Application of Controltac™ Graphic Film Series IJ380 on Substrates with Recesses

Recommended Types of Graphics

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

Proper ink drying is very important to minimize the risk of film lifting in recesses.

3M™ Controltac™ Graphic Film IJ380 can be printed with most available printer systems using solvent based inks. For printed graphics kept on the roll, it is recommended to loosely wind the graphics so that air in the space between the windings is allowed to pass through the roll. It is preferable to use fans to provide good air circulation through the roll.

Allow a minimum of 24 hours at 23 °C after printing before laminating the graphics with 3M™ Scotchcal™ 8580 Overlaminate film.

3M™ Controltac™ Graphic Film IJ380 can also be printed with UV piezo inks, however, for applications on flat substrates only.

Screen Printing

3M™ Controltac™ Graphic Film IJ380 can be screen printed with Scotchcal™ Screen Printing Ink Series 1900. 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 Scotchcal™ Overprint Clear 1920DR.

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

3M™ Scotchcal™ 8580 Overlaminate film and Scotchcal™ Overprint Clear 1920DR provide the required flexibility for applications on substrates with contours and 3D corrugations.

During the lamination process the unwind tension of the 3M™ Scotchcal™ Overlaminate 8580 must be controlled in order to avoid overstretch.

The bond of 3M™ Scotchcal™ Overlaminate 8580 to printed 3M™ Controltac™ Graphic Film IJ380 is reinforced by maintaining a dwell time of minimum 24 hours at 23 °C after lamination before application of the graphics.

**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 Scotchcal™ Overprint Clear 1920DR.
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 samples.

For large format graphics Scotchcal™ Application Tape SCPM-19 can be used. 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

Clean the substrate thoroughly with 3M™ Surface Preparation System as grease and oil prevent the film from adhering properly. Use lint-free paper towels. After cleaning make sure that the substrate is completely dry.

Note: Do not use isopropyl alcohol as this can affect the lifting resistance of the film in the recessed area. Other solvents than 3M™ Surface Preparation System may affect the expected lifting resistance performance of the film, too.

Alternatively, instead of manual application, specially developed 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.

Application on flat surface

Position the panel onto the substrate and fix the panel with masking tape at the sides and then on the top.
Remove the masking tapes from the sides. Roll the panel up to the top.

Remove the liner carefully from the film.

Start the application on the flat part of the substrate and bridge the film over the recessed areas and deep corrugations. Use a PA-1 applicator to apply the film on to the substrate. Avoid air entrapment between the film and the substrate. Use a low friction sleeve if the graphic does not use application tape. For 3M™ Controltac™ Graphic Film IJ380 a thin cotton sleeve should be used.

In case application tape is used, remove the application tape.
Application on recessed areas

Apply the film manually or with appropriate tools on the recessed areas. When applying manually, wear cotton gloves to lower the friction between finger and film. Heat the film with a hair dryer or a professional heat gun to a temperature of approximately 30 °C to 40 °C. **Do not overheat the film.** Only moderate heat is needed for making the film soft and conformable.

![Image](image1)

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

![Image](image2)

Use the big hand roller for applying the film into the center of the recess starting from the middle towards the edge of the film.

![Image](image3)

Using manual application or the hand roller, heat the film to a temperature of approximately 30 °C to 40 °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.

![Image](image4)

To complete the application, heat the film to a temperature of approximately 30 °C to 40 °C and use the small hand roller to close the remaining air channels between the film and the substrate.

Air bubbles between the film and the substrate must be removed with the air release tool.
**Multi Panel**

Multi panel graphics should be applied with an overlap between 3 and 10 mm.

**Post-Heating**

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 with a hot air gun. By doing this, overlooked air bubbles can be detected. Air bubbles between the film and the substrate must be removed with the air release tool.

Remove the detected air bubbles with the air release tool.

After checking air bubbles, the applied area should be heated to a temperature of at least 85 °C to 100 °C. Re-roll immediately the film with the small hand roller in the recessed areas and corrugations. This softens the adhesive, closes remaining air channels and ensures good final adhesion.

**Note:** In order to avoid lifting at the overlaps of the panels, post-heating of the overlaps with the hot-air gun of a minimum of 120 °C is necessary to avoid lifting failures.

Re-heating of the film and repressing the film into the corrugations is a quality control to assure a proper application without air bubbles.

Omitting this 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. When scoring the film into 10 – 30 cm wide parts removal can be made easier. Be careful not to damage the substrate.

Remarks
This bulletin provides technical information only.

Important Notice
All questions of warranty and liability relating to this product are governed by the terms and conditions of the sale, subject, where applicable, to the prevailing law.

Before using, the user must determine the suitability of the product for its required or intended use, and the user assumes all risk and liability whatsoever in connection therewith.

Additional Information
Visit the web site of your local subsidiary at www.3mgraphics.com for getting more:
- details about 3M MCS Warranty and 3M Performance Guarantee
- additional instruction bulletins
- a complete product overview about materials 3M is offering.