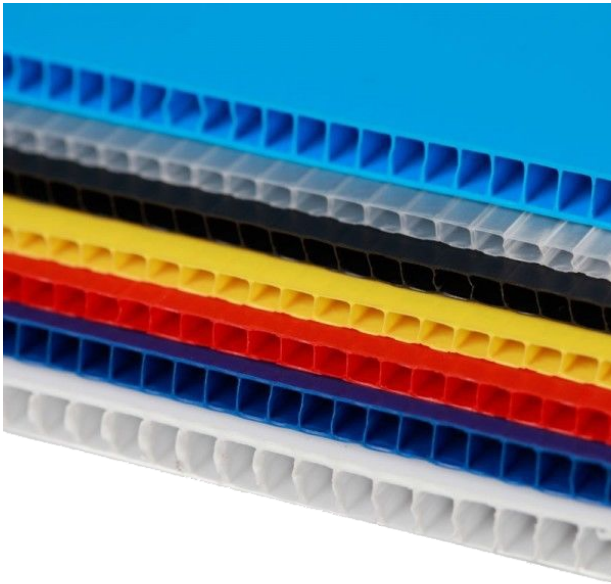



Tips For Printing On Corrugated Plastic



 **Corrugated plastic** is a light weight, tough material which can be easily cut and formed. It is offered in a wide range of colors and thicknesses. It is known under many trade names including Coroplast, IntePro, Correx, Corflute and others.

Chemically inert, most solvents, oils or water have no effect. It can handle the rigors of adverse weather and can be produced flame retardant.

These factors coupled with low-cost make it an ideal material to create commercial signs. These signs run the gamut from yard to political whose main attribute is inexpensive yet durable product.

Unfortunately the nature of UV ink in tandem with the substrate's non-porous properties can make one's stomach do flips or one's hair stand on end. Before you reach for the Tums and Brylcreem here are a few hints to ease your pain.

Let me set the stage, TCS Technologies is a UV lamp manufacturer. We specialize

in providing second source replacement ultraviolet lamps for a wide variety of UV printers. We are not affiliated with any printer or ink manufacturer. Any recommendations we have relate to UV lamp–ink performance. Many companies are quick to place blame on the UV lamp. In most cases nothing could be further than the truth. For example, take the same ink operating at the same speed on a different substrate; if it

cures, the issue lies outside the UV lamp.

If you listen to most printing machine salesman they will go to great lengths to explain that their machine will print anything, do anything and cost nothing to operate. If you ask about printing on Coroplast or Correx, etc., they will tell you “piece of cake”. Well my experience is nothing could be further from the truth.

The main problem printing on corrugated plastic is

ADHESION. There is nothing more frustrating than printing a job that looks great out of the printer only to have the ink tear, flake off or pull away from the finished product.

 Things you can try:

Talk to your raw material supplier. Try to get by the salesman and find some tech-service guy who actually knows the product. These people exist and you need be persistent to find them. If you cannot find “the geek” in

technical service consider alternative product or supplier. You will be surprised how quickly “the geek” will be made available.

Eliminate static. Corrugated plastic is notorious for static issues. Dust sticks to it, hence when you print, your ink “adheres” to the charged particles rather than the material surface itself. If sufficient charge is present one could re-direct ink droplets and you end up with an off-target ink ghosting.

When attempting to reduce static you must eliminate charge on BOTH SIDES of the substrate. There are anti-static wands and other methods available but the easiest is to pre-wash (wipe-down) the substrate using isopropyl alcohol or an alcohol and water solution. Again if you do not treat both sides your problem will never go away.

Put less ink down. Seems obvious but often overlooked. Corrugated plastic is non-

absorbent, apply smallest amount of ink to do the trick. If you see “orange peel”, bi-directional banding (lawn mower effect) you certainly will have adhesion issues with corrugated plastic. For a solution you need to check your printer manual to adjust lay down.

Allow adequate post cure. Salesman will tell you UV curing is instantaneous process with immediate results. Truth is the ink feels dry but is actually pinned in

place. There is a post cure phenomenon that can take up to 36 hours to complete.

Proper adhesion requires a thorough and complete cure.

Ink that appears to be dry continues to cure for some time after printing, which allows for improved adhesion.

This is particularly true in the first 24 hours after printing, but can continue for up to 36 hours. For best results, delay trimming of adhesion-challenged materials during this post-print-cure period.

Hold off on any rigorous testing or handling until the sheet is fully cured.

Consider adhesion promoters. As stated above, cleaning substrate with alcohol or an alcohol and water solution may improve adhesion. To achieve a strong bond on non-porous substrate consider an adhesion promoter. Consult you ink supplier for recommendations.

Adjust UV lamp output. Most inkjet printers

estimate UV lamp life around 500 hours (idle time plus print time). To reach this goal they suggest operating the lamps at low power for the first 300 hours and gradually increasing power as the lamp ages. Simply defined, it is the hours the lamp produces enough UV energy to properly cure the ink within the available exposure time. In the case of corrugated plastic, lamp life is significantly reduced. Most jobs cannot be run other than at high power.

At TCS Technologies we have developed a lamp specifically for use on corrugated plastic. UV penetration is increased with about 25% reduction in life. The good news is our lamps cost 50% to 60% less than the OEM lamp so this is not as painful as it sounds. If your adhesion problems are UV intensity related, then increasing lamp power will increase the ink's bond with the substrate. This is especially true when printing more than one coat. In this

case the first printed layer must be fully cured before subsequent coats are applied. Adjust combination of lamp power and print speed. In a perfect world, ink and media bond is improved at high lamp power and slow print speed. Consider uni-directional printing over bi-directional. Since this is not a perfect world, this combination produces the highest amount of heat perhaps adversely affecting (warping) the substrate. Some printers offer

an option of UV exposure without printing. This allows for lower temperature multiple exposures. To further complicate matters, there is a fine line between adequate and over-curing. This can cause ink to become too brittle and flaky when trimmed.

Clean reflectors, quartz plates and air filters. Most ultraviolet lamps are air cooled hence they must live with whatever air is provided. Lamps must be kept clean. All types of

dust, powder, grease, smoke and misting ink must be cleaned from lamp. Often shop contaminants will blow over the lamp sticking to the quartz literally baking onto the surface. This reduces UV energy and may cause bulb overheating. The same holds true with reflectors, and quartz plates (if used). Use a lint free cloth with Windex or Simple Green to clean. Don't waste your money on special UV lamp cleaners as they have dubious value! If solvents are

permitted, use isopropyl alcohol. For extreme cases use a mild abrasive such as Soft Scrub to clean the UV lamp. Be sure to rinse any residue off the glass before reinstalling lamp. Consider replacing quartz filter plate (also available from TCS Technologies) to maximize UV performance.

Make sure shutters are operating correctly. Make absolutely sure the lamp assembly shutters are opening completely. On more than one occasion we have seen screws come loose preventing the shutter from opening. It is hard enough working with corrugated plastic. The key to success is having a high output lamp mounted in a clean fully operating UV system.

Talk to your printer's tech-service manager. Some printers are simply not designed to effectively print corrugated plastic. You will not hear this from the sales department but you might from engineering or tech-service.

Consider changing ink suppliers. Your printer must operate over a wide range of substrates hence the OEM ink must do the same. The result may be questionable adhesion on plastics. If all else fails consider alternative ink supplier. We have seen significant improvement in adhesion based solely on ink and or ink color.

Remember there is a fine line between adhesion and cure. However adhesion or better put lack of is not simply indicative of faulty UV lamp. Many factors influence adhesion. If your ink adheres to a different substrate it is safe to assume you are dealing with an adhesion problem not a lamp problem. At TCS Technologies we are happy to work with you. If all else fails consider top coating. Feel free to contact us with any questions.

TCS Technologies
manufacturer of cost effective
ultraviolet (UV) curing lamps
and quartz plates to fit
virtually all digital inkjet, wide
format and flatbed UV
printers.