



MAKROTECH FR

Arla Plast MAKROTECH is our range of opaque coloured polycarbonate sheets. The product is virtually unbreakable with extremely high impact resistance. The product offers high temperature performance too.

MAKROTECH FR is flame retardant sheet produced with halogen free according to DIN VDE 472 part 815.

A yellow card on the base material is also available on the UL website.

MAKROTECH FR BENEFITS:

- Flame retardant (halogen free)
- High impact resistance and virtually unbreakable
- Wide temperature range

APPLICATION AREAS:

Flame retardant requirements (UL 94, oxygen index, glow wire) for indoor flat, curved and formed applications like electrical appliances, machine covers and containers.

DELIVERY PROGRAM:

Standard size: 1250 x 2050 mm

Max width:

- Smooth 00/00: 2050mm
- With embossing: 1700 mm

Thickness range: 1,5 – 8 mm

Colours: standard colours and customer specific colours

Embossing: 00/00, 00/35, 00/40

MAKROTECH FR TYPICAL PROPERTY VALUES

Property	Value	Unit	Standard
Physical properties			
Density	1,20	g/cm ³	ISO 1183
Moisture absorption 24 h, 23°C, 50% RH	0,15	%	ISO 62
Mechanical properties			
Tensile strength at yield (at break)	63 (70)	N/mm ²	ISO 527
Tensile elongation at yield (at break)	6 (110)	%	ISO 527
Elastic modulus	>2300	N/mm ²	ISO 527
Flexural modulus	>2300	N/mm ²	ISO 178
Izod notched impact strength +23 °C	>65	kJ/m ²	ISO 180/1A
Izod notched impact strength -30 °C	10	kJ/m ²	ISO 180/1A
Izod unnotched impact strength -30 °C	NB	kJ/m ²	ISO 180/1U
Charpy unnotched impact strength -40°C	NB	kJ/m ²	ISO 179/1eU
Charpy notched impact strength -30 °C	11	kJ/m ²	ISO 179/1eA
Charpy notched impact strength+23 °C	75	kJ/m ²	ISO 179
Rockwell hardness	M70	R-scale	ISO 2039-2
Hardness, H358/30	95	N/mm ²	ISO 2039-1
Thermal properties			
Coefficient of linear thermal expansion (20-70°C)	7x10 ^{-0,5}	K ⁻¹	ISO 11359-2
Heat deflection temperature, HDT A (1,80 N/mm ²)	127	°C	ISO 75
Heat deflection temperature, HDT B (0,45 N/mm ²)	138	°C	ISO 75
Vicat temperature VST/B 120	145	°C	ISO 306
Vicat temperature VST/B 50	141	°C	ISO 306
Thermal conductivity	0,20	W/mK	ISO 8302
Ball Pressure Test, 125 °C +/- 2 °C	Pass	-	IEC 60695-10-2
Fire properties			
UL 94 V0 Rating	1,5	mm	UL 94
UL 94 5VA Rating	3	mm	UL 94
Glow Wire Flammability Index 850 °C	passes at 1	mm	IEC 60695-2-12
Glow Wire Flammability Index 960 °C	passes at 1,6	mm	IEC 60695-2-12
Oxygen Index (LOI)	35	%	ISO 4589
Electrical properties			
Volume resistivity, dry	>10 ¹⁴	Ωm	IEC 60093
Surface resistivity, dry	>10 ¹⁵	Ω	IEC 60093
Dielectric strength	17	kV/mm	IEC 60243-1
Dissipation factor (tan δ), dry, 50 Hz	0,001	-	IEC 60250
Relative permittivity 50 Hz	2,7	-	IEC 60250
Relative permittivity 1 MHz	2,7	-	IEC 60250

Properties reported here are typical values. Arla Plast makes no representation that the material in any particular shipment will conform exactly to the values given. The above information is based upon experience and given in good faith. Due to many factors which are outside our knowledge and control, no warranty is given or is to be implied with respect to such information. Detailed product specification and technical manual/information is available on request.