

# ORALITE® 5650RA

## FLEET ENGINEERING GRADE REFLECTIVE FILM

### WITH *RAPIDAIR*® TECHNOLOGY

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#### Description

Fleet engineer grade reflective marking film and digital print media featuring superior glass bead reflective performance for emergency and commercial vehicle graphics. ORALITE® 5650RA is very bright and crisp from dusk to dawn, and also during poor weather conditions. The retro-reflective properties act as a safety mechanism when headlights and streetlights bounce off the film, alerting oncoming traffic and pedestrians to be aware. Experience bubble-free applications with ORAFOL's *RapidAir*® adhesive technology. (ORALITE® 5650RA offers a slightly higher initial tack than ORALITE® 5600RA) Perfect for larger-format print & cut graphic applications.

#### Release Liner

89# PE-coated silicone paper featuring advanced air release technology to facilitate quicker, easier application

#### Adhesive

Clear, solvent-based, repositionable, permanent adhesive (removable with heat)

#### Application Temperature

**Minimum application temperature:** > +60°F

**For best application experience:** Apply graphics in a controlled environment between 65°F – 75°F. Ideal humidity between 50% - 60% humidity

**Below 60°F:** Material will feel rigid and may have poor adhesion characteristics to the application surface. Introduce heat to the surface to improve initial tack and adhesion properties.

**Above 75°F:** Material will be more prone to over-stretching and the adhesive will feel more aggressive.

#### Applications

- Flat, or Moderate to Complex Curves – long-term reflective graphic applications
  - Plotter Cut Reflective Graphics
  - Printed Reflective Graphics
- Automotive Commercial Fleet Graphic & Wrap Applications
- Box Truck & Trailer with Rivets Graphic & Wrap Applications
- Transit Graphic Applications
- Emergency Vehicle & Apparatus Graphic Applications
  - Striping
  - Lettering
  - Badges
  - Maltese Cross
  - Star of Life
  - Battenburg Pattern
  - Etc.
- Long-term reflective outdoor general signage
  - Parking lot Signage
  - Park and Recreational Signage

#### Application Method

- Dry Application Only

#### Recommended Laminates

- **Standard:** ORAGUARD® 290 (2 mil)
- **Standard:** ORAGUARD® 290F (2 mil)
- **Standard:** ORAGUARD® 293 (1 mil)
- **Upgrade:** ORAGUARD® 279 (2 mil)

#### Printability/Ink Compatibility

Latex, Solvent, Eco-Solvent, UV Curable Thermal, UV-Gel, and Screen Printing. [Click Here](#) to view ORAFOL ICC Profiles.



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## Processing and Handling

Specially developed for digitally printable vehicle graphics applications to produce reflective lettering, markings, and decorations.

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 painted surfaces should be completely cured. The compatibility of selected surfaces should be tested by the user, prior to application of the material.

**The ORALITE® 5650RA must be installed using a dry application method. Wet applications will alter the short and long-term performance of the material and will not be warranted. Wet applications may cause discoloration or black staining beneath the top layer of the film.**

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 is compatible with many of today's OEM Latex, Solvent, Eco-Solvent, UV, UV-Gel, inks. Visit [www.orafol.com](http://www.orafol.com) and click on Support to locate downloadable Color Profiles. If protective over-laminate is required, utilize ORAGUARD 290, 290F, 293, 279 in order to provide increased UV protection.

It can also be screen printed with ORALITE® 5018 screen printing ink and protected with ORALITE® 5051 for additional UV protection. When using non-ORAFOL inks or printers, the application must be tested and approved by the user.

For best graphic removal results during colder months of the year, users should bring the vehicle indoors and acclimate it to approximately 65°F to 75°F. Next, utilize an artificial heat source such as a heat gun, propane torch, or mobile infrared station to soften the properties of the adhesive and film to allow for easier removal, with minimal to no adhesive residue left behind.

In the event adhesive residue remains on the vehicle surface after removal, a solvent-based adhesive remover may be required to completely remove any residual adhesive.

For additional questions or support, please contact an ORAFOL Product Technical Support Specialist at the number below.



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#### Technical Data

<b>Thickness*</b> (without liner and adhesive)	5-mil
<b>Temperature resistance</b>	Adhered to aluminum, -58°F to 203°F
<b>Suitable Fire Extinguishing Media</b>	Water spray mist, dry extinguishing agent, carbon dioxide, foam
<b>Fire Rating</b>	ASTM # 84-07 Class "A"
<b>Adhesive Power*</b> (FINAT TM-1, after 72h, average)	Adhered to stainless steel: 3.8 lb/in Adhered to acrylic coating: 3.9 lb/in
<b>Tensile Strength</b> (DIN EN ISO 527)	Along: Min. 10 MPa Across: Min. 10 MPa
<b>Shelf life**</b>	2 years
<b>Minimum life expectancy***</b> (based on accepted Application procedures on vertical surfaces)	7 years (unprinted)
<b>Minimum Application temperature</b>	> 60°F
<b>Available lengths</b> <b>Available widths</b>	150' (50-yard) and 30' (10-yard)   75' (25-yard) (white only 15" (punched) 24", 30", 48", 54" (white only), 60" (white only)
<b>Recommended Laminates</b>	ORAGUARD® Series 290, 290GF, 293, 279
<b>Recommended Application Tapes</b>	ORATAPE® Series HT55, MT95, MT72
<b>Print Compatibility</b>	Latex, Solvent, Eco-Solvent, UV-Gel, Thermal & Screen Printing: ORALITE® 5018 Screen Printing Ink is recommended

\* average

\*\* in original packaging, at 68°F and 50% relative humidity

\*\*\* Located in Climate Zone 1



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#### Product Data

ORALITE® Series 5650RA meets the following ASTM D 4956 specifications for Type I, Class 1 retroreflective sheeting.

		Minimum coefficient of retroreflection (R) cd/ft <sup>2</sup> (cd • lx <sup>-1</sup> • m <sup>-2</sup> )				Daytime Luminance Factor (Y%)	
Observation Angle		0.2°		0.5°			
Entrance Angle		-4°	30°	-4°	30°	Minimum	Maximum
white	010	70	30	30	15	27	
yellow	020	50	22	25	13	15	45
orange	035	25	7	13	4	10	30
red	030	14	6	7.5	3	2.5	15
green	060	9	3.5	4.5	2.2	3	12
blue	050	4	1.7	2	0.8	1	10
brown	080	1	0.3	0.3	0.2	1	9

#### Color Specification Limits (Daytime)\*

		1		2		3		4	
		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
yellow	020	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472
orange	035	0.558	0.352	0.636	0.364	0.570	0.429	0.506	0.404
red	030	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346
green	060	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771
blue	050	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216
brown	080	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390

#### Color Specification Limits (Nighttime)\*

		1		2		3		4	
		x	y	x	y	x	y	x	y
white	010	no requirement							
yellow	020	0.513	0.487	0.500	0.470	0.545	0.425	0.572	0.425
orange	035	0.595	0.405	0.565	0.405	0.613	0.355	0.643	0.355
red	030	0.650	0.348	0.620	0.348	0.712	0.255	0.735	0.265
green	060	0.007	0.570	0.200	0.500	0.322	0.590	0.193	0.782
blue	050	0.033	0.370	0.180	0.370	0.230	0.240	0.091	0.133
brown	080	0.595	0.405	0.540	0.405	0.570	0.365	0.643	0.355

\*The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System measured with CIE Standard Illuminant D65.



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## Note:

All ORALITE® products are manufactured within an ISO 9001:2008 controlled manufacturing environment and batch traceability is possible on the basis of the roll number.

## IMPORTANT NOTICE

When using ORALITE® sheeting, please comply with relevant national specifications. ORAFOL recommends obtaining 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.

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 allowed to dry for at least three weeks and to completely cure respectively. 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. The low tensile strength of the material can make the removability of the reflective film more difficult. Please review applicable application information published by ORAFOL.

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

WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

ORALITE® is a trademark of ORAFOL Europe GmbH.



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