PLEXIGLAS®
THE ORIGINAL BY RÖHM

PLEXIGLAS®
Solid Sheet and Block

PLEXIGLAS® LED for backlighting, white
WH14, WH72, WH51, WM51, WM54

Product

These white translucent sheets were specially developed for backlighting with LEDs. Combining LEDs with PLEXIGLAS® LED makes for maximum efficiency and superior lighting technology, especially in illuminated signs, store fixtures and exhibition booths.

PLEXIGLAS® LED for backlighting offers a high degree of white opacity in incident light and daylight. Its translucency has been optimized to offer extremely high transmission paired with high light diffusion, which prevents any LED hot spots. Two PLEXIGLAS® LED variants are offered in thicknesses of 3-10 mm: WH14 with high transmission and WH72 with pronounced light diffusion.

In thick sheets and blocks, these two features are continued through WH51 and WM51. WM51 is characterized here in varying thicknesses by a similar white shade in incident light, where the transmission increases with thinner thicknesses. WH51 has the same transmission in varying thicknesses, whereby the white shade in incident light appears richer in a lower thickness.

WM54, in thickness 30mm, has a higher transmission compared to WM51, but a slightly less white opacity.

Properties

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

- extremely high weather resistance,
- ease of fabrication,
- 100% recyclability,

PLEXIGLAS® LED WH14, WH72, WH51, WM51, WM54 offer the following characteristics:

- brilliant, extremely weather-stable whiteness in incident light
- no LED hot spots due to optimum light diffusion
- high luminous efficiency through improved diffusion

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Applications

These properties make PLEXIGLAS® LED especially suitable as:

- **a thin sheet (WH14, WH72** for advertising signs: glowing letters, light boxes, backlighting in exhibition booths and store fixtures (see Fig. 1).

  The lighting example in Fig. 1 shows greater brightness with PLEXIGLAS® LED than with a conventional grade with comparable light diffusion.

- **a thick sheet/block (WH51, WM51, WM54)** with a material thickness of 15-30 mm: routed letters in illuminated signs, backlighting in furniture and store fixtures.

  Figs. 2.1-2.2b show different variants of these applications.

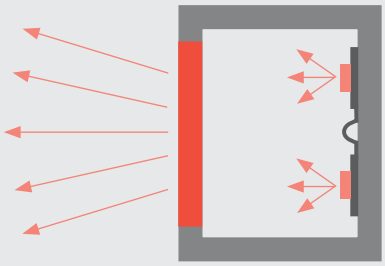

Fig. 1: Illuminated sign with a thin sheet

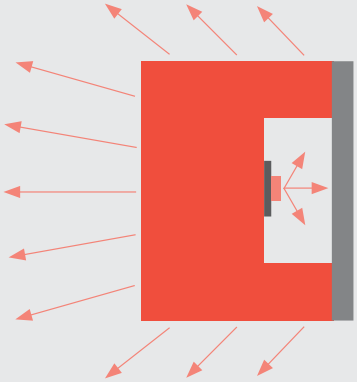

Fig. 2.2a: Indirect Backlighting with routing

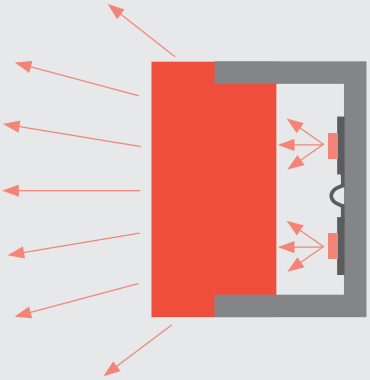

Fig. 2.1: Backlighting with a thick sheet

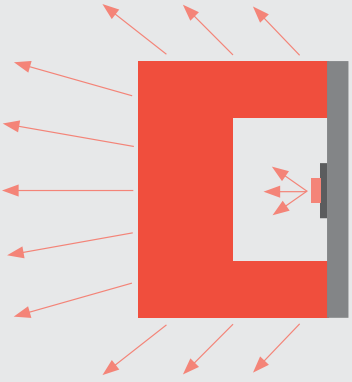

Fig. 2.2b: Direct backlighting with routing

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Machining

PLEXIGLAS® LED can be machined just like standard PLEXIGLAS® GS. The following Guidelines for Workshop Practice are available for PLEXIGLAS®:

- Machining PLEXIGLAS® (Ref. No. 311-1)
- Forming PLEXIGLAS® (Ref. No. 311-2)
- Joining PLEXIGLAS® (Ref. No. 311-3)
- Fabricating Tips for PLEXIGLAS® Solid Sheet (Ref. No. 311-5)

Notes on routing letters out of thick sheets (WH51, WM51 and WM54):

- Example: Cut out the contour of a letter sized 300 x 300 mm with a laser or milling cutter. The mirror is 60 mm wide. Cut a groove in the back of the piece and insert the LED modules. The LED modules light forwards or backwards depending on the type of luminous letters.
- The reverse side is usually covered with white, highly reflective material (e.g. powder-coated aluminum sheet)
- LEDs can be embedded in routed cavities. The wall thickness should not be reduced to less than 40% of the original material thickness so that the light can be diffused to best effect. Walls should not be made thinner than 12 mm in 30mm-thick sheets.
- Routing automatically changes the light diffusion properties, i.e. the resulting workpiece has lower light diffusion and higher light transmission. If routing leaves 40% of the original thickness, as is usually the case, the lighting values stay within a very positive range.

The decision tree in Fig. 3 helps you to choose the correct material.

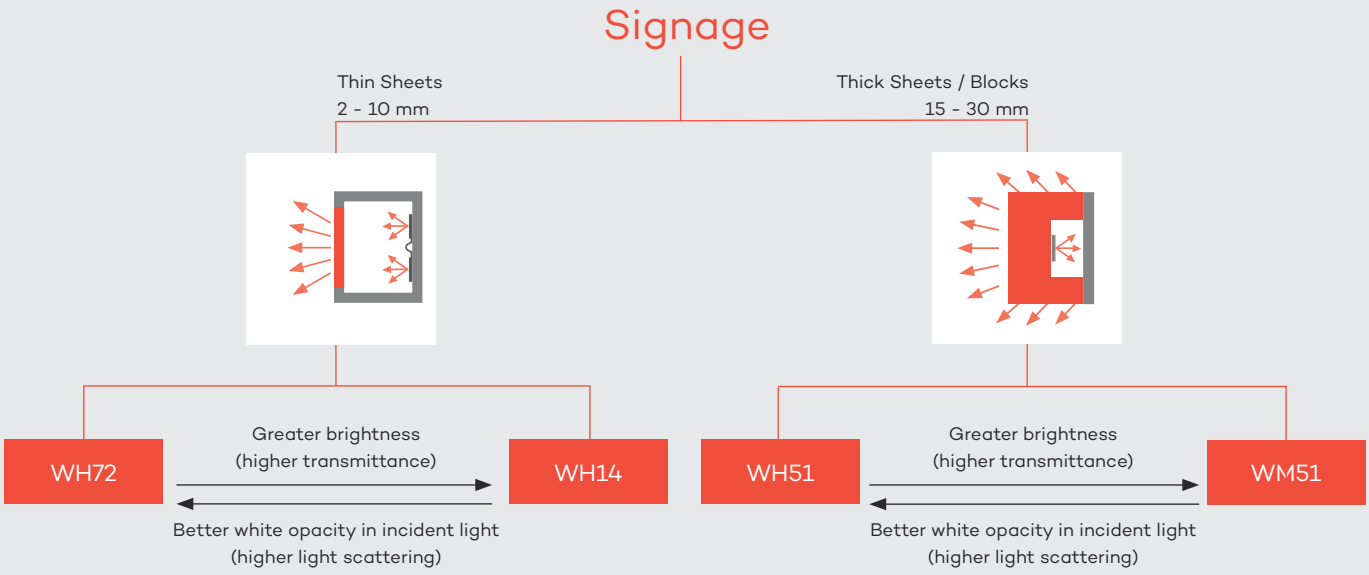

Fig. 3: Decision tree

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Brightness of a light box			
LED grade (see grade)	**τ_{D65}* (τ_{D65}*)**	**Color**	**Luminance (Luminance)**
WH14 (WH02)	47 % (44 %)	White	1468 cd/m² | + 22% (1208 cd/m²)
WH72 (WH73) (WN071)	31 % (23 %) (30 %)	White	1007 cd/m² | + 41 % (633 cd/m²) (805 cd/m²)

Measured with OSRAM BackLED BA01LA-W4F LED modules, with 115 modules/m² in the structure shown in Fig. 2.

PLEXIGLAS® LED, Backlighting white		
PLEXIGLAS® LED	**Thickness [mm]**	**τ_{D65}***
PLEXIGLAS® LED WH14	3	47 %
PLEXIGLAS® LED WH72	3	31 %
PLEXIGLAS® LED WH51	15, 20	5 %
PLEXIGLAS® LED WM51	15 20 30	13 % 8 % 5 %
PLEXIGLAS® LED WM54	30	6 %

* Transmittance DIN 5033, ISO 13468-2.

Delivery forms

Size: 3,050 mm x 2,030 mm, from a thickness of 25 mm: 3,000 mm x 2,000 mm.

The complete product range can be found in the PLEXIGLAS® sales handbook.

Information for processing the WH51, WM51 and WM54 varieties for milled lettering: The top side of the sheets / blocks (just like the front of the letter) is marked by inkjet printing.

This product belongs to the PLEXIGLAS® LED product family and was specially developed for the illuminated signage industry. You can find other interesting products developed for LED applications in the information sheet “PLEXIGLAS® LED Overview” (No. 212-6).

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