

# Printing the Graphics Layer

## UV curable screen inks

## How to Guide

This simple How to Guide will show you the best way to screen print second surface graphics using UV curable inks on Autotex and Autoflex hardcoated films from MacDermid Autotype.

**Objective** - To reliably print high quality, second surface graphics using UV curable screen inks onto Autotex and Autoflex, which combines high definition images with good colour density and optimised adhesion to the substrate.

### Recommendations:

**Substrates** - To help you select the best substrate for your application, use the applications filter function on the Hardcoated Films page in [www.macdermidautotype.com](http://www.macdermidautotype.com). Please note UV screen inks have the best adhesion to Autotex/Autoflex products that have the 7 Series primer.

**Frames** - It is critical that the mesh releases from the ink film immediately after the squeegee passes, so high tension stretching (> 20N/cm) onto a rigid metal frame is required. Autotype's 2-Part Screen Adhesive will hold the high mesh tensions that are required and will not slip when exposed to Autosolve cleaning solvents.

**Mesh** - Always choose the highest quality monofilament polyester mesh for graphics printing as variations in weave quality will show up in the print, especially if transparent colours are being printed. The required final ink film thickness will determine which mesh count to use, as a starting point use a 150.31/cm yellow or amber mesh which will print approximately 4µ–6µ cured ink film thickness. See printing section below for more advice on ink film thickness and ink adhesion.

It is critical that the mesh is totally clean and free from all ghost images before the stencil is made. Contamination in the mesh will lead to poor ink flow and will show as ghost images in the print. Always use Universal Mesh Prep or Auto Degreaser Concentrate to ensure the best stencil adhesion possible and use Autokleen Plus or Quick Clean to remove any mesh staining if the screen has been used before.

**Stencils** - When printing fine or reversed out images, it is very important to use a flat (low Rz) stencil such as Capillex 18 to minimise saw toothed edges. To get the very best results, low Rz should also be combined with a low (EOM) stencil profile which will minimise ink build at the image edge, this is especially important when using UV curable inks. The low Rz/EOM of Capillex CP controlled profile capillary films makes this the ideal product for UV inks as this will typically give an EOM of only 2µ on a 150.31Y mesh.

When printing less complex images, a high quality dual-cure direct emulsion such as PLUS 7000 is ideal, or if a one pot emulsion is preferred, then use PLUS 1-SR.

**Printing** - If high opacity is required for the final flood coat colour, then it is better to print two thin layers rather than one thick one. Be careful when overprinting trap colours as 24µ is the maximum total ink thickness recommended, thicker ink layers will suffer from poor adhesion.

**Note:** Always print Windotex and Fototex lacquers first before printing the graphics layer to prevent 'airing off' adhesion problems. Ensure that the inks do not become cured on the mesh by printing them in a non-safe light production area (for example if sunlight falls on the press).



## How to minimise dust contamination

Dust is impossible to remove from the dried print, therefore prevention is always better than contamination!

- Remove any contamination from the dry screen prior to printing with a low tack roller
- If the print room is not a 'clean room', then create a cleaner environment around the press by curtaining. This will also enable you to increase the relative humidity (RH) to reduce static build up during printing. An extractor hood will be required for local exhaust
- The operators should wear clean room clothing
- Always clean the substrate prior to printing using a low tack roller or machine
- Fit antistatic bars/static dissipaters to the press
- Try to restrict personnel movement in the area during printing
- Place tack mats around the press
- Cover the screen during stoppages or remove the ink
- Never return unused ink to the pot

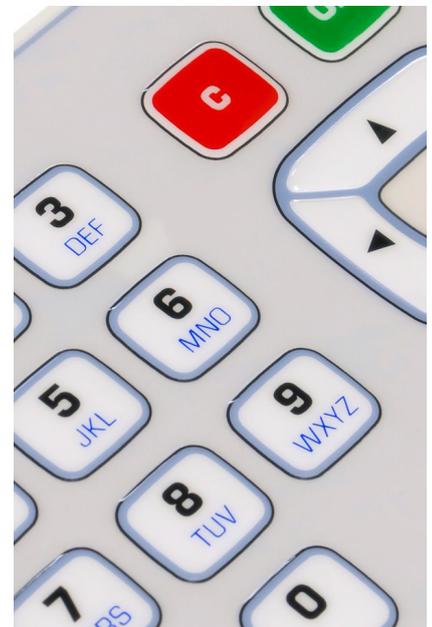
**UV curing:** Complete curing is essential to achieve good inter-layer adhesion and adhesion to the primer. Curing dark colours may cause the substrate to heat up excessively so two lower power passes may be better than one single high power pass. Refer to the ink manufacturer's recommendations for curing.

**Ink cleaning - press wash:** If the screen needs to be cleaned during printing use Autosolve Press Wash AF and allow the mesh to dry out completely before recommencing printing.

**Ink cleaning - archiving:** If the screen is to be archived for reuse, the screen can be cleaned with Autosolve Press Wash AF40 (Flash point 44°C) or Autosolve Press Wash AF55 (Flash point 57°C), paying particular attention not to damage the stencil.

**Ink cleaning - decoating:** If the stencil is to be decoated, use Autosolve Graphics (low VOC) or Autosolve Industrial which are water washable screen cleaning solvents. Do not store 'inked' screens in a white light area that could cause the UV ink to cure on the mesh, making it much harder to remove.

**Stencil removal:** Ghost images in the mesh will cause shadow marks in the print, therefore to get the best results use Autostrip stencil stripper followed by Autokleen Plus, low caustic haze remover. Quick Clean is an ideal product to use if there is just a UV ink stain that needs removing.



### Products for UV screen printing second surface graphics

|                        |  |
|------------------------|--|
| Hardcoated films       | Autotex & Autoflex with 7 series primer          |
| Mesh adhesive          | 2-Part Screen Adhesive                           |
| Mesh degreasers        | Universal Mesh Prep & Auto Degreaser Concentrate |
| Photostencil films     | Capillex 18 & Capillex CP                        |
| Photostencil emulsions | PLUS 7000 & PLUS 1-SR                            |
| Press wash solvents    | Autosolve Press Wash AF, AF40 & AF55             |
| Screen wash solvents   | Autosolve Graphics & Autosolve Industrial        |
| Stencil stripper       | Autostrip  |
| Haze remover           | Autokleen Plus & Quick Clean                     |

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