

# GGF Installation Quality Standard for Applying Adhesive Backed Polymeric Film to Glass

5.18.2 **June 2015**

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### Introduction

This standard has been developed by the GGF **Window** Film Group, in association with all major film manufacturers, to provide a methodology for the assessment and application of adhesive backed polymeric film to glass. It is an evolving specification reflecting current design, material requirements and legislation and will be subject to review as necessary.

## 1. Scope

This standard details the typical equipment, test methods, application and acceptance criteria applicable to the process of applying adhesive backed polymeric film ("film") to glass. Information is given on preparation of a method statement covering site risk assessment. The certified applicator shall install the window film in accordance with this GGF standard, and the manufacturer's recommendations, in order to meet the criteria of this Data Sheet and GGF Data Sheet 5.18.1, "Visual Quality for Adhesive Backed Polymeric Filmed Glass".

It is recommended that applicators read through this Data Sheet prior to commencing film installation.

Applicators should ensure suitable training is obtained prior to film installation including appropriate health and safety and working from heights training.

## 2. Definitions and Description

See GGF Datasheet 5.18.3 "GGF Recommendations for Adhesive Backed Polymeric Film Applied to Glass: Definitions, Descriptions and Components".

## 3. Appropriate equipment / materials

Appropriate installation materials include the following:

- Pressure spray bottle
- Clean water

- Cleaning / application solution
- Cutting machine
- Access equipment
- Trimming knife
- Glass scraper
- Window cleaning squeegee
- Application squeegees
- Straight edge margin cutting tool
- Calibrated tape measure
- Adhesive tape
- Soft paper towels or water absorbing material (non lint)
- Rubbish bags
- Protective sheets
- External edge sealant
- Sharp disposal container

Note: In general, it is recommended to use high quality distilled or Reverse Osmosis (RO) water for application of adhesive backed polymeric film to glass, but in many cases local tap water has been found to be acceptable quality. However, applicators should be aware that water containing minerals such as calcium carbonate (found in hard water) can react with many soaps, including those found in shampoos and washing up liquids.



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This reaction can form a solid residue that contaminates the cleaning / installation solution and reduces the ability to position the film ("slip"); the contamination may also reduce the adhesive bond strength between the film and the glass surface, including for safety / security films. Other residues in tap water, such as chemicals containing chlorine and / or sulphur, may react with metal layers within the film to cause demetallisation. Local tap water may also be too acidic due to pollution (e.g. from "acid rain"). If RO water is used, the RO filters must be changed according to quality of the source water.

### 4. Pre-checks

**4.1** Ensure all relevant equipment is present clean and in good working order.

**4.2** Check that frame type and condition, glass size and site access all agree with the written work instructions.

**4.3** Prepare a written statement covering the work site Risk Assessment. Details of the Risk Assessment can be found in the GGF Installation Training Manual.

### 5. Location preparation

**5.1** The applicator shall ensure that there is sufficient room to operate all equipment safely, with minimum disruption to the client. When a cutting machine is required, it shall be erected in an area where few people pass. Protect all appropriate areas with an absorbent material if required.

Note 1: Depending on the Risk Assessment, working areas may need to be cordoned off and suitable warning signs displayed.

Note 2: As the procedures require the use of water, care should be taken to minimise slipping, electrical and other risks.

**5.2** The glazing area should be clean and dust free.

Note: If the glazing area is unacceptably dirty or dusty, then pre-cleaning before commencement of film installation is necessary.

**5.3** Spray the window thoroughly with cleaning / application solution.

**5.4** Thoroughly clean the surface of the glass using appropriate equipment, removing all foreign bodies, taking care to avoid damage to the glass, frame and glazing system.

**5.5** Rinse glass and frame from top to bottom with the cleaning / application solution. Some types of cleaning solution require rinsing with clean water, in which case the manufacturer's recommendations should be followed.

**5.6** Using a window cleaning squeegee remove all residual cleaning / application solution from the glass, working from the top to the bottom.

**5.7** Using a lint free absorbent material, wipe around the frame of the window to remove excess cleaning / application solution.

**5.8** Inspect glass, frame and glazing to ensure readiness for film application and re-clean if necessary.

**5.9** Spray the prepared glass surface with a fine mist of application solution.

### 6. Film preparation

#### 6.1 Inspection

**6.1.1** Check film specification and note the manufacturer's film type and batch/reference number, and record it.

**6.1.2** Remove film from packing and inspect for visual defects and damage.

**6.1.3** Any non-conforming film should be labelled "Reject", segregated from other film, and notified to internal quality assurance.

#### 6.2 Material Cutting

**6.2.1** Where required, mount the film on a cutting machine and secure in position.

**6.2.2** Cut the film to the appropriate size.

**6.2.3** Where necessary, roll each piece of film with the release liner outermost, and secure with masking tape with the film reference and size marked on it.

**6.2.4** When the film for a group of premeasured panes has been cut and rolled, transfer the film from the cutting area to the installation location, storing it according to the manufacturer's recommendations.

### 7. Installation

**7.1** Spray the pre-cleaned pane with the cleaning / application solution.

**7.2** Remove the liner from the pre-cut film, spraying the adhesive face of the film thoroughly with the cleaning / application solution. If the film has an over-coat barrier, rinse off thoroughly with the cleaning / application solution.

Note: Depending upon adhesive type, e.g. dry water activated adhesives, spraying of the adhesive surface during removal of the liner may not be necessary.

**7.3** Offer the adhesive side of the film to the prepared surface of the glass and place it in position.

**7.4** Spray the surface of the film using the application solution to enable the squeegee to move freely across the surface without disturbing its position and to minimise surface abrasion.

**7.5** Use the appropriate squeegee to remove the excess application solution from between the film and the glass (see Figure 1), taking care to overlap the squeegee strokes.

**7.6** Where appropriate, place the straight edge margin cutting tool against the window frame. Using a trimming knife with a sharp blade, trim the excess film ensuring all margins (edge gaps) are in accordance with GGF Data Sheet 5.18.1 "Visual Quality for Adhesive Backed Polymeric Filmed Glass".

**7.7** Repeat the previous squeegee procedure with increasing pressure as necessary. Ensure good contact between the edge of the film and the glass.

**7.8** Dry thoroughly the perimeter of the glass and film, using a lint free absorbent material.

**7.9** It may be necessary to re-squeegee a perimeter band of about 100 mm to ensure the edge of the film is in close contact with the glass surface.

## 8. Splicing of applied film

The majority of manufacturers supply film in varying widths, generally up to 1524 mm (60") with some films available in 1829 mm (6") width. Inevitably some window panes will exceed maximum film width; under these circumstances, it becomes necessary to perform a splice using two or more sections of the film.

Under normal circumstances, a splice is vertical and positioned for low visual disturbance. Under some circumstances, horizontal splices or vertical splices in the middle of the pane can be used.

### 8.1 Methods of splicing

Depending upon the film type, the methods given in 8.2, 8.3 and 8.4 may be used. Overlap joints (section 8.4) are not to be used for safety / security films.

### 8.2 Butt splice

Apply one piece of film (in accordance with section 6) to one side of the glass up to the trimming stage. Apply the second piece of film to the glass positioning the film so that the two edges butt together. Both pieces of film shall be applied so that the shading is matched; usually this means that the same machine edge of the film is used.

Note: If the window bows, the machine edge of the film is not straight, or the glazing uses curved glass, a cut splice will be required.

Note: In some specialised cases an additional piece of safety film may be required to overlap both pieces of film at the butt joint to reinforce the join.

### 8.3 Cut splice

Overlap the film by approximately 25 mm. Use a sharp stainless steel blade to cut through both pieces of film. Squeegee the film parallel to the splice, and finish the window in the normal way.

Note: Take care to avoid damage to the glass surface during this process. Do not use carbon steel blades since these have a significant risk of scratching the glass.

### 8.4 Overlapped splice

This method shall not be used when applying safety / security films. Initially overlap the film by approximately 25 mm, positioning the film so that there is a final overlap  $\leq 6$  mm.

## 9. Visual quality inspection

A visual inspection of the installation shall be carried out by the applicator in accordance with the GGF Data Sheet 5.18.1 "Visual Quality for Adhesive Backed Polymeric Filmed Glass". Any non-conformities identified, either during installation or on final quality inspection, shall be corrected.

## 10. Marking of safety film

Safety films used to comply with BS 6262-4, "Safety related to human impact", shall be correctly marked to show compliance with the relevant British Standard (BS EN 12600). The marking shall be as follows:

- (a) an identifiable name, or trademark, or other mark capable of identification through a suitable source\*
- (b) the type of material, i.e. "F" for film applied glass
- (c) the number of the British Standard, i.e. BS EN 12600
- (d) the classification according to BS EN 12600

This mark shall be permanent, and applied during installation in a position so that it will remain completely visible and readable after installation.

## 11. Housekeeping

The applicator shall clear all the waste film and excess water from the installation and cutting areas, and reinstate the area as close as possible to the condition in which it was found originally.

## 12. External films

Where external films have been specified and where circumstances dictate, e.g. climatic conditions and glazing angle, the installer shall check the manufacturer's

installation recommendations in relation to the use of external sealants.

## 13. References

Current GGF Datasheets for adhesive backed polymeric film are:

**5.18.1 "GGF Visual Quality for Adhesive Backed Polymeric Filmed Glass"**

**5.18.2 "GGF Installation Quality Standard for Applying Adhesive Backed Polymeric Film to Glass"**

**5.18.3 "GGF Recommendations for Adhesive Backed Polymeric Film Applied to Glass: Definitions, Descriptions and Components"**

**5.18.4 "GGF Recommendations for Adhesive Backed Polymeric Film Applied to Glass in the Overhead Position for Containment of Glass in the Event of Failure: Types of Systems and Precautions in Use"**

**5.18.5 "GGF Recommendations for Adhesive Backed Polymeric Film Applied to Glass in the Overhead Position for Containment of Glass in the Event of Failure: Test Method"**

**5.18.6 "GGF Recommendations for Blast Mitigation: Adhesive Backed Polymeric Film Applied to Glass"**

**5.18.7 "GGF Standard for On-Site Peel Adhesion Testing of Aged Adhesive Backed Polymeric Film Applied to Vertical Flat Glass"**

**5.18.8 "GGF Adhesive backed Polymeric Film-Guidelines for installation on existing Glazing"**