



Makrolon® AL sheet

Automotive lamination

Makrolon® AL sheet is a one side hard coated polycarbonate product designed to meet the high optical quality requirements of automotive laminates. State-of-the-art manufacturing and inspection processes ensure minimal inclusions and surface defects. The advanced hard coat technology significantly enhances the abrasion resistance, chemical resistance, and weathering properties of the product while maintaining the excellent impact performance of Makrolon polycarbonate.

Applications

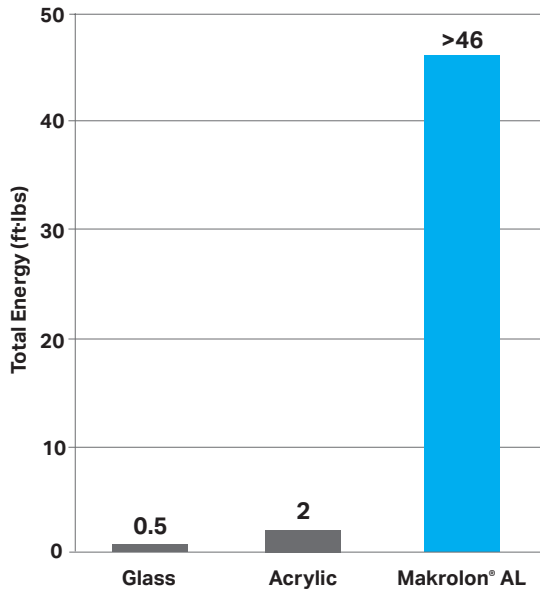
Automotive laminates

Typical Properties*			
Property	Test Method	Units	Values
PHYSICAL			
Specific Gravity	ASTM D 792	–	1.2
Refractive Index	ASTM D 542	–	1.586
Light Transmission, Clear @ 0.125"	ASTM D 1003	%	86
Water Absorption, 24 hours @ 73°F	ASTM D 570	%	0.15
Poisson's Ratio	ASTM E 132	–	0.38
MECHANICAL			
Tensile Strength, Break	ASTM D 638	psi	9,500
Tensile Strength, Yield	ASTM D 638	psi	9,000
Tensile Modulus	ASTM D 638	psi	340,000
Elongation	ASTM D 638	%	110
Flexural Strength	ASTM D 790	psi	13,500
Flexural Modulus	ASTM D 790	psi	345,000
Compressive Strength	ASTM D 695	psi	12,500
Compressive Modulus	ASTM D 695	psi	345,000
Izod Impact Strength, Notched @ 0.125"	ASTM D 256	ft-lbs/in	18
Izod Impact Strength, Unnotched @ 0.125"	ASTM D 256	ft-lbs/in	60 (no failure)
Instrumented Impact @ 0.125"	ASTM D 3763	ft-lbs	>46
Shear Strength, Break	ASTM D 732	psi	10,000
Shear Strength, Yield	ASTM D 732	psi	6,000
Shear Modulus	ASTM D 732	psi	114,000
Rockwell Hardness	ASTM D 785	–	M70 / R118
THERMAL			
Coefficient of Thermal Expansion	ASTM D 696	in/in/°F	3.75 x 10 ⁻⁵
Coefficient of Thermal Conductivity	ASTM C 177	BTU-in/hr-ft ² -°F	1.35
Heat Deflection Temperature @ 264 psi	ASTM D 648	°F	270
Heat Deflection Temperature @ 66 psi	ASTM D 648	°F	280
Brittleness Temperature	ASTM D 746	°F	-200

*Typical properties are not intended for specification purposes

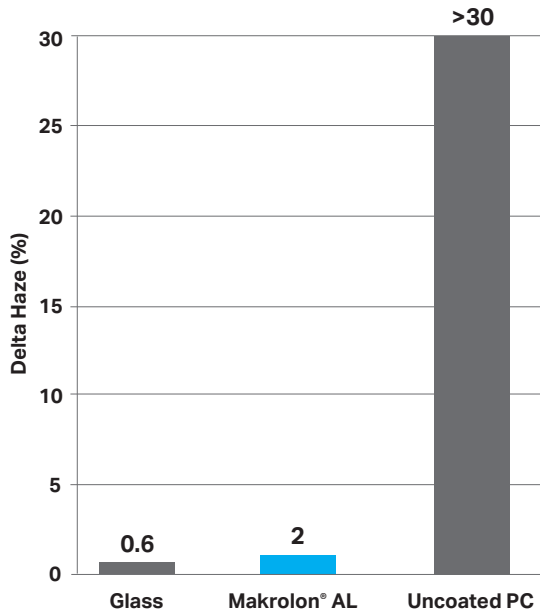
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Impact Resistance*



*Instrumented Impact per ASTM D 3763, sample thickness 0.125" nominal

Abrasion Resistance*



*Taber Abrasion per ASTM D 1044, 100 cycles, CS-10F wheel

Chemical Resistance*

Chemical Tested	Resistance Time
Acetone	>24 hrs
Ammonia (10% concentration)	>24 hrs
Antifreeze (50/50)	>24 hrs
Benzene	>24 hrs
Bleach (Clorox concentrated)	>24 hrs
Chloroform	>24 hrs
Denatured Alcohol	>24 hrs
Di (2-ethylhexyl) phthalate	>24 hrs
Diesel Oil	>24 hrs
Isopropyl Alcohol (IPA)	>24 hrs
Kerosene	>24 hrs
Methyl Alcohol	>24 hrs
Methyl Butyl Ketone	>24 hrs
Methyl Ethyl Ketone	>24 hrs
Methylene Chloride	>24 hrs
Naphthalene, 1-bromo-	>24 hrs
Potassium Hydroxide - Lye (10%)	>24 hrs
Sodium Hydroxide (10%)	>24 hrs
Toluene	>24 hrs
Turpentine	>24 hrs
Unleaded Gasoline (87 Octane)	>24 hrs
Vinegar	>24 hrs
Xylene	>24 hrs
Acids:	
Hydrochloric Acid (20%)	>24 hrs
Nitric Acid (20%)	>24 hrs
Sulfuric Acid (20%)	>24 hrs

*Tested in accordance to ASTM D 1308-02

Always keep hazardous chemicals away from uncoated edge of Makrolon Polycarbonate

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