OPTIMUM MESH CHARACTERISTICS

FOR SCREEN PRINTING LARGE FORMAT GRAPHICS

PRINTING POINT-OF-PURCHASE, TRANSPARENT INKS & BACKLIT GRAPHICS

GRAPHIC SCREEN PRINTING

visit us online

Visit us online at **SourceOne.Nazdar.com** for more information about our featured graphic screen printing mesh, SEFAR® PME.

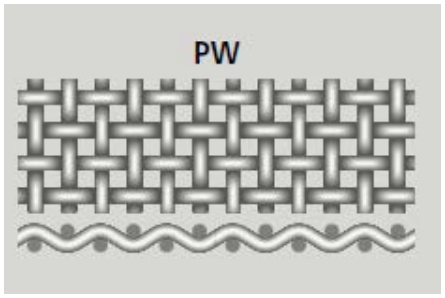
INTRODUCTION

Mesh selection for every screen application is critical. Once a screen is made, any changes needed due to tension, ink flow or ability to hold detail will take you back to the beginning of the process and shut production down. The result of this can be very costly. Today's printer has a wide assortment of characteristics to select from in choosing a mesh. The following information is a walk-through of those characteristics to help you make the best selections for the specifications of the job.

SCREEN MESH 101

There are many types of screen mesh available for screen printing applications. Most graphic screen printing applications use a high modulus (meaning high tensile strength), low elongation polyester monofilament plain weave mesh. Plain weave (PW) is a 1:1, one thread under and over another one thread weave pattern.

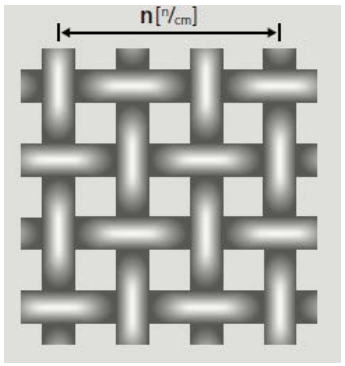
Plain weave mesh: top and side view



The thread count is a measurement per linear inch that can range from a "coarse" mesh count of 83 threads per inch, to a "fine" mesh count of 420 threads per inch.

Mesh threads come in varying nominal thread diameters measured in microns. Thread diameter specifications are measurements of the thread diameter prior to the weaving process. A 32 micron thread is smaller than a 34 micron thread diameter.

Mesh count



Within a given mesh count, the thread diameter is measured in microns (1/1000 mm or 1/25,000 inch). Thread diameter specifications are measured and determined prior to the weaving process. Mesh count (n) is the number of threads per centimeter (cm) or inch.

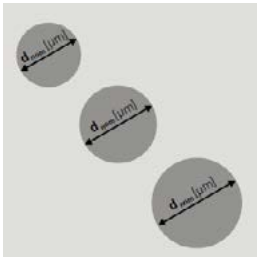
The most common colors of screen mesh used today are yellow and white. Yellow mesh is most often chosen when printing very fine detail and four color process halftone printing as it reduces

light refraction and reflection from within the thread itself during stencil exposure. The dye and dye application used on screen printing mesh are designed to absorb the blue UV light, which minimizes light scatter during the screen exposure process.

So how does all of this information translate? An example mesh specification of 140/355 - 30Y PW breaks down to mean the following:

140/355: 140 threads per centimeter or 355 threads per inch
30: the thread diameter is 30 microns
Y: designates the mesh color – yellow
PW: plain weave mesh

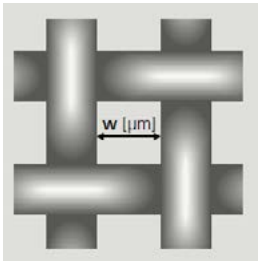
Thread diameter nominal



All of these numbers and letters are very important as they are referring to mesh geometry which define the two and three-dimensional aspects of the mesh overall.

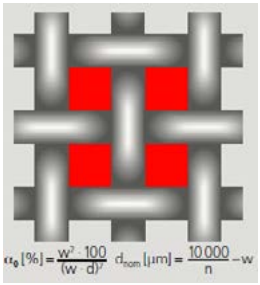
The thread diameter and thread count determine the mesh opening or space between the threads. The thread diameter is measured in microns, prior to weaving.

Mesh opening



Mesh opening (w) measured in microns, is the distance between two adjacent warp or weft threads. Warp threads run the length of the bolt of mesh. Weft threads run the width of the mesh.

Percentage of open area



The percentage of open area is the sum of all mesh open areas expressed as a percentage of the total screen area. The percent of open area is mainly determined by the thread count and diameter.

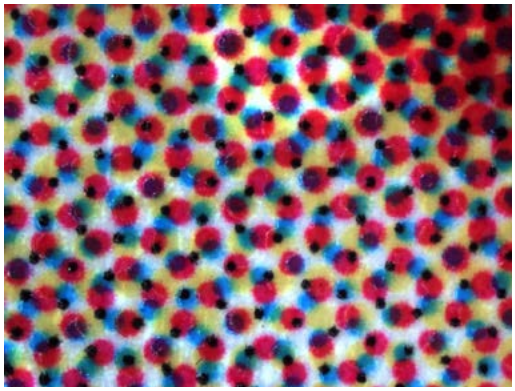
THE IMPORTANCE OF MESH SPECIFICATIONS

In large format printing, maintaining registration from one part of the screen to another has historically been a challenge. A high modulus, low elongation mesh with consistent tension levels in the warp and weft threads provides the most stable mesh geometry. This results in the lowest image distortion and highest levels of precise registration and image reproduction.

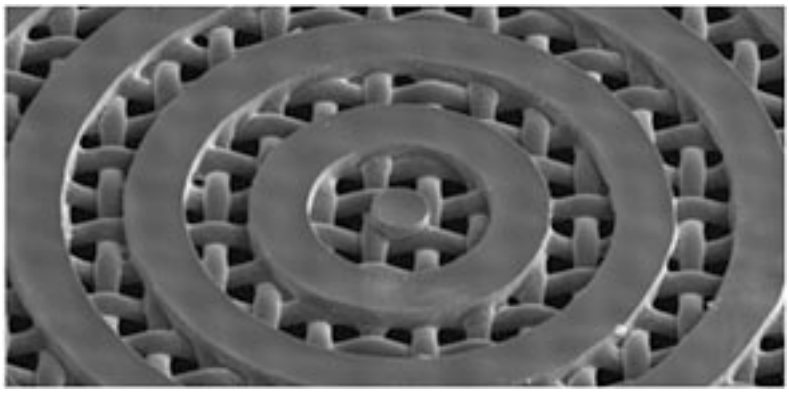
Managing image distortion is crucial when printing and maintaining precise registration of

halftone dots to produce accurate rosette patterns. A rosette pattern is achieved in color printing when a very small circle of halftone dots, formed by three or more process color screens, are overprinted at the correct screen angles with the precise dot size. This pattern has a high frequency that reduces its visibility.

Rosette patten precisely registered

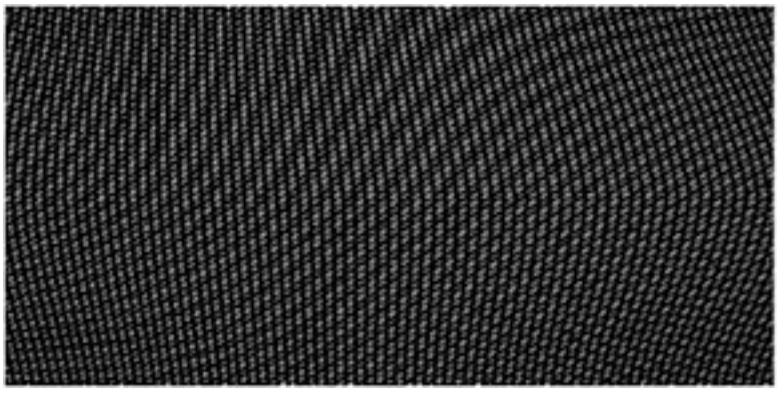


When printing large format transparent colors, backlit displays and high end graphics, a mesh with a thinner thread and greater percentage of open area provides an overall thinner fabric thickness and the surface of the mesh is much smoother.



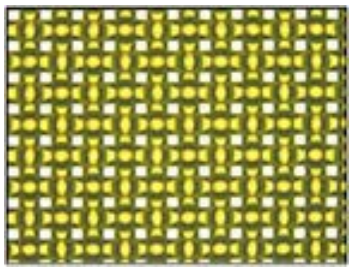
Smoother mesh / greater stencil definition

The larger percentage of open area allows better flow-through of transparent inks and provides an even ink deposit. With less thread mass to interfere and interact with halftone dots when printing four color process, issues with localized moiré patterns can be reduced and eliminated.

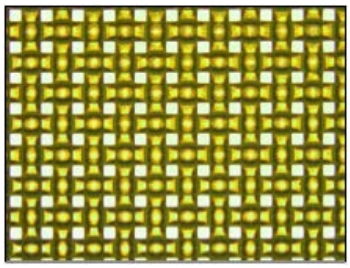


Moiré pattern

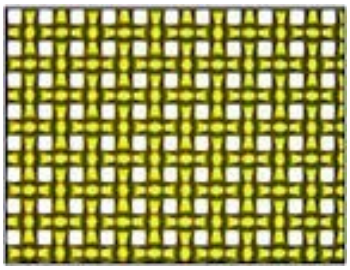
Below are examples of three fabrics with the same 380 thread count but varying thread diameters of 34 micron, 32 micron and 30 micron. Today's advances in thread technology provide stronger, thinner threads (less chance of tearing on large frames) leaving greater open area for ink flow-through.



SEFAR® PET 1500 380-34 PW



SEFAR® LFM 380-32 PW



SEFAR® PME 380-30 PW

OTHER CHARACTERISTICS TO CONSIDER

When choosing mesh to more effectively print large format graphics, transparent inks and backlit displays, consider the following:

Antistatic feature: When stretching large format screens, removing a number of yards off a bolt of mesh without antistatic treatment can create a static buildup charge that can deliver quite a shock to the screen maker. Good antistatic properties reduce the susceptibility to attract dust to the mesh. By avoiding dust on the mesh, which results in pinholes, production is not delayed with touching up pinholes so screens get to press faster.

Resolution optimized mesh color: When using mesh dyed with specifically engineered color to absorb the exposure spectrum of the exposure unit, reflected stray light is effectively neutralized and the screen image is accurate to the original artwork, as well as the final printed reproduction.

Adhesion optimized surface treatment: Mesh that has optimized surface treatment results in supplying additional surface area on the mesh threads which provides uniform coating of direct emulsion stencils. When using capillary film stencils, easier and more effective application of the stencil film is achieved due to excellent wetting properties. Superior stencil adhesion expands the resolution capabilities of fine details.

CONCLUSION

Choosing mesh with the characteristics listed above when printing large format graphics, transparent inks or backlit signs will greatly enhance your image quality and success.

Nazdar SourceOne, the leading supplier of screen and digital printing equipment, inks and supplies in the United States, Mexico and Central America, has now expanded our Sefar mesh product line to include SEFAR® PME mesh.

SEFAR® PME is the screen printing mesh for use in the industrial environment. It is based on an innovative, high modulus polyester yarn developed by Sefar having extraordinary tensile strength combined with very low and evenly-balanced elongation. SEFAR® PME sets new standards in the stencil making process. Its quality printing results are hugely impressive in the most demanding and innovative printing applications.

For more information about this new product, please contact your sales representative or a member of Nazdar SourceOne customer service by means of the contact information at the bottom of this page, or visit us online.

about us

NAZDAR SOURCEONE

Nazdar SourceOne is the leading supplier of screen and digital printing equipment, inks and supplies. We maintain relationships with the world's foremost manufacturers, providing best-in-class technology and quality to specialty graphic printers in the United States, Mexico and Central America. With a network of 16 locations, we deliver localized inventory, superior customer service and expert technical support to the graphic, textile and industrial markets. Learn more at SourceOne.Nazdar.com.