

## Product Description

ORALITE® retroreflective films series 6710 Engineer Prismatic Grade are flexible, weatherproof, self-adhesive films with excellent corrosion and solvent resistance. The product was specifically developed for the manufacture of traffic control, guidance, warning and information signs, which are intended for long term vertical outdoor use.

ORALITE® 6710 sheeting is composed of a UV stabilised acrylic front film. Its retroreflective system consists of sealed cells of air backed microprisms, using total internal reflection. The distinct shape of the sealing pattern identifies the machine direction and the manufacturer of the sheeting shown in Figure 1. The sheeting displays a watermark with the product series and information as well as the lot number in alternate repeat pattern to provide identification to users and visual verification of proper use by inspectors, shown in Figure 2.

## Retroreflectivity

ORALITE® 6710 exceeds the minimum performance requirements of DIN EN 12899-1 (class R1), DIN 67520:2013-10 (RA1; design C) and ASTM D4956-13 (type I sheeting). The required minimum retroreflection values, shown in Tables 1 and 2, are complied with when measured in accordance with the corresponding specifications using CIE standard illuminant A, and the provisions of CIE No.54.2.

## Colour

ORALITE® 6710 sheeting is available in white (010), yellow (020), orange (035), red (030), green (060), blue (050) and brown (080). The sheeting conforms to the daytime colour requirements in Tables 3 and 4 when measured in accordance with the corresponding specifications, the provisions of CIE No. 15.2, and shall comply with the specifications of DIN 6171:2013-10 and ASTM D4956-13.

Figure 1 - Sealing pattern and application directions

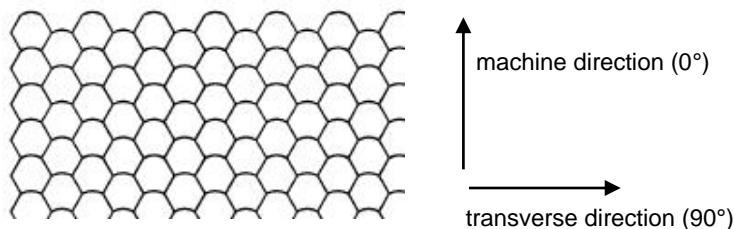


Figure 2 - Watermark



## Adhesive

The adhesive consists of a solvent polyacrylate, permanent pressure sensitive adhesive specially formulated for the application to metallic surfaces such as aluminium and zinc coated steel plate. The adhesive is protected by a release liner made of polypropylene film, silicone coated on one side, 0.075 mm [0.003"] thickness.

## Application/Processing

ORALITE® 6710 was especially developed for traffic control applications. Surfaces to which the material will be applied must be thoroughly cleaned from dust, grease or any contamination which could affect the adhesion of the material. The adhesive is optimized for application on metallic surfaces. For other applications the user is fully responsible for evaluating the suitability of the product, and for any risks associated with that use.

ORALITE® 6710 in white colour can be screen printed with ORALITE® 5018 screen printing ink. A transparent coating is not necessary. The material can also be printed with the ORALITE® UV Traffic Sign Printer using ORALITE® 5019 UV Digital Printing Ink and a protective overlay film. Overlay film recommended is ORALITE® 5062 Transparent Film. The printed or laminated sheeting will continue to meet the colour specifications and retroreflective values of the respective colour provided that ORAFOL's application guidelines are followed.

Please refer to the Practical Information #4.5 published by ORAFOL for full instructions or contact your ORAFOL Reflective Solutions Division representative for advice relating to the above.

### Warranty

No warranty is given for purposes other than those listed in the Technical Datasheet or which are not processed according to ORAFOL's processing and handling instructions. The durability of the signs will depend on a variety of factors, including but not limited to substrate selection and preparation, compliance with recommended application guidelines, geographic area, exposure conditions and maintenance of the product and finished sign. Sign failures caused by the substrate or improper surface preparations are not the responsibility of ORAFOL. Please refer to the Warranty document published by ORAFOL for detailed information

**Note:** All ORALITE® products are manufactured within an ISO 9001:2008 controlled manufacturing environment. Batch traceability is possible on the basis of the roll number.

### Product Data

#### Retroreflectivity for new sheeting (cd/lx/m<sup>2</sup>) as per EN12899-1:2007 and ASTM D4956-13:

Table 1 – Specific coefficient of retroreflection (exceeding class RA1)									
Observation angle	0.2°			0.33°			2°		
Entrance angle	5°	30°	40°	5°	30°	40°	5°	30°	40°
white (010)	100	40	10	80	35	9	5	2.5	1.5
yellow (020)	60	26	7	45	20	6	3	1.5	1
orange (035)	30	12	2.2	25	10	2.2	1.2	0.5	#
red (030)	22	9	2	17	6.5	1.8	1	0.5	0.5
blue (050)	6	2.4	0.5	4	1.3	#	#	#	#
green (060)	13	5	1.5	11	5	1.2	0.5	0.3	0.2
brown (080)	5	2	#	20	8	#	#	#	#

# - reflectivity larger than zero

Table 2 – Specific coefficient of retroreflection (ASTM 4956-13, Type I)				
Observation angle	0.2°		0.5°	
Entrance angle	-4°	30°	-4°	30°
white (010)	70	30	30	15
yellow (020)	50	22	25	13
orange (035)	25	7	13	4
red (030)	14	6	7.5	3
blue (050)	4	1.7	2	0.8
green (060)	9	3.5	4.5	2.2
brown (080)	1	0.3	0.3	0.2

**Colour specification limits for new sheeting:**

Table 3 – Chromaticity coordinates (DIN 6171-1:2013-10)									
Colours	1		2		3		4		Luminance Factor $\beta$
	x	y	x	y	x	y	x	y	
<b>white (010)</b>	0.305	0.315	0.335	0.345	0.325	0.355	0.295	0.325	$\geq 0.27$
<b>yellow (020)</b>	0.494	0.506	0.470	0.480	0.513	0.437	0.545	0.455	$\geq 0.16$
<b>orange (035)</b>	0.631	0.369	0.552	0.359	0.506	0.404	0.570	0.430	$\geq 0.12$
<b>red (030)</b>	0.735	0.265	0.700	0.250	0.607	0.343	0.655	0.345	$\geq 0.03$
<b>blue (050)</b>	0.100	0.109	0.146	0.156	0.183	0.115	0.137	0.038	$\geq 0.01$
<b>green (060)</b>	0.007	0.703	0.216	0.448	0.147	0.400	0.018	0.454	$\geq 0.03$
<b>brown (080)</b>	0.455	0.397	0.523	0.429	0.479	0.373	0.558	0.394	0.03 – 0.09

Table 4 – Chromaticity coordinates (ASTM D4956)									
Colours	1		2		3		4		Luminance Factor (Y %)
	x	y	x	y	x	y	x	y	
<b>white (010)</b>	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329	$\geq 27$
<b>yellow (020)</b>	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472	$15 \geq Y \geq 45$
<b>orange (035)</b>	0.558	0.352	0.636	0.364	0.570	0.429	0.506	0.404	$10 \geq Y \geq 30$
<b>red (030)</b>	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346	$2.5 \geq Y \geq 15$
<b>blue (050)</b>	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216	$1 \geq Y \geq 10$
<b>green (060)</b>	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771	$3 \geq Y \geq 12$
<b>brown (080)</b>	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390	$1 \geq Y \geq 9$

### Physical and Chemical Properties

<b>Thickness*</b> (without protective paper and adhesive)	0.170 mm (6.8 mils)
<b>Temperature resistance</b>	adhered to aluminium, -56° C to +82° C (-70° F to 180° F)
<b>Resistance to cleaning agents</b>	adhered to aluminium, 8h in solution (0.5% household cleaning agents) at room temperature and 65° C (150° F), no variation
<b>Adhesive power*<sup>1</sup></b> (FINAT-TM 1 after 24h, stainless steel)	15 N/25mm (1 inch)
<b>Shelf life***</b>	1 year
<b>Application temperature</b>	> +10° C (50° F)
<b>Service life by specialist application**</b> under vertical outdoor exposure	7 years (not printed)

\* average    \*\* standard central European climate    \*\*\* in original packaging, at 20° C and 50% relative humidity    <sup>1</sup> 180° Peel @ 300mm (12") /min

**Note:** Values stated in SI units are to be regarded as standard. The values in parentheses are conversions and shall not be considered as the standard, as these values maybe approximate.

### IMPORTANT NOTICE

When using ORALITE® 6710 sheeting the relevant national specifications have to be complied with. ORAFOL recommends you obtain the current requirements from your local authority and ensure product conformance with such requirements. Please contact ORAFOL for further information.

All ORALITE® products are subject to careful quality control throughout the manufacturing process and are warranted to be of merchantable quality and free from manufacturing defects. Published information concerning ORALITE® products is based upon research which the Company believes to be reliable although such information does not constitute a warranty. Because of the variety of uses of ORALITE® products and the continuing development of new applications, the purchaser should carefully consider the suitability and performance of the product for each intended use, and the purchaser shall assume all risks regarding such use. All specifications are subject to change without prior notice.

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