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Everlux[®]-RL

Reflectoluminescent safety signs for mines

ÉDITION SPÉCIALE POUR MINES

Retroreflective properties

The retroreflective sheeting used in ☼ Everlux®-RL products meet the coefficient values of retroreflective products as specified in the standards EN 12899-1:2007 and ASTM D4956-13.
The minimum performance requirements for a Type I ^(a) retroreflective sheeting color “White” and the Minimum Coefficient of Retroreflection (RA) for the Everlux-RL are as follows:

Minimum performance requirements for a Type I Retroreflective sheeting color “White”		
Observation Angle	ASTM D4956-13	EN 12899-1:2007
	0.2°	20'
Entrance Angle	-4°	+5°
Minimum Coefficient of Retroreflection R _A (cd • lux ⁻¹ • m ⁻²)	70	50

(a) According to ASTM D4956-13 a retroreflective sheeting Type I is a retroreflective sheeting referred to as “engineering grade” that is typically an enclosed lens glass-bead sheeting. Applications for this material include permanent highway signing, construction zone devices, and delineators.

Minimum reflectiveness parameters Everlux-RL	
Colour	White
⁽¹⁾ R _A (cd • lux ⁻¹ • m ⁻²) 0,2°;-4°	70
⁽²⁾ R _A (cd • lux ⁻¹ • m ⁻²) 0,33°; 5°	50

(1) According to ASTM D4956-13
(2) According to EN 12899-1:2007

Photoluminescent properties

The ☼ Everlux®-RL products meet the international norms DIN 67510-4:2008 and ISO 16 069:2004.
With the correct activation process, defined by each norm, the ☼ Everlux®-RL products show the following photoluminescent properties:

Norms	Minimum luminance properties (mcd/m²)			Period of light decay (min)
	10 minutes	60 minutes	90 minutes	Luminance intensity greater than a 0.32 mcd/sqm
DIN 67510-4:2008	23	3	n.a.	-
ISO 16069:2004	20	2.8	n.a.	340
☼ Everlux®-RL	57 ⁽¹⁾	7 ⁽¹⁾	-	845 ⁽¹⁾
	20 ⁽²⁾	2,9 ⁽²⁾	-	380 ⁽²⁾

n.a. – not applicable

(1) Photoluminescent performance measured in compliance with Test Method DIN 67510-1:2009. The product was activated with a non-diffusing, unfiltered, continuous short xenon-arc source of light of 180 W, providing a mean illuminance of 1 000 lux on the surface of ☼ Everlux®-RL for 5 minutes. Lamp model: OSRAM XBO R 180 W/45 C OFR.

(2) Photoluminescent performance measured in compliance with Test Method “On-site” defined by ISO 16069 - Annex C. The stimulation of the Everlux-RL products was made by a fluorescent cool white source of light, of 18 W, with a correlated color temperature of 4000K for 15 min, providing an illumination of 25 lux. Lamp model: OSRAM L18W/840.

Reflecto-luminescent signs

There are many situations where there is movement of both people and vehicles at the same time and at the same place in mines, and therefore there is a need for the information conveyed by the safety signs to be understood by all the parties involved and in all circumstances i.e.:

- Miners;
- Drivers of vehicles/machineries;
- Circumstances where vehicles/machineries are moving, with lights on, and miners are present.

④ Everlux®RL – Reflecto-luminescent signs are a new product at a global level with the advantage of combining two concepts in signs: The photoluminescent sign and the retro-reflective sign.

This sign system also performs a double function:

- The presence of external light from the vehicles/machineries or head torch lights allows it to react as a retroreflective product, i.e., the light is reflected back in the same direction it came from allowing the total visibility of the object (a characteristic already used in traffic signs).
- In total absence of light it acts as a photoluminescent product having absorbed the luminous radiation while exposed to the surrounding light (or light from vehicles/machineries or head torch light) and in a black-out situation the signs will remain visible for a period greater than 340 minutes which is the minimum period required by Norms.

④ Everlux®RL is manufactured with a generation of LLL pigments (Low Location Lighting) especially developed for situations where the surrounding light is diminished.

These signs are also ideal for situations where the fire and rescue service need to locate risers or hydrants thereby enabling these to be found more quickly, either by the fire engine lights or head torch lights.



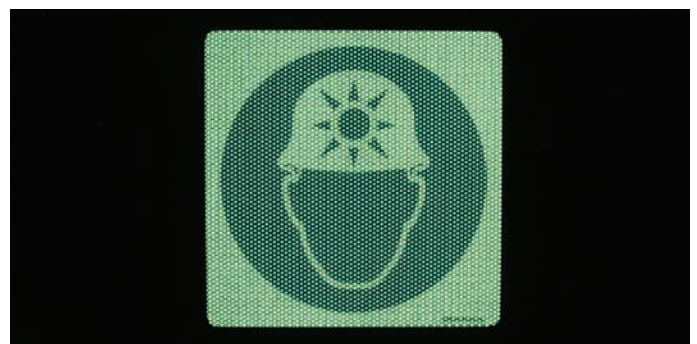
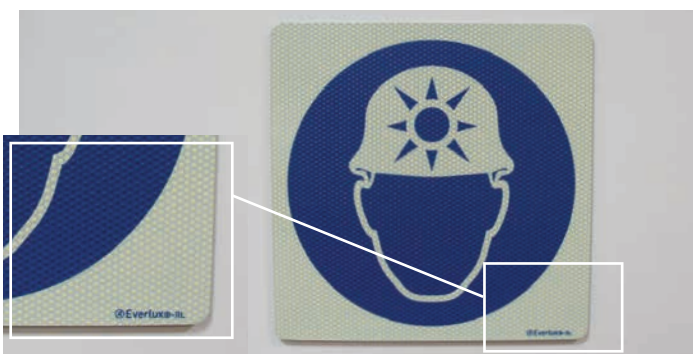
Retro-reflective Effect

Retro-reflective safety signs for vehicles, machineries or head torch light



Photoluminescent Effect

Photoluminescent signs for miners in the dark



Reflecto-luminescent signs

Evacuation routes and emergency exits in accordance with ISO 7010: 2011

(mm)
300x150
400x200



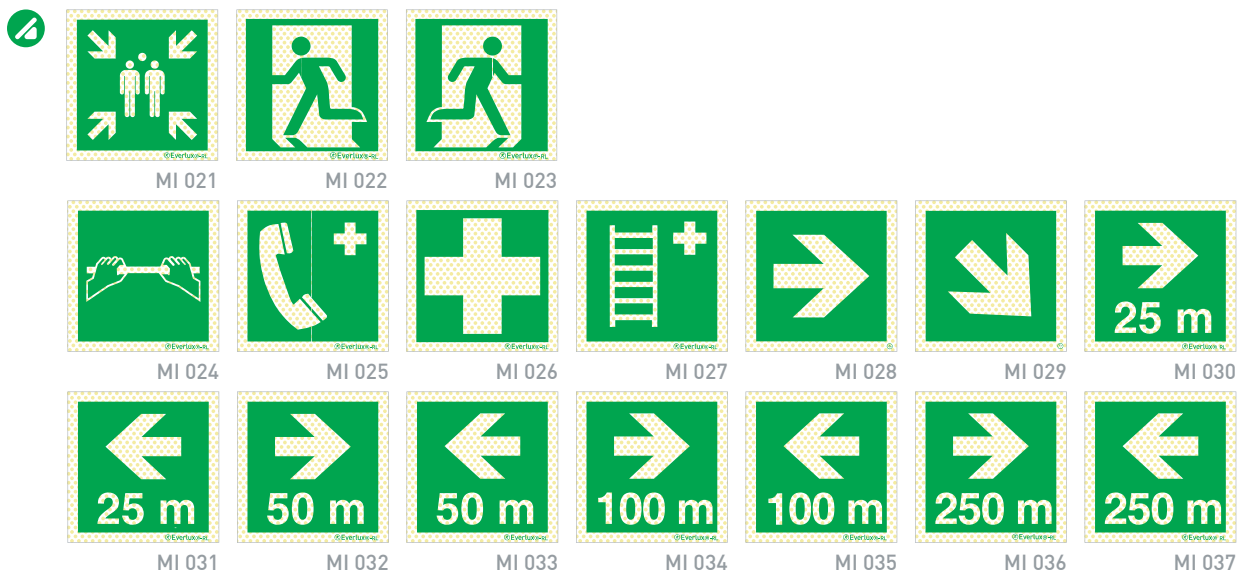
Escape route signs

(mm)
300x150
400x200



Evacuation routes and first aid equipment

(mm)
200x200
300x300
400x400



Emergency equipment signs

(mm)
200x200
300x300
400x400



Emergency equipment signs with english text



Emergency equipment signs with french text



Emergency equipment signs with spanish text



The ISO 23601:2009 standard establishes design principles for displayed Escape Plans that contain information relevant to fire safety, escape, evacuation and rescue of the facility's occupants. These plans may also be used by intervention forces in case of emergency and are intended to be displayed as signs in public areas and workplaces. The Escape Plans shall be designed in accordance with the evacuation strategy of the facility and addresses the specific needs of the occupants of the premises or part thereof.



Note: also available
in ANSI paper sizes
B, C, D and ISO sizes
A3, A2, A1.
See page 14.

Exit signs

(mm)
300x150
400x200



Fire fighting equipment in accordance with ISO 7010:2011

(mm)
200x200
300x300
400x400



Numbers and letters

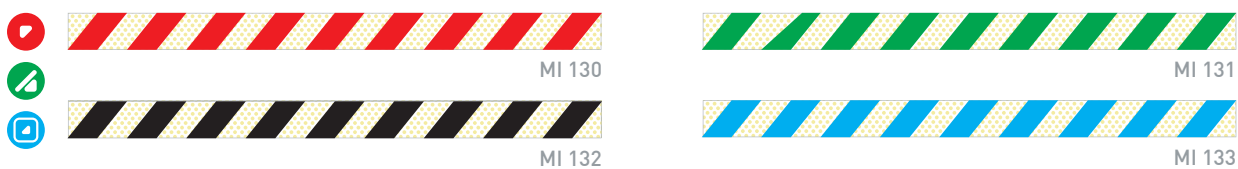


Obstacle marking strips

(mm)
600x60
600x100



(mm)
1200x60
1200x100



Reflecto-luminescent signs

④ Everlux® RL safety bumper for flat surfaces and for edges

In all premises there are obstacles that can create a danger to the movement of people. Also pillars, tubes and other objects protruding from walls, pavements or ceilings can cause damage to users when they occur along the evacuation routes. The ④ Everlux® RL safety bumpers allow the softening of the impact in a way to minimise the effects of a collision. As they are photoluminescent they not only minimise the consequences of the impact but also help to prevent it as they remain visible in any circumstances, even in the absence of light.

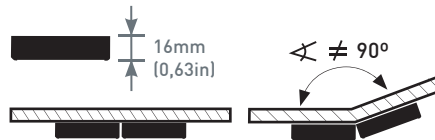
Technical Characteristics of ④ Everlux® RL Bumpers

- Material: cellular neoprene
- Resistance to fire: self-extinguishing (ex-class M1)
- Coating: with a retroreflective canvas and a photoluminescent material for ④ Everlux® RL Bumpers.

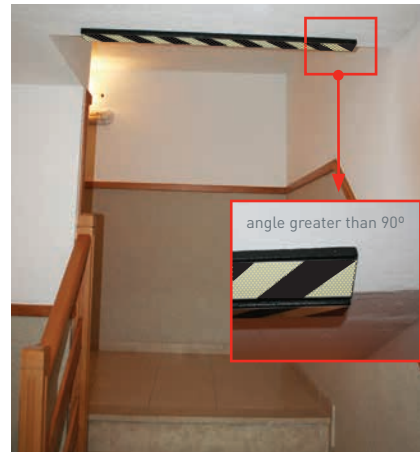


Various bumpers can be put side by side to offer a wider area of protection. Each bumper is supplied with a high adherence adhesive tape to allow it to be quickly and efficiently adhered to most common surfaces that are clean and free from dust.

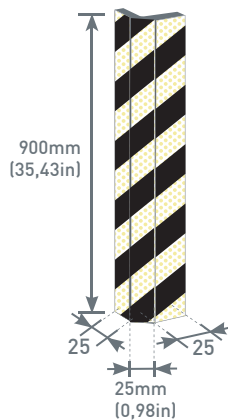
For angles other than 90°, flat bumpers should be used.



Sizes in mm (inch)

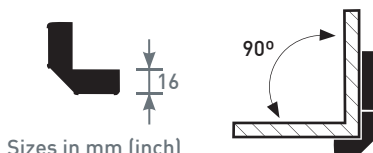


RL bumper for flat surfaces MI 150

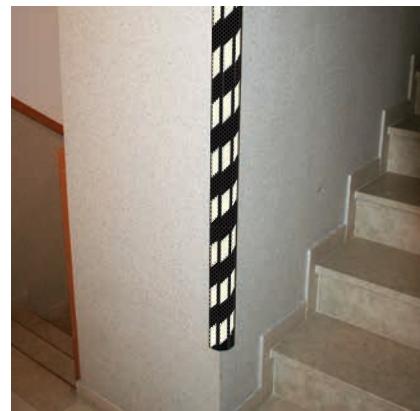


Each bumper is supplied with two high adherence adhesive tapes (one for each internal surface) so as to allow it to be quickly and efficiently adhered to most common surfaces that are clean and free from dust.

This bumper can be applied together with the bumpers for flat surfaces (ref. 88 561) to increase the protection areas (see scheme below).



Sizes in mm (inch)



RL bumper for edges MI 151

Warning signs



(mm)
300x300

Warning signs with english text



(mm)
400x600
600x900

Warning signs with french text



(mm)
400x600
600x900

Reflecto-luminescent signs

Warning signs with french text

(mm)
400x600
600x900



Warning signs with spanish text

(mm)
400x600
600x900



Mandatory signs

(mm)
200x200
300x300
400x400



Mandatory signs with english text

							(mm) 400x600 600x900
HEAD PROTECTION MUST BE WORN	RESPIRATORS MUST BE WORN	PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN	WEAR SAFETY HARNESS	MANDATORY PEDESTRIAN WALKWAY	ANTI-VIBRATION BELT MUST BE WORN		
MI 03 80	MI 03 81	MI 03 82	MI 03 83	MI 03 84	MI 03 85		
							
REFLECTIVE VEST MUST BE WORN	FLASH LIGHT MUST BE USED	INSPECT WIRES AND CHAINS	CONFIRM THE EARTH CONNECTION BEFORE MAINTENANCE	DISCONNECT BEFORE MAINTENANCE	DISCONNECT IF METHANE EXCEEDS 1.5%		
MI 03 86	MI 03 87	MI 03 88	MI 03 89	MI 03 90	MI 03 91		

Mandatory signs with french text

							(mm) 400x600 600x900
PORT DU CASQUE OBLIGATOIRE	PROTECTION OBLIGATOIRE DES VOIES RESPIRATOIRES	PROTECTION INDIVIDUELLE CONTRE LES CHUTES OBLIGATOIRE	HARNAIS DE SÉCURITÉ OBLIGATOIRE	PASSAGE OBLIGATOIRE POUR PIÉTONS	CEINTURE ANTI-VIBRATION OBLIGATOIRE		
MI 04 00	MI 04 01	MI 04 02	MI 04 03	MI 04 04	MI 04 05		
							
PORT OBLIGATOIRE D'UN GILET RÉFLÉCHISSANT	LAMPE TORCHE OBLIGATOIRE	EXAMINER LES CÂBLES ET CHÂÎNES	CONFIRMER LA MISE À LA TERRE AVANT TOUTE MAINTENANCE	DÉCONNECTER AVANT TOUTE MAINTENANCE	DÉCONNECTER SI LE MÉTHANE DÉPASSE 1.5%		
MI 04 06	MI 04 07	MI 04 08	MI 04 09	MI 04 10	MI 04 11		

Mandatory signs with spanish text

							(mm) 400x600 600x900
ES OBLIGATORIO USAR CASCO	ES OBLIGATORIO USAR MÁSCARA	ES OBLIGATORIO USAR PROTECCIÓN INDIVIDUAL CONTRA CAÍDAS	USO OBLIGATORIO DEL CINTURÓN DE SEGURIDAD	PASO OBLIGATORIO PARA PERSONAS	ES OBLIGATORIO USAR CINTURÓN ANTIVIBRATORIO		
MI 04 20	MI 04 21	MI 04 22	MI 04 23	MI 04 24	MI 04 25		
							
ES OBLIGATORIO USAR CHALECO REFLECTANTE	ES OBLIGATORIO USAR LINTERNA	OBLIGATORIO REVISAR CABLES Y CADENAS	CONFIRMAR LA CONEXIÓN A TIERRA ANTES DE INICIAR EL MANTENIMIENTO	OBLIGATORIO DESCONECTAR ANTES DE INICIAR EL MANTENIMIENTO	OBLIGATORIO DESCONECTAR SI EL NIVEL DE METANO REBASA 1.5%		
MI 04 26	MI 04 27	MI 04 28	MI 04 29	MI 04 30	MI 04 31		

Reflecto-luminescent signs

Prohibition signs

(mm)
200x200
300x300
400x400



Prohibition signs with english text

(mm)
400x600
600x900



Prohibition signs with french text



Prohibition signs with spanish text



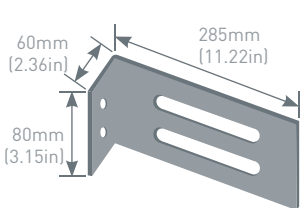
Reflecto-luminescent signs

Aluminium accessories for Type 2 and for Panoramic signs

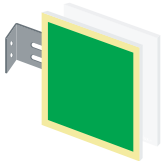
Ⓢ Everlux[®] RL types of application can be:
Type 1 - Parallel wall mounted sign;
Type 2 - Perpendicular wall mounted sign fixed on an appropriate bracket;



MI 560



single-sided

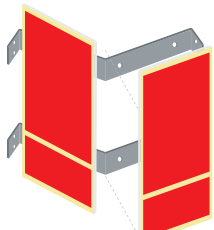
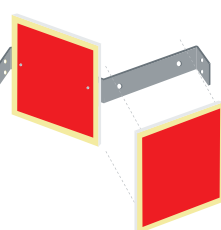
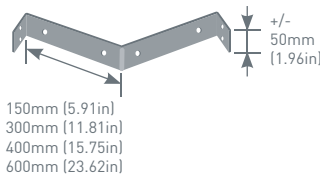


double-sided

Type P - Panoramic signs are comprised of two signs mounted on an aluminium frame at a 90 degree angle



MI 561



Size conversion table: mm/inches

mm	inch
150x300	5.91x11.81
200x200	7.87x7.87
300x150	11.81x5.91
300x300	11.81x11.81
400x200	15.75x7.87
400x400	15.75x15.75
600x60	23.62x2.36
600x100	23.62x3.94
400x600	15.75x23.62
600x900	23.62x35.43
900x25x25x25	35.43x0.98x0.98x0.98
900x65	35.43x2.56
1200x60	47.24x2.36
1200x100	47.24x3.94

Everlux evacuation plan sizes	
mm	in
400x300	15.75x11.81
600x400	23.62x15.75
900x600	35.43x23.62

ANSI evacuation plan sizes		
	mm	in
B	279x432	11x17
C	432x559	17x22
D	559x864	22x34

ISO evacuation plan sizes		
	mm	in
A3	297x420	11.69x16.54
A2	420x594	16.54x23.39
A1	594x841	23.39x33.11

Practical testing

To observe the functionality and advantages of Reflecto-luminescent signs, please observe the following steps:

Part 1: retro-reflective test

- Install the sign at the appropriate height which is most commonly within the 1.5 – 1.8m range from floor level and is considered to be the most suitable for comprehension at “eye level”;
- Expose the sign surface to a light source;
- When the sign is met with external direct light, in the form of vehicle headlights, a flashlight, or a helmet lamp for example, it will react in a similar retro-reflective manner to traffic signs;
- The light is reflected back in the same direction as the source which will allow total visibility of the sign and its inherent message.

Once you have completed the retro-reflective performance test you can also test the sign's photoluminescent performance.

Part 2: Luminance test

Please note that the photoluminescence test is a consequence of the retro-reflective test and as such the sign and installation position should remain the same as the test above.

- Once the retro-reflective test has been completed switch off/ remove all light sources;
- In the absence of light, the photoluminescent aspect of the sign emits the light (which was absorbed and stored from the incidental light source) and allows total visibility of the sign and its inherent message, even during “black-out” conditions.

So, within the one sign you have the advantage of combining two concepts that offer two different solutions: the retro-reflective properties that enhance the visibility of the sign when exposed to light and the photoluminescent properties that guarantees the sign's visibility even when no light source is available.

In accordance with legislation, standards and consumer protection
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