

## Description

ORALITE® VC 104+ Rigid Grade is a tough weather resistant product designed for rugged outdoor use. The material is intended for application as conspicuity marking on trucks and trailers with rigid sides.

## Product Construction

ORALITE® VC 104+ Rigid Grade is composed of cube corner (microprism) retroreflective elements integrally bonded to a flexible, smooth-surfaced tough and weather resistant UV stabilised polymeric film. The prism surfaces are coated with a vacuum deposition of aluminium to provide a mirror surface to the prism facets. The resulting material is not more than 0,16 mm thick, and comes with an aggressive high-tack pressure sensitive adhesive. The product is single layer, with no need for edge sealing.

## Product Approval

ORALITE® VC 104+ Rigid Grade is approved to Regulation ECE 104 Class C.

## Film Logo Pattern



## Colour

ORALITE® VC 104+ Rigid Grade is available in yellow, white and red. The colours conform to the requirements of Regulation ECE 104. The colour shall be located in the area defined by the chromaticity coordinates and luminance factor provided in Table 2, when measured in accordance with the provisions of CIE No.15 and illuminated with the CIE standard illuminant D<sub>65</sub> at an angle of 45° to the normal (45° / 0° geometry). The measured value shall be the average of 8 readings. The test sample shall be rotated 45 degrees. The retroreflected colour (nighttime colour), when illuminated with CIE standard illuminant A at an observation angle of 20' and entrance angles of  $\beta_1 = +/- 5^\circ$ , and  $\beta_2 = 0^\circ$  shall be located within the area defined by the chromaticity coordinates in Table 3.

## Retroreflectivity

ORALITE® VC 104+ Rigid Grade complies with the minimum reflectivity requirements of Regulation ECE 104 Class C. When illuminated with CIE standard illuminant A and measured with the provisions of CIE No. 54, the coefficient of retroreflection for ORALITE® VC 104+ Rigid Grade shall be not less than the values in Table 1.

## Adhesive

The adhesive is protected by a release liner, which shall be removed by peeling, without soaking in water or other solvents.

A 25 mm strip shall provide a bond such that it shall support an 800 g weight for 5 minutes without the strip peeling for a distance of more than 50 mm when applied to a smooth aluminium surface as specified in the ASTM 4956 adhesion test.

The adhesive service temperature ranges from -40° C to +90° C (\*).

(\*) Data based on laboratory testing and under no load. The practical service temperature is dependent on variables including the substrates being bonded, environmental conditions, the loading and method of application.

## Application Instructions

Material must be applied when the air and surface temperature is between 15° C and 38° C to assure proper adhesive bonding. Surfaces must be cleaned for all grease, oil and dirt. Use a clean towel and Isopropyl alcohol or similar to wipe the surface before application. If any air bubbles are trapped, use a pin to puncture the bubble and squeegee to push the air towards the pin hole. Please contact ORAFOL for complete application instructions.

## Shelf Life

The sheeting must be used within 1 year from the shipment date. All rolls including partially used rolls should be stored in original packaging, tightly wound. Store in a clean and dry area, away from direct sunlight. Store at room temperature 20° C and at 50% relative humidity.

## Warranty

ORALITE® VC 104+ Rigid Grade has a ten year warranty. Please contact ORAFOL for full details.

**Table 1**  
**Retroreflectivity**

| Observation Angle | Entrance Angle ( $\beta$ ) |     |     |     |     |     |
|-------------------|----------------------------|-----|-----|-----|-----|-----|
|                   | Beta 1 ( $\beta_1$ )       | 0°  | 0°  | 0°  | 0°  | 0°  |
| 20' (0,33°)       | Beta 2 ( $\beta_2$ )       | 5°  | 20° | 30° | 40° | 60° |
| White             | R'                         | 450 | n/a | 200 | 95  | 16  |
| Yellow            | R'                         | 300 | n/a | 130 | 75  | 10  |
| Red               | R'                         | 120 | 60  | 30  | 10  | n/a |

All values have units of cd/lux/m<sup>2</sup>.

**Table 2**  
**Colour Specification Limits (Daytime)**

| Colour | Chromaticity Coordinates* |       |       |       |       |       |       |       |        |
|--------|---------------------------|-------|-------|-------|-------|-------|-------|-------|--------|
|        | 1                         |       | 2     |       | 3     |       | 4     |       | Y      |
|        | x                         | y     | x     | y     | x     | y     | x     | y     |        |
| White  | 0,300                     | 0,270 | 0,385 | 0,355 | 0,345 | 0,395 | 0,260 | 0,310 | > 0,25 |
| Yellow | 0,545                     | 0,454 | 0,487 | 0,423 | 0,427 | 0,483 | 0,465 | 0,534 | > 0,16 |
| Red    | 0,690                     | 0,310 | 0,595 | 0,315 | 0,569 | 0,341 | 0,655 | 0,345 | > 0,03 |

\*) The four pairs of chromaticity coordinates determine the acceptable chromaticity on the CIE diagram

**Table 3**  
**Colour Specification Limits (Nighttime)**

| Colour | Chromaticity Coordinates* |       |       |       |       |       |       |       |
|--------|---------------------------|-------|-------|-------|-------|-------|-------|-------|
|        | 1                         |       | 2     |       | 3     |       | 4     |       |
|        | x                         | y     | x     | y     | x     | y     | x     | y     |
| White  | 0,373                     | 0,402 | 0,417 | 0,359 | 0,450 | 0,513 | 0,548 | 0,414 |
| Yellow | 0,585                     | 0,385 | 0,610 | 0,390 | 0,520 | 0,480 | 0,505 | 0,465 |
| Red    | 0,720                     | 0,258 | 0,735 | 0,265 | 0,665 | 0,335 | 0,643 | 0,335 |

\*) The four pairs of chromaticity coordinates determine the acceptable chromaticity on the CIE diagram

## IMPORTANT NOTICE

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.

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