

# Liquid Lamination Handbook

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# Introduction

Our Liquid Lamination Handbook will help you to get the very best out of Liquid Lamination.

Liquid Lamination is cross compatible with most mainstream inks and print media making it a popular choice as an alternative to film lamination on flexible surfaces or pre-hung graphics for example canvas, fleet graphics or wallpaper. Liquid lamination enhances colours as well as providing added and extended protection of many other types of digital images such as Photographic Inkjet prints.

We are here to support you to get the very best out of liquid lamination and we encourage you to check with our experienced team. We do everything we can to ensure the success of your projects, by advising you on printers, media, inks and lamination.

These are the sections of the Liquid Lamination Handbook:

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Extensive support is available on the phone or online. We would enjoy talking to you about your business, printing and finishing needs, and how we can help you. On site or at our Head office we provide one to one training and guidance as well as offer pre-testing assessment.

# What are clear coatings and liquid laminates?

Clear coatings, also called liquid laminates or Giclee varnish are an inexpensive way to protect your *prints, digital wall coverings, fine art such as canvas, signs, banners, truck sides, awnings as a small example*. Liquid laminates are cost-effective, easy to apply, and do not require extensive equipment, some can even be applied by a hand roller.

Liquid laminates feature the most current innovations in ultraviolet light absorbers and light stabilizers that offer protection for many products. Use liquid laminates for:

- Digital inkjet output
- Printed and airbrushed products
- Traditional signage and graphic art applications
- Digital wall coverings (wallpaper)
- Indoor and Outdoor protection

We offer, *ClearShield®* and *ClearJet®*, premium grade, high-performance products. They have been specially developed to:

- Protect inks from ultraviolet exposure
- Protect inks from abrasion and marring
- Provide resistance to chemicals and water
- Enhance Digital images
- Refresh images

Film lamination adheres to the printed media and comes in two types; Pressure Sensitive adhesive that only needs pressure to stick, or Heat Sensitive type that is only sticky when heat is applied. In some cases the added rigidity of film lamination does not meet the criteria for some applications, for example Digital Wallpaper. The natural bond of liquid laminates without the use of pressure/heat sensitive adhesives as with film lamination, plus its greater flexibility when applying onto most surfaces, can make Liquid lamination more suitable than conventional lamination film. Film lamination is more suitable when rigidity is needed for example with Pop Up displays, however if adhesive bond, de-lamination or compatibility of laminates to the printed substrate is an issue, then Liquid lamination can be a safer option.

# Four major benefits of Liquid Lamination

## Liquid Lamination to protect ink.

In digital printing, the ink held in the coating of the media must be protected from a number of hazards:

- Abrasion and marring
- Wind, rain, pollution and wind-borne particles
- Any forms of moisture
- Handling
- UV exposure (fading)
- Chipping of UV ink from rigid substrates.

One of the easiest and most economical methods of protection is with ClearShield and ClearJet.

## Liquid Lamination enhances the colour of prints

Liquid Laminates enhance the visual appearance of ink. They deepen the colour and increase the colour density especially the Satin and Gloss versions. Test have shown that even after long term exposure images can be made more vibrant with a secondary application of a Satin or gloss Liquid laminate.

## Liquid Lamination protect thermal transfers

ClearShield and ClearJet protect thermal transfer as well as printed materials against abrasion and are flexible enough for canvas, banners, truck sides and for vehicle (fleet) graphics. They will also contour for application over rivets. For thermal transfer images ClearShield and Original ClearJet are recommended.

## Liquid Lamination benefit traditional materials

Traditional materials like painted surfaces and vinyl signage also benefit from liquid lamination. Liquid lamination protects from peeling by sealing the edges of digital wall coverings (wallpaper) vinyl graphics and lettering. Liquid laminates can significantly increase the life expectancy of plastic. Vinyl is protected without losing its flexibility. Our coatings enhance the visual appearance of many products by intensifying colours and making signs and banners look more unified and smooth.

## Choosing between ClearShield and ClearJet

ClearJet is solvent-based, and ClearShield is water-based. They are both highly durable and provide comparable protection. To decide which product to use, wet a small area of the print:

- If you see any water sensitivity, cracking or bleeding, choose ClearJet.
- If there is no water sensitivity, choose either ClearJet or ClearShield.
- If you are coating solvent-based inks, typically choose ClearShield.

Some helpful technical information:

- Most solvent based inks can be coated with water based liquid laminates, ClearShield.
- Most eco-solvent inks and some large format solvent inks are very slow to dry and will not be successfully coated with ClearShield if the ink is not fully cured. For eco-solvent inks we recommend Original ClearShield.
- Infrared driers are frequently used at the back end of eco-solvent and some low volatility ink printers to ensure the inks are dry and fully cured.
- Water (Aqueous) dye based inks are water sensitive. Most water based pigmented (UV) inks are not water sensitive.

# ClearShield water based Liquid Laminate

ClearShield is the liquid lamination coating for water resistant media/ink combinations and solvent, eco-solvent, latex and UV inks. It is the first choice for all non water sensitive inks. ClearShield was developed using premium quality resins and ultraviolet inhibitors that protect the substrate, ink, and the liquid lamination itself against UV exposure. The ClearShield range is non-yellowing with excellent exterior durability and are highly flexible.

Use ClearShield on most substrates, including water resistant canvas, vinyl, banners, fibreglass, wood, metal, plastic, and paper. You can apply it over solvent-based inks, most water-based paint and pigment ink systems. ClearShield is available in several versions to match the needs of different inks, substrates, and applications. If spilled, ClearShield can be easily cleaned up with soap and water.

## ClearShield Type LL and CSX5000

The LL range is designed primarily to be used with Automated Liquid Laminators. They can be used manually, our brush and roll recommendations below ClearShield apply to these versions. Good results can be achieved with a mop applicator – a common window washing mop head made of material like lamb's wool fastened to a dowel rod. Typically, you want the applicator to be fully saturated.

Most customers simply pour the coating in puddles or lines on the material to be coated. They then use the applicator to spread the coating. Try to apply the coating evenly and consistently. CSX5000 might require slight thinning with water when using mops.

## ClearShield Type C

Begin by saturating the roller with Type C. Use either a high density foam roller or a short nap roller with no more than a 3/16" nap. Remove excess fluid so it is not dripping off the roller. It is best not to use a pan for loading the roller. The irregular lines in the pan may transfer onto the image. If you do want to roll out the excess, use a piece of cardboard or other smooth surface to roll on. Apply one thin coat, moving from one side of the canvas to the other. It is not necessary to have a wet, saturated film across the whole surface. Allow the first thin coat to dry to touch, about 30 minutes to 1 hour. Apply a second thin to medium coat in the same manner as the first coat, from side to side. That should be sufficient for a pleasing visual appearance and adequate protection. Two thin coats yield a visually more pleasing finish than one saturated coat.

# ClearShield Anti-Graffiti Coating

ClearShield Anti-Graffiti is a dual-component system. The base product 'Anti-Graffiti' coating can be used as a laminate without mixing with the cross linking hardener (CX100) providing excellent surface adhesion, UV protection and Graffiti resist coating. To obtain the optimum anti-graffiti protection the CX100 is added. Maximum mixing rate is 3ml of CX100 per litre of 'Anti-graffiti' liquid (15ml per 5 litres). For ultimate protection and adhesion add a top coat of our CSX5000 before applying the 'Anti-graffiti'.

The component surface may be cleaned with a range of solvents including our citrus-based graffiti remover. Our remover allows a quick, environmentally friendly removal of graffiti. Tests have been carried out against several common chemicals. No effect was shown on a 10 minute spot test done with the following chemicals: Acetone, Toluene, Gasoline, Ammonia (5%) as well as withstanding 200+ double rubs of MEK.

Any 'Anti-graffiti' liquid laminate that has been mixed with the CX100 must be used or discarded as it hardens. The solution will start becoming gel like in 4-6 hours depending on the concentration of the hardener and the atmospheric conditions.

**Any machines or equipment used must be thoroughly cleaned within this period.**

# ClearShield Retarder

In hot, humid and dry climates, it may be necessary to add a retarder to maintain the proper flow characteristics for brush and roll and even spray applications. Typically, retarders are added as needed with a recommended starting point of 1-3% by volume.

## ClearJet solvent based liquid laminate

ClearJet coatings are produced for dye-based inks when the media/ink combination is water-sensitive which could cause issues using ClearShield water based version. ClearJet is typically used only for water-based inks or when the surface is likely to fail with water based product (i.e. non water resistant inkjet media). It works on most substrates, including canvas, vinyl (enamel receptive and non-enamel receptive), banners, fibreglass, wood, metal, plastic, and paper. It is sometimes used on eco and light solvent inks. ClearJet is available in two forms, Original Version and Series FA for fine art.

Series FA is specially formulated to penetrate the canvas, making the media/ink combination more flexible and will not cause discolouration or colour shifts. It does not react with the ink jet receptive layer of most fine art substrates.

- Series FA is available in aerosol, brush and roll, and spray versions in gloss, semi-gloss, and low gloss.
- Original ClearJet is available in aerosol, brush and roll, and spray versions in gloss and semi-gloss.

## Tips for ClearShield hand rolling

With ClearShield, bristle brushes can be used however a much better finish is achieved with the use foam rollers and foam applicators. For roll application, you'll get the best results with a 3/16" nap roller (not mohair) or a high density white foam roller. We do not recommend black foam pads or rollers because they occasionally bleed. Applying ClearShield liquid laminates is an acquired skill. Here are our recommendations:

**It is very important to always work with full, wet coats. Water based products dry very quickly and will not level well if applied with a dry roller (A dry applicator either is not sufficiently loaded with coating or the bulk of the liquid laminate has already been transferred from the applicator to the surface).**

1. Let your printed print dry for 24 hours.
2. Stir up well before use, don't shake. After Stirring it is recommended to leave the liquid to settle prior to coating as bubbles/foam can cause imperfections in the coating.
3. Roll on the liquid with a generous saturation of the roller to enable and ensure a good flood coat of the surface. Using a back and forth motion, start in one corner of the print and roll to the opposite corner, drawing from the puddle you created when first placing the roller on the print. The roller should push out excess coating in the direction of the uncoated substrate. Apply as little pressure as possible making sure you do not overwork the liquid laminate.
4. Continue until you have completely covered the print or run out of liquid laminate. If you run out, load and submerge the roller again and begin in the last wet area to be coated. Do not start in an uncoated area and roll back. This technique mimics the wet edge associated with spray application.
5. To allow the material to flow out, try to work wet (thicker, full coats). If the finish does not appear smooth enough (glass like) while still wet, you can reroll the print with the same roller you used. Do not saturate the roller again; reroll with a moderately loaded applicator. This must be done very quickly after the initial application
6. Do not over roll the fluid as this can affect the quality of the finish (rough rather than smooth) as the liquid needs to flow out and will self level.
7. If you want a second coat, wait for the first coat to fully dry (usually about 1 hour) and then apply the second coat at a 90 degree angle to the first.
8. A dilution with water is not necessary (If desired no more than 10%).
9. The room must be dust free and well ventilated to will improve curing and drying time.
10. We recommend the use of high density foam roller or HVLP Spray system. For HVLP guns the pressure we recommend is 30 PSI at the gun. The ideal tip size should be 1.3 mm but you can use up to 1.6 mm.
11. During lamination, the ambient temperature target is 20°C with a relative humidity of 50%.

12. Surface dryness is achieved after 20-30 minutes depending on the thickness of the laminate added (good drying properties after several hours) in normal warm/dry ambient conditions.
13. Storage of Landor ClearShield should be in a dry place not under +5°C.
14. Do not leave the bottles open for extended periods of time and ensure bottles are well sealed after use. Liquid laminate can react to air exposure if the bottles are not re-sealed. This can lead to Congealing effect (Strings and threads) these need to be removed by re-filtering the liquid from the container. Re-filtering of the laminate is recommended if it has not been used for an extended period of time.
15. The guarantee or storage life is 12 month from manufacturers' production date.

## Tips for ClearJet brush and hand rolling

For ClearJet, bristle brushes can be used. Pad applicators or rollers are recommended for a more uniform coating and better results. For roll application, you'll get the best results with a 3/16" nap roller (not mohair) or a high density white foam roller. We do not recommend black foam pads or rollers because they occasionally bleed. Applying solvent based liquid laminates is an acquired skill. Here are our recommendations:

1. Let your printed print dry for 24 hours.
2. Stir up well before use, don't shake. After stirring it is recommended to leave the liquid to settle prior to coating as bubbles/foam can cause imperfections in the coating.
3. Roll on the liquid with a generous saturation of the roller to enable and ensure a good flood coat of the surface. Using a back and forth motion, start in one corner of the print and roll to the opposite corner, drawing from the puddle you created when first placing the roller on the print. The roller should push out excess coating in the direction of the uncoated substrate. Apply as little pressure as possible making sure you do not overwork the liquid laminate.
4. Continue until you have completely covered the print or run out of liquid laminate. If you run out, load and submerge the roller again and begin in the last wet area to be coated. Do not start in an uncoated area and roll back. This technique mimics the wet edge associated with spray application.
5. To allow the material to flow out, try to work wet (thicker, full coats). If the finish does not appear smooth enough (glass like) while still wet, you can reroll the print with the same roller you used. Do not saturate the roller again; reroll with a moderately loaded applicator. This must be done very quickly after the initial application
6. Do not over roll the fluid as this can affect the quality of the finish (rough rather than smooth) as the liquid needs to flow out and will self level.
7. If you want a second coat, wait for the first coat to fully dry (usually about 1 hour) and then apply the second coat at a 90 degree angle to the first.
8. The room must be dust free and well ventilated to will improve curing and drying time.
9. We recommend the use of high density foam roller or HVLP Spray system. For HVLP guns the pressure we recommend is 30 PSI at the gun. The ideal tip size should be 1.3 mm but you can use up to 1.6 mm.
10. During lamination, the ambient temperature target is 20°C with a relative humidity of 50%.
11. Surface dryness is achieved after 20-30 minutes depending on the thickness of the laminate added (good drying properties after several hours) in normal warm/dry ambient conditions.
12. Storage of Landor ClearJet should be in a dry place not under +5°C.
13. Do not leave the bottles open for extended periods of time and ensure bottles are well sealed after use. Liquid laminate can react to air exposure if the bottles are not resealed. This can lead to Congealing effect (Strings and threads) these need to be

removed by re-filtering the liquid from the container. Re-filtering of the laminate is recommended if it has not been used for an extended period of time.

14. The guarantee or storage life is 12 month from manufacturers' production date.
15. ClearJet Retarder and Reducer are formulated for maximum compatibility with ClearJet and allow the user maximum control over application in a variety of climatic conditions.

## Tips for using aerosol cans

ClearJet A2000 Series and Series FA Fine Art. Using an aerosol is easy to learn. Here are some tips for achieving an even finish:

1. Before you use an aerosol can, always shake it well. This is more critical with semi-gloss and low gloss versions.
2. Always begin the spray off to the side of the surface to be coated.
3. Keep the can between 3-6 inches from the surface, the uniformity of the distance is important. Drier and warmer temperatures will require closer application. Sensitive ink jet receptive layers may require further distance on the first pass (6-9 inches). This is called a tack coat and will protect the surface because most of the solvents will have evaporated when the coating reaches the print. A second medium wet to wet coat can then be applied. Holding the can further away from the surface will yield a lower gloss.
4. Never turn your wrist! Turning your wrist will change the amount of fluid volume delivered to the surface. To ensure an even coating, always keep your wrist the same distance from the surface, and move your arm.
5. Always continue the spray past the edge of the print you are coating.
6. To ensure a uniform coating, while off the print move the spray can about halfway down the coated area from the last pass and continue applying the liquid laminate in the reverse direction. This gives a 50% overlap (a 2 pass application).
7. Throughout the coating process, make this a continuous motion. Try not to stop, particularly when it's hot or dry.

## Accessories

Clearstar's liquid laminates are ideal for large volume customers using liquid laminators such as the **StarLam 1600R**. The StarLam 1600R is a 64" roll to roll liquid laminator that is easy to operate and applies a smooth even layer of ClearShield laminate over a wide variety of substrates.

As well as a wide choice of liquid laminates to get the job right first time, we also offer additional accessories to support you:

- Application Fluids
- Window Application Fluids
- Adhesive Removers
- Liquid Laminate Removers for Clean up and for Machines
- Roller trays, Hand Rollers, and Application kits
- Manual Liquid laminate Applicator
- Automated Liquid laminator curing systems

More information available at <http://www.landoruk.com/starlam1600r.htm> .

## Uses and recommendations

<b>Products</b>	<b>Properties</b>	<b>How to Apply</b>	<b>Finish</b>
<i>ClearShield Original</i>	Thickest film build. Suitable for vertical applications. Recommended for Eco-Solvent Inks	Spray, foam applicator, roller.	Gloss Semi-gloss 20 degree satin Matte
<i>ClearShield Type LL</i>	Lower viscosity than original ClearShield. Same resin solids. Recommended for Eco-Solvent inks.	Spray, liquid laminators, and hand application with roller, pad, or foam applicators and window "mops."	Gloss Semi-gloss 20 degree satin Matte
<i>ClearShield Type CSX5000</i>	High quality, resilient, and elastic characteristics for use with most inks and substrates, for Vehicle Graphics (wraps), vehicle curtain and truck side with added chemical resistant for higher traffic areas or Public spaces	Spray, liquid laminators, and hand application with roller, pad, or foam applicators and window "mops."	Gloss Satin Matte
<i>Wallpaper Matte</i>	Low gloss applications with a semi-matte finish but maintaining a good anti abrasion resistance. Suitable for many wallpaper applications.	Use all hand application, spray and liquid laminators.	Matte
<i>ClearShield Type C</i>	Water resistant canvas applications (highly flexible). Also suitable for some micro porous ink jet receptive substrates to help reduce or eliminate pinholes.	Use all techniques, including most liquid laminators.	Gloss Semi-gloss 30 degree satin* *best applied by spray or liquid laminator
<i>ClearShield Anti-Graffiti Clear</i>	Highly flexible, chemical and ultra-violet resistant. Two-component, water-based liquid laminate easily cleaned with solvent or Landor's non-petrochemical citrus based anti-graffiti cleaner.	Use all techniques or roller, spray and liquid laminators. When applied with a Laminator dilution is requires with water to working viscosity. When mixed with Cross linker hardener no more than 3ml per 1 litre shall be used.	Gloss May be used without cross-linking agent and will exhibit excellent durability with low graffiti resistance.
<i>ClearJet Original</i>	Used mainly for water-based inks or non water resistant inkjet media. It works on most substrates, including canvas, vinyl, banners, fibreglass, wood, metal, plastic, and paper.	Aerosol, brush and roll, and spray.	Gloss Semi-gloss Low Gloss
<i>ClearJet Fine Art (FA)</i>	Specially formulated to penetrate canvas and not react with the inkjet coating on most Fine Art substrates.	Aerosol, brush and roll, and spray.	Gloss Semi-gloss Low Gloss