

Technical Bulletin

Professional Etching Process for Hydro-Solve Magnesium



Luxfer Hydro-Solve Magnesium uses a safer aqueous photoresist coating that eliminates the requirement for many solvents traditionally used in processing. Solvents produce VOC's, are classified as Dangerous Goods, emit strong unpleasant odours and the waste product is costly to dispose correctly to comply with Government and Council regulations. Using Hydro-Solve Magnesium's water based developers and coating removers eliminates the need for solvent developer and solvent coating remover. When processed correctly and with the recommended chemistry, Hydro-Solve provides the absolute best fine detail of any aqueous-developed coated plate.

Here is a step by step guide on guidelines for usage:

Before You Start:

Ensure all staff or those that may be in contact with the process are wearing the appropriate safety equipment. These include Protective Gloves, Protective Eyewear and Protective Clothing. Ensure the workplace is clean, dust free, well ventilated and has good lighting.

Take care with any unexposed plates once the plastic protective coating is removed. The photosensitive coating is light sensitive and any exposure to UV light sources can partially expose the coating and render the plate unusable. Use common sense around any chemical and always use care and caution at all times.

- **EXPOSURE:** Before any activity, ensure that your UV Lamps and reflectors are totally clean and in good operating condition. It is important that the lamps provide a peak at a wavelength of 380 Nanometres. Test a small piece of Hydro-Solve Magnesium using the Stouffer 21-Step Sensitivity Guide to determine proper exposure time which should be a Step 8 – 10 (up to 10 – 11 for fine line work). Repeat this test weekly to ensure the intensity and power of your UV lamps is correct. We strongly suggest using Matte Imaging Film and not Gloss Imaging Film as chemical emissions during exposure can disrupt the film-to-plate contact when using Gloss Imaging Film.
- **VACUUM FRAME:** Before any activity, ensure that the vacuum frame glass is totally clean and free of any lint, dust or debris and wipe all surfaces with Isopropyl Alcohol regularly. Spots on glass lead to pinholes and image loss, that may not be visible at time of exposure. Ensure the frame forms a complete seal when closed. The seal must be absolutely airtight to hold film tightly in contact to plate during exposure.
- **DEVELOPER SOLUTION:** Use the specially formulated Hydro-Solve Developer Concentrate for best results. Mix ONE part Hydro-Solve Magnesium Developer Concentrate and FOUR parts water in a non aluminium tray. Warm the solution and maintain the temperature at 27° - 30° C and keep check with a thermometer. *(Hydro-Solve Magnesium plates can be developed in a 1.3% Caustic Soda and water, or in extreme circumstances Red-Top Solvent Developer, however is not recommended and you must test for suitability)*
- **DEVELOPING:** Immerse the exposed plate in the tray and gently agitate the solution over plate surface. Do not rub or wipe plates while in the developer solution. The image will emerge and the plate will fully develop in about three minutes. Remove plate from developer and rinse under clean running water, then wipe with clean lint free cloth.
- **DESCUM:** Do not over-descum the Hydro-Solve Magnesium plate. Use a light 1% to 2% Nitric Acid solution and be particularly sensitive around fine lines and screen images on plate.
- **PRE ETCH PLATE PROTECTION:** Post descum, apply liberal amounts of Luxfer Express Guard, A Gum or Pure Gum Arabic with a soft sponge prior to etching. This vastly enhances the etch performance and importantly, prevents snap oxidation which can lead to pimples on plate surface.
- **ETCHING BATH FORMULATION:** Blend approximately 20% Acid, 5% Etching Oil and 75% Water. It is critical that quality acid is used and it is 42° Baumé Nitric Acid or 70% Nitric Acid concentrate. Etching oil is added @ 5.0% (use either Rev-Flex or X5K)
- **ETCHING PROCESS:** Time, temperature and paddle speeds should be the same as for Red-Top material. As a guide Stoma machines run an average paddle speed of around 500-550 RPM at 30° - 32°C. It is advisable to work with lower paddle speeds to produce more uniform shoulders between free standing lines and reverses. The shoulder can be adjusted by raising or lowering the RPM (lower RPM's = wider shoulders, higher RPM's = steeper shoulders) For OH&S ensure proper ventilation and you must have a full extraction hood and exhaust fan over the bath capable of providing a high air velocity of 100-120 FPM at the hood.
- **COATING REMOVAL:** Remove the Hydro-Solve top coating as soon as possible after etching. Only use the recommended Hydro-Solve Coating Remover (undiluted) in a non aluminium tray. This should be warmed and maintained at 22-25° C and regularly checked with a thermometer. Immerse plate into tray and gently agitate the solution over the plate. The coating will loosen in 5 to 10 minutes, then gently wipe the plate with the Luxfer Soft Etching pad to complete up the process.
- **POST ETCHING:** Wash plate with warm water and detergent, rinse with clean water then dry with clean cloth. A final application of Luxfer Express Guard or similar Gum Arabic Concentrate is recommended to protect the finished plate and then buff smooth and dry.

WASTE DISPOSAL: (Guidance Only) The waste generated from Hydro-Solve processing should be disposed of in a responsible way and must conform to local EPA and Council regulations. CHECK FIRST. It is possible to treat waste by neutralising the acid for disposal into the waste water stream. Chemicals that are suitable are Sodium Metasilicate or Soda Ash pH Increaser (Hy-Clor) This should be slowly added to the waste liquid and measured with a quality pH meter to ensure the rebalancing has been effective to a pH of at least 7.0. It is also recommended to remove any emulsified oils from the surface of the liquid before discharging and filter final waste to catch any solids that may have formed. It is critical to record all works and keep dated batch samples of any materials that you are intending to discharge into the waste water stream. Again, check with local authorities in your area first before undertaking any waste disposal activity.