

## Product Description

ORALITE® retroreflective films series 9910 Brilliant Grade Premium are highly reflective, weatherproof, self-adhesive films with excellent corrosion and solvent resistance. The product was especially developed for the manufacture of traffic control, guidance, warning and information signs, which are intended for long-term vertical outdoor use.

ORALITE® 9910 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 number and roll ID in a repeat pattern to provide identification to users & visual verification of proper use by inspectors, shown in Figure 2.

The product complies with the requirements of ASTM D 4956-17 concerning microprismatic materials exceeding the minimum coefficient of retroreflection for performance class type XI for the colours listed in Table 1.

## Retroreflectivity

ORALITE® 9910 exceeds the minimum performance requirements of ASTM D 4956-17 type XI. The required minimum retroreflection values, shown in table 1, 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® 9910 Brilliant Grade Premium sheeting is available in white (010), yellow (020), red (030), orange (035), blue (050), green (060), brown (080) and the fluorescent colours fluorescent yellow-green (029), fluorescent yellow (037) and fluorescent orange (038). The sheeting conforms to the daytime colour requirements in table 2 when measured in accordance with the corresponding specifications, the provisions of CIE No. 15.2, and shall comply with the specifications of ASTM D 4956-17.

Figure 1 - Sealing pattern and application directions

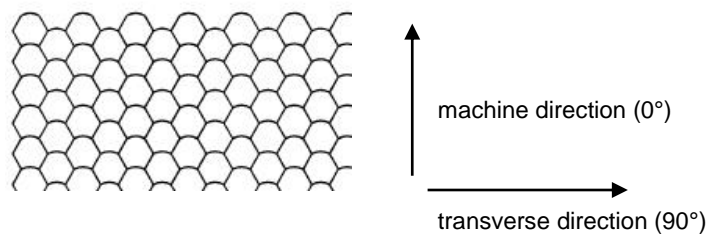


Figure 2 - Watermark



## Adhesive

The adhesive consists of a solvent polyacrylate, permanent pressure sensitive adhesive specially formulated for the application onto 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 thickness.

## Application/Processing

ORALITE® 9910 Brilliant Grade Premium 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. Freshly lacquered or painted surfaces should be completely cured. The compatibility of selected lacquers and paints should be tested by the user, prior to application of the material. For other applications the user is fully responsible for evaluating the suitability of the product, and for any risks associated with that use.

ORALITE® 9910 in white colour can be screen or digitally printed or laminated with overlay films. The printed or laminated sheeting will continue to meet the retroreflective values of the respective colour provided that ORAFOL's application guidelines are followed. The overlay films recommended are: ORALITE® 5061 Transparent Film, ORALITE® 5090 Anti Dew film and ORALITE® 5095 Anti Graffiti film. The screen printing ink recommended is ORALITE® 5018. A transparent coating is not necessary.

The material can also be printed on the ORALITE® UV Traffic Sign Printer with the specially developed UV Digital Printing Ink ORALITE® 5019i. For long-term vertical outdoor use, the printed material should be used in combination with a clear ORALITE® overlay film.

Please refer to the Practical Information #4.6 published by ORAFOL for full instructions or contact your ORAFOL Reflective Solutions Division representative for advice relating to the above.

**Product Data**

Retroreflectivity for new sheeting (cd/lx/m<sup>2</sup>) as per ASTM D 4956-17:

Table 1 – Specific coefficient of retroreflection (ASTM D 4956-17, type XI)						
Observation angle	0.20°		0.50°		1.00°	
Entrance angle	-4°	30°	-4°	30°	-4°	30°
white (010)	580	220	420	150	120	45
yellow (020)	435	165	315	110	90	34
red (030)	87	33	63	23	18	7
orange (035)	200	77	150	53	42	16
blue (050)	26	10	19	7	5	2
green (060)	58	22	42	15	12	5
brown (080)	17	7	13	5	4	1
fl. yellow-green (029)	460	180	340	120	96	36
fl. yellow (037)	350	130	250	90	72	27
fl. orange (038)	175	66	125	45	36	14

Daytime colour specification limits for new sheeting:

Table 2 – Chromaticity coordinates (ASTM D 4956-17)									
Colours	1		2		3		4		Luminance Factor Y
	x	y	x	y	x	y	x	y	
white (010)	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329	> 27
yellow (020)	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472	15 ≤ Y ≤ 45
red (030)	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346	2.5 ≤ Y ≤ 15
orange (035)	0.558	0.352	0.636	0.364	0.570	0.429	0.506	0.404	10 ≤ Y ≤ 30
blue (050)	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216	1 ≤ Y ≤ 10
green (060)	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771	3 ≤ Y ≤ 12
brown (080)	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390	1 ≤ Y ≤ 9
fl. yellow-green (029)	0.387	0.610	0.369	0.546	0.428	0.496	0.460	0.540	> 60
fl. yellow (037)	0.479	0.520	0.446	0.483	0.512	0.421	0.557	0.442	> 40
fl. orange (038)	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355	> 20



### Physical and Chemical Properties

<b>Thickness*</b> (without protective liner)	Standard colours: 0.370 mm Fluorescent colours: 0.420 mm
<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*</b> (FINAT-TM1 after 24h, stainless steel)	15 N/25 mm (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	up to 12 years (not printed) up to 10 years for fluorescent yellow-green up to 3 years for fluorescent orange

\* average

\*\* in original packaging, at 20°C and 50% relative humidity

\*\*\* standard central European climate

**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.

All ORALITE® products are manufactured within an ISO 9001:2015 controlled manufacturing environment and batch traceability is possible on the basis of the roll number.

### IMPORTANT NOTICE

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.

When using ORALITE® 9910 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.

ORALITE® is a trademark of ORAFOL Europe GmbH

