

Reflective Solutions

Vehicle Conspicuity



Engineered to Save Lives™

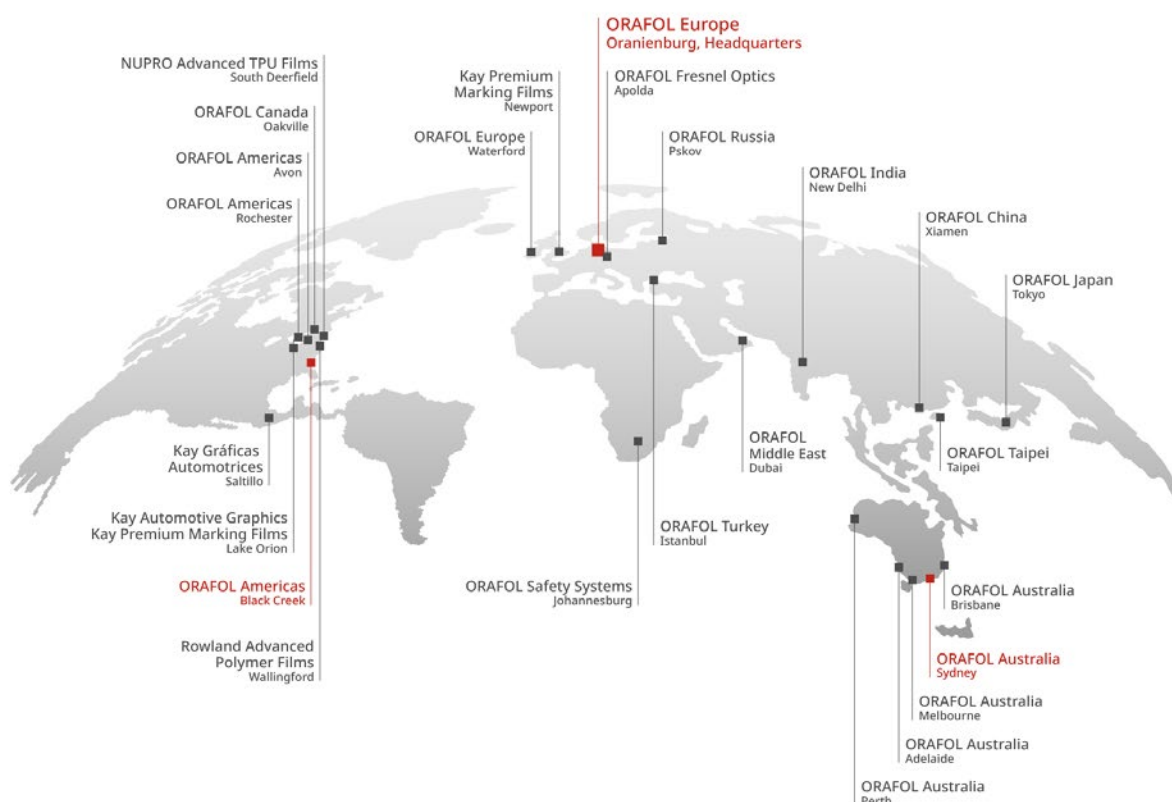


ORAFOL Europe GmbH

Headquarters and production facility

ORAFOL is one of the world's leading manufacturers of innovative self-adhesive graphic films, reflective materials and adhesive tape systems. The international ORAFOL GROUP is headquartered just outside the city gates of Berlin, in Oranienburg.

ORAFOL's Worldwide Locations



Reflective Solutions for Vehicle Conspicuity

Find the right solution for your needs

ORAFOL is a full range supplier of high quality reflective materials for all types of vehicle applications.

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Reflective Films for Vehicle Conspicuity

	Product	Service Life	Standard Colours	Fluorescent Colours	Approval	Technology	Page
Trucks and Trailers	ORALITE® VC 104+ Rigid Grade	Up to 10 years			ECE 104 Class C	Prismatic	8
	ORALITE® VC 104+ Rigid Grade Segmented	Up to 10 years			ECE 104 Class C	Prismatic	8
	ORALITE® VC 104+ Rigid Grade Imagine	Up to 10 years			ECE 104 Class C	Prismatic	9
	ORALITE® VC 104+ Rigid Grade Imagine Evo	Up to 3 years			ECE 104 Class C	Prismatic	9
	ORALITE® VC 104+ Flex Grade	Up to 3 years			ECE 104 Class C	Prismatic	8
	ORALITE® VC 104+ Flex Grade Imagine	Up to 3 years			ECE 104 Class C	Prismatic	9
	ORALITE® 5650D RA	Up to 7 years			ECE 104 Class D	Embedded Glass Beads	10
	ORALITE® 5650E RA	Up to 7 years			ECE 104 Class E	Embedded Glass Beads	10
	ORALITE® 5600E / 5600E RA	Up to 7 years			ECE 104 Class E	Embedded Glass Beads	10
	ORALITE® Truck Flags	Up to 1 year				Prismatic	11
Reflective Livestock Films	ORALITE® VC 612 / VC 612RA	Up to 7 years				Prismatic	13
	ORALITE® VC 412RA	Up to 5 years				Prismatic	13
	ORALITE® VC 110	Up to 10 years				Prismatic	14
	ORALITE® 6900	Up to 10 years				Prismatic	14
	ORALITE® 5600 / 5600RA	Up to 7 years				Embedded Glass Beads	14
	ORALITE® 5650RA	Up to 7 years				Embedded Glass Beads	14
Pre-printed Reflective Films	ORALITE® VC 612	Up to 5 years				Prismatic	15
	ORALITE® 6901	Up to 7 years				Prismatic	15
	ORALITE® 5921M	Up to 5 years				Prismatic	15
	ORALITE® 5821	Up to 5 years				Encapsulated Glass Beads	15
	ORALITE® 5421	Up to 4 years				Embedded Glass Beads	15
Non-Reflective Materials	ORACAL® 7510RA	Up to 2/3 years					16
	ORACAL® 7710 / 7710RA	Up to 3 years					16
	ORACAL® 977	Up to 6 years					16

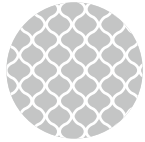
Pattern Guide



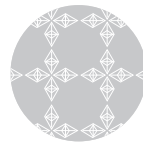
ORALITE® VC 612



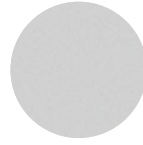
ORALITE® VC 110
ORALITE® VC 104+



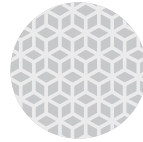
ORALITE® 6900



ORALITE® Truck Flags



ORALITE® 5600
ORALITE® 5650



ORALITE® VC 412RA



ORALITE® 5921M



ORALITE® 6901



ORALITE® 5821



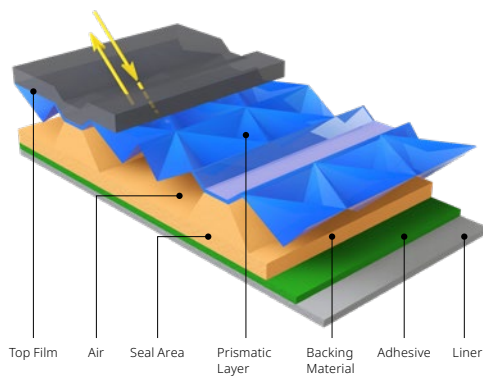
ORALITE® VC 612



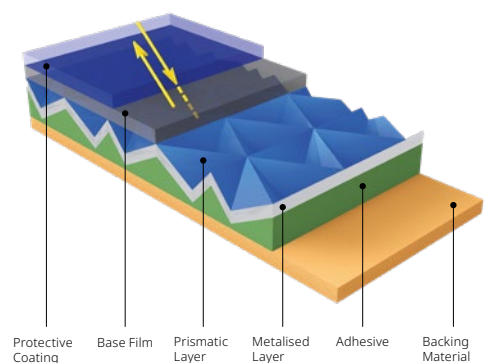
ORALITE® 5421

Principles of Retroreflection

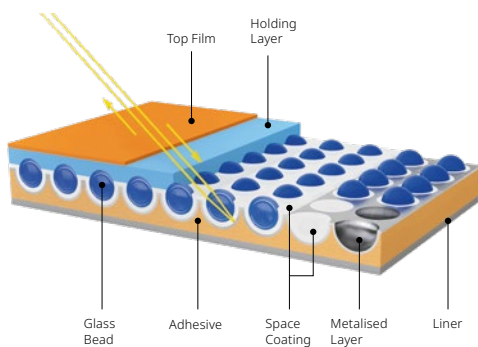
Prismatic Air-backed Construction



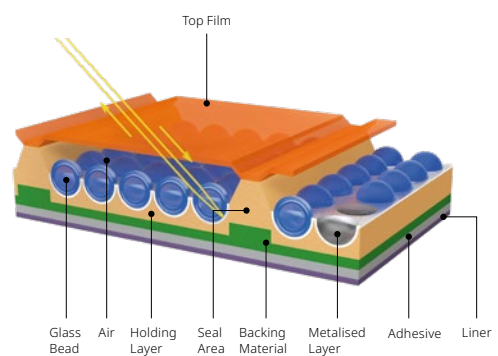
Prismatic Metalised Construction



Embedded Glass Bead Construction



Encapsulated Glass Bead Construction



Trucks and Trailers



ECE 104 Regulation

Since 10 July 2011 conspicuity markings have been compulsory for new type approved trucks with a tonnage over 7,5 tonnes (N2 and N3) and for trailers with a tonnage of more than 3,5 tonnes (O3 and O4).

Reflective materials which must comply with regulation ECE 104 of the United Nations Economic Commission for Europe (UNECE) have to be applied to the sides and rear of all relevant vehicles.

As the inventor of microprismatic retroreflective technology primarily mandated for ECE 104 markings, ORAFOL's materials have been setting the standard for HGV visibility performance since the early 1990s.

ECE 104 Regulation Overview

M Motor vehicles used for the transport of passengers		Mandatory since 10th July 2011*	Allowed	Not allowed
M1	Motor vehicles used to transport passengers with no more than 8 seats in addition to the driver's seat	-	-	✗
M2	Motor vehicles used to transport passengers with more than 8 seats with a maximum weight of 5 tonnes	-	✓	-
M3	Motor vehicles used to transport passengers with more than 8 seats and with more than 5 tonnes in weight	-	✓	-
N Motor vehicles used for the carriage of goods		Mandatory since 10th July 2011*	Allowed	Not allowed
N1	Motor vehicles used for the carriage of goods with a maximum weight of 3,5 tonnes	-	✓	-
N2	Motor vehicles used for the carriage of goods with a weight over 3,5 tonnes but not exceeding 7,5 tonnes	-	✓	-
N2	Motor vehicles used for the carriage of goods with a weight exceeding 7,5 tonnes	✓	✓	-
N3	Motor vehicles used for the carriage of goods with a weight exceeding 12 tonnes	✓	✓	-
O Trailers		Mandatory since 10th July 2011*	Allowed	Not allowed
O1	Trailers with a maximum weight not exceeding 0,75 tonnes	-	-	✗
O2	Trailers with a weight exceeding 0,75 tonnes but no more than 3,5 tonnes	-	✓	-
O3	Trailers with a weight exceeding 3,5 tonnes but no more than 10 tonnes	✓	✓	-
O4	Trailers exceeding 10 tonnes in weight	✓	✓	-

*) For new registrations

Where should the conspicuity tapes be applied?



Please Note: Tape colour combinations may differ from country to country according to legislation.

ORALITE® VC 104+ Rigid Grade / Rigid Grade Segmented

Product benefits include:

- Single-layer prismatic film construction
- Expected performance life on the vehicle: up to 10 years
- Application to rigid surfaces
- Polyester construction means no cracking
- Approved to ECE 104 Class C
- Emark: ORAFOL-C-E4-104R 00 0001
- Easy to cut and apply
- Withstands power washing
- ORALITE® VC 104+ Rigid Grade Segmented: Supplied in pre-cut pieces 48 mm x 50 mm with rounded corners

Product	Colours	Roll sizes	Service Life
ORALITE® VC 104+ Rigid Grade	White, yellow, red	50 mm x 50 m	Up to 10 years
ORALITE® VC 104+ Rigid Grade Segmented	White, yellow, red	50 mm x 50 m	Up to 10 years

ORALITE® VC 104+ Tanker Stickers

Product benefits include:

- Single-layer prismatic film construction
- Expected performance life on the vehicle: up to 10 years
- For application to rigid surfaces
- Polyester construction means no cracking
- Approved to ECE 104 Class C
- Emark: ORAFOL-C-E4-104R 00 0001
- Easy to cut and apply
- Withstands power washing
- Supplied in pre-cut pieces 160 mm x 50 mm* with rounded corners – ready to apply to the circular rear end of a tanker vehicle

Product	Colours	Roll sizes	Service Life
ORALITE® VC 104+ Tanker Stickers	White, yellow, red	50 mm x 10 m 50 mm x 50 m Rolls are kiss-cut every 16 cm into round-corner labels with 6 mm spacing between labels	Up to 10 years

* Special size 90 mm also available upon request

ORALITE® VC 104+ Flex Grade

Product benefits include:

- Single-layer prismatic film construction
- Expected performance life on the vehicle: up to 3 years
- For application to curtains/tarpaulins
- Vinyl construction which flexes and stretches with the curtain
- Approved to ECE 104 Class C
- Emark: ORAFOL-C-E4-104R 00 0002
- Easy to cut and apply
- Withstands power washing
- Supplied as a continues tape or in pre-cut pieces 48 mm x 50 mm with rounded corners
- Applies as a single strip

Product	Colours	Roll sizes	Service Life
ORALITE® VC 104+ Flex Grade	White, yellow, red	50 mm x 50 m Segment size is 48 mm x 50 mm (with 6 mm spacing between segments)	Up to 3 years (when applied to new curtains)

* Special size 90 mm also available upon request





Option to Customise

Rigid Grade and Flex Grade

ORALITE® VC 104+ Imagine

The high quality option for customised truck marking tapes

Product benefits include:

- All the same features and benefits as VC 104+ Rigid Grade or VC 104+ Flex Grade tape, but with a customised logo or text integrated every 32 cm
- Minimum quantity: Rigid Grade Imagine 100 rolls / Flex Grade Imagine 120 rolls
- Expected performance life on the vehicle: Rigid Grade up to 10 years / Flex Grade up to 3 years
- Approved to ECE 104 Class C

Product	Colours	Roll sizes	Service Life
ORALITE® VC 104+ Rigid Grade Imagine	White, yellow, red	50 mm x 50 m	Up to 10 years
ORALITE® VC 104+ Flex Grade Imagine	White, yellow, red	50 mm x 50 m	Up to 3 years (when applied to new curtains)

Rigid Grade

ORALITE® VC 104+ Imagine Evo

Makes personalisation possible in a choice of colours - even when just limited quantities are required.

Product benefits include:

- All the same features and benefits as VC 104+ Rigid Grade, but with a customised logo or text integrated every 32 cm
- Low volumes possible (6 rolls)
- White tape colour: Multi colour* or single colour logo possible
- Red or yellow tape colour: white or black logo possible
- Expected performance life on the vehicle: up to 3 years
- Approved to ECE 104 Class C

* Please contact ORAFOL for details.

Product	Colours	Roll sizes	Service Life
ORALITE® VC 104+ Imagine EVO	White, yellow, red	50 mm x 50 m	Up to 3 years
ORALITE® VC 104+ Tanker Stickers Imagine Evo	White, yellow, red	Sheets of 300 mm x 320 mm with 12 stickers per sheet	Up to 3 years

Trucks and Trailers – ECE 104 Classes D and E

Product	Thickness in microns (without protective paper)	Approved to ECE 104	Repositionable	Permanent application	Removable (after service life)	Removable by heat (after service life)	Page
ORALITE® 5600	150	-	+	0	++	++ ¹⁾	14
ORALITE® 5600RA	150	-	+++	0	++	++ ¹⁾	14
ORALITE® 5600E	135	Class E	+	0	++	++ ¹⁾	10
ORALITE® 5600E RA	140	Class E	+++	0	+	++ ¹⁾	10
ORALITE® 5650RA	150	-	++	++	+	+ ²⁾	14
ORALITE® 5650D RA	150	Class D	++	++	+	+ ²⁾	10
ORALITE® 5650E RA	140	Class E	++	++	+	+ ²⁾	10

¹⁾ While the use of heat will help to remove the product, a solvent based adhesive remover may be required to completely remove residual adhesive

²⁾ While the use of help will help to partially remove the product, a solvent based adhesive remover will be required to completely remove residual adhesive/product.

Identical properties of all: colour range, vinyl top coat, durability (shelf life, service life)

Fleet Marking Grade

ORALITE® 5600E

For self-adhesive graphics applied onto rigid trailer sides.

Product benefits include:

- Flexible embedded glass bead film construction
- 11 vivid colours
- Expected performance life on the vehicle: up to 7 years
- Easy to apply with good adaptability for uneven surfaces and good repositioning properties

Fleet Marking Grade

ORALITE® 5600E RA

- 5600E RA: *RapidAir®* construction for extra easy application
- Excellent printability, and easy to use on cutting plotters
- For application to rigid surfaces
- **Approved to ECE 104 Class E.** The material is watermarked.
- Withstands power washing

Product	Colours	Printing	Roll sizes	Service Life
ORALITE® 5600E / ORALITE® 5600E RA	White, yellow, red, orange, blue, green, black, azure, gold, lemon, ruby	Screen printing (ink: ORALITE® 5018) Ink-jet printing	1520 mm x 50 m 1370 mm x 50 m 1235 mm x 50 m 920 mm x 50 m 760 mm x 50 m 610 mm x 50 m	Up to 7 years

Fleet Engineer Grade

ORALITE® 5650D RA

Ideal for letterings, markings and decorations applied onto rigid trailer sides

Product benefits include:

- Flexible embedded glass bead film construction
- 11 vivid colours
- Expected performance life on the vehicle: up to 7 years
- Easy to apply with good adaptability for uneven surfaces and good repositioning properties
- ***RapidAir®* construction for extra easy application**

Fleet Marking Grade

ORALITE® 5650E RA

- 100% splice free
- Excellent printability
- For application to rigid surfaces
- Highly resistant to most industrial cleaning processes
- **5650D RA: Approved to ECE 104 Class D**
- **5650E RA: Approved to ECE 104 Class E**
- Both materials are watermarked

Product	Colours	Printing	Roll sizes	Service Life
ORALITE® 5650D RA / ORALITE® 5650E RA	White, yellow, red, orange, blue, green, black, azure, gold, lemon, ruby	Screen printing (ink: ORALITE® 5018) Ink-jet printing	1520 mm x 50 m 1370 mm x 50 m 1220 mm x 50 m 760 mm x 50 m 610 mm x 50 m Also available in 25 m lengths	Up to 7 years

ORALITE® Truck Flags

Our truck flags are prismatic, high visibility flags, approved according to the German § 53b Abs. 5 StVZO standard. The flags can be supplied with or without aluminium holder.

Product benefits include:

- Approved to the German § 53b Abs. 5 StVZO standard
- Outstanding long distance night time visibility
- Each flag is 430 mm x 250 mm, and the flags are sold in pairs of two
- Chevron printed in white/red, including approval reference
- Tough fabric reinforced backing for extra durability

Product	Colours	Roll sizes	Durability
ORALITE® Truck Flags	White / red	430 mm x 250 mm	1 year



Emergency Services and Utility Vehicles



Ecoflex

ORALITE® VC 412RA

Product benefits include:

- Flexible product, conformable on curved surfaces
- *RapidAir®* for easy application
- No edge sealing required
- Available in 7 colours
- Service life: 3 to 5 years

Product	Colours	Roll sizes	Service Life
ORALITE® VC 412RA Ecoflex	White, yellow, red, green, royal blue, fluorescent lime, fluorescent orange	1235 mm x 50 m / 25 m 610 mm x 50 m / 25 m	3 to 5 years



Flexibright™

ORALITE® VC 612 / VC 612RA

Product benefits include:

- Single-layer flexible prismatic film construction – makes application easy even onto slightly curved surfaces
- No edge sealing required
- Available in 9 colours including fluorescent options
- Expected performance life on the vehicle: up to 7 years
- Approved in the UK by the Home Office CAST
- Easily removable as whole pieces
- Easy damage repair
- Withstands power washing
- VC 612RA: *RapidAir*® construction for extra easy application and repositioning

Product	Colours	Roll sizes	Service Life
ORALITE® VC 612 / VC 612RA	White, yellow, red, blue, green, fluorescent lime, fluorescent yellow*, fluorescent orange, fluorescent red-orange	1235 mm x 50 m / 25 m / 10 m 610 mm x 50 m	Non-fluorescent colours: Up to 7 years Fluorescent colours: contact ORAFOL for details

* Fluorescent yellow is only available without *RapidAir*®.

Livery Film

ORALITE® VC 110

Product benefits include:

- Single-layer prismatic film construction
- No edge sealing required
- Available in white colour
- Expected performance life on the vehicle: up to 10 years
- Reflectivity complies to ECE 104 Class C (Note: No e-mark)
- Withstands power washing

Product	Colours	Roll sizes	Service Life
ORALITE® VC 110	White	610 mm x 10 m 1235 mm x 10 m 610 mm x 50 m 1235 mm x 50 m	Up to 10 years

Brilliant Fleet Marking Grade

ORALITE® 6900

Product benefits include:

- Double-layer prismatic film construction*
- Outstandingly bright and vivid daytime colours – including fluorescent options
- Expected performance life on the vehicle: up to 10 years
- Approved in the UK by the Home Office CAST

Edge sealing is recommended. Contact ORAFOL for information.

Product	Colours	Roll sizes	Service Life
ORALITE® 6900	White, red, green, royal blue, fluorescent yellow-green, fluorescent orange	610 mm x 50 m 1235 mm x 50 m	Up to 10 years

Fleet Marking Grade

ORALITE® 5600 / 5600RA / 5650RA

Ideal for letterings, markings and decorations

Product benefits include:

- Highly flexible embedded glass bead film construction
- 11 vivid colours
- Expected performance life on the vehicle: up to 7 years
- Easy to apply with good adaptability for uneven surfaces
- 5600 / 5600RA: Easy removal from painted surfaces (using heat)
- Excellent printability

Product	Colours	Roll sizes	Service Life
ORALITE® 5650 RA	White, yellow, red, orange, blue, green, black, azure, gold, lemon, ruby	1235 mm x 50 m 610 mm x 50 m	Up to 7 years
	White only	1520 mm x 50 m 1370 mm x 50 m 760 mm x 50 m Also available in 25 m lengths	
ORALITE® 5600 / 5600RA	White, yellow, red, orange, blue, green, black, azure, gold, lemon, ruby	1235 mm x 50 m 610 mm x 50 m	Up to 7 years
	White only	1520 mm x 50 m 1370 mm x 50 m 760 mm x 50 m Also available in 25 m lengths	



Flexibright™ Fleet Marking Grade

ORALITE® VC 612

Product benefits include:

- Single-layer flexible prismatic film construction – makes application easy even onto slightly curved surfaces
- No edge sealing required
- Available in fluorescent lime/red
- Expected performance life on the vehicle: up to 5 years
- Approved to TP ESC-B for French fire vehicles
- Easily removable as whole pieces
- Easy damage repair
- Standard versions available with left and right printing
- Withstands power washing

Product	Colours	Roll sizes	Service Life
ORALITE® VC 612 Flexibright™	Fluorescent lime / red	141 mm x 9 m / 141 mm x 50 m 282 mm x 9 m / 282 mm x 50 m 1200 mm x 10 m / 1200 mm x 50 m	Up to 5 years
ORALITE® VC 612RA Flexibright™	Fluorescent lime / red	1200 mm x 10 m / 1200 mm x 25 m 1200 mm x 50 m	Up to 5 years

Brilliant Fleet Marking Grade

ORALITE® 6901

Product benefits include:

- Double-layer prismatic film construction*
- Outstandingly bright and vivid daytime colours, fluorescent yellow-green/red
- Expected performance life on the vehicle: up to 7 years
- Approved to N.I.T. 273 (approval number: TP ESC-B 15035)
- Standard versions available with left, right and chevron printing

Edge sealing is recommended. Contact ORAFOL for information.

Product	Colours	Roll sizes	Service Life
ORALITE® 6901	Fluorescent yellow-green / red	1200 mm x 50 m	Up to 7 years

*7 years relates to the reflective performance for approved edge sealed materials. 3 year print durability.

Prismatic Fleet Marking Grade

ORALITE® 5921M

Product benefits include:

- Highly flexible single-layer prismatic film construction
- No edge sealing required
- Available in white/red
- Expected performance life on the vehicle: up to 5 years
- Approved to ECE 104 Class F
- Complies to ECE 70 Class 5, DIN 30710, TP ESC-B
- Standard versions available with left, right and chevron printing.
- Withstands power washing
- Also available in kits.

Product	Colours	Roll sizes	Service Life
ORALITE® VC 5921M	White / red	141 mm x 50 m 282 mm x 50 m 1200 mm x 50 m	Up to 5 years

High Intensity Fleet Marking Grade

ORALITE® 5821

Product benefits include:

- Flexible, encapsulated glass bead film
- Available in red/white
- Expected performance: up to 5 years
- Also available in kits
- DIN 30710, TP ESC-B 10072

Product	Colours	Roll sizes	Service Life
ORALITE® 5821	White / red	141 / 282 / 1200 mm x 50 m	Up to 5 years
ORALITE® 5421	White / red	141 / 282 mm x 9 m 141 / 282 / 1200 mm x 50 m	Up to 4 years

Commercial Fleet Marking Grade

ORALITE® 5421

Product benefits include:

- Highly flexible, embedded glass bead film
- Available in red/white
- Expected performance: Up to 4 years
- Also available in kits
- DIN 11030, TP ESC-B 10071

Fluorescent Premium Cast

ORACAL® 7510RA

The ideal fluorescent non-reflective film for markings on EMS and utility vehicles.

Product benefits include:

- Fluorescent non-reflective film
- *RapidAir*® construction
- Expected performance : Fluorescent yellow 3 years / Fluorescent red 2 years
- For application onto lacquered surfaces
- Easy to cut and apply

Product	Colours	Roll sizes	Service Life
ORACAL® 7510RA	fluorescent yellow, fluorescent red	378 mm x 50 m 500 mm x 50 m 630 mm x 50 m 914 mm x 50 m 1000 mm x 50 m 1260 mm x 50 m	Fluorescent yellow 3 years / Fluorescent red 2 years

Fluorescent Premium Cast

ORACAL® 7710 / 7710RA

The ideal fluorescent non-reflective film for large markings on EMS and utility vehicles.

Product benefits include:

- Fluorescent non-reflective film
- 7710RA has *RapidAir*® construction
- Expected performance life: up to 3 years
- For application onto lacquered surfaces
- Easy to cut and apply
- 7710: Recommended for wet application
- 7710RA: Recommended for dry application

Product	Colours	Roll sizes	Service Life
ORACAL® 7710/7710RA	fluorescent yellow, fluorescent red	7710: 1260 mm x 25 m / 50 m 7710RA: 1520 mm x 25 m / 50 m	Up to 3 years

Premium Livery Cast

ORACAL® 977

The ideal non-reflective film for markings or graphics on EMS and utility vehicles.

Product benefits include:

- Non-reflective film
- Available in different colours
- Expected performance life: up to 6 years
- For application onto lacquered surfaces
- Easy to cut and apply
- Withstands power washing

Product	Colours	Roll sizes	Service Life
ORACAL® 977	Police blue, black Contact ORAFOL for more information	1520 mm x 25 m 1520 mm x 50 m	Up to 6 years





Full range of reflective materials for agricultural vehicles and equipment

Reflective Materials for Slow Moving Vehicles

Agricultural vehicles and machinery, while designed for use in the field, sometimes have to use public roads. There are serious road safety risks associated with using poorly lit agricultural vehicles on public roads. Spring and autumn are the busy periods for the agricultural industry. Farmers are kept busy until late evening, and drive mostly on relatively unlit or poorly lit roads.

Rear end collisions often occur when motorists approaching agricultural vehicles from behind misjudge the speed difference between their own vehicle and that of a slower moving agricultural one. Furthermore, side impact collisions often occur when motorists or cyclists collide with an agricultural vehicle that is making a slow wide turn.

Reflective marking material is an effective means of identifying agricultural equipment. Properly placed reflective material will help the equipment stand out on the roadway. Ideally, agricultural equipment on the roadway should be conspicuous since other motorists will notice the equipment immediately and have sufficient time to avoid risk of a collision.



Regulation ECE 86

Regulation ECE 86 specifies the requirements for lighting systems of Category R, S and T agricultural and forestry vehicles. Regulation ECE 86 specifically mandates or recommends the following in terms of mounting of retroreflective signs:

Red/white warning films compliant to ECE 104 Class F are mandatory for vehicles with overall widths > 2.55 m. The warning films are recommended for narrower Category S vehicles. Instead of warning films adhered directly onto agricultural machines, red/white warning signs compliant to ECE 70 Class 5 are alternatively permissible. Red/white warning signs will increase the visibility of slow moving vehicles when viewed from the rear. Hence, road users will recognise the size of agricultural machinery early enough to slow down and, if needed, safely overtake.

Marking of the contours of agricultural machines with ECE 104 Class C materials is also in principle recommended. Contour markings will increase the visibility of agricultural machinery especially when these are approached from the side. Contour markings will enable drivers to recognise the dimensions of agricultural machinery early enough to, if necessary, slow down safely. Contour marking will reduce the risk of serious accidents happening as a result of collisions from the side.



SMV rear marking plates compliant to ECE 69 are furthermore recommended, and also mandatory in some countries, on all vehicles with a maximum allowed top speed of 40 km/h. The shape and design of these special signs, which are mounted on the rear of agricultural machinery, indicate to road users approaching from the back that the vehicle ahead is a slow moving vehicle. Drivers will thus be able to brake in time. Rear-end collisions with slow vehicles will thus be safely prevented.

ORAFOL offers a wide range of products for all of the above applications. Contact us and we would be pleased to assist in finding the best solution for your application.



Engineered to Save Lives™

Vehicle Conspicuity

ORAFOL Europe GmbH
Orafolstraße 1, D-16515 Oranienburg, Germany
Tel: +49 (0)3301 864-0 / reflective.solutions@orafol.de

Find out more about our products at:
www.orafol.com · www.orafoleurope.com

