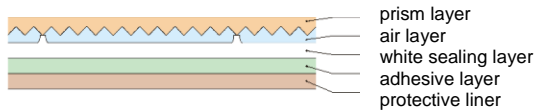


1. Processing instructions for ORALITE® 5910DP High Intensity Prismatic Grade Film

Series ORALITE® 5910DP is designated for UV-digital print and lamination with a protective laminate such as ORALITE® 5061/5090 or 5095. The basic composition of this product is illustrated below:



The information within this document is based on our knowledge, experience and application tests. Its purpose is to provide suggestions and support to practitioners. Even though it is not possible to explain all aspects that need to be taken into account, this guideline comprises a large number of useful tips for handling ORALITE® High Intensity Prismatic Grade films.

Specific knowledge and skills of sign producers are prerequisites for the processing of ORALITE® High Intensity Prismatic Grade film. On account of the large number of conditions that may influence the processing, adhesive bonding and use of the films, the sign producer should carefully consider the suitability and performance of the product for each intended use and perform their own tests.

2. Storage and Transportation



ORALITE® High Intensity Prismatic Grade film should be stored in a cool and dry, indoor area that is protected from direct sunlight. Recommend temperatures for storage are from 18° C to 24° C [65° F to 75° F] and air humidity of 40% to 60%.

Rolls should be stored in the original carton. The rolls have standard spacers [core plug] that prevent contact between the roll surface and the carton and thus the formation of pressure marks and surface damage. Please make sure that partly processed rolls are never stored without spacers.

When making the rolls available for processing, it is advisable to use a horizontal suspension system. If the rolls are stored in a vertical, freestanding position, a negative influence on the film's characteristics is not expected. It is crucial to place the roll on the spacer so as to avoid breakage at the edges and contamination.

Blank or printed film sheets are supplied in cartons that have been specifically designed to the sheet dimensions. There are 50 sheets per carton. If the sheets are stored outside the carton, please make sure to put individual sheets on a flat and stable support so that they do not adjoin or overlap at the edges. Sheets may be stacked. However, in order to limit the weight load not more than 40 to 50 sheets should be stacked.

3. Printing

ORALITE® 5910DP High Intensity Prismatic Grade film can be digitally printed with ORALITE® 5019 UV Digital Printing Ink and the ORALITE® UV Traffic Sign Printer.

3.1 Storage and transportation of printed sheets and traffic signs

Printed sheets can be stored horizontally. Please note that the maximum number of sheets stacked should not exceed 40 to 50 sheets. Prints on pre-laminated traffic sign substrates should be stored vertically and separated by an intermediate layer of suitable paper or support film. A low pressure load is crucial.

ORAFOL recommends indoor storage of sign faces or finished signs in an upright vertical position, with 2 cm [1 inch] spacers between the signs in an area protected from excessive moisture or overheating. Outdoor storage should be done in a vertical position with 10 cm [4 inches] spacers between the signs. The spacers should not touch the reflective surface. If a wrapping is done, the material used shall allow air circulation and be removed when whet.

3.2 UV digital printing

ORAFOL's UV digital printing system, especially designed for but not limited to the manufacturing of traffic signs, consists of ORALITE® UV Traffic Sign Printer using the supplied RIP software, ORALITE® 5019 UV Digital Printing Ink and our recommended ORALITE® overlay films. After application of a clear protective laminate, the product is stable in long term outdoor use and meets the requirements of reflection class RA2/R2/type IV/class 400.

The printing process requires an air and material temperature between 20° C and 26° C as well as air humidity between 40 - 60 %. The room should be free from dust to prevent entrapment of dust during printing. The surface of the ORALITE® reflective films requires cotton gloves to prevent contamination of the surface and to allow a flawless print image.

For further details on printing preparation, cleaning and care intervals please refer to the handbooks and documentations of the ORALITE® UV Digital Traffic Sign Printer and the RIP software.

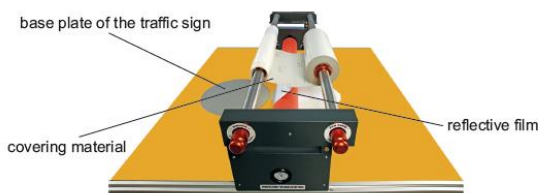
Lamination with clear protective laminates shall be done at a maximum temperature of 37°C [100F] and 0.6 m/min [2 ft./min] to yield a good lay flatness and stress free laminated product. Please contact your ORAFOL representative for further details on recommended plotters, stencils and machine settings.

4. Adhesive bonding and laminating

In order to achieve proper adhesion of the films, the substrate must be dry and free of dust, oil, fats, silicon or other contamination. If the substrate needs to be treated with a solvent, the next processing step cannot be carried out until the solvent is completely evaporated. When films are adhered to metallic substrates, fine grinding of the surfaces is advantageous.

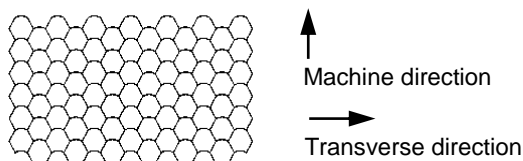
ORALITE® 5910DP has been optimized for application onto flat substrates such as aluminium alloys or galvanized steel.

Laminating should not be carried out at air and material temperatures of less than 15° C [60° F]. The optimum temperature is about 21° C [70° F]. The films should be stored in the rooms in which they will be processed for at least 48 hours. Adequate curing of the ink is a prerequisite for any further processing of printed reflective films as otherwise the evaporating solvent may cause blistering and even tearing of the films. If you intend to use a film-laminating machine, a controllable unwinding and winding motor is recommended. The upper roller should be rubber coated with Shore hardness 65 to 75. The optimum roll gap should be adjusted over the entire width. A flatbed roll applicator is recommended for the lamination of larger webs.



If it is necessary to apply two pieces of prismatic sheeting side by side (splicing), they must not overlap. Depending on the format, the gap should be approximately 1 mm [0.04 inches]. Please make sure that a right side of the film web is always bonded to a left side, thus ensuring the uniform orientation of the film's honeycomb structure (shown below).

honeycomb/cell structure (schematic)



ORALITE® High Intensity Prismatic Grade films comply with the relevant minimum reflective data in machine direction as well as in transverse direction.

When a hand roller is used for lamination, the film must be placed on the sheet in such a way that it protrudes at least 5 mm [0.25 inches] from the surface on all sides. It is recommended to proceed as follows to ensure the accurate positioning of the sheet: In a first step, peel off 60 to 80 cm [24 to 32 inches] of the protective paper or film from the ORALITE® High Intensity Prismatic Grade film. Align the sheet on the substrate and press down the area where the adhesive is exposed. Then get hold of the folded-over protective paper underneath the sheet and slowly peel it off further, while pressing down the sheet with the rubber hand roller. Finally, the edges of the traffic sign sheet should be trimmed with a **sharp knife** applied at a 30° angle.

Caution! Before laminating any ORALITE® film to a substrate, please make sure it is dry!

5. Cleaning of the applied products

Surfaces should only be cleaned with clear water, water/isopropanol (80/20%) or diluted soap solution. Please do not use any solvents, thinner or abrasive cleaning agents for the cleaning of reflective films! We also do not recommend the use of power washers for cleaning of road signs.

For further information on the above described materials, please visit www.orafol.com.