



PLEXIGLAS® Solid Sheet and Rod

PLEXIGLAS® LED for edge lighting

Product

Whether it's in sheet or rod form, PLEXIGLAS® LED shines over the entire surface. The LED light is introduced through the edge or the face surface.

The patented light guiding material distributes the light as evenly as possible and ensures a high light yield.

PLEXIGLAS® LED for backlighting HC is a version that can be manufactured on request and features a scratch-resistant coating on one side. This makes the user side insensitive to visually disturbing damage in poster applications, for example. This side also becomes more robust during assembly.

Properties

In PLEXIGLAS® LED for edge lighting, light emission has been improved and the product is crystal clear when unlit. It does not have any structures or prints that are visually disturbing. The highly transparent base material and the light guiding principle mean the light emitted by the LEDs is transmitted from the edge and into the depth of the material by surface reflections.

Due to the special light-scattering particles, the light given off by the LEDs is extracted on its way through the sheet / rod, causing the surface to shine.

For optimum light yield that's as uniform as possible, it is very important to use the recommended type (see "Available options").

In addition to the well-known and proven PLEXIGLAS® properties, such as

- very high weatherability and 100% recyclability

PLEXIGLAS® LED for edge lighting has the following special features:

- The LED light is emitted over the surface with a high efficiency level of 70% to 97%.
- No disturbing patterns that generate hot spots
- Unlit: crystal clear and transparent
- Lit: impressive, pleasant light
- Unique, patented technology
- Almost uniform light distribution over the entire surface

PLEXIGLAS® LED for edge lighting HC has a scratch-resistant coating on one side:

- Excellent abrasion and chemical resistance, plus an outstanding surface appearance
- Not suitable for reshaping



Applications

Equipped with LED strip modules, the sheet shines almost uniformly over its entire surface with the light emitted by the LEDs, creating ultra-thin light surfaces. In rod form, the whole surface of the product shines due to light being fed in from one or two sides.

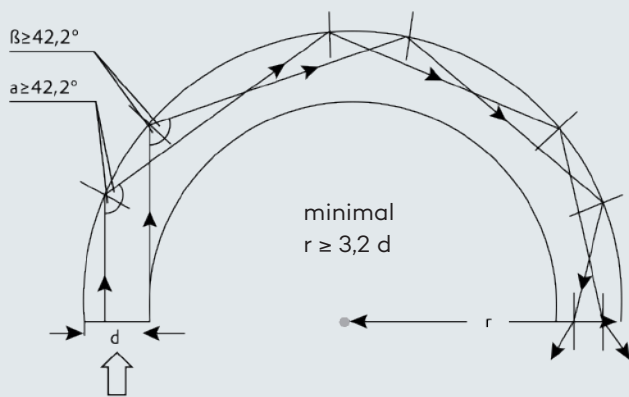
- Sheets: For ultra-flat, backlit posters, displays and signs. Thin, decorative wall coverings glow in the LEDs' color, creating flat, thin lighting elements. The alternation between the LED light show and the unlit, crystal-clear view opens up new design options.
- Rods: Lighting accents in architecture, in design or in furniture construction, exhibition booth construction and shop fitting; individual luminaires; self-luminous light guides.

Processing

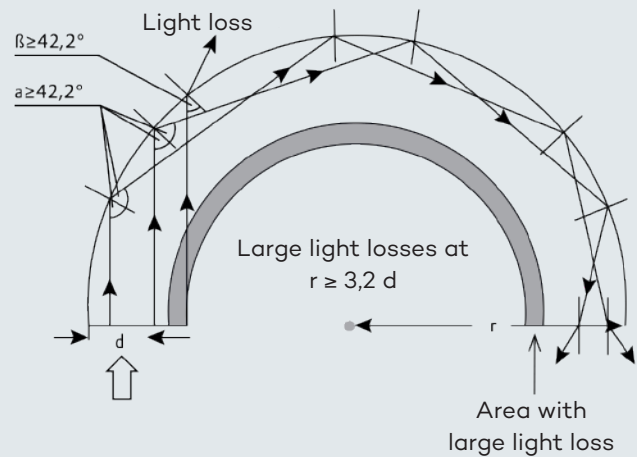
PLEXIGLAS® LED can be processed like standard PLEXIGLAS®:

- Machining PLEXIGLAS® (Ref. No. 311-1)
- Forming PLEXIGLAS® (Ref. No. 311-2)
The bending radius should be greater than six times the sheet thickness or the rod diameter, so the light follows the curvature. (The scratch-resistant version cannot be reshaped)
- Joining PLEXIGLAS® (Ref. No. 311-3)
- Surface-treating PLEXIGLAS® (Ref. No. 311-4).
Surface defects can be removed by polishing, so the lighting technology is completely restored.
- Tips for processing PLEXIGLAS® solid sheets (Ref. No. 311-5)

Math. limit value: $r \geq 3.2 \cdot d$



In practice, we recommend a curvature radius of $r \geq 6 \times$ material thickness



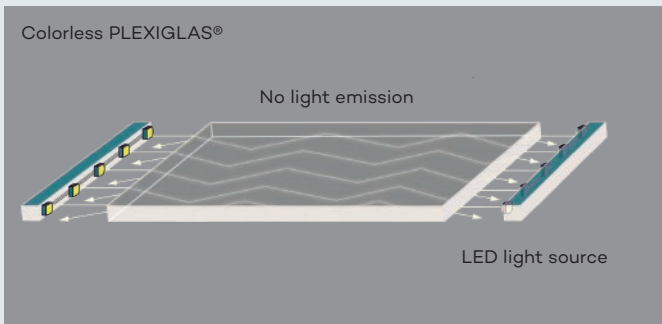


PLEXIGLAS® Solid Sheet and Rod

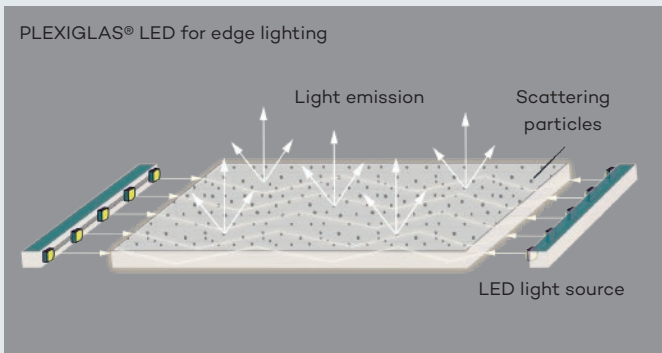
Functionality and material properties

Functional principle

Clear PLEXIGLAS® guides light by total reflection. Rays of light remain in the sheet and only emerge at the edges:



Scattering particles embedded in PLEXIGLAS® LED for edge lighting deflect the rays of light, thus overcoming the total reflection. Rays of light can also leave the sheet at the surfaces.

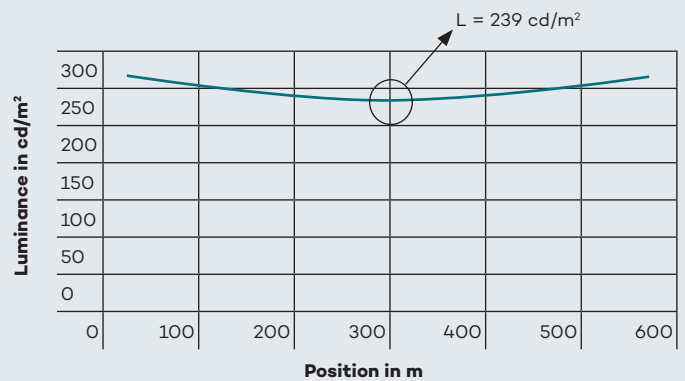


Lighting range

Depending on the size of the light guide, there are different versions of PLEXIGLAS® LED for edge lighting available. Please refer to "Available options" for details of the recommended types for bright and even illumination of the lighting range.

Luminance

The ideal luminance curve is shown in the graph:



■ PLEXIGLAS® LED for edge lighting

○ Comparison of luminance at 300 mm

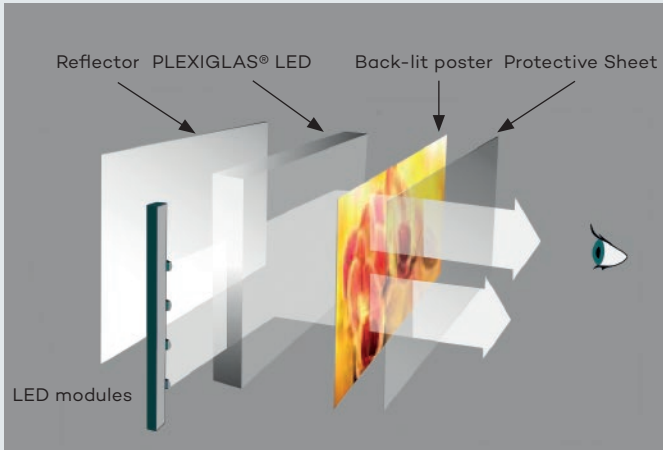
LED coupling on both sides, version: OE011 L

Material recommendations

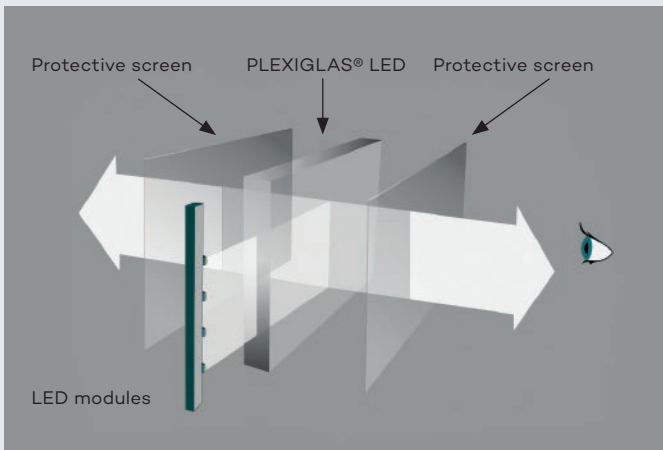
Rear reflector	PLEXIGLAS® WH01 PLEXIGLAS® WN297	White, cast White, extruded
Diffuser	For example: PLEXIGLAS® Satinice OD010 DF	Highly efficient, light-scattering velvet surface
Transparent protective screen	PLEXIGLAS® Optical OA570 HC/HCM PLEXIGLAS® XT OA570 AR PLEXIGLAS® GS and XT, colorless	Scratch-resistant and special UV protection Anti-reflective Universal



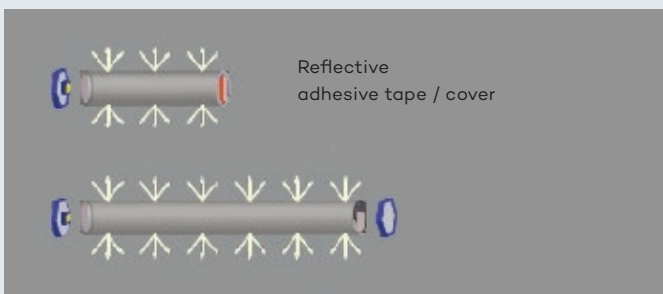
Installation situation



Poster backlighting



Transparent light surfaces



Coupling for rods on one and two sides

PLEXIGLAS® LED for edge lighting is equipped with LED strip modules on one or two sides, and on four sides for very high brightness levels. A protective screen protects the light guide from damage that would cause undesirable light emission. This protective screen can be transparent, or in decorative applications it can be designed as a diffuser (please refer to the table for additional materials).

Notes:

- The light is only transmitted entirely once the laminating film has been removed.
- For optimum light yield, the suitable types (SM, L, XL, XXL) should be selected.
- Polish all edges to minimize light losses. Edges without LEDs should be covered with white-reflecting materials.
- Bonding, laminating and printing interferes with light transmission, and uniform illumination is reduced.
- Bring the LEDs close to the edge so the light cone is fully coupled into the material.
- Weak points in the LED system as a whole reduce the overall performance. Note the LEDs and the LED thermal management system selected.



Available options

Please refer to the PLEXIGLAS® Sales Handbook for additional details about the types' and thicknesses' availability.

The scratch-resistant coated version, PLEXIGLAS® LED for edge lighting HC, can be manufactured on request.

Please refer to the Technical Information for PLEXIGLAS® Optical (scratch-resistant, coated (HC)) with Ref. No. 232-24 for details about the technical values of the surface with a scratch-resistant coating.

PLEXIGLAS® LED for edge lighting				
Lighting range	SM	L	XL	XXL
Light feed-in on two sides	Up to 300 mm	300 – 600 mm	600 – 1,200 mm	1,200 – 2,000 mm
Light feed-in on one side	Up to 150 mm	150 – 300 mm	300 – 600 mm	600 – 1,000 mm
Sheet thickness [mm]	4	4, 6, 8	4, 6, 8, 10	8, 10
scratch-resistant (HC), extruded (3,050 x 2,050 mm)	OE010 HC	OE011 HC	OE012 HC	OE013 HC
Extruded (3,050 x 2,050 mm)	OE010 SM	OE011 L	OE012 XL	OE013 XXL
Rod diameter [mm]	-	D8, D20, D40	D8, D20, D40	D8, D20, D40
Extruded rod (L: 2,000 mm)	OE010 SM	OE011 L	OE012 XL	OE013 XXL

POLYVANTIS GmbH

Riedbahnstraße 70
64331 Weiterstadt
Germany

www.plexiglas.de
www.polyvantis.com

® = registered trademark

Semi-finished polymethyl methacrylate (PMMA) products from POLYVANTIS are sold on the European, Asian, African and Australian continents under the registered trademark PLEXIGLAS®, in the Americas under the registered trademark ACRYLITE®, both owned by Röhm GmbH, Darmstadt, or its affiliates. Certified to DIN EN ISO 9001 (Quality) and DIN EN ISO 14001 (Environment)

This information and all further technical advice is based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether express or implied, or guarantee of product properties in the legal sense is intended or implied. We reserve the right to make any changes according to technological progress or further developments.

The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.