

TECH Insights

Preparing floors for applying self adhesive films

Contents

- 1 Overview
- 1 Inspection is key
- 2 Variety of floor areas
 - Internal
 - External & Covered outdoor
 - High humidity
 - Cold Climate
- 3 Variety of floor surfaces
 - Polished Concrete & Tile
 - Interior
 - Concrete - Exterior
 - Tile – Interior
 - Carpet – Interior
- 7 Removing existing self adhesive film
- 7 Printing & Laminating
- 7 Installation
- 7 Test, Test, Test

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Overview

The information in this document is designed to provide a general understanding of how to prepare floors prior to applying self adhesive films for floor graphic applications.

ORAFOL warrant its material to be free of manufacturing defects, however ORAFOL cannot pre-determine compatibility of its products when applied to the broad variety of floors and floor finishes.

Floor graphics may need to be applied to surfaces including internal and external floors and may also include covered outdoor areas, underground areas, high humidity areas as well as areas subject to pollutants and chemicals. The variety of floor areas is endless, just like the many types of floor construction materials.

Floor construction materials may be concrete, tile, timber, laminate or carpet or could include a variety of composite materials.

The information in this document is designed to assist the material specifier and application specialist with a basic understanding of how to appropriately prepare the floor surface and test for compatibility between the self adhesive film and the floor to which the finished floor graphic will be applied.

Inspection is key

Irrespective of the floor construction a smooth, well prepared floor surface is critical for adhesion of self adhesive films for floor graphic applications. This guideline is designed to assist you to achieve a smooth and properly prepared surface and a quality finished project.

Preparing your floor can be quite simple if the floor is in good, clean, solid condition. However, preparation can become complex if the floor surface is not in a suitable condition. Therefore, inspection is key.

Debris of any type may interfere with the adhesive performance and may lead to delamination of the floor graphic from the floor. All debris must be thoroughly cleaned and dried prior to the application of any self adhesive graphic floor film. Coated floors should be thoroughly inspected for adhesion of the coating to the base surface. This can be done with adhesive tape or the self adhesive film.

A small section of self adhesive film can be applied to the coated surface, left to bond for 24 hours, then removed to determine if the coated surface is adequately bonded to the base material. Any delamination of coating could result in future problems. Any delamination of coating indicates that the coated surface needs rectifying before proceeding to apply self adhesive film.

Variety of floor areas

- Internal
- External
- Covered outdoor
- High humidity
- Cold climate

All of these floor areas may carry different requirements in terms of floor construction materials, the finished coating on the floor, surface preparation, choice of self adhesive film, the end use application, the overall durability requirements, slip rating requirements and the expected life of the final floor graphic.

When managing projects in these areas consideration should be given to the type of floor construction, the coating on the floor, preparation of the coating, the likelihood of adverse weather (heat, rain, wind, snow, hail) having some impact on the floor, moisture from external or internal environment, chemicals from immediate environment, cleaning chemicals, pollutants from environment and of course slip rating requirements for the specific surface location.

Internal floors can vary considerably. They may be timber, tile or a coated concrete surface. In these instances consideration must be given to the type of coating and how long the coated surface has been allowed to thoroughly dry. Adhesion of the coating to the base material must be checked by applying a small piece of self adhesive film to the cleaned surface, allowing to bond for at least 24 hours. Then remove the film to check for any delamination. If there is any delamination from the base material this coating must be rectified before proceeding. This test will also give some indication about the adhesion of the film to the painted surface. It may also indicate if a coating of Viponds Self Adhesive Prep Coat is required. If a strong bond is not achieved we suggest you discuss this with ORAFOL who can recommend a self adhesive film with a higher tack adhesive and / or an alternate preparation method.

External floor surfaces and construction materials can vary considerably. These surfaces are also subjected to a broad range of adverse weather conditions. They may be timber, tile or a concrete, they may also be coated surfaces. In these instances consideration must be given to the type of coating and how long the coated surface has been allowed to thoroughly dry. Adhesion of the coating to the base material must be checked by applying a small piece of self adhesive film to the cleaned surface, allowing to bond for at least 24 hours. Then remove

the film to check for any delamination. If there is any delamination from the base material this coating must be rectified before proceeding. This test will also give some indication about the adhesion strength of the film to the surface. It may also indicate if a coating of Viponds Self Adhesive Prep Coat is required. If a strong bond is not achieved we suggest you discuss this with ORAFOL who can recommend a self adhesive film with a higher tack adhesive and / or an alternate preparation method.

Covered outdoor floors can vary considerably. They may consist of materials including concrete, tile, timber, stone or brick. There are many variables to consider with all external floors as well as the considerations necessary to manage the environmental elements that may impact the final floor graphics. Slip rating of the floor graphic is also a major consideration, particularly if the area is an entrance to commercial business or a public thoroughfare.

High humidity areas can be problematic if care and consideration is not given to the surface, the application process and the choice of self adhesive film. In these instances we refer to bathrooms, saunas etc. These areas can carry a broad temperature range as well as high to very high levels of humidity. Firstly the space must be managed to standard temperature and humidity (18-24 degrees C / 35-50% RH) where test film should be applied to the floor surface. Then allowing the temperature & humidity to raise to levels the space will operate, test the adhesion of the film to the surface. In these instances a self adhesive film carrying a solvent based adhesive is recommended.

Cold climate areas can be troublesome if care and consideration isn't given to the surface, the application process and the choice of self adhesive film. In these instances we refer to cool rooms & refrigeration units which carry a range of floor surfaces including concrete, tile, aluminium, plastic materials or metal surfaces. These floor surfaces may be coated or uncoated and these areas may be subjected to very low sub zero temperatures. Firstly the space must be managed to standard temperature and humidity (18-24 degrees C / 35-50% RH) where test film should be applied to the floor surface. Then allowing the temperature & humidity to reach the levels the space will operate, test the adhesion of the film to the surface. In these instances a self adhesive film carrying a solvent based adhesive is recommended along with an appropriate film to manage these extreme cold conditions.

Variety of Floor surfaces

As previously mentioned there are a broad variety of floor surfaces that may need to be addressed. These surfaces may include;

- Polished Concrete & Tile – Interior
- Concrete & Tile – Exterior
- Carpet – Interior

Polished Concrete & Tile – Interior

Prior to preparing the concrete or tile surface the construction should be allowed to cure for at least one to two months to ensure concrete is completely dehydrated. Unsealed concrete floors, interior or exterior may be affected by many environmental effects including efflorescence. Simply stated, efflorescence occurs when water containing dissolved salts are brought to the surface of masonry, the water evaporates and the salts are left on the surface. If proper preparation is not followed prior to the application of self adhesive film the salts will most likely cause the self adhesive film to delaminate from the concrete surface. Areas like unsealed concrete floors, interior or exterior, can be challenging, therefore proper preparation and manufacturer recommendations should always be followed.

1. Preparation

To prepare the concrete surface, you will need to clean the surface thoroughly, following the concrete manufacturers or the cleaning fluid manufacturers recommendations. Any liquid cleaning treatment should be allowed to dry for at least 24hrs, or as per the manufacturers recommendations.

Prior to applying the graphics project we recommend applying a small amount of the self adhesive film to a small test section. Allow this to bond for 24hrs and then remove. This is for 2 reasons.

1. To test adhesive bond to the floor surface.
2. To test for any adhesive residue left on the surface after the film is removed.

2. Design & Application

When you are satisfied that adhesion is strong and there was no remaining residue you can continue applying the film for your floor graphics project. Floor graphic applications should also take design into consideration.

The objective is to decorate the floor and also ensure you meet the specific requirements of the site location. Therefore consideration must be given to the type of materials to be used.

There are several options to consider, including;

1. Single film with textured surface carrying a slip rating, printed with graphics.
2. Base layer printed film with textured slip resistant laminate.

In both cases design of the graphics, in particular avoiding square cut corners is recommended. Square cut corners can become a lift point and a potential hazard. By incorporating rounded corners into your design will help to eliminate this issue from occurring.

3. Self adhesive film

After following the preparation advice you can then apply your choice of self adhesive film. Always refer to PDS applicable to your chosen product & ensure you pre-test product suitability prior to proceeding with the full project. Products for this application may include many ORAJET® self adhesive films with a range of different adhesive characteristics. These ORAJET® Films carry a range of compatible ORAGUARD® laminates suitable for floor graphic applications.

ORAJET® self adhesive print film choice may include the following;

- Non PVC – short term applications
 - ORAJET® 3172 – Removable Adhesive
 - ORAJET® 3174 – Permanent Adhesive
 - ORAJET® 3720 – Removable Adhesive
 - ORAJET® 3740 – Permanent Adhesive
- Monomeric – short term applications
 - ORAJET® 3162 – Removable Adhesive
 - ORAJET® 3164 – Permanent Adhesive
- Polymeric – medium term applications
 - ORAJET® 3169 – Removable Adhesive
 - ORAJET® 3650 – Permanent Adhesive
 - ORAJET® 3554 – Permanent High Tack Adhesive

Fire Retardant

Many of these ORAJET® self adhesive print films carry Fire Certification: AS 5637.1 – 2015.

Further details and reference can be found within ORAFOL Warranty & Certification.

ORAGUARD® self adhesive laminates may include the following;

- Non PVC – short term applications
 - ORAGUARD® 236 – slip rating P2
- Monomeric – short term applications
 - ORAGUARD® 210SO – slip rating P2
- Special PVC – medium term applications
 - ORAGUARD® 250AS – slip rating P2
 - ORAGUARD® 255AS – slip rating P3

Slip Resistance

These ORAGUARD® self adhesive laminates carry Slip Certification: AS 4586-2013
Further details and reference can be found within ORAFOL Warranty & Certification.

Fire Retardant

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Concrete & Tile – Exterior

Prior to preparing the concrete or tile surface the construction should be allowed to cure for at least one to two months to ensure concrete is completely dehydrated. Unsealed concrete floors, interior or exterior may be affected by many environmental effects including efflorescence. Simply stated, efflorescence occurs when water containing dissolved salts are brought to the surface of masonry, the water evaporates and the salts are left on the surface. If proper preparation is not followed prior to the application of self adhesive film the salts will most likely cause the self adhesive film to delaminate from the concrete surface. Areas like unsealed concrete floors, interior or exterior, can be challenging, therefore proper preparation and manufacturer recommendations should always be followed.

1. Preparation

To prepare the concrete or tile surface, you will need to clean the surface thoroughly, following the manufactures or the cleaning fluid manufacturers recommendations. Any liquid cleaning treatment should be allowed to dry for at least 24hrs, or as per the manufacturers recommendations.

Prior to applying the graphics project we recommend applying a small amount of the self adhesive film to a small test section. Allow this to bond for 24hrs and then saturate the test piece with water. Allow this to soak in the wet conditions for at least 24hrs. When the area is thoroughly dry remove the self adhesive film.

This is for 2 reasons.

- a. To test adhesive bond to the floor surface.
- b. To test for any adhesive residue left on the surface after the film is removed.

The wet test is important in this situation as external concrete & tile surfaces absorb water. This can adversely compromise the adhesive properties and affect the adhesion of the floor graphic to the surface

2. Design & Application

When you are satisfied that adhesion is strong and there was no remaining residue you can continue applying the film for your floor graphics project. Floor graphic applications should also take design into consideration.

The objective is to decorate the floor and also ensure you meet the specific requirements of the site location. Therefore consideration must be given to the type of materials to be used. There are several options to consider, including;

- a. Single film with textured surface carrying a slip rating, printed with graphics.
- b. Base layer printed film with textured slip resistant laminate.

In both cases design of the graphics, in particular avoiding square cut corners is recommended. Square cut corners can become a lift point and a potential hazard. By incorporating rounded corners into your design will help to eliminate this issue from occurring.

3. Self adhesive film

After following the preparation advice you can then apply your choice of self adhesive film. Always refer to PDS applicable to your chosen product & ensure you pre-test product suitability prior to proceeding with the full project. Products for this application may include many ORAJET® self adhesive films with a range of different adhesive characteristics. These ORAJET® Films carry a range of compatible ORAGUARD® laminates suitable for floor graphic applications.

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- Polymeric – medium term applications
 - ORAJET® 3169 – Removable Adhesive
 - ORAJET® 3650 – Permanent Adhesive
 - ORAJET® 3554 – Permanent High Tack Adhesive

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 - ORAGUARD® 236 – slip rating P2
- Monomeric – short term applications
 - ORAGUARD® 210SO – slip rating P2
- Special PVC – medium term applications
 - ORAGUARD® 250AS – slip rating P2
 - ORAGUARD® 255AS – slip rating P3

Slip Resistance

These ORAGUARD® self adhesive laminates carry Slip Certification: AS 4586-2013

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Carpet – Interior

Prior to applying floor graphics onto carpet surfaces it is important to determine what type of carpet construction you are dealing with. The chemical composition of carpet varies considerably, as does the surface tension of the fibre which does impact the performance of the adhesive on the floor graphic film.

Carpet types tested, and carpet surfaces that you contend with may include;

- 100% pure wool – Hard twist cut pile
- 100% pure wool – Heather hard twist
- 100% pure wool – Texture loop pile
- 100% pure wool – Geometric loop pile
- 100% pure wool – Berber loop pile
- 100% pure wool – Level loop pile
- 100% pure wool – Patterned loop pile
- 100% Solution Dyed Nylon – Cut pile
- Recycled polypropylene

In addition certain types of recycled, low-VOC or environmentally friendly carpets may be labelled as stain resistant and their properties may also reduce adhesion. Often sold as carpet tiles, they are typically made from either durable and resilient nylon or polypropylene. Also known as olefin, polypropylene will not fade, will not absorb water and can contain anti-staining additives - which also repel adhesives. Polypropylene carpet will have a low surface energy (LSE) surface, which means it has a weak molecular attraction and is therefore more difficult to bond with other substances such as adhesive. Combine LSE with anti-staining additives and you get a surface that is very difficult to adhere to - very much like low-VOC latex (Teflon) paint on walls. Normal removable adhesive will take 48 hours to properly wet out, but with this type of carpet the adhesive does not wet into the surface.

Carpet types can all deliver different adhesion characteristics, therefore reinforcing the need to determine actual carpet type prior to producing floor graphics.

To ensure your selected self adhesive floor graphics product is suitable for its intended location on any surface, an adhesion test is strongly recommended before proceeding. No one wants to spend time and money on a project that ends in failure and this is especially important with floor graphics; loss of adhesion can pose a serious safety hazard.

Apply a small piece of your selected self adhesive film to a section of the carpet in an obscure location. Apply

necessary pressure to form an adequate bond to the carpet surface. In some cases the initial tack will be a good indication of adequate bond strength.

Where initial bond appears to be strong, leave to fully bond for 24hrs before peeling the film away from the carpet. This is for 2 reasons.

1. to evaluate the bond strength between the film and the carpet.
2. to determine if carpet fibre is removed, or adhesive is left behind after removing the film.

ORAFOL offer numerous self adhesive film products to consider. Popular products include ORAJET® 3554 Polymeric Print film. This product has delivered excellent results on most carpet products. This film can be laminated with ORAGUARD® laminates including ORAGUARD® 250AS (P2) or 255AS (P3). These textured laminates are Slip Certified to AS 4586-2013 and provide a non slip surface for interior graphics.

The combination of any of these films will also carry FR Certification – Group 1, AS 5637.1 - 2015.

Design & Application

When you are satisfied that adhesion is strong and there was no remaining residue you can continue applying the film for your floor graphics project. Floor graphic applications should also take design into consideration. The objective is to decorate the floor and also ensure you meet the specific requirements of the site location. Therefore consideration must be given to the type of materials to be used. There are several options to consider, including;

- a. Single film with textured surface carrying a slip rating, printed with graphics.
- b. Base layer printed film with textured slip resistant laminate.

In both cases design of the graphics, in particular avoiding square cut corners is recommended. Square cut corners can become a lift point and a potential hazard. By incorporating rounded corners into your design will help to eliminate this issue from occurring.

Fire Retardant

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Further details and reference can be found within ORAFOL Warranty & Certification.

Slip Resistance

Several ORAGUARD® self adhesive laminates carry Slip Certification: AS 4586-2013

Further details and reference can be found within ORAFOL Warranty & Certification.

Removing existing Self adhesive film

The best way to deal with existing self adhesive film is to remove it by stripping it away. ORAFOL do not recommend applying self adhesive film over aged self adhesive film. Peel the existing film away. For difficult sections a heat gun may be useful to warm and soften the adhesive. The degree of difficulty can vary depending on the type of carpet surface and the adhesive characteristics of the self adhesive film. Once the self adhesive film is removed make certain that all previous adhesive is thoroughly cleaned away.

Printing & Laminating

There are three critical steps that need to be followed when producing your floor graphics.

1. Use the correct colour profiles. Check for the latest updates at: [https://www.orafol.com/en/americas/support /// ICC Profiles](https://www.orafol.com/en/americas/support///ICCProfiles)

The profile will automatically synchronize the ink levels, heater settings, and feed speed necessary to help ensure quality printing.

2. When utilizing solvent or eco-solvent inks: Prior to trimming or laminating, it is important that the graphic sit for 48-72 hours, to allow the ink to thoroughly out-gas. Prints heavy in ink saturation need to cure and out-gas for approximately 72 hours. This is crucial to ensure your floor graphics do not start curling around the edges.

Keep in mind that due to widely varying production shop environments, curing times may vary.

3. For best results on contour-cut floor graphics, leave a 20-25mm unprinted, white border all the way around the printed area to minimise potential edge curling that typically occurs when contour cutting through a printed bleed.

When choosing a laminate, it is important to know what the Slip Rate requirements are for your specific site location.

Installation

When installing your graphic, always apply the material using a dry application method; under no circumstances should a wet application be used.

Lay the graphic, image-side down, on a flat surface and pull back the liner about 6-12 inches. Sharply crease the liner while holding it away from the adhesive. Align the graphic on the floor and use finger pressure to tack in place. Using a Squeegee, work from the centre to the edge, then return to the centre and work to the opposite edge. Use overlapping strokes while applying a small portion of the graphic at a time.

If your graphic is made up of more than one panel, avoid using horizontal seams when possible. When the entire graphic has been applied to the floor, reapply pressure with the squeegee around the edges of the graphic multiple times to ensure a good bond.

If the graphic will come into contact with regular cleanings, such as mopping, soil removal, etc., graphics should be sealed in those areas. This is especially important where the graphic is terminated at the floor.

Test, Test, Test.

As explained many times through this technical advice there are so many variables to contend with when applying self adhesive films to floors. These variables are far too numerous to mention all, however this paper does cover many.

Not only are there variables in floor types, there are variables to consider in terms of location.

For these reasons we strongly advise testing.

Test product onto the floor surface on site before undertaking the full project. The onus is on the installer to confirm suitability of individual products for specific applications, before proceeding.

For more information contact your local ORAFOL representative

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