

## Description

ORALITE® 5500 Engineer Grade are weatherproof, self-adhesive retroreflective films with excellent corrosion and solvent resistance. The product was especially developed for the manufacture of traffic control, guidance, information and warning signs as well as for reflective lettering, numbers and symbols, which are intended for long term outdoor use.

## Product Construction

ORALITE® 5500 Engineer Grade is composed of an alkyd resin film. Its retroreflective system consists of catadioptric glass beads which are embedded in a transparent layer of plastic material.

## Retroreflectivity

ORALITE® 5500 Engineer Grade comply with EN12899-1 (RA1; design A) and ASTM D4956-09 (Type I sheeting). The required minimum retroreflection values are shown in Tables 1 and 2 respectively.

When using ORALITE® 5500 Engineer Grade, 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.

## Colour

ORALITE® 5500 Engineer Grade is available in white (010), yellow (020), red (030), orange (035), blue (050), green (060), brown (080) and black (070). The colours at daylight comply with the specifications of this class (RA1; design A).

## Adhesive

Solvent polyacrylate, permanent adhesive specially formulated for the application on metallic surfaces such as aluminium and zinc coated steel plate. The adhesive is protected by a release liner made of PE coated silicone paper, 145 g/m<sup>2</sup>.

## Printing

ORALITE® 5500 Engineer Grade is suitable for screen printing. ORALITE® screen printing inks series 5010 and 5018 are recommended. A transparent coating is not necessary. Please refer to the Practical Information #4.2 published by ORAFOL for full instructions.

## Application

ORALITE® reflective films series 5500 Engineer Grade were especially developed for traffic control and lettering applications. Please refer to the Practical Information #4.2 published by ORAFOL for full instructions. For other applications the user is fully responsible for evaluating the suitability of the product, and for any risks associated with that use. Please contact your ORAFOL Reflective Solutions Division representative for advice.

**Note:** The batch traceability according to ISO 9001 is possible on the basis of the roll number.

## Physical and Chemical Properties

<b>Thickness*</b> (without protective paper and adhesive)	110 micrometer
<b>Temperature resistance**</b>	adhered to aluminium, -56° C to +82° C (-68° F to 180° F)
<b>Salt-water resistance (DIN 50021)</b>	adhered to aluminium, after 100h at 23° C (74° F), no variation
<b>Resistance to solvents and chemicals</b>	with expert application resistant to most oils, grease, fuels, aliphatic solvents, weak acids, salts and alkalis
<b>Resistance to cleaning agents</b>	adhered to aluminium, 8h in suds (0,5% household cleaning agents) at room temperature and 65° C, no variation
<b>Adhesive power*</b> (FINAT-TM1 after 24h, stainless steel)	15 N/25 mm (25 mm = 0.98 in) (film tear)
<b>Shelf life***</b>	2 years
<b>Application temperature</b>	> +10° C
<b>Service life by specialist application</b> under vertical outdoor exposure (standard central European climate)	7 years (not printed)

\* average    \*\* standard central European climate    \*\*\* in original packaging, at 20°C and 50% relative humidity

## Product Data

Retroreflectivity for new sheeting (cd/lx/m<sup>2</sup>) as per EN12899-1:2007 and ASTM D4956-09:

Table 1 – Specific coefficient of retroreflection (EN 12899-1:2007 RA1; design A)									
Observation angle	0.2°			0.33°			2°		
	5°	30°	40°	5°	30°	40°	5°	30°	40°
<b>white (010)</b>	70	30	10	50	24	9	5	2.5	1.5
<b>yellow (020)</b>	50	22	7	35	16	6	3	1.5	1
<b>red (030)</b>	14.5	6	2	10	4	1.8	1	0.5	0.5
<b>orange (035)</b>	25	10	2.2	20	8	2.2	1.2	0.5	#
<b>blue (050)</b>	4	1.7	0.5	2	1	#	#	#	#
<b>green (060)</b>	9	3.5	1.5	7	3	1.2	0.5	0.3	0.2
<b>brown (080)</b>	1	0.3	#	0.6	0.2	#	#	#	#
<b>black * (070)</b>	25	10		20	8				

# Value greater than zero but not significant or applicable

\* Not EN12899-1 requirement

**Table 2 – Specific coefficient of retroreflection (ASTM D4956-09 Type I sheeting)**

Observation angle	0.2°		0.5°	
Entrance angle	-4°	30°	-4°	30°
white (010)	70	30	30	15
yellow (020)	50	22	25	13
red (030)	14	6	7.5	3
orange (035)	25	7	13	4
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 (EN12899-1:2007 Class CR2)**

Colours	1		2		3		4		Luminance factor $\beta$
	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	$\geq 0.35$
yellow (020)	0.494	0.505	0.470	0.480	0.493	0.457	0.522	0.477	$\geq 0.27$
red (030)	0.735	0.265	0.700	0.250	0.610	0.340	0.660	0.340	$\geq 0.05$
orange (035)	0.610	0.390	0.535	0.375	0.506	0.404	0.570	0.429	$\geq 0.17$
blue (050)	0.130	0.086	0.160	0.086	0.160	0.120	0.130	0.120	$\geq 0.01$
green (060)	0.110	0.415	0.150	0.415	0.150	0.455	0.110	0.455	$\geq 0.04$
brown (080)	0.455	0.397	0.523	0.429	0.479	0.373	0.558	0.394	$0.03 \leq \beta \leq 0.09$
black (070)	Black is the colour at daylight. When illuminated in darkness, it appears silver to silver-grey.								

## 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](http://www.orafol.com) for detailed information.

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