


# Graphic Printing Troubleshooting Guidelines

## Voids or skips in ink

| Possible Cause | Potential Solution |
|---|---|
| **Substrate contaminated with dust, dirt, or oily residue** | Wipe substrate with anti-static duster, lint-free isopropyl alcohol wipes or tack cloth. |
| **Debris in image area** | Clean bottom of screen with press wash to remove debris.<br>Clean work area regularly.<br>Increase humidity level. |
| **Ink too thick** | Thin ink with appropriate reducer/thinners. |
| **Off contact/peel excessive** | Reduce off contact/peel distance. |
| **Squeegee pressure insufficient** | Increase squeegee pressure. |
| **Squeegee too hard** | Use softer durometer squeegee. |
| **Squeegee angle too high** | Lower squeegee angle. |
| **Squeegee speed too fast** | Reduce squeegee speed. |
| **Mesh too fine** | Use coarser mesh. |
| **Stencil too thick** | Reduce the number of emulsion coats for thinner stencil thickness. |
| **Flood coat insufficient** | Ensure an even flood coat is done directly after printing.<br>Reduce flood bar speed. |
| **Film positive has pinholes** | Repair positive with opaqueing marker and re-expose. |
| **Ink foaming in screen** | Reduce printing speed.<br>Use screens with higher tension. |
| **Ink not properly ground (agglomerates present)** | Use fresh ink that has been manufactured properly. |
| **UV ink has excessive silicone flow control agent** | Re-mix ink with less flow control.<br>Observe manufacturer limits when using additives. |

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## Incomplete image edges

| Possible Cause | Potential Solution |
|---|---|
| **Squeegee pressure insufficient** | Increase squeegee pressure. |
| **Image edge blocked with stencil** | Remake stencil using correct exposure time.<br>Washout image completely. |
| **Image edge blocked with debris** | Wipe bottom of screen with press wash to remove debris. |
| **Image edge blocked with mesh threads** | Use different mesh or angled fabric to avoid thread interference. |
| **Ink drying in screen** | Correct using 'Solvent ink drying in screen' chart. |
| **Film positive has defects** | Repair artwork and remake film positive. |
| **Off contact/peel excessive** | Reduce off contact/peel distance. |
| **Image too close to frame** | Select frame size where image takes up no more than 70% of the total mesh area. |

## Cob-webbing or static strings

| Possible Cause | Potential Solution |
|---|---|
| **Static electricity excessive** | Increase relative humidity level.<br>Use anti-static elimination equipment.<br>Electrically ground table bed.<br>Set vacuum draw to minimum needed to hold sheet.<br>Reduce print speed.<br>Use antistatic spray or ink additives. |
| **Ink too thick or tacky** | Mix ink well before use.<br>Add retarder or thinner to ink. |
| **Screen tension insufficient** | Use screens with higher tension. |
| **Off-contact and/or peel excessive** | Reduce off-contact/peel distance. |
| **Squeegee pressure excessive** | Reduce squeegee pressure. |

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## Ink streaking

| Possible Cause | Potential Solution |
|---|---|
| **Squeegee or flood bar has nicks** | Sharpen or replace worn squeegees.<br>Smooth or replace nicked flood bar. |
| **Squeegee pressure insufficient** | Increase squeegee pressure. |
| **Squeegee speed too fast** | Reduce squeegee speed. |
| **Ink not mixed thoroughly** | Mix ink with a mixer before using it on press. |
| **Ink has debris or contaminates** | Filter ink threw a screen to remove debris.<br>Use fresh ink. |
| **Screen mesh damaged** | Remake stencil on undamaged mesh. |
| **Ink too old** | Rotate ink inventory using First In, First Out.<br>Date ink cans as they are received.<br>Observe the manufacturer specified shelf life. |
| **Squeegee too hard** | Use softer durometer squeegee. |
| **Stencil coating uneven** | Remake stencil using nick free coating trough and consistent coating pressure. |

## Ink flowing poorly (mesh marks)

| Possible Cause | Potential Solution |
|---|---|
| **Ink too thick or tacky** | Mix ink well before use.<br>Add retarder or thinner to ink. |
| **Mesh too fine** | Use coarser mesh. |
| **Squeegee angle too high** | Lower squeegee angle. |
| **Squeegee pressure insufficient** | Increase squeegee pressure. |
| **Off-contact/peel too high** | Reduce off-contact/peel distance. |
| **Screen tension insufficient** | Use screens with higher tensions. |
| **Ink dried/cured too quickly** | Allow sufficient ink flow-out time after printing. |
| **Mesh not properly reclaimed** | Remake screen on properly cleaned mesh. |
| **Squeegee speed too fast** | Reduce squeegee speed. |
| **Flood speed too fast** | Reduce flood stroke speed. |
| **Squeegee too hard** | Use softer durometer squeegee. |

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## Ink smearing

| Possible Cause | Potential Solution |
|---|---|
| **Screen tension insufficient** | Use screen with higher tensions. |
| **Squeegee pressure excessive** | Reduce squeegee pressure. |
| **Off-contact/peel is excessive** | Reduce off-contact/peel distance. |
| **Image too close to frame** | Select frame size where image takes up no more than 70% of the total mesh area. |
| **Substrate sticking to mesh due to static electricity** | Increase relative humidity level.<br>Use anti-static elimination equipment.<br>Electrically ground table bed.<br>Set vacuum draw to minimum needed to hold sheet.<br>Reduce print speed.<br>Use antistatic spray or ink additives. |
| **Vacuum table pressure insufficient** | Increase vacuum pressure.<br>Mask off open holes on vacuum bed.<br>Service press bed vacuum to ensure adequate pressure. |
| **Flood bar pressure excessive** | Reduce flood bar pressure. |
| **Vacuum table, screen and squeegee not parallel** | Level press components properly. |
| **Ink too thin** | Use higher viscosity ink.<br>Remix ink with less thinner/reducer.<br>Thicken ink with appropriate additives. |
| **Squeegee edge dull** | Sharpen or replace worn squeegees. |
| **Off-contact/peel insufficient** | Increase off-contact distance. |
| **Mesh too coarse** | Use finer mesh. |

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## Ink bleeding

| Possible Cause | Potential Solution |
|---|---|
| **Ink too thin** | Use higher viscosity ink.<br>Remix ink with less thinner/reducer.<br>Thicken ink with appropriate additives. |
| **Ink mixed poorly** | Mix ink thoroughly before use. |
| **Substrate too absorbent or rough** | Adjust artwork resolution for substrate limitations. |
| **Flood pressure excessive** | Reduce flood bar pressure. |
| **Stencil too thin** | Increase the number of emulsion coats for thicker stencil.<br>Use round edge scoop coater for initial coats. |
| **Mesh too coarse** | Use finer mesh. |
| **Squeegee pressure excessive** | Reduce squeegee pressure. |
| **Squeegee speed too slow** | Increase squeegee speed. |
| **Squeegee angle too low** | Raise squeegee angle. |
| **Squeegee too soft** | Use higher durometer squeegee. |
| **Squeegee edge dull** | Sharpen or replace worn squeegees. |
| **Too much ink in screen** | Remove extra ink to eliminate uncontrolled flow-back. |

## Orange peel / fisheyes in ink

| Possible Cause | Potential Solution |
|---|---|
| **Ink incompatible with substrate** | Select proper ink for substrate being printed. |
| **Substrate surface contaminated** | Clean substrate surface with lint-free isopropyl alcohol wipes. |
| **Ink mixed poorly** | Mix ink thoroughly before use. |
| **Ink mixed with incompatible additives or solvents** | Re-mix with proper solvents and/or additives.<br>Use only manufacturer recommended thinners. |
| **Substrate surface uneven** | Fill texture with base print of clear. |
| **UV ink has excessive or incorrect silicone flow control agent** | Re-mix with less flow control.<br>Use manufacturer recommended additives.<br>Observe manufacturer limits when using additives. |

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## Pinholes appearing on print

| Possible Cause | Potential Solution |
|---|---|
| **Stencil has pinholes** | Use proper exposure times for stencil.<br>Prepare screen in dust controlled environment.<br>Block out screen adequately prior to printing. |
| **Stencil breaking down on press**<br>**Screen underexposed** | Use exposure calculator to determine proper exposure time. |
| **Screen not dried properly** | Dry screens completely before exposure. |
| **Stencil material out of date** | Use fresh emulsion. |
| **Humidity excessive** | Use moisture resistant dual cure emulsion. |

## Sawtooth on edges

| Possible Cause | Potential Solution |
|---|---|
| **Stencil is too thin** | Increase the number of emulsion coats for thicker stencil.<br>Use round edge scoop coater for initial coats. |
| **Stencil severely underexposed** | Use exposure calculator to determine proper exposure time.<br>Check lamp for consistency and level of output. |
| **Mesh threads blocking image edge** | Use different mesh or angled fabric to avoid thread interference. |
| **Ink too thick** | Mix ink well before use.<br>Thin ink with appropriate reducer/thinners. |
| **Mesh too coarse** | Use finer mesh. |
| **Film positive has pattern** | Remake film positive with higher resolution output device. |
| **Ink drying in screen** | Correct using ‘Solvent ink drying in screen’ chart. |

## Double image at edges

| Possible Cause | Potential Solution |
|---|---|
| **Screen tension insufficient** | Use screen with higher tensions. |
| **Off-contact/peel insufficient** | Increase off-contact distance. |
| **Substrate uneven or very textured** | Clean ink buildup from screen periodically. |
| **Squeegee pressure excessive** | Reduce squeegee pressure. |
| **Squeegee pressure uneven** | Adjust press to achieve uniform squeegee pressure. |

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## Ghost image in print

| Possible Cause | Potential Solution |
|---|---|
| **Mesh reclaimed incorrectly** | Remake stencil on properly cleaned mesh. |
| **Screen mesh damaged, abraded or burnished** | Remake stencil on new or undamaged mesh. |

## Loss of detail/sharpness

| Possible Cause | Potential Solution |
|---|---|
| **Screen tension insufficient** | Use screens with higher tension. |
| **Squeegee pressure excessive** | Reduce squeegee pressure. |
| **Mesh too coarse** | Use finer mesh. |
| **Stencil too thin** | Increase the number of emulsion coats for thicker stencil.<br>Use round edge scoop coater for initial coats. |
| **Ink too thin** | Use higher viscosity ink.<br>Remix ink with less thinner/reducer.<br>Thicken ink with appropriate additives. |
| **Squeegee edge dull** | Sharpen or replace worn squeegees. |
| **Stencil severely underexposed** | Use exposure calculator to determine proper exposure time.<br>Check lamp for consistency and level of output. |
| **Substrate too absorbent or rough** | Adjust artwork resolution for substrate limitations. |
| **Squeegee too soft** | Use higher durometer squeegee. |
| **Squeegee angle excessive** | Raise squeegee angle. |
| **Flood pressure excessive** | Reduce flood pressure. |

## Ink deposit too thin

| Possible Cause | Potential Solution |
|---|---|
| **Mesh too fine** | Use coarser mesh. |
| **Squeegee speed too fast** | Reduce squeegee speed. |
| **Ink too thin** | Use higher viscosity ink.<br>Remix ink with less thinner/reducer.<br>Thicken ink with appropriate additives. |
| **Squeegee too hard** | Use softer durometer squeegee. |
| **Squeegee angle too high** | Lower squeegee angle. |

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## Ink deposit too thick

| Possible Cause | Potential Solution |
|---|---|
| **Mesh too coarse** | Use finer mesh. |
| **Ink too thick** | Thin ink with proper thinner/reducer. |
| **Squeegee speed too slow** | Increase squeegee speed. |
| **Squeegee too soft** | Use harder durometer squeegee. |
| **Squeegee angle too low** | Raise squeegee angle. |
| **Flood bar pressure excessive** | Reduce flood bar pressure. |
| **Off-contact/peel is excessive** | Reduce off-contact/peel distance. |

## Ink deposit uneven

| Possible Cause | Potential Solution |
|---|---|
| **Squeegee pressure uneven** | Adjust press to achieve uniform squeegee pressure. |
| **Screen frame warped** | Remake screen on flat stable frame. |
| **Squeegee edge uneven** | Sharpen or replace worn squeegees. |
| **Squeegee too soft** | Use higher durometer squeegee. |
| **Mesh too coarse** | Use finer mesh. |
| **Squeegee blade too long** | Select squeegee 1-2 inches (3-5 cm) wider on each side of image. |
| **Screen tension uneven** | Ensure screens have uniform tension.<br>Check for mesh rips or slippage and replace as necessary. |
| **Flood pressure uneven** | Adjust press to achieve uniform flood bar pressure. |
| **Vacuum table, screen and squeegee not parallel** | Level press components properly. |
| **Vacuum table indented** | Repair or replace vacuum table. |
| **Substrate thickness uneven** | Adjust press to print as even as possible.<br>Switch substrates if possible. |
| **Squeegee angle too low** | Raise squeegee angle. |
| **Off-contact/peel too high** | Reduce off-contact/peel distance. |

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## Ink foaming in screen

| Possible Cause | Potential Solution |
|---|---|
| **Squeegee and/or flood speed too fast** | Reduce stroke speed. |
| **UV ink requires flow control/bubble breaker additive** | Add small increments of bubble breaker.<br>Observe manufacturer limits when using additives. |
| **Ink mixed excessively** | Use lower mixing speed.<br>Allow bubbles to disperse after mixing. |

## Solvent ink drying in screen

| Possible Cause | Potential Solution |
|---|---|
| **Ink reduced improperly** | Use retarder to reduce inks instead of thinners. |
| **Flood coat insufficient** | Perform thick flood coat directly after printing. |
| **Mesh too fine** | Use coarser mesh. |
| **Detail too fine** | Use correct mesh and ink for image detail. |
| **Airflow at print station excessive** | Remove fans and other causes of increased airflow.<br>Direct airflow away from screen or move print station. |
| **Ink too thick** | Thin ink with appropriate reducer/thinners. |
| **Ambient temperature high** | Reduce room temperature if possible. |
| **Squeegee too soft** | Use harder durometer squeegee. |
| **Squeegee edge dull** | Sharpen or replace worn squeegees. |

## Solvent ink does not coat substrate (first color refusal)

| Possible Cause | Potential Solution |
|---|---|
| **Ink selection incorrect for substrate** | Contact supplier to determine proper ink series for substrate. |
| **Substrate surface contaminated** | Clean substrate with isopropyl alcohol and lint-free wipes. |
| **Substrate surface energy too low** | Raise substrate surface energy by treating with flame, corona discharge, or flashing through the reactor. |
| **Substrate printed on untreated side (polyolefins)** | Print on treated side of substrate. |
| **Substrate treatment inconsistent or out of date (polyolefins)** | Use fresh substrate.<br>Use an adhesion modifier. |

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## Second ink does not cover the first properly

| Possible Cause | Potential Solution |
|---|---|
| **First ink not sufficiently dry** | Adjust dryer to dry ink completely.<br>Check dryer thermostat and thermocouples for proper operation. |
| **Silicone excessive in first ink down** | Change ink. |
| **Second ink deposit too thick** | Reduce ink with proper thinner/reducer.<br>Observe manufacturer limits when using additives. |

## Solvent ink will not dry

| Possible Cause | Potential Solution |
|---|---|
| **Dryer settings improper** | Adjust dryer to dry ink completely.<br>Check dryer thermostat and thermocouples for proper operation. |
| **Ink modified improperly** | Use manufacturer recommended additives/solvents.<br>Observe manufacturer limits when using additives. |
| **Epoxy ink catalyst quantity incorrect** | Add catalyst per manufacturer recommendations.<br>Mix catalyst in ink thoroughly. |

## Solvent ink offsetting on back of substrate

| Possible Cause | Potential Solution |
|---|---|
| **Ink insufficiently dried** | Adjust dryer to dry ink completely.<br>Check dryer thermostat and thermocouples for proper operation. |
| **Substrate sheets too heavy** | Monitor substrate stack height.<br>Edge stack substrate. |

## Transparent UV inks clouding

| Possible Cause | Potential Solution |
|---|---|
| **Opaque ink used in transparent color match** | Use only transparent inks for transparent color matches. |
| **Ink has excessive flow agents or reducers** | Remix ink with less flow agents or reducers.<br>Observe manufacturer limits when using additives. |

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## Poor opacity with UV ink

| Possible Cause | Potential Solution |
|---|---|
| **Ink has too much mixing clear** | Re-mix ink with less clear. |
| **Mesh too fine** | Use coarser mesh. |
| **Squeegee too hard** | Use softer durometer squeegee. |
| **Squeegee angle too high** | Lower squeegee angle. |
| **Stencil too thin** | Increase the number of emulsion coats for thicker stencil.<br>Use round edge scoop coater for initial coats. |
| **Metallic pigment quantity insufficient (metallic inks)** | Add additional metallic pigment to base, not to exceed manufacturer recommended limits. |

## Poor gloss on UV ink

| Possible Cause | Potential Solution |
|---|---|
| **Ink under cured** | Decrease dryer belt speed.<br>Increase lamp power.<br>Add 5% clear to ink. |
| **Ink selection incorrect** | Consult manufacturer/supplier for proper ink series. |
| **Halftone extender base used instead of mixing clear** | Re-mix ink with correct clear. |
| **Flattening agent added to ink** | Re-mix ink without flattening agent. |

## Metallic UV ink rubbing off

| Possible Cause | Potential Solution |
|---|---|
| **Metallic pigment excessive** | Overprint metallic with clear to seal the pigment.<br>Add more clear base to reduce the metallic pigment concentration. |
| **Clear ink selected incorrect** | Mix metallic pigment with correct clear ink. |

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