

### Product Description

ORALITE® reflective film series 5650RA FLEET ENGINEER GRADE with Rapid Air® Technology is a tough weather and solvent resistance product which boasts high flexibility combined with excellent corrosion resistance. The Rapid Air® technology enables easy and quick application reducing the incidence of bubbles & creases, especially of large-sized applications. The adhered product is designed for permanent applications.

The material is plotter cuttable and is especially developed for high-quality commercial and fleet livery to produce lettering, markings and decorations. The material can be applied to moderately curved surfaces with rivets or corrugated substrates, due to its special cast PVC construction.

ORALITE® 5650RA is composed of catadioptric glass beads which are embedded in a transparent layer of plastic material (design A, formerly Type I).

### Retroreflectivity

ORALITE® 5650RA meets the performance requirements of ECE 104 class D and is available as 5650D RA product with watermark. Typical values of retroreflection 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® 5650RA is available in 11 different colours. ORALITE® 5650RA-070 displays a black colour at daylight. When being illuminated in darkness, it appears silver to silver-grey. The colour specifications measured in accordance with CIE No. 15.2 are listed in table 2.

### Adhesive

The adhesive consists of a solvent polyacrylate, permanent pressure sensitive adhesive. The product features a low initial tack and a positionable adhesive due to the Rapid Air® Technology. The release paper (145 g/m<sup>2</sup>) has a PE coating applied to silicone-coated paper on either side. As the product and batch number are applied to the silicone-coated paper, all production parameters and raw materials can be completely traced.

### Application/Processing

ORALITE® 5650RA was especially developed for high-quality commercial and fleet livery. 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. The self adhesive reflective material can only be used for dry application. For other applications the user is fully responsible for evaluating the suitability of the product, and for any risks associated with that use.

ORALITE® 5650RA can be screen printed with ORALITE® 5018 screen printing ink or inkjet printed with solvent based inks, UV- or Latex inks. Please refer to the chosen ink manufacturer's instructions to determine if an application laminate is required. If required, it is recommended that the material is laminated with ORALITE® 5051, ORAGUARD® 289F, ORAGUARD® 290F or ORAGUARD® 293F in order to provide increased UV protection.

While the use of heat will help to partially remove the product, a solvent based adhesive remover will be required to completely remove residual adhesive/product.

Please refer to the Practical Information 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 9001:2008 controlled manufacturing environment & batch traceability is possible on the basis of the roll number.

**Product Data**

Typical Values for the coefficient of retroreflection (measured according to DIN 67520):

Table 1 – Specific coefficient of retroreflection in cd/(lx m <sup>2</sup> )				
Observation angle	0.2°		0.33°	
Entrance angle	5°	30°	5°	30°
white (010)	100	40	80	35
yellow (020)	60	25	45	20
red (030)	18	8	15	6
orange (035)	27	10	23	8
blue (050)	5	1.7	4	1
green (060)	13	5	11	5
black (070)	35	15	30	10
azure (084)	9	4	7	2.5
gold (091)	70	27	50	22
lemon (213)	75	30	55	25
ruby (364)	10	5	8	4

Colour specification limits at daylight (new sheeting, measured in accordance with CIE No. 15.2):

Table 2 – Chromaticity coordinates									
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	≥ 0.35
yellow (020)	0.494	0.506	0.470	0.480	0.513	0.437	0.545	0.455	≥ 0.27
red (030)	0.735	0.265	0.700	0.250	0.607	0.343	0.655	0.345	≥ 0.05
orange (035)	0.631	0.369	0.552	0.359	0.506	0.404	0.570	0.430	≥ 0.12
blue (050)	0.100	0.109	0.146	0.156	0.183	0.115	0.137	0.038	≥ 0.01
green (060)	0.007	0.703	0.216	0.448	0.147	0.400	0.018	0.454	≥ 0.04
black (070)	0.385	0.355	0.300	0.270	0.260	0.310	0.345	0.395	0 ≥ β ≥ 0.03
azure (084)	0.120	0.125	0.160	0.120	0.160	0.480	0.160	0.460	≥ 0.03
gold (091)	0.460	0.440	0.480	0.440	0.480	0.420	0.460	0.420	≥ 0.16
lemon (213)	0.395	0.515	0.450	0.460	0.495	0.502	0.423	0.574	≥ 0.16
ruby (364)	0.710	0.290	0.610	0.300	0.569	0.341	0.655	0.345	≥ 0.03



### Physical and Chemical Properties

<b>Thickness*</b> (without protective paper)	150 micron (5.9 mils)	
<b>Temperature resistance***</b>	adhered to aluminium, -50°C to +95°C (-58°F to 203°F)	
<b>Adhesive power*<sup>1</sup></b> (FINAT-TM1* after 24h)	adhered to stainless steel: 18 N/25mm (1 inch) adhered to acrylic coating: 14 N/25mm (1 inch)	
<b>Shelf life**</b>	2 years	
<b>Application temperature</b>	> 15°C (60°F)	
<b>Service life by specialist application***</b> under vertical outdoor exposure	7 years	
* Average value	** 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.

### 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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