

11/2007



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Printing with Water-based Screen Printing Inks

Aqua-Jet[®] FGL M

Aqua-Jet[®] KSF

AquaCell[®] GL

Important Directions for the Use of Water-based Screen Printing Inks

1. General Characteristics

Aqua-Jet® FGL M and Aqua-Jet® KSF are water-based screen printing ink systems for several areas of application. These ink systems provide good light-fastness and weather resistance making them suitable for long-term outdoor use.

AquaCell® GL is mainly applicable to paper, paperboard and cardboard and also has good light-fastness. This ink system resembles a solvent based ink system regarding printing behavior so it is easy to handle.

Aqua-Jet® FGL M, Aqua-Jet® KSF and AquaCell® GL for double side printing are not recommended to a certain degree since there is the risk of blocking when the material is exposed to high strain.

2. Fabrics

All polyester fabrics of 5 – 150 threads/cm (13 – 380 threads/inch) are suitable. When printing fine lines and halftone screen motives the use of colored fabrics is recommended (yellow, yellow-orange).

3. Stencil

Water-resistant emulsions or capillary films are necessary. Pröll recommends Emulsion Norikop 7 S.

Before and after exposure the emulsion must be completely dried.

The stencil should be exposed for the maximum exposure time:
The more light the better the stencil's durability.

Colored meshes are recommended because they leave scope for varying exposure times.

The Norikop emulsions can be post-exposed, at best on the squeegee side, for a higher number of prints per screen.

4. Printing

Prior to printing it is required to add 1 % defoamer and, if necessary, 2 % Crosslinker L 20749. The pot life amounts to approx. 8 hours.

Use Defoamer L 54131 with Aqua-Jet® FGL M and AquaCell® GL.

Use Defoamer L 36273 with Aqua-Jet® KSF.

The following thinning recommendations with water are given:

Aqua-Jet® FGL M 10 % minimum

Aqua-Jet® KSF 5 – 10 %

AquaCell® GL 10 % minimum

The relative humidity in the printing room should be at least 50 %, or better 60 – 70 %. The purchase of a humidity control system might be taken into consideration.

Before printing the stencil has to be wet so that water contained in the ink cannot be extracted and the ink can flow.

After each print the stencil must be coated thickly with ink (approx. 3 mm (0.12 inch)). This prevents the ink from drying in during the printing process and during printing stops.

Thickly coating the stencil provides an extensive surface area of moisture which can evaporate, but high humidity in the printing room counteracts this evaporation.

The area where the ink is not in motion has to be kept wet by spraying water on the unmoved ink in order to prevent skinning caused by evaporation.

When printing, dried ink can be washed out with Aqua-Jet® Liquid Cleaner L 34642 or L 47603.

Stubborn dried ink can be removed with solvent-based Cleaner 6614.

5. Screen Cleaning

The screen has to be wiped and the image area has to be kept wet. Afterwards the squeegee has to be removed and immersed into water.

The ink taken from the screen must not be placed into the original can. If cleaning immediately after printing is impossible, immerse the stencil into water or keep the stencil wet.

The stencil should be cleaned with the liquid cleaner and a soft brush. After that the stencil can be washed out with a high pressure cleaner. For ink that is difficult to remove, use the liquid cleaner again and let it react for a few minutes, afterwards wash it out with water.

Stubborn dried ink can be removed from the stencil with Solvent Cleaner 6614 after the stencil is dry.

Cleaning in screen washing machines is also possible when using a suitable solvent cleaner.

6. Practical Hints

The binder systems Aqua-Jet® FGL M and Aqua-Jet® KSF are dispersions consisting of very small polymer particles (< 0.1 micrometer = 1/10000 mm) which are stabilized in water by means of alkaline reagents.

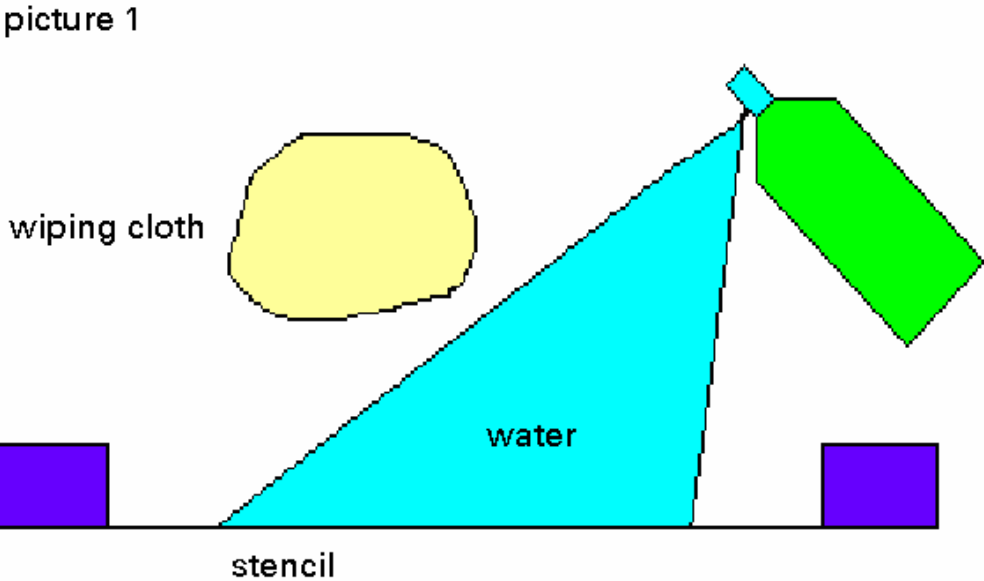
The coalescence of binder particles during the drying process and the evaporation of the alkaline substances transform the ink into a waterproof film which, of course, also applies to the ink film dried in on the mesh.

This is the reason for the different handling of the Aqua-Jet® ink systems compared to that of the solvent based inks.

On the following pages this different handling is schematically shown.

Printing with Water-based Inks

1. Wet the stencil with water prior to the printing process.



A dry stencil can cause bad printing results, especially when printing half-tone motives and fine lines.

Printing with Water-based Inks

2. Production

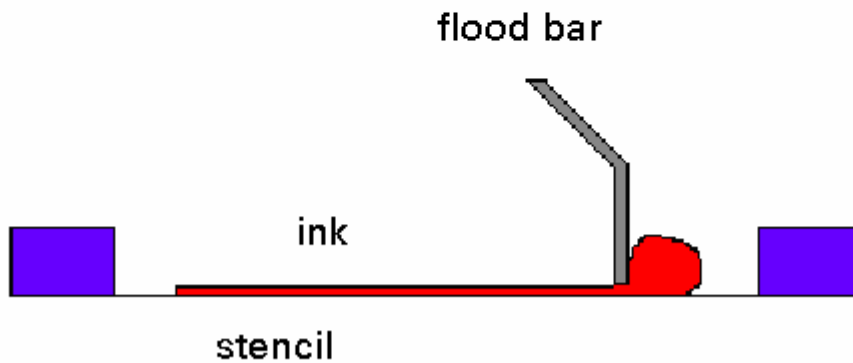
Put a thick layer of ink on the stencil (2 - 3 mm (0.08 – 0.12 inch)).

For partly or fully automatic machines the use of a flood bar whose edge is thick and rounded and which only lies slightly on the stencil is recommended (see picture 2).

Immediately after printing the stencil has to be filled with ink again.

Handling the ink in this way provides a trouble-free production.

picture 2



3. Short printing stops up to 3 minutes

The stencil should be left as shown in picture 2, with the ink fully covering the stencil.

This enables short printing stops up to 3 minutes without screen cleaning, for example for checking the printing result.

Printing with Water-based Inks

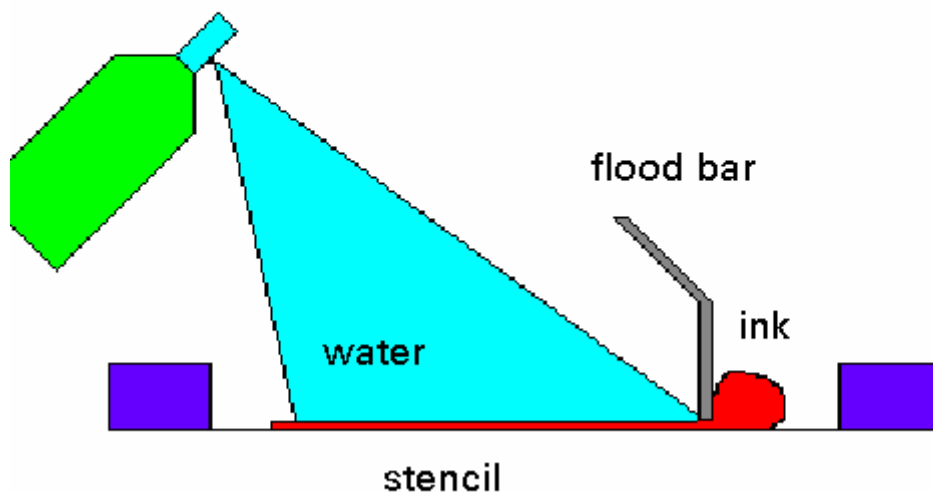
4. Printing stops up to 15 minutes

The screen has to be filled thickly with ink and has to be sprayed additionally with water as shown in picture 3.

This prevents water from evaporation from the ink and hence alleviates ink drying in the mesh.

After the stop, waste sheets should be printed until the motives are clear again.

picture 3



5. Printing stops longer than 15 minutes

It is recommended to wipe out the screen prior to the stop and to wash out the printing motive with Liquid Cleaner Aqua-Jet®.

The area where the ink is not in motion should be kept wet by spraying water on it.