

# Makrolon® UV

## Solid polycarbonate sheet



S Line  
Standard

### Your benefits:

- excellent weathering resistance
- extreme impact strength
- good fire rating
- thermoformable

**Makrolon® UV** sheets are made from clear-transparent polycarbonate sheets with UV protection on both sides. They are the perfect choice for a long service life owing to their good weathering resistance. These attributes are backed up by our 10-year guarantee on weathering resistance and a 10-year guarantee on retaining their mechanical properties.

### Applications:

**Makrolon® UV** is ideal for outdoor applications:

- covered walkways and bus shelters
- barrel vaults and skylights (also thermoformed)

### Available sizes:

**Makrolon® UV** is available in thicknesses of 2 – 15 mm and in the following sizes; other sizes, colors and sheet thicknesses on request.

### Colors:

clear 2099  
white 2130  
white 2150  
bronze 2850  
grey 2760  
blue 2550  
green 2650

### Sizes (Standard):

3,050 x 2,050 mm  
6,110 x 2,050 mm

|   | Test Conditions              | Typical values <sup>(1)</sup> | Unit                | Standard        |
|---|------------------------------|-------------------------------|---------------------|-----------------|
| <b>PHYSICAL</b>                         |                              |                               |                     |                 |
| Density                                 |                              | 1200                          | kg/m <sup>3</sup>   | ISO 1183-1      |
| Water absorption saturation             | water at 23 °C               | 0.30                          | %                   | ISO 62          |
| Water absorption equilibrium            | 23 °C, 50% relative humidity | 0.12                          | %                   | ISO 62          |
| Refractive index                        | Procedure A                  | 1.587                         | –                   | ISO 489         |
| <b>MECHANICAL</b>                       |                              |                               |                     |                 |
| Tensile modulus                         | 1 mm/min                     | 2350                          | MPa                 | ISO 527-1,-2    |
| Yield stress                            | > 60 mm/min                  | > 60                          | MPa                 | ISO 527-1,-2    |
| Yield strain                            | 50 mm/min                    | 6                             | %                   | ISO 527-1,-2    |
| Nominal strain at break                 | 50 mm/min                    | > 50                          | %                   | ISO 527-1,-2    |
| Flexural modulus                        | 2 mm/min                     | 2350                          | MPa                 | ISO 178         |
| Flexural strength                       | 2 mm/min                     | 90                            | MPa                 | ISO 178         |
| Charpy impact strength                  | 23 °C, unnotched             | non-break                     | kJ/m <sup>2</sup>   | ISO 179-1eU     |
| Charpy impact strength                  | 23 °C, 3 mm, notched         | 80P                           | kJ/m <sup>2</sup>   | ISO 179-1eA     |
| Izod impact strength                    | 23 °C, 3.2 mm, notched       | 90P                           | kJ/m <sup>2</sup>   | ISO 180-A       |
| <b>THERMAL</b>                          |                              |                               |                     |                 |
| Vicat softening temperature             | 50 N, 50°C/h                 | 148                           | °C                  | ISO 306         |
| Thermal conductivity                    | 23°C                         | 0.20                          | W/(m.K)             | ISO 8302        |
| Coefficient of linear thermal expansion | 23 to 55°C                   | 0.65                          | 10 <sup>-4</sup> /K | ISO 11359-1, -2 |
| Temperature of deflection under load    | 1.80 Mpa                     | 128                           | °C                  | ISO 75-1, -2    |
| Temperature of deflection under load    | 0.45 Mpa                     | 140                           | °C                  | ISO 75-1, -2    |
| <b>ELECTRICAL</b>                       |                              |                               |                     |                 |
| Electrical strength                     | 1 mm                         | 34                            | kV/mm               | IEC 60243-1     |
| Volume resistivity                      |                              | 1E14                          | Ohm.m               | IEC 60093       |
| Surface resistivity                     |                              | 1E16                          | Ohm                 | IEC 60093       |
| Relative permittivity                   | 100 Hz                       | 3.1                           | –                   | IEC 60250       |
| Relative permittivity                   | 1 MHz                        | 3.0                           | –                   | IEC 60250       |
| Dissipation factor                      | 100 Hz                       | 5                             | 10 <sup>-4</sup>    | IEC 60250       |
| Dissipation factor                      | 1 MHz                        | 95                            | 10 <sup>-4</sup>    | IEC 60250       |

<sup>(1)</sup> These values are measured on injection molded samples, and are not intended for specification purposes.

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Exolon Group S-Line, the standard product line, represents a range of certified quality products which offer the reliable solution for most applications.

**Light Transmission:** Test Method according to DIN EN ISO 13468 - The stated thicknesses are not all available as standard. Please ask us for more information. The stated values are typical values only.

| Light transmission in %  | 2  | 3  | 4  | 5  | 6  | 8  | 10 | 12 | 15 |
|--------------------------|----|----|----|----|----|----|----|----|----|
| Makrolon® UV clear 2099  | 88 | 87 | 87 | 86 | 85 | 84 | 82 | 81 | 79 |
| Makrolon® UV white 2130  | 40 | 30 | 23 | 18 | 13 |    |    |    |    |
| Makrolon® UV white 2150  | 60 | 50 | 40 | 33 | 28 | 20 |    |    |    |
| Makrolon® UV bronze 2850 | 63 | 50 | 50 | 50 | 50 | 50 | 42 | 36 |    |
| Makrolon® UV grey 2760   |    | 62 | 55 | 49 | 43 | 34 | 26 |    |    |
| Makrolon® UV green 2650  |    | 77 | 73 | 71 | 68 | 62 | 60 | 56 |    |
| Makrolon® UV blue 2550   |    | 61 | 55 | 51 | 46 | 40 |    |    |    |

### Fire Rating (\*):

| Country | Standard                           | Rating                        | Thickness                                      | Color  |
|---------|------------------------------------|-------------------------------|--|--|
| UK      | BS 476 Part 7<br>BS 476 Part 7     | Class 1Y<br>Class 1Y          | 2,3,4,6 & 12 mm<br>5 mm                        | clear 2099<br>white 2130                               |
| France  | NF P 92-501&505<br>NF F 16-101&102 | M2<br>M2<br>F2<br>F1          | 2 – 15 mm<br>3 – 6 mm<br>2 – 15 mm<br>3 – 6 mm | clear 2099<br>bronze 2850<br>clear 2099<br>bronze 2850 |
| Europe  | EN 13501-1                         | B s1 d0<br>B s1 d0<br>B s2 d0 | 1 – 6 mm<br>1 – 3 mm<br>1 – 6 mm               | clear 2099<br>white 2150<br>all colors                 |
| USA     | UL94                               | V2<br>HB<br>V0                | 0.75 – 1.4 mm<br>≥ 1.5 mm<br>≥ 10 mm           | all colors<br>all colors<br>clear 2099                 |

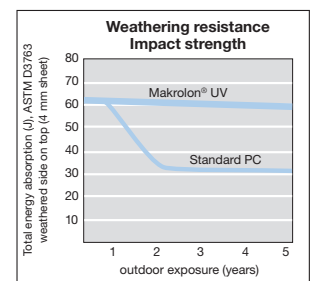
### Glow wire flammability index, IEC 60695-2-12, in °C (\*):

|                          | 2   | 3   | 4   | 5   | 6   |
|--------------------------|-----|-----|-----|-----|-----|
| Makrolon® UV clear 2099  | 800 |     | 960 |     | 960 |
| Makrolon® UV bronze 2850 |     | 960 | 960 |     |     |
| Makrolon® UV white 2130  | 960 | 960 | 960 |     |     |
| Makrolon® UV white 2150  |     | 960 | 960 | 960 | 960 |

(\*): Fire certificates could be limited in time and scope, always check if the mentioned certificate is valid for the purchased Polycarbonate sheet type at the date of delivery. Polycarbonate sheets may change their fire behavior due to ageing and weathering. The indicated fire rating was tested on new / unweathered Product in accordance with the indicated fire classification standards.

**Weathering Resistance: Makrolon® UV** sheets show excellent weathering resistance, which guarantees their impact strength even after many years. Since their introduction in 1989, the sheets have been examined in an intensive test program, including a real-time outdoor exposure test in a southern European climate (Bandol). The sheets are provided with a 10-year warranty on unbreakability and on optical properties.

**Permanent Service Temperature:** The permanent service temperature without load is approx. 120 °C.



**exolon**  
GROUP

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