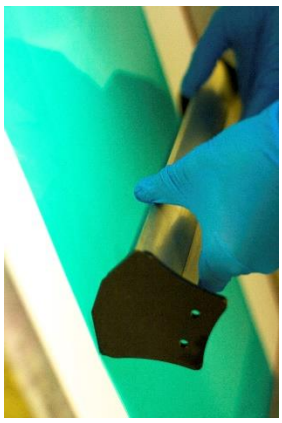
HOW TO COAT CPS ULTRA COAT EMULSION | SCREEN PRINTING GUIDE

This How to Guide will take you, step by step, through proven techniques for coating CPS ULTRA COAT® photostencil emulsions.

Objective – To achieve consistent production of high quality stencils that meet all your screen printing requirements.

Recommendations:

Sensitising and mixing - CPS ULTRA COAT® emulsions are supplied either pre-sensitised, or with a separate Diazo sensitiser in a sachet (1) or bottle (2).



1) The Diazo powder sachet is designed for direct addition to the emulsion without the need for pre-dissolving in water. This will ensure that the factory controlled viscosity is retained to give you the optimum consistency.

Always use scissors to open the Diazo powder sachet to ensure you get a clean cut. Hold the open sachet 1 to 2cms from the emulsion surface and gradually sprinkle the powder onto the emulsion. Use a wooden, or plastic stirrer (never use a metal stirrer) to 'fold' in the Diazo powder to the emulsion, as this will minimise powder loss. The emulsion then needs to be mixed very thoroughly.

2) The Diazo bottle is designed for pre-dissolving the diazo using warm water prior to addition to the emulsion. Half fill the bottle and shake (with the lid in place) and pour the dissolved diazo directly into the emulsion, repeat the fill process to ensure the correct amount of water is added. Use a wooden, or plastic stirrer (never use a metal stirrer) to thoroughly mix the emulsion.

#ScreenprintingTopTip: Sensitise the emulsion at least 24 hours before it is needed in production to allow the Diazo to dissolve completely and for the emulsion to de-aerate.

One-pot photopolymer emulsions also require mixing prior to their initial use, as the contents may settle slightly during storage.

Manual or Automatic coating - Excellent results can be achieved with both manual and automatic coating, but automatic coating machines typically achieve a greater degree of consistency than manual coating. Coating machines are of particular benefit when processing very large screens, or where the screens are all the same size.

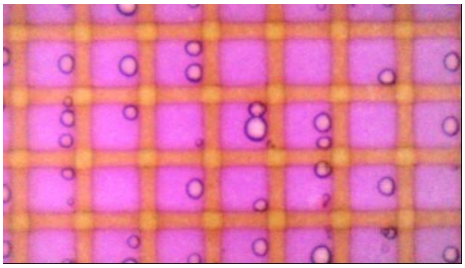
Coating trough selection –

Selecting and then maintaining the coating trough is critically important for achieving a quality result. Troughs are available with either a sharp or round edge profile depending on what deposit is required. A sharp edge trough will deposit significantly less emulsion per coat than a round edge trough. The coating edge of the trough must be inspected regularly for any nicks or profile irregularities and replaced if damaged.

Coating techniques - Coating pressure, angle, speed and depth of emulsion in the coating trough will all affect the amount of emulsion that is applied with each pass. Below is an overview of each technique:

Pressure – A consistent pressure is actually more important than absolute pressure. Use sufficient pressure to ensure that the trough edge is in perfect contact with the mesh and that this contact is maintained throughout the stroke. The pressure may have to be increased slightly when using a high viscosity emulsion, to prevent it 'pooling' in the centre of the screen. A mesh deflection of 1 to 3mm at the trough edge is fairly typical depending on emulsion viscosity.

Angle – Typically an angle of 15° to30° from the horizontal is used. Once again maintaining a consistent angle is the most important factor. Many troughs have the end caps pre-cut to the appropriate angle.



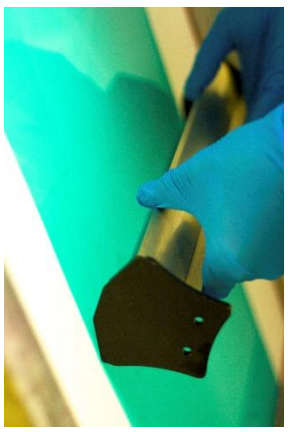
Speed – Always try to coat as slowly as possible as this will help minimise the amount of air trapped in the mesh openings (see picture). This is particularly important with coarse meshes and high viscosity emulsions. However, if you manually coat slowly, be careful not to introduce judder lines across the mesh. As a rough guide, speeds can range from 80 to 300cm/min depending on the viscosity of the emulsion.

#ScreenprintingTopTip: Quite small variations in the depth of the emulsion in the coating trough can have a significant impact on the coating thickness. Where coating thickness is critical, i.e. four-colour halftone printing, ensure that the troughs are always filled to the same depth for each screen in the set.

Always wipe the coating edge clean immediately after coating.

Coating Regime - The number of coats you apply and the coating regime used is the primary control of stencil Rz and EOM. For most screen printing applications the objective is to produce a screen that has a thin, flat stencil surface on the print side, with just a thin, fully cured layer of emulsion on the squeegee side. Stencil build comes primarily from applying multiple wet coats from the squeegee side, whilst stencil smoothness comes from applying thin, face-coats of emulsion to the print side.

The typical coating regime for manual coating is to apply 1 or 2 base coats of emulsion to the print side of the screen which ‘fills’ the mesh and then immediately apply 1 or 2 coats to the squeegee side. This pushes the wet emulsion back through the mesh to the print side, leaving only a thin, sealing layer on the squeegee side. With coating machines you have the capability to coat both sides with each pass, and this is a very effective method



There are obviously many variations to this theme depending on frame size, mesh count, image requirements etc. but the principle requirement is to start on the print side and finish on the squeegee-side.

Face-coats - All emulsions lose volume during drying as the water evaporates and consequently they shrink back around the mesh fibres to leave an uneven surface. Face-coating is used to fill in these hollows in the uneven emulsion surface on the print side, to create a flat stencil surface (low Rz) which minimises sawtoothing during printing. Face-coating can only be applied to screens that have already been fully dried. Typically 2 face-coats are applied and then the screen is dried again. If an even lower Rz is required, then additional face-coats can be applied. Some coating machines are fitted with IR driers which facilitate intermediate drying and allow face-coats to be applied as part of a continuous production process.

#ScreenprintingTopTip: For high specification applications, a sharp edged trough can be used in conjunction with a round edge trough. Use the round edge trough for the base layer and the sharp edge trough for the wet-on-dry face-coats. This reduces the surface roughness (Rz) without significantly increasing the stencil profile (EOM).

Drying - Emulsion screens must be dried horizontally with print side down. If the screens are dried vertically, the emulsion will 'curtain' as it flows down the mesh before drying. Screens should be dried thoroughly using warm, dry air (35°C, 10% RH) for best results. Drying is a critical step in the screen making process, so refer to the 'How to Guide Correct drying of emulsion' for more information.

Measuring stencil profile (EOM) - The ability to measure stencil profile is critical for consistent screen printing, as even a +1µ difference in stencil profile can give a noticeable difference in wet ink deposit. A hand held coating thickness measuring device is simple to use on Polyester mesh and will give an instant reading.

Measuring stencil roughness (Rz) - A rough stencil (high Rz) will give poor print quality, so the ability to measure Rz is very useful. There are many portable Rz metres available today that will give you an instant measure of your stencil's surface roughness.

Coating ultra-thick stencils - There is a special technique for coating ultra-thick stencils (>200µ). Refer to the How to Guide on How To Coat High Build Emulsions/Ultra Thick Stencils on our website at www.cps.eu for more information.

CPS Stencil Making Products	
CPS Ultra Coat 100	Economical general purpose solvent resistant emulsion. CPS Ultra Coat® 100 is a durable single cure low solids emulsion, for screen printers of point of display and fine graphics. The easy reclaim properties of this emulsion means that less stencil remover is required, making the process more sustainable.
CPS Ultra Coat 200	High durability water resistant textile and fine art screen printing emulsion. CPS Ultra Coat® 200 is the most durable water resistant and hazard label free emulsion in the range. Used by screen printers of plastisol, water based and discharge inks to print onto garments, jute bags, wallpapers and fine arts.
CPS Ultra Coat 535	Ideal for all general and high quality applications using solvent based, UV curing or water based inks. CPS Ultra Coat® 535 is a durable water and solvent resistant emulsion that is used by screen printers to print onto glass, paper, textiles, garments, hats, bags and plastics. The easy reclaim of this emulsion means that less stencil remover is required, making the process more sustainable.
CPS Ultra Coat Viking	Recommended for the highest quality applications using solvent based, UV curing or water based inks. CPS Ultra Coat® Viking is a high resolution, durable water and solvent resistant emulsion that is used by screen printers to print onto glass, paper, textiles, garments, hats, bags and plastics etc.
CPS Ultra Coat 550	Recommended for the highest quality applications using solvent based, UV curing or water based inks. CPS Ultra Coat® 550 is a highly durable water and solvent resistant emulsion that is used by screen printers to print onto paper, board, textiles, garments, hats, bags and plastics etc. The easy reclaim of this emulsion means that less stencil remover is required, making the process more sustainable.

CPS Stencil Making Products	
CPS Ultra Coat Titanium	Recommended for the highest quality applications using solvent based, UV curing or water based inks. CPS Ultra Coat® Titanium is a high resolution, highly durable water and solvent resistant emulsion that is used by screen printers to print onto paper, board, textiles, garments, hats, bags and plastics etc.
CPS Ultra Coat Triton	CPS Ultra Coat® Triton is a discharge, water and plastisol ink resistant emulsion that offers textile screen printers of bags, garments and tea towels the ability to meet the continued demand for prints that have a soft feel and finish.
CPS Ultra Coat Neptune	Fast exposing and durable, water and UV resistant emulsion ideal for DTS and CTS as well as conventional exposure. CPS Ultra Coat® Neptune is a water resistant emulsion that offers energy savings for screen printers of bags, garments, fine arts and flags due to its fast exposure speed.
CPS Ultra Coat HB	High solids, fast exposing emulsion, ideal or 3D effects. CPS Ultra Coat® HB is a hazard label free and durable emulsion for industrial membrane touch switches and textile screen printing of garments and bags. Its high solids content makes this emulsion suitable for high build screen printing of plastisol and UV varnishes/lacquers to create 3D effects.
CPS Ultra Coat 900	Fast exposing and a highly durable, solvent resistant emulsion ideal for DTS and CTS as well as conventional exposure. CPS Ultra Coat® 900 is a solvent resistant emulsion that offers energy savings for screen printers of point of display and membrane touch switches due to its fast exposure speed.
CPS Ultra Coat 600 W	Fast exposing and a highly durable water resistant emulsion, ideal for DTS and CTS as well as conventional exposure. CPS Ultra Coat® 600W is a water resistant, high resolution and a highly durable emulsion that offers energy savings for screen printers of bags, garments,
CPS Ultra Coat CTS L	Ultra fast exposing durable solvent resistant emulsion for DTS and CTS. CPS Ultra Coat® CTS L is durable computer to screen (CTS) graphics emulsion for screen printing of conventional and water based UV inks.

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