

**THE NETHERLANDS**
(N E D E R L A N D)**COMMUNICATION**

Concerning:

- ~~approval granted~~
- ~~approval extended~~
- ~~approval refused~~
- ~~approval withdrawn~~
- ~~production definitely discontinued~~

of retro-reflective markings of heavy and long vehicles and their trailers, pursuant to Regulation number 104.

Approval number: E4-104R-00 0002

Extension number: 07

1. Trade name mark of the marking material : REFLEXITE VC 104 Conspicuity material
Curtain Grade;
REFLEXITE VC104 + Curtain Grade;
REFLEXITE VC104 + Curtain Grade Imagine;
VC104 + Curtain Grade Segmented;
VC104 + Curtain Grade Segmented Imagine;
ORALITE VC104 + Curtain Grade;
ORALITE VC104 + Curtain Grade Imagine;
ORALITE VC104 + Curtain Grade Segmented;
ORALITE VC104 + Curtain Grade Segmented
Imagine
 2. Class of the marking material : C/~~D~~/E
 3. Name and address of the manufacturer : ORAFOL Europe GmbH,
Reflective Solutions Ireland
Unit 5, Cleaboy Business park,
Old Kilmeaden Road, Waterford, Ireland
- Assembly plant address : ORAFOL Europe GmbH,
Orafolstrasse 2,
D-16515 Oranienburg,
Germany



4. If applicable, name and address of manufacturer's representative : --
5. Date on which the marking material was submitted for approval tests : June 17, 1998;
December 2, 1999;
September 14, 2007;
July 2, 2010;
January 7, 2011;
June 30, 2012;
30 April 2013;
6 October 2014
6. Technical service responsible for conducting approval test : DEKRA Certification B.V.
7. Date of test report issued by the technical service : September 23, 1998;
January 13, 2000;
November 8, 2007;
August 19, 2010;
January 12, 2011;
July 18, 2012;
21 May 2013
17 October 2014
8. Number of test report issued by the technical service : 98-103;
99-221;
2109752-QUA-PHO 07-170;
2137117-QUA/PHO 10-142/2;
2141491-PHO 11-007;
2155583-PHO 12-132;
2163281-PHO 13-135-2
2174910-PHO 14-218-2
9. Remarks : --
10. Approval : ~~granted/refused/extended/withdrawn~~
11. Reason(s) for the extension (if applicable) : Alternative brand name "ORAFOL" with marketing name "ORALITE ..."
12. Place : Zoetermeer
13. Date : 24-OCT-2014



14. Signature :


Uwe Löbig

Name :

15. Annexed is a list of documents making up the approval file, deposited with the competent authority which granted approval; a copy can be obtained on request.
- 1 Drawing No. "Reflexite VC104 conspicuity Material – Curtain Grade" dated November 8, 1999
 - 1 Drawing No. D292 dated 07/01/2011
 - 1 Technical Product Bullitin "Reflexite VC104 + Curtain Grade" Bullitin 100-12
 - 1 Technical Product Bulitin "Reflexite VC104+ Curtain Grade Imagine" Bullitin 100-12 and an example with a logo.
 - 1 Technical Datasheet page 1 and 2 "ORALITE VC104+ Curtain Grade" dated 2015/01 (annexed)
 - 1 Technical Datasheet page 1 and 2 "ORALITE VC104+ Curtain Grade Imagine" dated 2015/01 (annexed)
 - 1 Technical Datasheet page 1 and 2 "ORALITE VC104+ Curtain Grade Segmented" dated 2015/01 (annexed)
 - Test report as mentioned in item 8

ORALITE® VC 104+ Curtain Grade

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Description

ORALITE® VC 104+ Curtain Grade is a tough weather resistant product designed for rugged outdoor use. The material is intended for application as line or contour marking on curtains for trucks and trailers.

Product Construction

ORALITE® VC 104+ Curtain 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 0,30 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+ Curtain Grade is approved to Regulation ECE 104 Class C.

Film Logo Pattern



Colour

ORALITE® VC 104+ Curtain 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 D₆₅ 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 $\beta_1 = \pm 5^\circ$, and $\beta_2 = 0^\circ$ shall be located within the area defined by the chromaticity coordinates in Table 3.

Retroreflectivity

ORALITE® VC 104+ Curtain 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+ Curtain Grade shall be not less than the values in Table 1.

Adhesive

The pressure sensitive adhesive is specially formulated to adhere to curtain side materials typically constructed of PVC coated polyester fabric. The performance of the adhesive will depend greatly on the curtain surface. Every curtain type should be assessed individually for suitability. Graphics printed by digital / screen / stencil technique and using clear coats or varnishes for additional durability need to be assessed for ORALITE® VC 104+ Curtain Grade adhesion. The adhesive is protected by a release liner, which shall be removed by peeling, without soaking in water or other solvents. The adhesive service temperature ranges from -34° 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

Please contact ORAFOL for complete application instructions.



ORAFOL Europe GmbH - Orafolstrasse 2 – D 16515 Oranienburg - Germany
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ORALITE® VC 104+ Curtain Grade

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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 20° C and 50% relative humidity.

Warranty

ORALITE® VC 104+ Curtain Grade has a three year warranty when applied onto new curtains. Please contact ORAFOL for full details.

Table 1
Retroreflectivity

Observation Angle	Entrance Angle (β)					
	Beta 1 (β_1)	0°	0°	0°	0°	0°
	Beta 2 (β_2)	5°	20°	30°	40°	60°
White	R'	450	n/a	200	90	16
Yellow	R'	300	n/a	130	75	10
Red	R'	120	60	30	10	n/a

All values have units of cd/lux/m².

Table 2
Colour Specification Limits (Daytime)

Colour	Chromaticity Coordinates*								Y
	1		2		3		4		
	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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ORALITE® VC 104+ Curtain Grade Imagine

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Description

ORALITE® VC 104+ Curtain Grade Imagine is a tough weather resistant product designed for rugged outdoor use. The material is intended for application as line or contour marking on curtains for trucks and trailers.

ORALITE® VC 104+ Curtain Grade Imagine can be customised to include the customer's logo offering new possibilities in brand awareness and corporate identity. Please contact ORAFOL for more information about how to order your customised ORALITE® VC 104+ Curtain Grade Imagine.

Product Construction

ORALITE® VC 104+ Curtain Grade Imagine 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 0,30 mm thick, and comes with an aggressive high-tack pressure sensitive adhesive. The product is single layer, with no need for edge sealing. The logo is printed underneath the film and therefore is permanently protected from the elements.

Product Approval

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

Visual Appearance



Colour

ORALITE® VC 104+ Curtain Grade Imagine 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 D₆₅ 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 $\beta_1 = \pm 5^\circ$, and $\beta_2 = 0^\circ$ shall be located within the area defined by the chromaticity coordinates in Table 3.

Retroreflectivity

ORALITE® VC 104+ Curtain Grade Imagine 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+ Curtain Grade Imagine shall be not less than the values in Table 1.

Adhesive

The pressure sensitive adhesive is specially formulated to adhere to curtain side materials typically constructed of PVC coated polyester fabric. The performance of the adhesive will depend greatly on the curtain surface. Every curtain type should be assessed individually for suitability. Graphics printed by digital / screen / stencil technique and using clear coats or varnishes for additional durability need to be assessed for ORALITE® VC 104+ Curtain Grade Imagine adhesion. The adhesive is protected by a release liner, which shall be removed by peeling, without soaking in water or other solvents. The adhesive service temperature ranges from -34° 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.



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ORALITE® VC 104+ Curtain Grade Imagine

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Application Instructions

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 20° C and at 50% relative humidity.

Warranty

ORALITE® VC 104+ Curtain Grade Imagine has a three year warranty when applied onto new curtains. Please contact ORAFOL for full details.

Table 1
Retroreflectivity

Observation Angle	Entrance Angle (β)					
	Beta 1 (β_1)	0°	0°	0°	0°	0°
20° (0,33°)	Beta 2 (β_2)	5°	20°	30°	40°	60°
White	R'	450	n/a	200	90	16
Yellow	R'	300	n/a	130	75	10
Red	R'	120	60	30	10	n/a

All values have units of cd/lux/m².

Table 2
Colour Specification Limits (Daytime)

Colour	Chromaticity Coordinates*							
	1		2		3		4	
	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
Yellow	0,545	0,454	0,487	0,423	0,427	0,483	0,465	0,534
Red	0,690	0,310	0,595	0,315	0,569	0,341	0,655	0,345

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

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Colour	Chromaticity Coordinates*							
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ORALITE® VC 104+ Curtain Grade Segmented

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Description

ORALITE® VC 104+ Curtain Grade Segmented is a tough weather resistant product designed for rugged outdoor use. The material is intended for application as line- or contour marking on curtains for trucks and trailers.

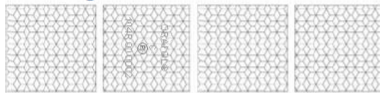
Product Construction

ORALITE® VC 104+ Curtain Grade Segmented 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 material comes with a pressure sensitive adhesive backing and segmented in pieces measuring 50,2 mm x 50 mm (spaced at 6 mm), which are joined together by an application liner. The application liner keeps the pieces in place and facilitates the application. The product is single layer, with no need for edge sealing.

Product Approval

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

Film Logo Pattern



Colour

ORALITE® VC 104+ Curtain Grade Segmented 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 D₆₅ 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 $\beta_1 = \pm 5^\circ$, and $\beta_2 = 0^\circ$ shall be located within the area defined by the chromaticity coordinates in Table 3.

Retroreflectivity

ORALITE® VC 104+ Curtain Grade Segmented 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+ Curtain Grade Segmented shall be not less than the values in Table 1.

Adhesive

The pressure sensitive adhesive is specially formulated to adhere to curtain side materials typically constructed of PVC coated polyester fabric. The performance of the adhesive will depend greatly on the curtain surface. Every curtain type should be assessed individually for suitability. Graphics printed by digital / screen / stencil technique and using clear coats or varnishes for additional durability need to be assessed for ORALITE® VC 104+ Curtain Grade Segmented adhesion. The adhesive is protected by a release liner which shall be removed by peeling, without soaking in water or other solvents. The adhesive service temperature ranges from -34° 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

Please contact ORAFOL for complete application instructions.



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ORALITE® VC 104+ Curtain Grade Segmented

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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 20° C and 50% relative humidity.

Warranty

ORALITE® VC 104+ Curtain Grade Segmented has a three year warranty. Please contact ORAFOL for full details.

Table 1
Retroreflectivity

Observation Angle	Entrance Angle (β)					
	Beta 1 (β_1)	0°	0°	0°	0°	0°
20' (0,33°)	Beta 2 (β_2)	5°	20°	30°	40°	60°
White	R'	450	n/a	200	90	16
Yellow	R'	300	n/a	130	75	10
Red	R'	120	60	30	10	n/a

All values have units of cd/lux/m².

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