ORALITE® 5900
High Intensity Prismatic Grade

Product Description

ORALITE® retroreflective films series 5900 High Intensity Prismatic Grade are highly reflective, 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® 5900 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.

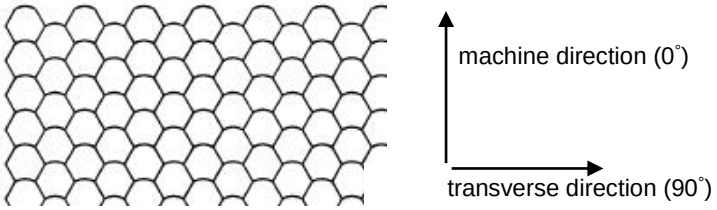
Retroreflectivity

ORALITE® 5900 exceeds the minimum performance requirements of DIN 67520:2008-11 (RA2; design C) and ASTM D4956-17 (Type IV 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® 5900 High Intensity Prismatic Grade sheeting is available in white (010), yellow (020), orange (035), red (030), green (060), blue (050) and brown (080) as well as fluorescent yellow-green (029) and fluorescent yellow (037). 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, & shall comply with the specifications of DIN 6171-1: 2011-11 & ASTM D4956-17.

Figure 1 - Sealing pattern and application directions



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® 5900 High Intensity Prismatic 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® 5900 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 #4.3 published by ORAFOL for full instructions, or contact your ORAFOL Reflective Solutions Division representative for advice relating to the above.

Note:

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.

Product Data

Retroreflectivity for new sheeting (cd/lx/m²) as per DIN 67520 and ASTM D4956-17

Table 1 – Specific coefficient of retroreflection (DIN 67520:2013-10 RA2)									
Observation angle	**0.2°**			**0.33°**			**2°**		
Entrance angle	**5°**	**30°**	**40°**	**5°**	**30°**	**40°**	**5°**	**30°**	**40°**
white	250	150	110	180	100	95	5	2.5	1.5
yellow*	170	100	70	122	70	64	3	1.5	1
red	45	25	15	25	14	13	1.0	0.4	0.3
green	45	25	12	21	12	11	0.5	0.3	0.2
blue	20	11	8	14	8	7	0.2	#	#
brown	12	8.5	5	8	5	3	0.2	#	#

*also for fluorescent yellow

Table 2 – Specific coefficient of retroreflection (ASTM D4956-17 Type IV)						
Observation angle	**0.1°**		**0.2°**		**0.5°**	
Entrance angle	**-4°**	**30°**	**-4°**	**30°**	**-4°**	**30°**
white	500	240	360	170	150	72
yellow	380	175	270	135	110	54
orange	200	94	145	68	60	28
red	90	42	65	30	27	13
green	70	32	50	25	21	10
blue	42	20	30	14	13	6
brown	25	12	18	8.5	7.5	3.5
fl. yellow-green	400	185	290	135	120	55
fl. yellow	300	140	220	100	90	40

Daytime colour specification limits for new sheeting

Table 3 – Chromaticity coordinates (DIN 6171:2003-08)									
Colours	1		2		3		4		Luminance Factor β
	x	y	x	y	x	y	x	y	
white	0.305	0.315	0.335	0.345	0.325	0.355	0.295	0.325	> 0.27
yellow	0.494	0.506	0.470	0.480	0.513	0.437	0.545	0.455	> 0.16
red	0.735	0.265	0.700	0.250	0.607	0.343	0.655	0.345	≥ 0.03
green	0.007	0.703	0.216	0.448	0.147	0.400	0.018	0.454	≥ 0.03
blue	0.100	0.109	0.146	0.156	0.183	0.115	0.137	0.038	≥ 0.01
brown	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 D4956-17)									
Colours	1		2		3		4		Luminance Factor (Y %)
	x	y	x	y	x	y	x	y	
white	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329	> 27
yellow	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472	15 ≤ Y ≤ 45
orange	0.558	0.352	0.636	0.364	0.570	0.429	0.506	0.404	10 ≤ Y ≤ 30
red	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346	2.5 ≤ Y ≤ 15
green	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771	3 ≤ Y ≤ 12
blue	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216	1 ≤ Y ≤ 10
brown	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390	1 ≤ Y ≤ 9
fl. yellow-green	0.387	0.610	0.369	0.546	0.428	0.496	0.460	0.540	≥ 60
fl. yellow	0.479	0.520	0.446	0.483	0.512	0.421	0.557	0.442	≥ 40

Physical and Chemical Properties

Thickness* (without protective paper and adhesive)	0.230 mm (9 mils)
Temperature resistance	adhered to aluminium, -56° C to +82° C (-70° F to 180° F)
Resistance to cleaning agents	adhered to aluminium, 8 h in solution (0.5% household cleaning agents) at room temperature and 65° C (150° F), no variation
Adhesive power*[1] (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	10 years (not printed)

* average
** standard central European climate *** in original packaging, at 20° C and 50% relative humidity [1]180° Peel @ 300 mm (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® 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.

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 full warranty document available at www.orafol.com for detailed information.