

# Practical Information

## Application of ORALITE® reflective sheeting on plastic substrates

These instructions describe the application of below listed ORALITE® reflective sheeting series on plastic substrates such as cones, or warning, construction/work zone and information signs. These application instructions are based on our internal tests and research and need to be followed to obtain the product performance as per technical data sheet of the mentioned ORALITE® series. Due to the wide variety of plastic polymers and qualities available on the market, we always recommend testing with your specific substrate before going to large scale use.

ORALITE® 5230/5231 Economy Grade  
ORALITE® 5430/5431 Construction Grade  
ORALITE® 5830/5831 High Intensity Construction Grade  
ORALITE® 5930/5931 High Intensity Prismatic Construction Grade  
ORALITE® 5930M/5931M Prismatic Construction Grade  
ORALITE® 5930MFLEX/5931MFLEX Premium Construction Grade

The above listed series include products of various reflectivity classes from RA1 (type I) to RA2 and RA3C (type IV, VI). Especially for RA3C applications, expert application knowledge needs to be used to achieve highest reflectivity results.

### 1. Recommended substrates

Generally, the following material groups are applicable for the application of the above mentioned ORALITE® reflective sheeting:

Polyester, glass fibre reinforced plastics, polypropylene, polyethylene and polybutene, soft and hard PVC, polycarbonate, polyacetate, polymethylacrylates, polystyrene, ABS and polyurethane.

Please be aware that, depending on the type and quality of substrate you use plasticisers, processing aids, stabiliser or monomers might migrate onto the surface or outgas over time. This might alter the adhesion of ORALITE® films.

### 2. Application/processing

#### 2.1 General information

In general, it is recommended to make own tests on the respective substrates prior to application of the ORALITE® reflective sheeting. Plastic substrates must be tested and approved by the ORAFOL Europe GmbH R&D department.

#### 2.2 Adhesives

For the lamination of plastic substrates, ORAFOL has developed specific adhesives for excellent adhesion and cold flow properties. For application on the above-mentioned polymer groups, ORAFOL exclusively recommends the use of the above listed ORALITE® reflective sheetings.

The adhesives used on these products reach their final adhesion after approximately 48 hours. Afterwards, the adhesive should have developed a strong bond to the substrate.

#### 2.3 Substrate requirements

The surface should have a roughness which ranges between 0.5 µm and 2 µm. The substrate should have completed manufacturing at least 2 weeks before lamination.

The substrate must be free from silicone, oil, grease, or other contamination. Thus, the substrate needs to be treated with a grease and silicone free solvent (e.g. isopropanol) in order to remove any particles, stains, or migrated plastic component.

#### 2.4 Application temperature

For the application, an ambient temperature of 18-25° C is recommended. The substrate temperature should not be below 20° C. After film application the construction should be stored for another 48 hours under same conditions.



### 3. Surface preparation for application

#### 3.1 Testing the substrate for outgassing

To test the substrate for outgassing, the following pre-test is necessary:

After cleaning, an ORALITE® reflective sheet, measuring approximately 100mm x 100mm, should be applied to the substrate and should be stored for approximately 24 hours at a temperature of about 60°C. If bubbles have formed, the plastic material is still outgassing.

#### 3.2 Flame treatment

Due to the unpolar characteristic of some plastics, a flame treatment of the surface might be necessary.

The complete surface of the substrate must be evenly treated with the flame. During the flame treatment the tip of the blue flame should have a distance of 2.5 cm to 5 cm to the surface in order to allow for a proper oxidation. An automated flame treatment is recommended.

#### 3.3 Surface tension testing after flame treatment

The so-called water test is recommended for testing the surface tension after the flame treatment. Purified water is dropped onto the surface of the substrate with a pipette. The quality of the flame treatment can be judged by the drop shape. The water drops show the difference between a sufficiently treated and an insufficiently treated surface.

The treated surface must have cooled down for at least 15 minutes to room temperature before further processing. It is not recommended to stack the substrates before application. The material should be applied to the flame treated surface within the same day.

### 4. Transport

The sheeting must be stored for at least 8 hours at room temperature after the application before it can be shipped. Finished parts may not be subjected to excessive humidity or heat during transport.

### 5. Durability of traffic signs

The durability of the sign will depend upon substrate and sheeting selection, preparation, application, maintenance, and exposure conditions. Lifetime statements in the technical data sheets and warranty documents refer to signs that were produced and applied according to above recommendations, the application/processing described in the technical data sheet and the warranty documents issued by ORAFOL. Sign failures caused by improper preparation, application or maintenance are not the responsibility of ORAFOL. A reduced service life or sign failure might be caused by snow packing or any other sign burial, improperly selected or prepared substrate, exposure to extreme atmospheric conditions in certain geographic areas, mechanical abrasion, exposure to aggressive chemicals, non-vertical application, use of other than the recommended ORAFOL products (inks, laminate films, lettering films etc.).

This application instruction was compiled to the best of our knowledge and with particular care. The information is based upon research and our own tests and corresponds to our present state of knowledge. It serves as information and does not constitute a warranty of specific product properties or suitability for specific performances and uses. We do not accept responsibility for printing errors, specification errors or mistakes. The content of this processing instruction is neither intended as an instruction manual nor as a legally binding basis. In principle, our General Terms and Conditions for Sale and Delivery apply.

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