



Product Data Sheet, October 2004

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
PHYSICAL				
Density		1.2	g/cm ³	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
MECHANICAL				
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		2400	MPa	ISO 527-2/1B/1
Limiting flexural stress		ca. 90	MPa	ISO 178
Impact strength	Charpy, unnotched	no break	kJ/m ²	ISO 179/1fU
	Charpy, notched	ca. 11	kJ/m ²	ISO 179/1eA
	Izod, notched	ca. 10	kJ/m ²	ISO 180/1A
	Izod, notched ¹⁾	ca. 70	kJ/m ²	ISO 180/4A
THERMAL				
Vicat softening temperature	Method B50	148	°C	ISO 306
Thermal conductivity		0.2	W/m °C	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
ELECTRICAL				
Dielectric strength		35	kV/mm	IEC 60243-1
Volume resistivity		10 ¹⁶	Ohm-cm	IEC 60093
Surface resistivity		10 ¹⁴	Ohm	IEC 60093
Dielectric constant	at 10 ³ Hz	3.1		IEC 60250
	at 10 ⁶ Hz	3		IEC 60250
Dissipation factor	at 10 ³ Hz	0.0005		IEC 60250
	at 10 ⁶ Hz	0.009		IEC 60250

The mechanical properties were measured on sheets of 4 mm or 3 mm¹⁾ thickness.

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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			
Makrolon® UV blue 2550		61	55						

Fire Rating (*)

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

Country	Standard	Rating	Thickness	Color
Germany	DIN 4102	B2	≥ 0.75 mm	all colors
U.K.	BS 476 Part 7	Class 1Y	2,4,6,8 & 12 mm	clear 2099
France	NFP 92-501&505	M2	2 - 12 mm	clear 2099
		M2	2 - 12 mm	white 2130
		M2	2 - 12 mm	bronze 2850
	NFP 16-101&102	F1	2 - 15 mm	clear 2099
F1	2 - 12 mm	white 2130		
Italy	CSE RF 2/75/A	Classe 1 Classe 1	2 - 10 mm roof 2 - 6 mm wall	all colors all colors

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 (Bandol) 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.

