MURAKAMI

April 2011

Technical Newsletter

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

Waterbase and Discharge Ink Printing

Objectives:

• To improve production performance, minimize down time, and optimize screen life by preparing durable stencils with quality products and screen making techniques .

• To understand the importance of a properly designed stencil making area.

Aquasol HV
For Water Base Discharge and Plastisol Inks

(Aquasol HVP
Aquasol TS
are also good choices)

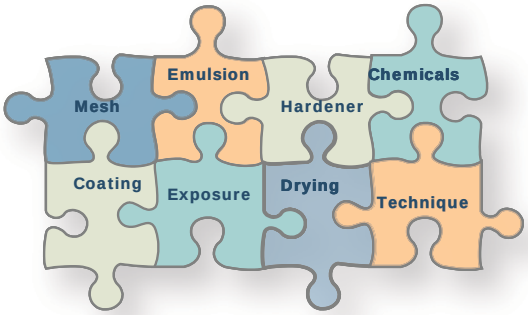
Details:

• Preparing quality screens for water base and discharge textile printing.

• Proper Coating, Drying and Exposure of emulsion for waterbase and discharge screens.

• Mesh and Squeegee selection. Press Set Up, Printing with waterbase and discharge inks.

Orientation: Understanding how many factors influence the success of the screen.



Control these 8 areas for durable screens.

• Water base and especially discharge inks are highly aggressive and require a durable stencil prepared with special emulsions and handling.

• ***Understand & Control*** the key variables to standardize processes, techniques and materials to yield the most durable stencil possible.

• Preparing Quality Screens is the key to faster and consistent production without having to go through costly down time due to premature stencil breakdown.

Topic 1: Mesh Selection

Mesh count (per inch)	Mesh Count US	Diameter (microns)	Mesh Opening (microns)	Open Area %	Thickness (microns)	Ink Vol	Tension Levels (Newtons)
86	86-T	100	195	44	165	73	30-47
110-71	110-S	71	160	48	115	55	23-36
LX-110-71	**LX-110-S**	**71**	**160**	**48**	**115**	**55**	**23-36**
110	110-T	80	151	43	140	60	28-44
125-71	125-T	71	132	42	122	51	26-40
135-48	**135-S**	**48**	**140**	**55**	**78**	**43**	**26-40**
LX-135-48	**LX-135-S**	**48**	**140**	**55**	**78**	**43**	**16-25**
135-54	135-T	54	134	51	88	45	18-29
150-48	**150-S**	**48**	**121**	**51**	**77**	**39**	**18-28**
LX-150-48	**LX-150-S**	**48**	**121**	**51**	**77**	**39**	**18-28**
150-54	150-T	54	115	46	84	39	22-35
160-48	**160-S**	**48**	**111**	**49**	**75**	**36**	**18-29**
160-54	160-T	54	105	44	84	37	26-41
180-48	**180-S**	**48**	**93**	**44**	**74**	**33**	**22-35**
LX-180-48	**LX-180-S**	**48**	**93**	**44**	**74**	**33**	**22-35**
180-54	180-T	54	87	38	82	31	26-40
200-48	200-S	48	79	39	73	28	24-37
200-54	200-T	54	73	33	82	27	27-43
225-40	**225-S**	**40**	**73**	**42**	**59**	**25**	**18-29**

• Water base and discharge need S thread mesh or Murakami's LX Mesh where optimum ink laydown is needed, (in **red.)**

• Notice that the meshes in red also have the largest open area in their mesh count. This open area allows discharge ink and waterbase to print easier, with better color and less prone to drying in the mesh.

• You will notice that there is both an LX Mesh and standard polyester mesh in the same mesh count. LX-Mesh is a totally new and unique mesh with very smooth mesh knuckles and a proprietary thread that allows inks to print easier and yet still have excellent tension retension and low elongation. LX-Mesh can withstand reclaiming better. Never use a pinpoint pressure washer spray on S or LX mesh which can damage fine meshes.

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Topic 2: Preparing the Mesh for Emulsion

Clean your mesh to avoid pinholes & fisheyes and Dry completely

Remove haze or ghost images	*Degrease Screen*	***Dry before coating***

Murakami HR-701

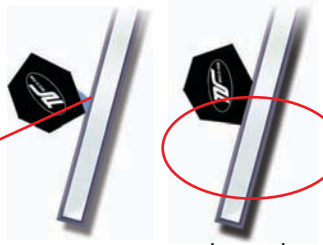
Non-caustic haze remover designed to remove stains in mesh without damaging the threads that is typical of caustic haze removers.

Murakami DGR-801

Murakami degreaser is designed to clean the mesh to remove grease and contaminants. Avoid stiff bristle brushes as they can damage fine mesh. Instead use a sponge like the one shown for degreasing the screen

Topic 3: Coating the Screen

Incorrect Angle of Scoop Coater



Correct Use of the Scoop Coater

Lay the scoop coater over so the end cap rests flat on the screen and coat ***slowly.*** This will produce more consistent emulsion coating, reduce pinholes and will allow the exposure to be more accurate to create strong screens for waterbase, discharge and plastisol.

Topic 3: Drying the emulsion

Drying conditions for coated screens is often overlooked. If the emulsion isn't dry on the inside it will not shoot well. It can feel dry to the touch, but have moisture inside the emulsion. ***You cannot make a strong screen for discharge or waterbase with a partially dry screen.*** Moisture will not allow complete exposure to take place, even if the exposure time is correct. The emulsion simply cannot cross link properly to create strong emulsion images.

30 pint dehumidifier Set to 35%

Proper Screen Room Conditions:

1. 35% Humidity. Low humidity levels make stronger screens. High Humidity levels allow moisture to remain in the screen and prevents proper exposure. Use a dehumidifier as shown.
2. Fans are up off the floor to avoid spraying dust onto screens that will create pinholes.
3. Floor is free of water, reclaiming and developing sinks are located away from screen storage.
4. For more information read our newsletter at: http://www.murakamiscreen.com/documents/ScreenRoomDesign.pdf

Detailed discharge prints like this need good emulsion and screen preparation.

A strong discharge screen will always make a great plastisol screen. A good plastisol screen however may not make a strong discharge screen that can even finish a print run.

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Topic 4: Selecting Emulsions

SBQ Pure Photopolymers
Aquasol TS, Aquasol HV and Aquasol HVP

- All three are pure SBQ photopolymer emulsions with high solids content.
- Adding diazo to Aquasol TS or HV will enhance water resistance.
- Excellent for WB, Discharge and Plastisol

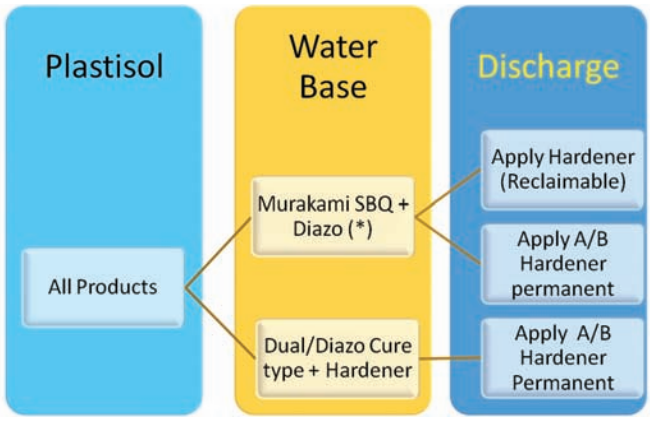
Dual Cure Emulsion SP-7500

- Dual cure type emulsion
All around product for plastisol, WB, and discharge

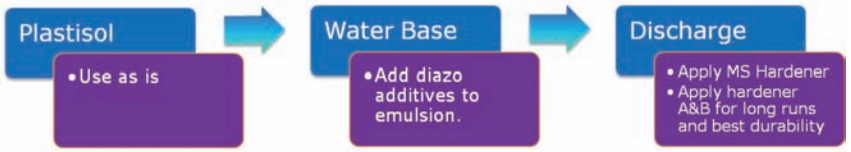
Pure Diazo Emuslions SP-300 and SP-1400

- Water Resistant diazo emulsion, durable and cost effective product
- SP-300 has excellent performance on roll-to-roll flat textile printing

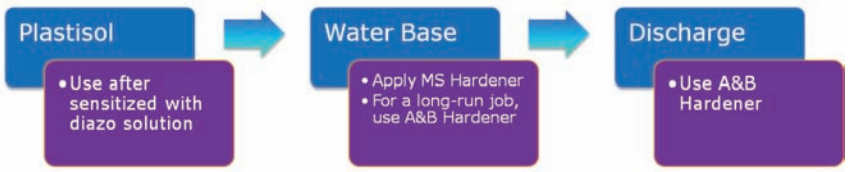
Product Guide by Application



*** For extended durability or aggressive in-line printing environments, it may require applying MS-Hardener . For semi to permanent stencils, apply A&B hardener.**



SBQ Pure Photopolymers:
Aquasol HV & HVP, Aquasol TS, Photocure TXR, Photocure BLU



Dual Cure and Diazo Emulsions:
SP-7500, SP-1400, SP-300

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Topic 5: Problems and Solutions:

What's happening with my screens?	Causes & Answers
Haze and ghost images left after reclaiming screen.	Apply 701 haze remover to screen and allow to sit for ten minutes before using pressure washer.
Pressure washer is working but the image is not washing out from the screen	Check opacity of the film. It should be dark enough that you can't see through it. A diazo emulsion may be too old.
Screens are degreased but still shows fisheyes and air bells after emulsion coating and drying	Rinse frame edges and mesh with clean water. Dry screen horizontally. Keep drying area free of dust. Avoid aiming fans directly on screens.
Screen is breaking down and melting after only a few hundred prints.	Check exposure times and age and strength of lamp. Dry emulsion completely before exposing.
Why is my screen full of pinholes?	Degrease well with 801. Slow down coating speed, and use dull edge on scoop coater. Expose completely

Topic 6: Image vs. Exposure

An underexposed screen will have an image, but the emulsion strength will be weak and the screen will break down sooner. The use of a pressure washer to develop a well exposed screen will bring out the details. The chart to the right shows the relationship between light strength and screen strength. If your exposure unit is below 3-5000 watts you can post expose and harden the screen with MS or A&B Hardeners to increase strength, but maximum screen strength comes from strong light and hardening.

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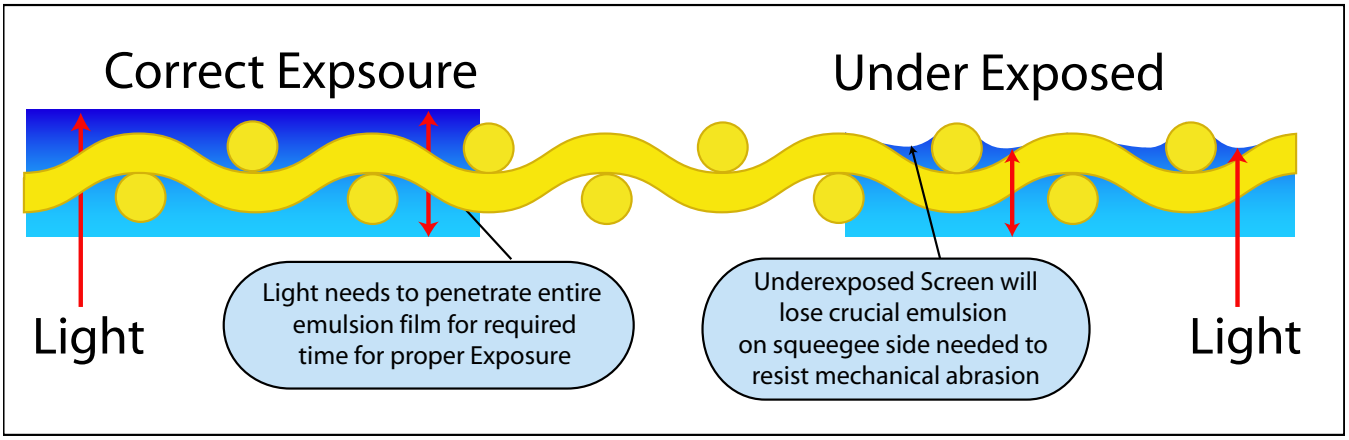
Topic 6: Exposure Cont.



• Murakami Emulsion holds excellent resolution when fully exposed. Use a pressure washer on fan spray at 12-18 inches to develop fine detail.

• Optimum durability starts with a fully exposed screen stencil. Underexposing the emulsion results in early stencil breakdown.

• Using excessive blockout on an underexposed screen will not prevent mechanical abrasion on the squeegee side.

• Check your film. If you see transparency through the black areas of the image the emulsion may expose and make washout difficult when the screen has been exposed completely for WB and discharge printing.

D-Max Test

Topic 7: Washout and Drying

• Wet stencil on both sides, wait a minute or two.

• Use pressure washer on fan spray setting.

• Continue to wash from print side until image is clear.

• Do a final rinse on the squeegee side to remove any residue.

• Blot with clean newsprint.

• Blow water from mesh with an air hose.

•Force dry with fan, in sun, or in hot box (best).

• SBQ emulsion remains light sensitive after development. Post expose squeegee side to sun or lamp on long WB or discharge print runs.

• Drying in a heated chamber or in bright warm sun will help reduce moisture trapped in emulsion during developing.

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Topic 8: Post Exposure

• Post exposing SBQ Emulsion continues curing any unfinished cross linking. It should not be used as a substitute for the proper exposure time. Weaker light sources can achieve stronger screens with post exposure.

• Underexposing emulsion and then post exposing does not yield as strong a screen as using the proper exposure time needed to achieve a completely exposed stencil.

• Expose squeegee side toward lamp or sun. If using an exposure lamp to post harden, wait until screen is dry and double the exposure time. If using the sun, you can place the wet screen in sun, squeegee side towards sun.

• Allow screen to dry before applying Hardeners so that excess moisture doesn't dilute hardeners when applied.

Topic 9: Stencil Hardening Reclaimable Screens:

• Once screen is dry, apply thin coats of the same emulsion around image using a sharp card or piece of plastic. Avoid thick coats and brush droplets as they will not expose completely

• For more abrasion resistance apply emulsion to squeegee side where the floodbar and squeegee start and stop.

• Required: Re-expose dried emulsion used for blockout in exposure unit or in sunlight. If applied to both sides, expose both sides.

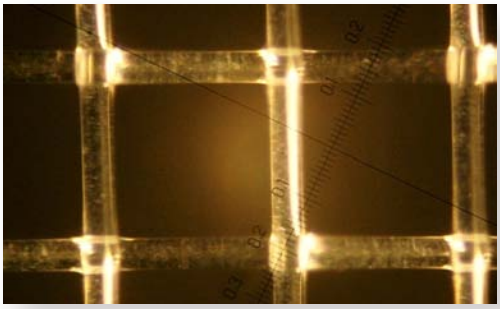
• Sponge both sides of screen with MS hardener or A&B Hardener over entire emulsion area and dry completely in sun or a hot box before printing.

Topic 10: Screen Mesh

Murakami Smartmesh is different. The difference is easy to see on press.

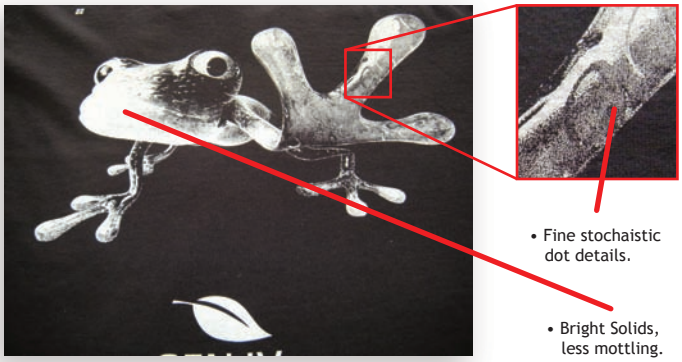
- More consistent registration
- Higher retained tension on stretch and glue frames providing longer life of the screen.
- Precise mesh openings eliminate spot moire and provides a perfect laydown of the ink.
- Available in S and our new LX Mesh that provide better baseplates, softer hand plastisol prints.
- Discharge prints are brighter and less prone to drying in when using LX-S Meshes.

LX Mesh: only Murakami has it



The photo above shows the excellent open area of LX Mesh that will print the types of base plates shown below. The print qualities of this mesh has no equal. Brighter, softer hand base plates, brilliant discharge prints, all with minimal squeegee pressure. See a video of this mesh in action at:

http://www.youtube.com/watch?v=WFShG5cWeGY



Printed on an automatic press, 1 print stroke.