing

- Non sticky white to print with foil without any issue.

- Water Base High Density with very sharp edges and softness.

Printex
Your Printing Partners

Towards Innovation

PRINTEX Chemicals (Pvt.) Ltd.

Defence Road, 0.5 Km off,
Bhopatian Chowk, Mauza Bhopatian,
Rohinala Raiwind Road,
Behind Zimbis Knitwear (Pvt) Ltd, Lahore.
Contact No. +92-42-35966300, +92-42-35966301.
Fax No. +92-42-35966300
E-mail: printexworld@gmail.com
Website : www.printex.com.pk