

Troubleshooting Pad Printing Problems

Image does not fully release from pad...

Causes	Solutions
Pad is to old not enough silicone oil left in pad	Replace pad or rejuvenate using silicone oil
Ink dried on pad	Add retarder or slower thinner
Contamination on surface of substrate or part to be imaged	Clean or wipe substrate with isopropyl alcohol or suitable cleaner
Ink is too thin	Remix new ink with less solvent
Speed of printing sequence is too slow	Increase speed of machine, caution watch quality of print and prevent pad wiggle
Pad pressure	Increase pad pressure
Plate etched too deep ink stays on pad	Remake shallower etched plate
Plate etched too shallow ink is drying	Slow machine down below image with air on pad, mix new ink with less retarder or faster thinner
Too much air circulation around press	Block any air currents
Ink left on pad during set up	Do not allow ink to dry on pad, remove only with adhesive tape
Timing of machine too fast	Slow down speed caution when speeding up machine prevent pad wiggle
Humidity too high in print area	Reduce humidity to 50%
Print area is too hot	Temperature should be 68°F or 20°C
Pad has been wiped with solvent	Change to new pad allow solvent to evaporate from previous pad, then wipe down with silicone.

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Print is smeared or blurred...

Causes	Solutions
Plate is etched too deep	Make new shallower depth plate
Part is moving in fixture	Secure part better during printing
Point of pad is in print image	Move pad point to a non-print portion of plate
Too much pad pressure	Decrease pressure - use as little pressure as possible to make good print
Pad Wiggles	Slow machine motion down to allow pad to stabilize
Pad is too soft	Use harder pad
Part fixture is moving	Remake or stabilize fixture
Incorrect pad or durometer	Select correct pad for substrate
Ink is too thin	Remix ink to a higher viscosity
Open etch plate being used	Use screen image plate

Image is distorted on a flat part; size of image is one square inch or less...

Causes	Solutions
Pad is too small	Use larger pad
Pad is not aligned with image on the plate	Align image to center of pad from the plate
Too much pad pressure	Decrease pad pressure, use the least amount pressure to pick up image from plate and to print
	Choose another pad shape
	Adjust tooling or support better

Image is distorted on cylinder, print area less than 90° arc...

Causes	Solutions
Pad is too small	Use larger pad, a pad can only be depressed about 1/3 before distortion will occur
Artwork	May require distortion to print
Cylinder bends during printing	Inflate with a nose cone or stiffen to prevent collapsing during printing
Image area is not horizontal	Adjust holding fixture so cylinder print area is horizontal and parallel to etch on the plate
Wrong shape or durometer for pad	Use a softer, larger or different shape pad so it can wrap part to be printed
Pad not supported during print stroke (skidding)	Give pad full support on both sides of the cylinder

Image is distorted on a compound curved substrate...

Causes	Solutions
Pad is too small	Use larger pad
Artwork is not distorted properly	Distort artwork based on pad shape and hardness
Wrong pad shape and durometer	Test different shape and hardness to see if image can be transferred without using art distortion
Placement of image on pad is incorrect	Align pad with center of image on the plate

Spots / Blotches in printed image...

Causes	Solutions
Ink is too thick	Thin, to correct viscosity
Ink is too old	Change to a new batch
Pad beyond life	Replace pad
Too much pad pressure	Decrease pad pressure, the least amount of pressure to pick up image and to transfer to substrate
Substrate contamination on surface	Clean surface of part
Plate too deep	Make shallower plate

Pinholes in print...

Causes	Solutions
Ink not mixed with additives well	Mix ink thoroughly
Ink viscosity is too high	Add thinner to correct viscosity
Ink is drying on pad	Adjust ink by adding retarder or thinner
Pad is too flat, trapping air bubbles in the ink layer	Use higher angle pad Slow down pad, down stroke to allow bubbles to escape
Texture on part is too high	Use harder durometer pad with a higher angle
Pin holes in film positive before making plate	Touch up positive and remake plate

Loss of registration of multicolored image...

Causes	Solutions
Pad is loose on mounting	Tighten pad mounting
Not the same pad style or shape or durometer between print stations	Use identical pads so all distortions will be equal, do not mix old and new pads
Apex of pad are in different locations	Align all pads to center of design, equal distortion is critical
Fixtures are not registered between stations	Realign fixtures to each other
Film positives do not line up to each other	Redo film positives
Parts are moving between print stations	Secure part in fixture

Printed image will not pass cross hatch test...

Causes	Solutions
Ink is not cured	All inks have different drying requirements, check manufacturer technical sheets for full cure times
Wrong type of ink	Use correct ink system for substrate being printed
Contaminated surface of parts	Clean parts with alcohol test for surface contamination, check part with a dyne solution, record level, wipe part with alcohol, retest with dyne solution - If readings are different parts have surface contamination
Polyethylene and polypropylene surface of material have not been pre-treated	Surface of material needs to be treated to a dyne level of 38 to 41 dynes

Fine detail and lines are not printing...

Causes	Solutions
Pad is too soft	Use harder durometer pad
Plate (cliché) is too old, worn out	Replace with new plate
Plate is too deep	Replace with shallower plate
ink is not thinned correctly	Thin ink to allow it to flow into plate image
Ink is drying into plate	Speed up print cycle, add retarder to slow down drying speed of ink
Movement of air on plate (cliché)	Prevent air flow
Pad is too flat	Use high angle pad

Not picking up full image on pad...

Causes	Solutions
Ink dried in plate (cliché)	Slow down ink evaporation by adding retarder or a slower thinner speed up cycle of machine on print stroke
Not enough pad pressure to pick up image from etched plate	Increase pressure
Pad too small	Use pad large enough to pick up entire image
Pad is new, too much release agent	Wipe pad with solvent to condition pad surface
Pad is contaminated on surface	Clean pad surface with masking tape
Pad is too flat in shape	Use higher angle pad
Pad is damaged in print area	Change to a new pad
Ink is too high in viscosity, too thick	Thin to correct thickness by adding thinner
Image falls on tip of pad	Move image off tip (be careful of distortion of print) or use different shaped pad

The print looks fuzzy or cobwebby at edges of design...

Causes	Solutions
Ink is too thick	Thin ink by adding solvent (thinner) Use faster thinner, slow down print stroke of machine, blow air on pad or run ink thicker
Build of ink on pad	Speed up machine use, use slower thinner or retarder, run ink thinner - Increase humidity, should be 50% and 70°-72°F, use a deionized unit ionized air blowing over substrate.
Static	- Antistatic additives added to ink - Ask operators not to wear clothing containing synthetic materials
Pad too flat in shape	Higher angle pad
Plate is too deep in etch	Make shallower etch in plate
Pad is too old	Replace with new pad
Machine is cycling too fast	Slow pad up strokes

Threads and splashes...

Causes	Solutions
Pad is hard	Use softer pad
Angle of pad too steep	Use flatter pad
Plate etch is too deep	Make shallower etch in plate

Ink not opaque...

Causes	Solutions
Ink is too thin	Change ink or add new ink
Plate etch is too shallow	Make new deeper etched plate
Pad is too soft	Use harder pad
Using screen printing ink	Use a pad printing ink
Pad is too old and dried out	Use new pad, be sure to condition pad surface with solvent to remove oils
Ink is drying into plate etch	Add retarder to ink
Pad is too flat	Use higher angle pad
Texture on substrate is too high or too much	Use a harder pad
Substrate is too dark for color	Print white under color or double hit

Ink is not printing on substrate uniformly...

Causes	Solutions
Depth of etch on plate is uneven	Remake plate to correct depth
Ink is not thinned correctly	Thin to proper consistency
Ink is not fully releasing from pad	Use new pad
Pad is too old, not enough silicone left in pad to give good transfer of image	Use new pad or coat pad with silicone oil to rejuvenate
The up and down stroke of machine is too fast of a speed	Slow down speed of machine
Pad is too soft	Use harder pad
Ink dried in etch of plate	Wash with solvent to remove dried ink
Not enough pressure on down stroke to plate or to substrate	Increase pressure on down stroke
Dirt under plastic plate causing a bump	Remove plate and clean back of plate and remount to base
Substrate is too heavy textured	Use a hard pad, sharp angle
Part or substrate is contaminated (dirty)	Clean parts
Spots in plates	Check film or screen, remake plate
Part not properly supported in tooling fixture	Support part properly

The printed image is not glossy enough...

Causes	Solutions
Gloss ink is not used	Make sure ink is made to be glossy
Thinning solvent is too aggressive for substrate	Change to a less aggressive solvent or use a less aggressive ink
Not transferring enough ink to substrate, etch too shallow	Make new plate with deeper etched image / double hit part
Image with a screened plate	Try using a plate without a screened image
Not enough hardener added to a 2-part ink	Correct allowable amount, will improve gloss of ink

Color does not match original color after printing...

Causes	Solutions
Ink is over-thinned	Adjust viscosity to correct thickness
Plate etch is too shallow	Make a new plate with a deeper etch
Parts are being cured at too high of a temperature (burning ink)	Cure at lower temperature for a longer period of time
Color match done with open etch then printed with a screened plate	Change plate to open image or reformulate ink to screened plate
Substrate color showing through the ink layer	Hit twice or lay down a white under base
Not all ink is releasing from pad	Adjust thinner or retarder so all ink is removed from pad