Direct Emulsion Stencil Troubleshooting

Pinholes

Possible Cause	Potential Solution
Stencil underexposed	Use exposure calculator to determine proper exposure time. Check lamp consistency and level of output.
Dust on exposure glass or film positive	Clean glass and film positive. Use lint free cloths.
Dirt in emulsion	Work in a clean area. Cover emulsion coating trough when not in use. Keep lid on emulsion container to minimize contamination.
Residual moisture in stencil from insufficient drying and/or excessive humidity	Allow additional drying time before exposing stencils. Reduce humidity with dehumidifier. Increase exposure time in humid conditions. Do not dry unexposed screen with extremely wet screens.
Mesh preparation insufficient	Use recommended degreasers/wetting agents. Completely rinse entire frame. Avoid touching degreased mesh. Do not allow degreased screens to sit for extended time.
Coating too thin	Adjust number of coats on screen to achieve proper stencil thickness. Use round edge scoop coater for initial coats.
Coating stroke too fast	Slow coating stroke to avoid creating air bubbles.
Air bubbles in emulsion	Allow minimum of one hour after mixing sensitizer in emulsion to allow bubbles to disperse.
Emulsion incompatible with ink	Select emulsion suitable for an ink system, i.e. water resistant stencil for water based inks.
Screen not dry before coating	Dry screens completely prior to coating.
Emulsion not dry before face coating	Dry emulsion thoroughly before face coating.
Stencil washout incorrect	Avoid excessive water pressure. Do not use hot water in excess of 100 degrees F (38 C). Wash both sides thoroughly. Do not wash screen for long periods of time.
Degreased screen exposed to compressed air	Avoid using compressed air to dry screens, it may contain water, dust or oil. Use a screen vacuum to speed drying.
Aggressive solvents used on press	Replace aggressive solvents and minimize wash-ups. Retard inks to prevent drying in screen.

Poor resolution or loss of detail

Possible Cause	Potential Solution
Contact between stencil and positive poor	Check vacuum. Check vacuum blanket or hoses for leaks. Check bleeder cord position. Check screen frames for warping.
Mesh too coarse for image detail	Switch to a higher mesh count or finer thread diameter.
Film positive density poor	Remake film positive with a solid density of 3.5 or higher.
Stencil dried with excessive heat	Do not exceed 100 degrees F (38 C) when drying stencils.
Light source causing light undercutting	Point light source too close, move to distance equal to diagonal of the screen frame. Use faster exposing emulsion. Replace multi-bulb light source with point light source.
White mesh scattering light	Switch to dyed mesh and test to determine new exposure.
Emulsion too old	Use fresh emulsion. Follow manufacturer storage times and conditions.
Stencil overexposed	Use exposure calculator to determine proper exposure time.
Emulsion on incorrect side of positive	Remake film positive with emulsion up right-reading.
Coated screen stored too long	Store coated screens for no more than 1-2 weeks.
Coated screen pre-exposed	Store coated screens in dark cool dry area. Store stencil material in light tight containers. Use yellow safe lights around unexposed screens.
Stencil washout incorrect	Avoid excessive water pressure. Do not use hot water in excess of 100 degrees F (38 C). Wash both sides thoroughly. Do not wash screen for long periods of time.
Film positive layered excessively	Re-image positive into one layer of film.
Emulsion coating uneven	Improve coating technique and/or equipment. Ensure screen tension is sufficient.

Emulsion coating uneven	
Possible Cause	Potential Solution
Coating device poor or damaged	Use scoop coater instead of makeshift applicator. Ensure scoop coater is not nicked, warped or bowed.
Screen tension insufficient	Use screens with higher tension.
Coating pressure uneven or excessive	Coat with steady even pressure. Mount screen in holding device while coating.
Coating speed irregular	Coat with slow, constant and controlled speed throughout stroke.
Scoop coater not filled insufficiently	Fill scoop coater at least half full of emulsion before coating.
Scoop coater too large for frame	Select scoop coater 4 inches (10 cm) narrower than I.D. of large frames and 2 inches (5 cm) narrower for small frames.

Premature stencil breakdown on press	
Possible Cause	Potential Solution
Stencil underexposed	Use exposure calculator to determine proper exposure time. Check lamp consistency and level of output.
Residual moisture in stencil from insufficient drying and/or excessive humidity	Allow additional drying time before exposing stencils. Reduce humidity with dehumidifier. Increase exposure time in humid conditions. Do not dry unexposed screen with extremely wet screens.
Mesh preparation insufficient	Use recommended degreasers/wetting agents. Completely rinse entire frame. Avoid touching degreased mesh. Do not allow degreased screens to sit for extended time.
Coating too thin	Adjust number of coats to achieve proper stencil thickness. Use round edge scoop coater for initial coats. Build emulsion on substrate side of screen. Dry screen substrate side down.
Emulsion too old	Use fresh emulsion. Follow manufacturer storage times and conditions.
Stencil inappropriate for water-based inks	Use water-resistant or waterproof stencils for water-based inks.
Squeegee pressure excessive	Reduce squeegee pressure. Reduce need for excessive pressure with higher screen tensions and lower off-contact.
Off-contact excessive	Decrease off-contact distance. Reduce need for high off-contact with higher screen tensions.
Floodbar pressure excessive	Reduce floodbar pressure.
Relative humidity excessive	Use moisture resistant dual-cure emulsion. Use dehumidifiers to help control press room conditions.
Aggressive solvents used on press	Replace aggressive solvents and minimize wash-ups. Retard inks to prevent drying in screen.
Screen tension insufficient	Use screens with higher tension.
Stencil not dry before printing	Thoroughly dry the stencil prior to printing.

Poor definition (sawtooth/lack of edge sharpness)	
Possible Cause	Potential Solution
Stencil underexposed or extremely overexposed	Use exposure calculator to determine proper exposure time. Check lamp for consistency and level of output.
Contact between stencil and positive poor	Check vacuum. Check vacuum blanket or hoses for leaks. Check bleeder cord position. Check screen frames for warping.
Film positive edge quality and/or density poor	Use film with a sharp hard image edge. Ensure film positive has a solid density of 3.5 or higher.
Residual moisture in stencil from insufficient drying and/or excessive humidity	Allow additional drying time before exposing stencils. Reduce humidity with dehumidifier. Increase exposure time in humid conditions. Do not dry unexposed screen with extremely wet screens.
Mesh too coarse for image detail	Switch to a higher mesh count or finer thread diameter.
Coating too thin	Adjust number of coats to achieve proper stencil thickness. Use round edge scoop coater for initial coats. Build emulsion on substrate side of screen. Dry screen substrate side down.
Stencil dried with excessive heat	Do not exceed 100 degrees F (38 C) when drying stencils.
White mesh scattering light	Switch to dyed mesh and test to determine new exposure.
Stencil washout incorrect	Avoid excessive water pressure. Do not use hot water in excess of 100 degrees F (38 C). Wash both sides thoroughly. Do not wash screen for long periods of time.

Scumming or thin haze in image areas after washout

Possible Cause	Potential Solution
Stencil underexposed	Use exposure calculator to determine proper exposure time. Check lamp consistency and level of output.
Film positive density poor	Remake film positive with solid density of 3.5 or higher.
Stencil washout insufficient	Wash out screen on both sides thoroughly to remove all unexposed emulsion.
Residual moisture in stencil from insufficient drying and/or excessive humidity	Allow additional drying time before exposing stencils. Reduce humidity with dehumidifier. Increase exposure time in humid conditions. Do not dry unexposed screen with extremely wet screens.
Contact between stencil and positive poor	Check vacuum. Check vacuum blanket or hoses for leaks. Check bleeder cord position. Check screen frames for warping.
Coated screen pre-exposed	Store coated screens in dark cool dry area. Store stencil material in light tight containers. Use yellow safe lights around unexposed screens.
White mesh scattering light	Switch to dyed mesh and test to determine new exposure.

Washout difficult

Possible Cause	Potential Solution
Stencil dried with excessive heat	Do not exceed 100 degrees F (38 C) when drying stencils.
Emulsion too old	Use fresh emulsion. Follow manufacturer storage times and conditions.
Coated screen stored too long	Store coated screens for no more than 1-2 weeks.
Coated screen pre-exposed	Store coated screens in dark cool dry area. Store stencil material in light tight containers. Use yellow safe lights around unexposed screens.
Film positive density poor	Remake film positive with solid density of 3.5 or higher.
Stencil overexposed	Use exposure calculator to determine proper exposure time.

Emulsion soft or washes/peels off mesh during washout

Possible Cause	Potential Solution
Stencil underexposed	Use exposure calculator to determine proper exposure time. Check lamp consistency and level of output.
Residual moisture in stencil from insufficient drying and/or excessive humidity	Allow additional drying time before exposing stencils. Reduce humidity with dehumidifier. Increase exposure time in humid conditions. Do not dry unexposed screen with extremely wet screens.
Emulsion too old	Use fresh emulsion. Follow manufacturer storage times and conditions.
Sensitizer improperly mixed	Dissolve sensitizer thoroughly. Mix completely with emulsion.
Mesh preparation insufficient	Use recommended degreasers/wetting agents. Completely rinse entire frame. Avoid touching degreased mesh. Do not allow degreased screens to sit for extended time.
Coating inconsistent	Improve coating techniques and/or equipment. Use screens with sufficient tension.
Stencil washout incorrect	Avoid excessive water pressure. Do not use hot water in excess of 100 degrees F (38 C). Wash both sides thoroughly. Do not wash screen for long periods of time.
Film positive clear density too high	Remake film positive with density of 0.3 or less in clear areas.

Screen image does not match positive size or proportion

Possible Cause	Potential Solution
Frames warped	Repair or replace warped frames.
Screen tension insufficient	Use screens with higher tension.
Vacuum pressure too high	Repair any tears or holes in vacuum blanket. Follow manufacturer setting for vacuum pressure.
Positives expanding from heat during exposure	Use more stable film positives.
Stencil dried with excessive heat	Do not exceed 100 degrees F (38 C) when drying stencils.
Film positive layered excessively	Re-image positive into one layer of film.

Reclaiming difficult	
Possible Cause	Potential Solution
Stencil underexposed	Use exposure calculator to determine proper exposure time. Check lamp consistency and level of output.
Stencil locked in from fast-flashing solvents	Use safety solvents to remove ink from screens. Avoid acetone, lacquer thinner containing toluene or ketones, and strong screen openers.
High pressure washer not used	Use a high pressure washer for reclaiming.
Screen stored for extended period of time	Reclaim stencils as soon as possible.
Reclaiming chemistry incompatible	Use recommended solvents and chemistry for reclaiming.
Emulsion coating uneven	Improve coating technique and/or equipment.