Product Description

ORALITE® retroreflective films series 6910 Brilliant Grade 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® 6910 sheeting is composed of a UV stabilized 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 number and roll ID in a repeat pattern to provide identification to users and visual verification of proper use by inspectors, shown in Figure 2.
The product complies with the requirements of EN 12899-1:2007 Clause 4.2 concerning microprismatic materials and has been granted a European Technical Approval (ETA No. 13/0247) exceeding the minimum coefficient of retroreflection for performance class R3B for the colours listed in Table 3.

Retroreflectivity

ORALITE® 6910 exceeds the minimum performance requirements of CUAP class R3B (Germany) and DIN 67520:2008-11 (RA3B; design C). 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® 6910 Brilliant Grade sheeting is available in standard traffic sign colours white (010), yellow (020), orange (035), red (030), green (060), blue (050) and brown (080) as well as in fluorescent colours fluorescent yellow (037), fluorescent yellow-green (029) and fluorescent orange (038). The sheeting conforms to the daytime colour requirements in tables 3 & 4 when measured in accordance with the corresponding specifications, the provisions of CIE No. 15.2, and shall comply with the specifications of DIN 6171-1:2011-11. The fluorescence luminance factors are given as informative values.

Figure 1 - Sealing pattern and application directions

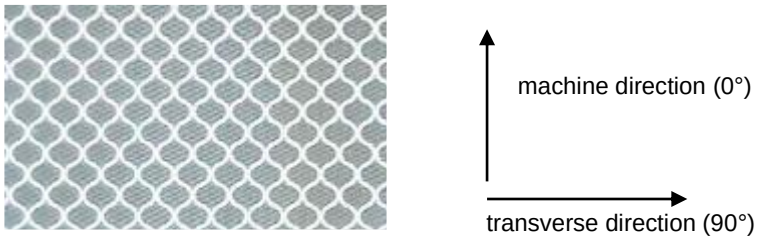
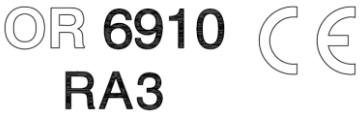


Figure 2 - Watermark



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® 6910 Brilliant Grade 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® 6910 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 inks ORALITE® 5019. For long-term vertical outdoor use, the printed material should be used in combination with ORALITE® 5061 Transparent Film.

Please refer to the Practical Information #4.4 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/m²) as per DIN 67520:2008-11:

Table 1 – Specific coefficient of retroreflection (DIN 67520:2008-11 RA3B; design C)

Observation angle		0.33°				1.00°				1.50°			
Entrance angle		**5°**	**20**	**30°**	**40°**	**5°**	**20**	**30°**	**40°**	**5°**	**20**	**30°**	**40°**
white	**(010)**	300	240	165	30	35	30	20	3.5	15	13	9	1.5
yellow	**(020)**	195	155	110	20	23	20	13	2	10	8	6	1
orange	**(035)**	150	120	83	15	18	15	10	2	7.5	6.5	4.5	1
red	**(030)**	60	48	33	6	7	6	4	1	3	2.5	2	0.5
green	**(060)**	30	24	17	3	3.5	3	2	0.5	1.5	1	1	#
blue	**(050)**	19	16	11	2	2.5	2	1.5	0.5	1	0.5	0.5	#

Table 2 – Specific coefficient of retroreflection, fluorescent colours (DIN 67520:2008-11 RA3B; design C)

Observation angle		0.33°				1.00°				1.50°			
Entrance angle		**5°**	**20**	**30°**	**40°**	**5°**	**20**	**30°**	**40°**	**5°**	**20**	**30°**	**40°**
fluo. yellow-green	**(029)**	240	190	130	24	28	24	16	2.5	12	10	7	1
fluo. yellow	**(037)**	195	155	110	20	23	20	13	2	10	8	6	1
fluo. orange	**(038)**	90	70	30	9	10	9	6	1	4,5	4	2,5	#

Daytime colour specification limits for new sheeting:

Table 3 – Chromaticity coordinates (DIN 6171-1:2013-10)										
Colours		1		2		3		4		Luminance Factor β
		x	y	x	y	x	y	x	y	
white	(010)	0.305	0.315	0.335	0.345	0.325	0.355	0.295	0.325	> 0.27
yellow	(020)	0.494	0.506	0.470	0.480	0.513	0.437	0.545	0.455	> 0.16
red	(030)	0.735	0.265	0.700	0.250	0.607	0.343	0.655	0.345	≥ 0.03
green	(060)	0.007	0.703	0.216	0.448	0.147	0.400	0.018	0.454	≥ 0.03
blue	(050)	0.100	0.109	0.146	0.156	0.183	0.115	0.137	0.038	≥ 0.01

Table 4 – Chromaticity coordinates, fluorescent colours (DIN 6171-1:2013-10)											
Colours		1		2		3		4		Luminance factor β	Fluo.* Luminance factor β_F
		x	y	x	y	x	y	x	y		
fluo. yellow-green	(029)	0.373	0.625	0.358	0.549	0.427	0.483	0.465	0.535	≥ 0.60	≥ 0.35
fluo. yellow	(037)	0.545	0.455	0.487	0.423	0.427	0.483	0.465	0.535	≥ 0.45	≥ 0.25
fluo. orange	(038)	0,570	0,430	0,506	0,404	0,569	0,341	0,655	0,345	≥ 0.30	≥ 0.18

* Fluorescent luminance factors are informative values only

Physical and Chemical Properties

Thickness* (without protective liner)	Standard colours: 0.345 mm Fluorescent colours: 0.385 mm
Temperature resistance	adhered to aluminium, -56° C to +82° C (-70° F to 180° F)
Resistance to cleaning agents	adhered to aluminium, 8h in solution (0.5% household cleaning agents) at room temperature and 65° C (150° F), no variation
Adhesive power* (FINAT-TM1 after 24h, stainless steel)	15 N/25 mm (1 inch) (film tear)
Shelf life**	1 year
Application temperature	> +10° C (50° F)
Service life by specialist application*** under vertical outdoor exposure	up to 12 years (not printed) up to 10 years for fluorescent yellow-green/yellow 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® 6910 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