



Product Data Sheet, January 2010

# Makrolon® UV

## Solid polycarbonate sheet

**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):**

2,050 x 1,250 mm  
3,050 x 2,050 mm  
6,110 x 2,050 mm

	Test Conditions	Typical Values	Unit	Test Method
<b>PHYSIQUE</b>				
Density		1.2	g/cm <sup>3</sup>	ISO 1183-1
Moisture absorption	after storage in standard climate 23 °C/50 % RH	0.15	%	ISO 62-4
	after storage in water at 23 °C until saturation	0.35	%	ISO 62-1
Refractive index	20 °C	1.586	–	ISO 489
<b>MECHANICAL</b>				
Tensile stress at yield		> 60	MPa	ISO 527-2/1B/50
Elongation at yield		6	%	ISO 527-2/1B/50
Tensile strength		> 60	MPa	ISO 527-2/1B/50
Elongation at break		> 70	%	ISO 527-2/1B/50
Elastic modulus		2,400	MPa	ISO 527-2/1B/1
Limiting flexural stress		approx. 90	MPa	ISO 178
Impact strength	Charpy, unnotched	no break	kJ/m <sup>2</sup>	ISO 179/1fU
	Charpy, notched	approx. 11	kJ/m <sup>2</sup>	ISO 179/1eA
	Izod, notched	approx. 10	kJ/m <sup>2</sup>	ISO 180/1A
	Izod, notched <sup>1)</sup>	approx. 70	kJ/m <sup>2</sup>	ISO 180/4A
<b>THERMAL</b>				
Vicat softening temperature	Method B50	148	°C	ISO 306
Thermal conductivity		0.2	W/m K	DIN 52612
Coeff. of linear thermal expansion		0.065	mm/m °C	DIN 53752-A
Heat deflection temperature under load	Method A: 1.80 MPa	127	°C	ISO 75-2
	Method B: 0.45 MPa	139	°C	ISO 75-2
<b>ELECTRICAL</b>				
Dielectric strength		35	kV/mm	IEC 60243-1
Volume resistivity		10 <sup>16</sup>	Ohm·cm	IEC 60093
Surface resistivity		10 <sup>14</sup>	Ohm	IEC 60093
Dielectric constant	at 10 <sup>3</sup> Hz	3.1		IEC 60250
	at 10 <sup>6</sup> Hz	3		IEC 60250
Dissipation factor	at 10 <sup>3</sup> Hz	0.0005		IEC 60250
	at 10 <sup>6</sup> Hz	0.009		IEC 60250

The mechanical properties were measured on sheets of 4 mm or 3 mm <sup>1)</sup> thickness.

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**S-Line** Bayer Sheet Europe 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 5036

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 (\*):**

Oxygen index (LOI) 28% ISO 4589-2 Method A.

Country	Standard	Rating	Thickness	Color
Germany	DIN 4102 DIN 5510-2 DIN 5510-2	B2 S3 SR2 ST2 S3 SR2 ST2	0,75 - 15 mm 4 mm 4 mm	all colors white 2130 white 2150
UK	BS 476 Part 7 BS 476 Part 7	Class 1Y Class 1Y	2,3,4,6 & 12 mm 5 mm	clear 2099 white 2130
France	NF P 92-501&505 NF F 16-101&102	M2 M2 F2 F2	2 – 15 mm 2 – 12 mm 2 – 15 mm 2 – 12 mm	clear 2099 bronze 2850 clear 2099 bronze 2850
Italy	CSE RF 2/75/A	Classe 1 Classe 1	2 – 10 mm roof 2 – 6 mm wall	all colors all colors
Europe	EN 13501-1	B s1 d0	1 – 6 mm 1 – 3 mm	clear2099 white 2150

**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 are limited in time, always check if the mentioned certificate is still valid.

**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 (Bandal) and in hot and humid regions (Florida and Singapore). 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.

