

MURAKAMI SCREEN USA

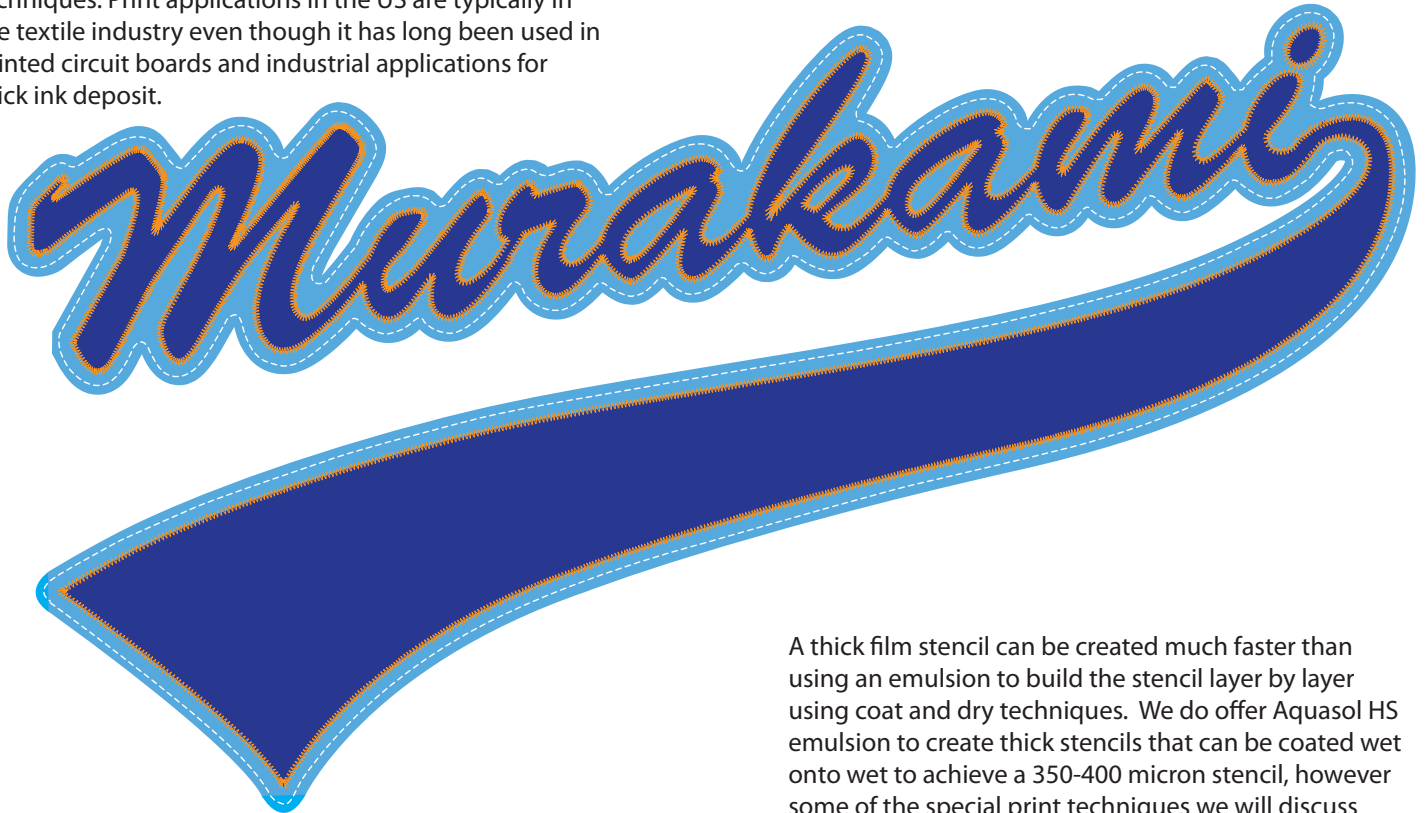
Technical Newsletter - October 2013

MURAKAMI SCREEN U.S.A., INC. 745 Monterey Pass Rd. Monterey Park, CA 91754 Tel 323.980.0662

Murakami Thick Film

Murakami Thick Film Stencils can open up creative print techniques that can enhance standard graphics and provide new print offerings for your customers. Murakami Thick Film has film thicknesses ranging from 100-1000 microns to cover many special effects print techniques. Print applications in the US are typically in the textile industry even though it has long been used in printed circuit boards and industrial applications for thick ink deposit.

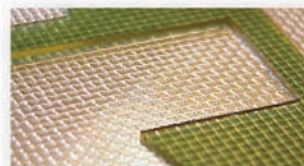
The tackle twill style art below was built in Adobe Illustrator on separate layers. The chain stitch is a dashed line stroke while the zig zag stitch was a custom brush created with a sample of the zig zag. Tight curves and corners were built by hand to improve the custom brush results so the zig zag appeared more threadlike.



Textile Usage for Special Effects:

- **High Density Ink** – High Density inks are making a comeback. Thick Film by Murakami creates the sharpest ink edge and details possible in a thick stencil. More on how to achieve special affects printing later in the article.
- **Gels** – Typically used as an overprint, great gel prints exhibit a glass like domed effect over underlying prints or to create an adhesive base for glitter dusting techniques or foil applications.
- **Puff Ink** – From the common 3D raised puff to suede, leather and blister puffs, these inks take a common print and can turn it into a multi level textured print with more sales appeal.
- **Glitters** – Too often a 25 mesh screen is coated with very little emulsion thickness. Ink deposition and coverage is improved with a thicker ink well to transfer a more continuous coating of glitter ink.

A thick film stencil can be created much faster than using an emulsion to build the stencil layer by layer using coat and dry techniques. We do offer Aquasol HS emulsion to create thick stencils that can be coated wet onto wet to achieve a 350-400 micron stencil, however some of the special print techniques we will discuss here print better with Murakami Thick Film. How could they be different? The brief explanation deals with the sharpness of the printing edge of the emulsion shoulder and the sharp vertical sidewall that only Murakami Thick Film can achieve.



**Thick Film
400 Microns**



**Aquasol HS
350 Microns**

MURAKAMI SCREEN USA

Technical Newsletter - October 2013

MURAKAMI SCREEN U.S.A., INC. 745 Monterey Pass Rd. Monterey Park, CA 91754 Tel 323.980.0662

Art Considerations:

The artwork must be created with art wide enough in the detail areas that the art will be printable after screen development. The rule of thumb is to have artwork in the detail area no thinner than the thickness of the thick film or emulsion thickness you are going to use on the screen. This allows for easier control of the print on press since it is very difficult to print art that is thinner than the film thickness since the narrow channels cannot clear ink easily with typical squeegee pressure. Once squeegee pressure is increased to clear the narrow details in the design, the other solid or wider areas of the print will not maintain sharp square corners or a flat surface when using high density inks. The goal of the art department is to create art that prints well at minimal squeegee pressure over the entire image. So keeping the thinnest art and details equal to film thickness assures these areas will print well.

The image below shows the 'M' from the art on the previous page. The smaller print loses the zig zag overlock stitch typical of a simulated tackle twill embellishment. The larger version shows the minimum art size necessary to show off this finer stitch. The chain stitch shows up as well, but can be used on the smaller versions. If the art contains many letters or elements that need a zig zag style stitch it is advisable to use a thinner line and greater spacing to keep the negative space open to simulate thread.

Using high density screens along with simulated stitching can give quite a realistic effect. The high density screens provide dimensional thickness like fabric, puff inks through simple 110 screens simulate thread quite well, and stacking the art can achieve more dimensionality. On my first attempt I used a 400 micron screen for both blues but found that the light blue printed through a 110 mesh offered more control and less elevation so that the gold zig zag stitch could print cleaner over a lower elevation.



*Inks courtesy of International Coatings
Lt Blue and Medium Blue: High Density Ink
White and Gold: Puff Ink*

MURAKAMI SCREEN USA

Technical Newsletter - October 2013

MURAKAMI SCREEN U.S.A., INC. 745 Monterey Pass Rd. Monterey Park, CA 91754 Tel 323.980.0662

Mesh Considerations: S mesh requires far less squeegee pressure when printing high density inks than typical T threads. The mesh count chosen will depend on the type of inks used. Some general recommendations. The print example in this article uses Smartmesh from Murakami.

Tackle Twill Example in this Article:

Real tackle twill embellishment is quite an expensive process whereas the look can be simulated very well with high density inks. The key is to simulate the dimensional thickness of the twill fabric as well as simulating the thread stitch to make it appear it was sewn on. .



Print Sequence

Med Blue Base – 400 Micron Murakami Thick Film 80LX - S

Flash

Cool

Lt. Blue High Density – 150 Murakami Thick Film 110 - S

Flash

Cool

Zig Zag Stitch Detail – 160-S Smartmesh

Flash

Cool

Chain Stitch Detail – 110T Smartmesh

Mesh Recommendations

Glitters – 25/S (larger openings) or 25T - for higher tensions

Gels – 60/T, 80/S, 80/SS, 110/S

Puff – 80/S, 110/T, 135/S, 150/S, 160T

Murakami Thick Film Selection:

100-250-micron thickness: Satin Gel Overprints, puff ink, Glitter applications, Suede and leather surfaces using specialty puff inks.

250-350 micron thickness: Detailed High Density prints, Glossy Gel Overprints, Puff with more loft, Suede Leather look, Glitters, Gel as an adhesive for Glitter Dusting.

350-400 micron thickness: – 400 Micron thick film is commonly used as an upper limit for high density inks. It is easier to stack two high density prints when trying to achieve thicker high density prints with square sharp ink edges. Murakami Thick Film above 400 microns requires artwork to be quite solid with minimal details to transfer the ink. **Other 400 Micron film uses:** high domed gloss gel, thick glitter deposits, suede puff, leather patch look.



MURAKAMI SCREEN USA

Technical Newsletter - October 2013

MURAKAMI SCREEN U.S.A., INC. 745 Monterey Pass Rd. Monterey Park, CA 91754 Tel 323.980.0662

Murakami Thick Film Usage Instructions:

Creating a Murakami Thick Film stencil is quite easy. We have a video on the web that shows the following process as well.

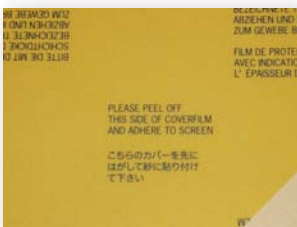
Video Link:

<http://www.youtube.com/watch?v=ztM4O6cIX1w>

1. Build Up Board – It is crucial to have a very smooth board that is smaller than the inside of the screen frame and yet larger than the Thick Film being adhered.



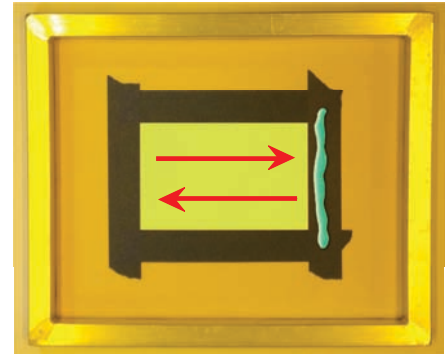
2. Prior to adhering the Film: Peel printed plastic off of the Thick film and place the emulsion side up onto the build up board.



3. Preparation: Place 2" masking tape on the inside of the screen along the edges of the Murakami Thick Film. This prevents excess emulsion drips along the edges of the film.



4. Adhering the film: Pour a small bead of One Pot Sol C onto the tape and with a squeegee make 2 passes across the film to adhere it.



Make 2 passes with squeegee

Carefully peel off masking tape and avoid dripping emulsion onto the thick film area.

5. Dry screen. Place screen in front of a fan to dry, (avoid excessive heat in a drying cabinet.) Once the adhering emulsion is dry and depending on the ambient outdoor humidity at your location you can either leave the clear protective plastic on or peel it off before coating the inside of the screen. In hot humid conditions like those found in the tropics it is advisable to peel the plastic before coating the inside of the screen to obtain quicker drying times. For cooler, drier areas the protective plastic can be left on until the entire screen is dry.

6. Coat the inside of the screen. With your scoop coater, coat twice on the inside of the screen with One Pot Sol C emulsion to complete the adhering process of the thick film and to block out the surrounding area.

7. Force dry again using a fan at ambient room temperatures. Excessive heat in a screen drying oven is to be avoided in high humidity, ok in drier climates.

MURAKAMI SCREEN USA

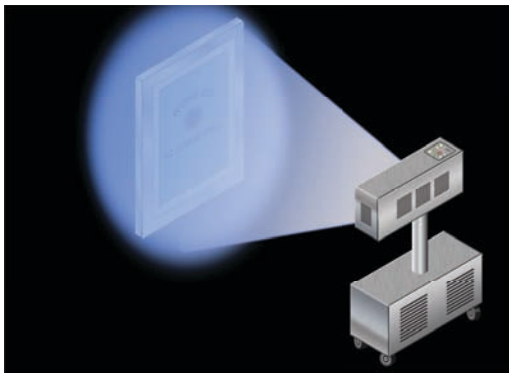
Technical Newsletter - October 2013

MURAKAMI SCREEN U.S.A., INC. 745 Monterey Pass Rd. Monterey Park, CA 91754 Tel 323.980.0662

Exposing Thick Film:

The type of exposure lamp you use will determine exposure times. The best stencils share the following exposure processes:

1. Wattage: Strong multi spectral 5kw exposure lamps work better. Basically stronger lamps with good multi spectral wavelength output will produce the strongest, sharpest stencils. Low wattage exposure units and fluorescent exposure systems can still expose the film but times will be far longer, often 3-5 longer for 1k units and 9 times longer for fluorescents.



2. Exposure Time: A 5kw lamp with a fresh bulb will expose the film at 1.5 minutes per 100 microns. A 400 micron film then would need a 6 minute exposure. This time can vary depending on distance from light source to the Thick Film, the age of the bulb, the spectral output of the lamp, and the d-max of the film. If you use light units for exposure you can test how many units this would be by noting the number of units in one minute and multiply this number by 6 for the units setting for a 400 micron sheet of Murakami Thick Film.

3. D-max, or the image's ability to block UV light is crucial for long exposures. If the image doesn't block the exposing light well you can flash or burn through the black image area and partially expose the thick film. This can make washout difficult and affect the edge quality of the stencil. Weak film sources like Vellum, or light transparent images on ink jet film have a low d-max reading. You can use 2 sheets of imaged vellum stacked on top of each other for stronger black images, use toner enhancer spray or adjust RIP controls for ink jet images to gain better d-max. Improving the black density is often the best fix to prevent burn through in the image area. We sell Wasatch SP Rip to improve ink jet images.

4. Exposing: Strong vacuum blanket draw down helps to maintain intimate contact of the film positive to the Murakami Thick Film to prevent undercutting of the image and loss of details and resolution. When the vacuum blanket draw down is complete, try moving the screen. The screen should not move at all. If you can move the screen while the vacuum blanket is drawn down you may have a leak that needs repair or you may need to replace the vacuum blanket.



Weak Vacuum Blanket



Strong Vacuum Blanket

5. Caution: Computer to Screen ink jet or thermal wax imaging systems need to have an adequate 'platen gap' between the print head and Murakami Thick Film to prevent the head from hitting the raised film on the bottom of the screen.

Developing Thick Film:

- 1. Wet both sides of the screen** with water or place in a water dip tank for a couple of minutes to soften the film and adhering emulsion.
- 2. Use a pressure washer** on fan spray setting to begin developing the image. Pressure washer development is recommended. Weak water streams will not perform well. The stronger, finer spray of a low PSI pressure washer develops the image better.



3. At a distance of 12-18 inches move the pressure washer wand back and forth to begin washing away layers of the thick film. Occasionally spray the inside of the image area at an angle to take off softened emulsion on the squeegee side as well. Never spray at a 90 degree angle with the pressure washer on the squeegee side. Only gently rinse with an angled spray on the inside.

MURAKAMI SCREEN USA

Technical Newsletter - September 2013

MURAKAMI SCREEN U.S.A., INC. 745 Monterey Pass Rd. Monterey Park, CA 91754 Tel 323.980.0662

4. As the thick film melts and washes off you can wash out details by moving the wand a little closer to the image, just remember to keep the pressure wand moving. When the image starts to open up you can work the edges and then finish with an angled spray on the inside of the screen to remove any film or emulsion that is hanging onto the image edges. If you see the thick film peeling off of the screen it is a sign that your exposure times are not long enough, or strong enough. Increase times or replace the bulb to insure proper exposure.

Murakami Thick Film Specifications:

Packaged: 5 Sheets per pack, 20 per case. Available in single sheets as well.

Size: 16"x23" Sheets: 100, 150, 200, 250, 300, 350, 400, 700, 1000 Micron thicknesss available.

Size 16"x35" Sheets: 100, 200, 300 Micron thicknesses available.

Shelf life: 1-2 years

Adhering Emulsion: One Pot Sol C

Usage: You can cut the film to fit the image size you will be printing. It is advisable to allow 1.5-2" of Murakami Thick above and below the art. The squeegee needs a run on and run off section of Murakami Thick Film so it can adjust to the gain in height caused by the film and maintain even squeegee contact as it print the image. The film should also be as wide as the squeegee being used to maintain constant even contact during the print process. Screen mesh peel and ink release are improved with a border of thick film after the squeegee has printed the image. One trick to get immediate separation of mesh and ink is to place some thin chipboard 1-2 inches past the image that the squeegee can finish the print stroke on. For high density prints this speeds up the release of the ink since the mesh lifts off immediately as the squeegee rides up onto the cardboard. This creates immediate release of the ink that normally would not take place until the pallet drops or the screen lifts away from the pallet depending on what automatic press you use.

Printing Trick for High Density Inks



Typically an automatic press will wait for all squeegee strokes to finish before lowering the shirt pallets or raising the screens. A wedge helps accelerate the separation of the screen and thick film from the ink deposit. This helps preserve edge quality and provide a uniform ink deposit on the shirt that will show good edge quality and consistent ink thickness when the ink is cured.



© Murakami Screen USA September 2013
all rights reserved.

A special thanks to International Coatings who supplied inks for this project.