

Precision

SECTION **4**

SCREENS

● SCREENS ●

THE SCREEN

The screen is comprised of a frame and a fabric mesh. The mesh is stretched to a predetermined tension and then glued to the frame. The quality of your print relates directly to the quality of your screen.

THE SCREEN FRAME

There are several types of screen frames available and even though they may be quite different in material or design, they all do the same thing, they provide a carrier for the mesh and consequently the image. The most common types of screen frames are wood, rigid aluminum, and the self-tensioning type frame.

Wood frames are the least expensive. Since they are inexpensive they are in wide use and are considered a consumable as they are generally replaced instead of re-stretched. Wood, being porous, absorbs water and solvents which swell the wood and can cause warping. The corner joints on wood frames are a weak spot that can contribute to warping as well. The mesh on a wood frame tends to lose its tension more quickly than on aluminum frames.

Rigid aluminum frames consist of hollow aluminum tubing that is welded in the corners. The screen stays flat, very important, and maintains fabric tension, also very important. Aluminum frames are lightweight, not affected by solvents, liquids, humidity or general wear and tear. They are easy to clean and can be re-used for many years without replacement. These are the screens of choice for your Precision system.

Self-tensioning frames are by far the most expensive. These screens are made for you to stretch yourself. You choose the mesh count and attach it to the frame through the use of locking strips. Some varieties of self-tensioning frames droll the mesh onto the frame, others use a "draw bar" system. These types of frames allow you to stretch the fabric to your desired mesh tension. Tension is measured through the use of a device which measures surface tension. If mesh tension becomes reduced or softened, and it will through use, the self-tensioning frame allows you to re-tension the mesh for the best performance. Self-tensioning frames provide the ultimate in control for high tech printing applications.

On both the wood and the rigid aluminum frames the fabric is attached using an instant acting adhesive. Once the fabric has been stretched to the desired tension, the adhesive is "activated" and the screen is then complete. As the screen is used some tension will be lost and cannot be regained. If the mesh becomes too loose the screen must be replaced or re-stretched with new fabric.

SCREEN FABRIC

Over the years there have been several materials used as screen mesh. The term "Silk Screen" derives from the fact that the original material was indeed Silk. Silk is rarely used now as it is expensive, not readily available and it is dimensionally unstable, in other words, it does not hold tension very well. Silk is also a multi-filament material [see explanation further in this section).

The most widely used mesh material is polyester. Polyester is very strong, can be stretched to incredible tension and maintain that tension very well. It is relatively inexpensive and readily available in a variety of widths and mesh counts. Polyester is produced either as a multi-filament or a mono-filament fabric. **Multi-filament fabric is made of multi strands of material** woven into one thread. Multi-filament is less expensive than mono for several reasons. First, it does not hold tension very well. It is difficult to clean and to reclaim. For these reasons it is considered a "use it once and throw it away" material. It is rarely used. Mono-filament is just that, one single thread of polyester. It holds tension well and is easily cleaned and reclaimed. Precision screens are supplied with the highest quality mono-filament fabric.

MESH COUNT

Mesh count, for mono-filament fabrics, is determined by the number of threads per inch [tpi]. For example, a 60 mesh screen has 60 threads per lineal inch. This is considered a coarse screen which will not provide much image detail but will allow a lot of ink to pass through resulting in a heavy deposit such as would be found in athletic numbering, some puff ink applications, etc. A 355 mesh screen has 355 threads per inch. Obviously a small amount of ink is allowed to pass through the mesh openings. This type of mesh would be used for extreme detail and would result in a soft finish on the garment. Mesh counts, for textile printing, range in mesh counts from 25 tpi on up to the 355 mentioned. The following chart illustrates different mesh counts and their suggested uses. Different fabric manufacturers have somewhat different tpi designations, i.e. one may list 109 where another has 110. They all have similar mesh ranges however.

Mesh Count	Use for
25 -60tpi	Athletic lettering and Numbers - Puff Ink - High Density Inks
86 - 110 - 125 tpi	Athletic lettering and Numbers - Puff Ink Use for underbase printing on dark garments or any application where a heavy, opaque print is desired. Not recommended for fine detail printing.
110 - 125 - 137 - 160	Basic printing on light or dark garments.
160 - 230	Good choice for multi.color printing on light garments or for printing on top of an underbase. Good detail achieved, some half tone applications.
195 - 230	Good for overprinting a base plate. Good choice for nylon jacket printing.
255 - 280	Commonly used for multi color "index" printing.
305 - 355	Used for 4-color process printing.

Note: The above represents suggestions for the various types of printing. It is not intended to be all inclusive. Experiment to find out what works best for you.

Mesh Color: Mesh is available either White or Dyed. Orange and Yellow are the most common dyed fabrics. Dyed fabric is a little more expensive but is highly recommended for any mesh count of 200 or higher. Dyed fabric absorbs the light from the exposure lamps resulting in better detail and edge definition. When light hits white fabric it tends to "scatter" rather than be absorbed. In the lower mesh counts, those below 200, it doesn't matter a great deal.

SCREEN TENSION

Mesh tension, how tightly the mesh is stretched onto the screen frame, is measured in newtons per centimeter or N/cm. A simple rule of thumb is "TIGHT SCREENS PRINT BETTER". This is fact. Generally mesh is stretched using a pneumatic stretcher. Most of these are pre-set so the fabric reaches the desired tension repeatedly. There is much discussion as to what is the best tension but a basic standard is 25 N/cm. Tension meters

can be bought to determine screen tension and it is not a bad idea to have one around. If a screen drops below 10 N/cm during its lifetime it should be re-stretched with new fabric. Loose mesh can flex as your squeegee is drawn over it resulting in a distorted or smeared image. When multi-color printing, loose mesh can affect your registration. With loose mesh you need to raise your off contact to compensate otherwise the mesh will want to stick to the print resulting in you "peeling" the screen away from the print. This will cause smearing and ink build up on the bottom of your screen. If a screen is properly tensioned it will "snap" away from the print as your squeegee passes. Minimal off contact is required when a properly tensioned screen is used. Better, sharper prints and less squeegee fatigue".