3M™ Controltac™ Graphic Film Series IJ380

Application to Substrates with Recesses

Introduction

3M™ Controltac™ Graphic Film IJ380 is an extremely flexible film, specially designed for the application of large format graphics onto substrates with contours and 3D corrugations.

3M™ Controltac™ Graphic Film IJ380 is suitable for solvent PIJ printing and for screen printing with solvent based inks.

Processing

PIJ Printing

IJ380 can be printed with most available printing systems in the market using solvent based inks. Proper ink drying after printing is very important to minimize the risk of film lifting in recesses.
If forced drying at temperatures between 60–70°C is not available, the following drying methods are recommended.

If the printed graphics are sheeted and racked, allow a minimum of 48 hours at 23°C after printing before laminating the graphics with 3M™ Scotchcal™ 8580 Overlaminate film.

If the printed graphics are kept on the roll, it is recommended to loose wind the graphics on the core so there is space between the windings to allow air to pass through the roll. It is preferable to use fans to provide good air circulation through the roll. Dry for a minimum of 48 hours at 23°C after printing before laminating the graphics with 3M™ Scotchcal™ 8580 Overlaminate film.

IJ380 can also be printed with UV piezo inks, however, for applications on flat substrates only.

Screen Printing

IJ380 can be screen printed with 3M™ Screen Printing Ink Series 1900. The screen mesh recommended is a 90T.
Conveyor Drying: Dry 1900 Series inks for a minimum of 30 seconds at 60–70°C.
It is recommended to allow a minimum of 24 hours after clear coating before applying application tape to the printed graphics.

Application of Overlaminate Films or Protective Clears

Graphics imaged on 3M™ Controltac™ Graphic Film IJ380 with ink jet printers can be laminated with specially developed 3M™ Scotchcal™ 8580 Overlaminate film or clear coated with 3M™ Screen Print Gloss Clear 1920.

Screen printed graphics can be clear coated with 3M™ Screen Print Gloss Clear 1920 or laminated with 3M™ Scotchcal™ Overlaminate 8580.

Only 8580 Overlaminate film and Screen Print Gloss Clear 1920 provide the required flexibility for applications on substrates with contours and 3D corrugations .

During the lamination process the unwind tension of the Overlaminate 8580 must be controlled in order to avoid overstretching the Overlaminate 8580.

After lamination, allow a minimum dwell time of 24 hours at 23°C before application of the graphics. This dwell time reinforces the bond of the Overlaminate 8580 to the printed IJ 380.

Exception: Unprocessed, i.e. non-printed film does not require an overlaminate or clear coat.

Note: Product durability and warranty can only be achieved by protecting the image with either 3M™ Scotchcal™ Overlaminate 8580 or 3M™ Screen Print Gloss Clear 1920.

Application Tape

The use of Application Tape is not required on laminated graphics. However, depending on environmental conditions (high temperature) it may be an advantage for a trouble free application.

The use of Application Tape is recommended for clear coated graphics.

For large format graphics use Scotchcal™ Application Tape SCPM-19. SCPS-100 is suitable for pre-spaced graphics or logos.

Application

3M™ Controltac™ Graphic Film IJ380 is not intended for wet applications. Residual water will cause lifting in the recesses after application.

General Procedure:

Cleaning

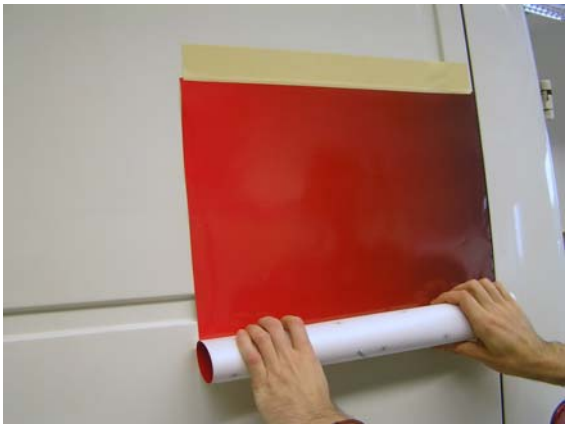
1. Clean the substrate thoroughly with 3M™ Surface Preparation System to remove oils/waxes. Any surface contamination will prevent the film from adhering properly. Use lint-free paper towels, one to clean and one to dry off. After cleaning make sure that the substrate is completely dry.

Note: Do not use alcohol based cleaning solvents e.g. isopropyl alcohol or methylated spirit as these can affect the adhesion of the film in the recessed area. Cleaning solvents, other than 3M™ Surface Preparation System, may also affect the expected adhesion and performance of the graphic film.

Application onto the flat surface

2. Position the graphic panel onto the substrate and fix the panel with masking tape at the sides and then on the top.

3. Remove the masking tapes from the sides. Roll the panel up to the top.



4. Remove the liner carefully from the film.

5. Start the application on the flat part of the substrate and bridge the film over the recessed areas and deep corrugations. Use a Gold PA-1 applicator to apply the film on to the substrate. Avoid air entrapment between the film and the substrate. If the graphic does not use application tape, use a 3M Cotton Squeegee Sleeve* on the PA-1 applicator.

*3M Stock Number DR500011264

6. If application tape is used, remove the application tape before carrying out Step 7.

Application into the recessed areas

7. Apply the film manually or with the appropriate 3M tools into the recessed areas. When applying manually, wear cotton gloves to lower the friction between finger and film. Warm up the film with a hair dryer or a hot-air gun to heat the film to a temperature of approximately 50°C. Only moderate heat is needed for making the film soft and conformable.

8. Stretch the film into the centre of the recess starting from the middle working towards the edges of the film.

9. Alternatively, instead of manual application, specially developed 3M hand-rollers can be used for the application of the film into recessed areas. The hand-rollers allow the film to be applied with uniform, continuous pressure and little friction.

10. Use the big hand-roller for applying the film into the centre of the recess starting from the middle working towards the edges of the film.

11. Using manual application or the hand-roller, heat the film to a temperature of approximately 50°C and continue applying the film to the flat part of the recess until a small air channel remains between the film and the corner of the recess.

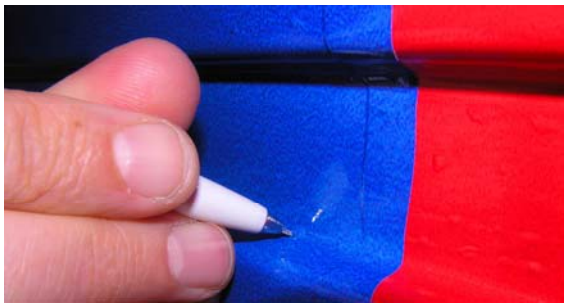
12. To complete the application, heat the film to a temperature of approximately 50°C and use the small hand-roller to close the remaining air channels between the film and the substrate.

13. Air bubbles between the film and the substrate must be removed with the air release tool.

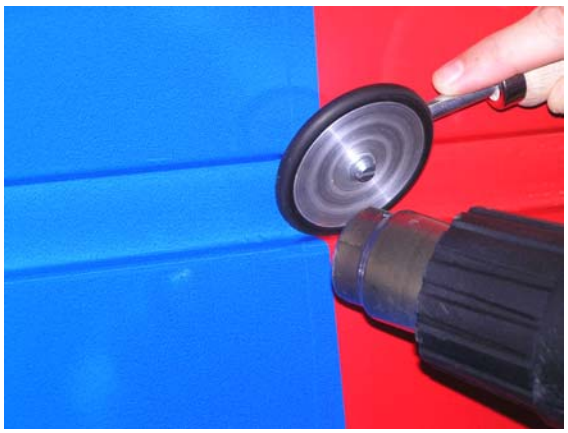
14. Multi panel graphics should be applied with an overlap between 3 and 7mm.

Post-Heating

15. Ensure that no air bubbles are left trapped between the substrate and the film by re-heating the film in the recessed areas and corrugations to a temperature of approximately 50-60°C with a hot air gun. This will detect any unnoticed air bubbles. After removing the identified air bubbles, continue to heat the applied area a temperature of at least 80°C. Re-roll immediately the film with the small hand-roller in the recessed areas and corrugations.
    Re-heating reduces the natural memory of the film which could cause lifting later on. It also softens the adhesive and ensures good initial adhesion.



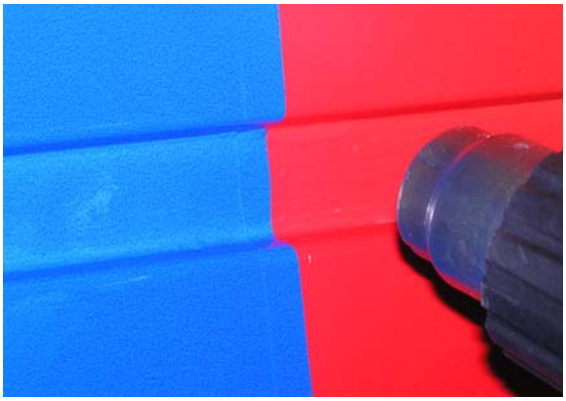
16. Remove the detected air bubbles with the air release tool.

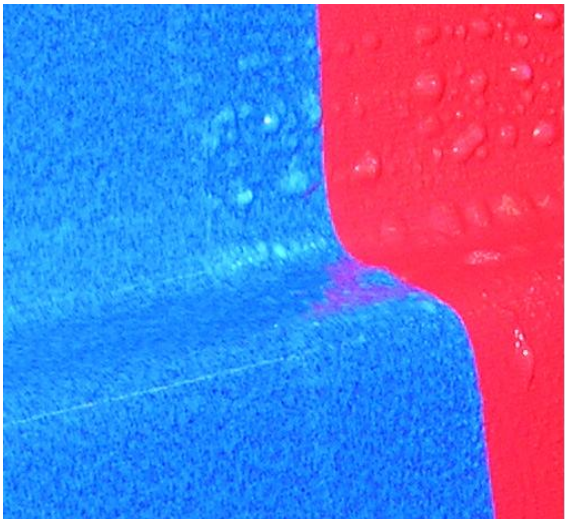


17. Re-heat the substrate again with the hot-air gun at a temperature of at least 80°C and press the film again with the small hand-roller.

18. Post-heat the edges of the film with the hot-air gun at temperatures of at least 80°C.

19. **Important:** In order to avoid lifting of the panel overlaps, post-heating of the overlaps at 120°C is necessary to avoid lifting failures. At 120°C, tiny bubbles may start to form on the film (small “boiling bubbles”).
    An IR-thermometer **must** be used to ensure the correct post-heating temperatures are achieved.





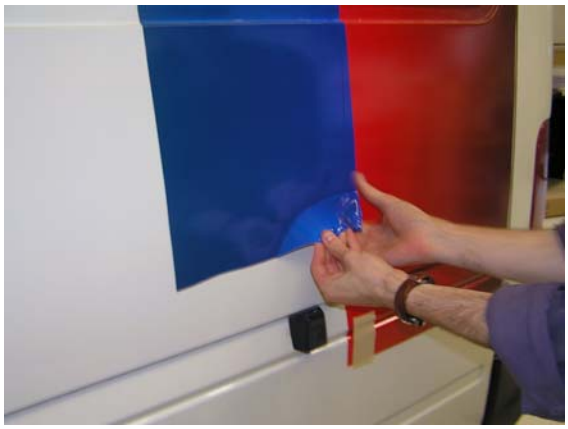
⚠CAUTION: Re-heating of the film and re-rolling the film into the recess or corrugation is a quality control step to ensure the application is completed correctly and that all air bubbles are removed.

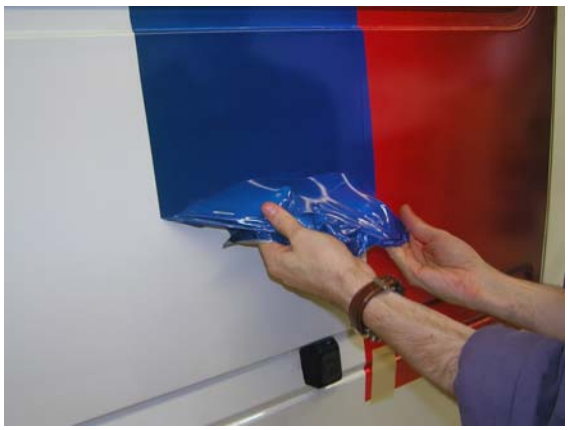
Omitting this step can lead to lifting failures!

Removal

Applied graphics can be removed with heat or chemicals.

Heat the film up with a hot-air gun at a temperature of approximately 60°C. Lift a corner from the film and pull the film from the substrate at a low pull-off angle.





Related 3M Literature

Listed below is related 3M Technical Literature which may be of interest:

Subject	Product Bulletin	Instruction Bulletin
3M™ Controltac™ Plus Graphic Film Series IJ380	IJ380	
3M™ Scotchcal™ Overlaminate 8580	8580	
3M™ Surface Preparation System	Surface Preparation	
Cold roll lamination		4.22
Using 3M application tapes; Premasking and prespacing for films and sheeting's		4.3
Storage, Handling, Maintenance, Removal		6.5

Health & Safety

Refer to the package label and the Material Safety Data Sheet for health, safety, and handling information on the products referenced in this bulletin. For 3M products, if necessary, you may contact our Toxicology/Product Responsibility Department on 01344 858000.

Important Notice to Purchaser

The 3M products described in this publication are covered by a 3M warranty and limitation of liability.

3M's warranty provides that if 3M finds that goods are defective in material or workmanship they will be replaced or the price refunded at 3M's option but note that 3M does not accept liability for other direct losses (except for personal injury or death) or consequential losses relating to defective products or from information supplied by 3M.

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