Dirasol Diazo-Photopolymer Emulsions

902 - 914 - 915 - 916 - 917 - Super Coat - 948 - 950 - SuperTex

The combination of Diazo and Photopolymer chemistry has created photostencil systems capable of the highest standards of printing for all applications and ink systems.

Main Characteristics

Dirasol ‰	902	914	915	916	917	Super Coat	948	950	SuperTex
Ink Resistance	SB, CUV, P	SB, WB, CUV, WUV	SB, WB, P CUV, WUV	SB, WB, CUV, WUV	SB,CUV,P	SB, WB, CUV, WUV	SB, CUV	SB, CUV	P, WBT
Colour	Violet	Mid Blue	Deep Blue	Deep Blue	Deep Blue	Deep Blue	Light Blue	Blue	Blue
Definition	8	5	8	8	9	8	9	10	8
Resolution	7	7	9	8	9	9	6	10	8
Decoatability	8	8	9	7	10	9	7	7	8
Solids Content (sensitised)	40%	35%	38%	40%	42%	38%	48%	50%	41%
Dry coating weight	18g/m²†	15g/m²†	17g/m²†	21g/m²†	22g/m²†	17g/m²†	77g/m²§	20g/m²¶	76g/m²*
Stencil Build (microns)	6†	5†	5†	6†	6†	5†	30§	5¶	20*
Sensitised viscosity at 25° (mPas)	8500	6000	4500	4500	5000	4500	11000	6000	6000
Approx. sensitised emulsion life (22°C)	3 months	3 months	1 month	1 month	1 month	1 month	2 months	3 months	1 month
Approx. coated screen life (22°C)	3 months	1 month	1 month	1 month	1 month	1 month	1 month	3 months	1 month
Typical through-cure exposure speed using 5kw metal halide lamp at 1.2m.	85 secs†	90 secs†	100 secs†	80 secs†	75 secs†	100 secs†	125 secs§	90 secs¶	70 secs*

KEY: SB = solvent-based ink. WB = water-based ink. CUV = conventional UV curing ink. WUV = water-based UV curing ink. P = plastisol ink. WBT = water-based textile ink.

10 = Superb. 5 = Good. 0 = Poor.

†1+2 coats on 150.34 PW dyed mesh. § 2+2 coats on 62.64 PW white mesh.
¶1+1 coating on 150.34 PW dyed mesh. * 2+2 coats on 43.80PW white mesh.

Properties

Dirasol 902 produces stencils with exceptional definition for graphic and industrial printing. Wide exposure latitude and easy decoatability.

Dirasol 914 is highly resistant to all graphic ink systems and has excellent resistance in high humidity conditions. Fast exposure speed and easy decoatability.

Dirasol 915 is resistant to all graphic, speciality and textile inks. Formulated to overcome static problems in high humidity conditions, caused by extreme climatic conditions or poorly ventilated work areas.

Dirasol 916 is a universal graphic emulsion. It offers superb definition for use with all graphic ink systems. Highly resistant to water-based UV graphic ink systems.

Dirasol 917 is specifically designed for high quality printing using conventional UV and Solvent-based inks. Fast exposure speed, and very easy decoating. Particularly suitable for producing wet-on-dry or face coated stencils.

Dirasol Super Coat has superb coating characteristics and is resistant to all graphic, speciality and textile inks. Formulated to overcome static problems in high humidity conditions, caused by extreme climatic conditions or poorly ventilated work areas.

Dirasol 948 has a high solids content, enabling the easy production of high-build stencils for applications requiring the printing of heavy deposits.

Dirasol 950 is specifically formulated for use with automatic coating machines, its high solids content (50%) provides excellent stencil build and edge definition with a 1+1 coating. Recommended for graphic and speciality printing.

Dirasol SuperTex has been specifically developed for the production of high quality, durable stencils for garment printers.

Also employing diazo-photopolymer technology is Dirasol SuperPro (see Information Sheet 'Dirasol Direct Projection Emulsions').

Dirasol Diazo-Photopolymer Emulsions

Instructions for Use

Safelighting

All handling of Dirasol emulsions should be carried out in light which is low in blue and ultra-violet content. A photographic safelight is not essential but it is desirable to use yellow or weak tungsten illumination. A useful form of light for the workroom is provided by gold fluorescent tubes and daylight should be excluded or filtered by a yellow lacquer coating or film applied over the windows.

Sensitising

Dirasol Diazo-photopolymer emulsions are supplied as two-pack systems consisting of:

Part A – coloured emulsion
Part B – diazo sensitiser

which should be mixed as follows:

1. Add water to the sensitiser bottle to not less than 80% of its total capacity and shake until the sensitiser is fully dissolved.
2. Add the sensitiser solution to Part A and thoroughly stir in with a plastic or wooden stirring stick. Ideally the emulsion should be allowed to de-gas for one hour before use.

If stored at room temperature, the sensitised emulsion should be used within the sensitised life quoted in 'Main Characteristics' page 1.

Preparing the Screen

Degrease the mesh in automatic machines using Xtend Prep 300 Sprayable Degreasing Concentrate or by hand with Prep 102 Degreasing and Emulsifying Concentrate.
When degreasing by hand, wet the screen and apply Prep 102 with a sponge or brush and then rub the mesh with a light circular motion. Ensure that both sides of the screen are thoroughly treated. Leave to stand for a minute and rinse with cold water to remove all traces of Prep. Allow mesh to dry before coating.

Sericol Coating Troughs

Sericol Coating Troughs are designed for accurate and consistent coating of direct photostencil emulsions. The troughs are composed of precision extruded aluminium channelling fitted with injection moulded end pieces. The channelling has a hard anodised finish which effectively seals the surface. This makes cleaning easy and also protects from corrosion. The end pieces have a special shoulder which ensures the coating edge is consistently at the optimum angle in relation to the screen. To help eliminate the beads formed at the extremities of conventional troughs, special slots have been incorporated into the end pieces. These features permit even relatively inexperienced operators to coat screens faster and more accurately.
Sericol Coating Troughs have been designed to deposit medium coating thicknesses. It is therefore possible to coat a screen to a given stencil thickness with fewer strokes than would be required with a sharper or less precise edge. The amount of emulsion used to coat a given area of a screen is principally governed by the fineness of the mesh. Sericol Coating Troughs have sufficient capacity to cover approximately 1.5-2m in a single stroke, and are available in sixteen standard sizes. When ordering please specify the overall length required, measured from the outside edge of one end piece to the other.

Coating

Automatic Coating
Apply a simultaneous single coat to each side of the screen, followed by a second coat to the squeegee side. If a higher build is required, extra coats should be applied to the squeegee side of the screen.

Hand Coating
Stand the screen on edge slightly inclined away from the operator and process the screen as follows:
Depending on the stencil build required, apply 1 or 2 coats, wet-on-wet, to the print side of the screen followed by more coats applied, wet-on-wet, to the squeegee side of the screen.

Drying

The wet screen must be dried in darkness or subdued yellow light, ideally in a horizontal position, squeegee side up. A warm air fan or well ventilated heated cupboard (up to 40°C) may be used but care should be taken not to blow dust on to the drying screen. For maximum stencil durability the screen must be thoroughly dry before exposure. Dried Dirasol screens may be stored in the dark at cool room temperatures for not longer than the time quoted in 'Main Characteristics', page 1.

Exposure

Correct exposure is most important to obtain optimum resolution, definition and stencil life. With an unfamiliar emulsion or light source, the use of an exposure test scale is recommended. This can be done by:

1. Using an exposure calculator.
2. Placing a strip of fine detail positive film over a coated screen and giving it a series of stepped exposures using a black paper mask. The exposure time is usually doubled from one step to the next. The correct exposure is the longest exposure that can be given whilst still obtaining optimum stencil resolution after wash-out. Over-exposed areas result in loss of detail,whilst under-exposed areas may result in weak, thin stencils.

Position the positive, emulsion side in contact with the Dirasol coating, on the underside of the dry screen, securing it with clear tape. Then place the complete screen into the vacuum print-down frame and ensure perfect contact before exposing.
The following guides can be the basis of an initial test exposure.

Lamp Type at 120cm Distance	50 Amp Open Carbon Arc	Metal Halide 1000W	2000W	3000W	5000W	6000W
902	720-840	360-440	180-220	110-150	70-90	60-80
914	1000-1062	500-530	235-280	155-190	90-115	75-95
915	1000-1062	500-530	235-280	155-190	90-115	75-95
916	700-740	350-400	165-210	110-140	65-85	55-75
917	680-720	330-380	155-200	100-130	60-80	50-70
Super Coat	1000-1062	500-530	235-280	155-190	90-115	75-95
948	1200-1300	585-665	285-335	190-230	115-135	95-115
950	1100-1200	540-570	260-290	160-190	90-120	70-100
Super Tex	1650-1950	1000-1070	470-530	305-385	180-220	145-185

Exposure values achieved with the following screens:

902, 914, 915, 916, 917 and Super Coat	150.34PW dyed (1+2 coats)
948	62.64PW White (2+2 coats)
950	150.34PW dyed (1+1 coats)
Super Tex	43.80 PW white (2+2 coats)

An HPR 125W Mercury Vapour Lamp achieved the same exposure values as a 1000W Metal Halide Lamp.

Dirasol Diazo-Photopolymer Emulsions

Exposure values quoted are the times required to fully cure and therefore completely harden the sensitised emulsion - Using these through-cure exposure values prevents emulsion being washed away from the inside of the stencil during development and ensures stencils of optimum definition, durability and decoatability. Where the prime requirement is stencil resolution, the exposure time may be reduced. Multifilament, stainless steel, different coloured mesh and multi-coat stencils require longer exposure, white mesh requires a shorter exposure. The length of exposure time depends on the light source, the thickness of the Dirasol coating, the fineness of the mesh, and the transparency of the background of the positive.

Very high build stencils have a significant effect on exposure as shown on the following tables for Dirasol 948:

VA32-50 Stainless Steel

Coatings	Exposure 3000W Metal Halide at 120cm	Average Thickness of Stencil (microns) including mesh
2 p+ 2s scrape	2.5 mins.	80
2 p+ 2s scrape + 2s	7.5 mins.	225
2 p+ 2s scrape + 4s	12 mins.	350
2p + 2s scrape + 6s	15 mins.	440

43.80 White Polyester

Coatings	Exposure 3000W Metal Halide at 120cm	Average Thickness of Stencil (microns) including mesh
2 p+ 2s scrape	2.5 mins.	80
2 p+ 2s scrape + 2s	5.5 mins.	160
2 p+ 2s scrape + 4s	7.5 mins.	230
2p + 2s scrape + 6s	10.5 mins.	300

p = print side s = squeegee side scrape = use the trough to remove excess emulsion from print side, to reduce air bubbles.

Six coats on the squeegee side is about the maximum number that can be applied before dripping occurs.

Developing

Place the screen in a sink or automatic developing machine and gently spray both sides with cold or warm water (not above 40°C). After 1-2 minutes the spray pressure can be increased slightly. Continue developing until all parts of the image appear clean and sharp. With thick, heavily coated screens, leave to stand wet for a few minutes before commencing spray development.

Final Drying and Spotting

Dry with the aid of a warm air fan. Any small blemishes or pinholes, usually caused by dust specks or spots on the positive, can be filled in by spotting with a brush containing screen filler or sensitised Dirasol emulsion. If using water-based inks, use a water resistant emulsion and post expose. After spotting, the screen is ready for printing.

Reclaiming the Screen

Automatic Screen Cleaning Machines:
Remove ink residues using an Xtend Screen Cleaner and decoat stencil using diluted Strip Liquid Concentrate.

Manual Screen Cleaning:
Remove ink residues using a wipe soaked with an Xtend Screen Cleaner. Rinse the screen with water and then apply diluted Strip Powder or Strip Liquid to both sides of the stencil. Leave for a few minutes. The stencil can then be easily removed with a strong water jet or high pressure water gun.

Standard Packing

Dirasol 902

DLD52/18	Large Jumbo Pack - Emulsion and Sensitiser to make 18 (4 x 4.5) ltr.
DLD52/5,4	Mini Jumbo Pack - Emulsion and Sensitiser to make 5.4 (6 x 0.9) ltr.

Dirasol 914

DBD54/18	Large Jumbo Pack – Emulsion and Sensitiser to make 18(4 x 4.5) ltr.
DBD54/5,4	Mini Jumbo Pack – Emulsion and Sensitiser to make 5.4(6 x 0.9) ltr.

Dirasol 915

DMM14/18	Large Jumbo Pack - Emulsion and Sensitiser to make 18 (4x4.5) ltr.
DMM14/5,4	Mini Jumbo Pack - Emulsion and Sensitiser to make 5.4 (6.0.9)ltr

Dirasol 916

DM916/5,4	Mini Jumbo Pack - Emulsion and Sensitiser to make 5.4 (6 x 0.9) ltr.
DM916/18	Large Jumbo Pack - Emulsion and Sensitiser to make 18 (4x4.5) ltr.

Dirasol 917

DM917/18	Large Jumbo Pack - Emulsion and Sensitiser to make 18 (4x4.5) ltr.
DM917/5,4	Mini Jumbo Pack – Emulsion and Sensitiser to make 5.4 (6 x 0.9) ltr.

Dirasol Super Coat

DMA07/18	Large Jumbo Pack - Emulsion and Sensitiser to make 18 (4x4.5) ltr.

Dirasol 948

DND58/5,4	Mini Jumbo Pack – Emulsion and Sensitiser to make 5.4 (6 x 0.9) ltr.
DND58/0,9	Small Individual Pack – Emulsion and Sensitiser to make 0.9 ltr.

Dirasol 950

EDM27/18	Large Jumbo Pack - Emulsion and Diazo Sensitiser to make 18 (4x4.5) ltr.

Dirasol SuperTex

DOTEX/18	Large Jumbo Pack – Emulsion and Sensitiser to make 18 (4 x 4.5) ltr.
DOTEX/5,4	Small Jumbo – Emulsion and Sensitiser to make 6 x 0.9ltr.

Storage

Unsensitised Dirasol should be stored in as cool a temperature as possible, but not below 2°C or above 35°C. Sensitised Dirasol should be stored under similar conditions, in its original container with the lid sealed. The product will remain stable at 22°C for up to the period stated in 'Main Characteristics', but this can be extended by keeping in a household type refrigerator. The storage time will be significantly reduced as the temperature increases above 22°C.

Safety and Handling

Dirasol Diazo-Photopolymer Emulsions:

- are formulated free from any toxic, carcinogenic, mutagenic or reprotoxic chemicals
- do not have a flashpoint and is therefore exempt from the Highly Flammable Liquid regulations

Comprehensive information on the Safety and Handling of Dirasol emulsions and Diazo Sensitiser is given in the appropriate Sericol Safety Data Sheets, available upon request.

Environmental Data

Dirasol Diazo-Photopolymer Emulsions:

- do not contain ozone depleting chemicals as described in the Montreal Convention.
- are moderately biodegradable as determined by the OECD 301D Closed Bottle Test.
- are free of any volatile solvent and is therefore beneficial to the environment when compared to solvent based products.
- are free from Phthalate Plasticisers.
- have a ph of 2-3

Problems and Solutions

Faults	Probable Cause and Remedies
1. Image does not wash out at all.	a. Accidental exposure - Check emulsion and coated screen have not been exposed to a light source or daylight. b. Screen dried with excessive heat - Dry screen at even temperature not exceeding 40°C. Avoid hot spots. c. Maximum storage life of sensitised emulsion or coated screen has been exceeded. d. Check positive for opacity.
2. Only part of image washes out.	a. Uneven coating on screen - Ensure screen is taut and coating trough is undamaged. b. Montage positives comprised of films of different clarity - Use same type film for image area. c. Exposure time excessive for detail areas of design - Use dyed mesh or reduce exposure. d. Uneven contact - Check vacuum frame for contact between positive and screen. e. Over-exposure - Reduce exposure time.
3. Apparent open areas of stencil will not print.	a. Inadequate washing out - Remove excess water from stencils. b. Inadequate exposure resulting in squeegee side of stencil running down screen, causing blocking during development or hardening.
4. Exposed stencil washing away from screen or premature stencil break-down.	a. Inadequate exposure - Dyed, multifilament and stainless steel meshes or multiple coatings all require longer exposure. A brown stained mesh after reclaiming the screen indicates under-exposure.
5. Image has excessive sawtooth.	a. Screen developed with excessive water pressure - Pre-soak screen and use gentle spray. b. Light scatter - Use dyed mesh. c. Insufficient contact - Ensure even contact between positives and screen. d. Mesh too coarse for design. e. Insufficient emulsion applied to mesh. f. Inadequate exposure - Increase exposure.
6. Fish Eyes	a. Screen improperly prepared - Thoroughly degrease with recommended preparation chemical. b. Blemishes on coating - Ensure coating trough edge is clean and no skin particles have formed on the surface from prolonged use of uncovered emulsion in the trough. c. Environmental contaminants - Ensure clean working area and limit dust contamination.
7. Pinholes in screen	a. Dirty glass or positive during exposure. b. Coating too fast - Slow down to allow mesh aperture to fully fill without aeration. c. Air bubbles in emulsion - Allow time to de-gas after mixing with sensitiser. d. Under-exposure - Increase exposure times to avoid weak stencil.

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PRINTED IN ENGLAND 1421/O4