made of makrolon®
High-tech plastic from Bayer

Product Data

MAKROLON® AR Sheet

Abrasion Resistant

MAKROLON® AR Sheet is a hard-coated polycarbonate product designed for exceptional durability in harsh environments. The advanced surface treatment provides outstanding resistance to abrasion when compared to uncoated transparent materials. MARKOLON AR features improved chemical resistance to common cleaners and solvents. This product is suitable for exterior applications where enhanced UV resistance is needed. MAKROLON AR Sheet has a seven (7) year Limited Product Warranty against breakage, yellowing and hazing for architectural glazing applications The terms of the warranty are available upon request.

Applications

Architectural glazing including correctional, detention, industrial and transportation shelters. machine guarding, heavy equipment and other applciation in harsh environments

Regulatory Code Compliance and Certifications

* IBC 2606.4, Class CC1 for gauges 60 - 500 mils
* Miami-Dade County NOA #08-0926.15
* CPSC 16 CFR 1201 Category II: Safety Standard for Architectural Glazing Materials
* ANSI Z97.1- 1984: American National Standard for Safety Glazing Materials Used in Buildings Safety Performance Specifications and Methods of Test
* UL 972: Burglary Resistant Glazing Materials UL Listed product UL File #BP2126
* UL 94 Flammability file # E71069

Typical Properties

Property	Test Method	Units	Values
PHYSICAL			
Specific Gravity	ASTM D792	-	1.2
Refractive Index	ASTM D542	-	1.586
Light Transmission, Clear @ 0.125"	ASTM D1003	%	86
Light Transmission, Gray, Bronze	ASTM D1003	%	50
Light Transmission, Dark Gray	ASTM D1003	%	18
Water Absorption, 24 hrs	ASTM D570	%	0.15
Poisson's Ratio	ASTM E132	-	0.38
Chemical Resistance	ASTM D1308	-	pass
MECHANICAL			
Tensile Strength, Ultimate	ASTM D638	psi	9,500
Tensile Strength, Yield	ASTM D638	psi	9,000
Tensile Modulus	ASTM D638	psi	340,000
Elongation	ASTM D638	%	110
Flexural Strength	ASTM D790	psi	13,500
Flexural Modulus	ASTM D790	psi	345,000
Compressive Strength	ASTM D695	psi	12,500
Compressive Modulus	ASTM D695	psi	345,000
Izod Impact Strength, Notched @ 0.125"	ASTM D256	ft·lbs/in	18
Izod Impact Strength, Unnotched @ 0.125"	ASTM D256	ft·lbs/in	60 (no failure)
Instrumented Impact, 0.125"	ASTM D3763	ft·lbs	>45
Shear Strength @ Yield	ASTM D732	psi	6,000
Shear Strength, Ultimate	ASTM D732	psi	10,000
Shear Modulus	ASTM D732	psi	114,000
Rockwell Hardness	ASTM D785	-	M70/R118
Taber Abrasion, 100 Cycles, CS10F wheel	ASTM D1044	%	1-2
THERMAL			
Coefficient of Thermal Expansion	ASTM D696	in/in/°F	3.75×10^{-5}
Coefficient of Thermal Conductivity	ASTM C177	BTU·in/hr·ft²·°F	1.35
Heat Deflection Temperature @ 264 psi	ASTM D648	°F	270
Heat Deflection Temperature @ 66 psi	ASTM D648	°F	280
Brittleness Temperature	ASTM D746	°F	-200
Shading Coefficient, Clear 0.125"	ASHRAE	-	1.02
Shading Coefficient, Gray, Bronze 0.125"	ASHRAE	-	0.70
U factor 0.25" (summer gain, winter loss)	ASTM D1363	BTU/hr·ft²·°F	0.90, 0.96
ELECTRICAL			
Dielectric Constant, @10Hz	ASTM D150	-	2.96
Dielectric Constant @ 60Hz	ASTM D150	-	3.17
Volume Resistivity	ASTM D257	Ohm·cm	8.2×10^{16}
Dissipation Factor @ 60 Hz	ASTM D150	-	0.0009
Arc Resistance	-	-	-
Stainless Steel Strip electrode	ASTM D495	Seconds	10-11
Tungsten Electrodes	ASTM D495	Seconds	120
Dielectric Strength, in air @ 0.125"	ASTM D149	V/mil	380
FLAMMABILITY			
Horizontal Burn, AEB	ASTM D635	inch	<1
Ignition Temperature, Self	ASTM D1929	°F	1070
Ignition Temperature, Flash	ASTM D1929	°F	870
Flame Class, Clear @ 0.060"	UL 94	-	HB
Flame Class, Clear @ 0.236"	UL 94	-	V1

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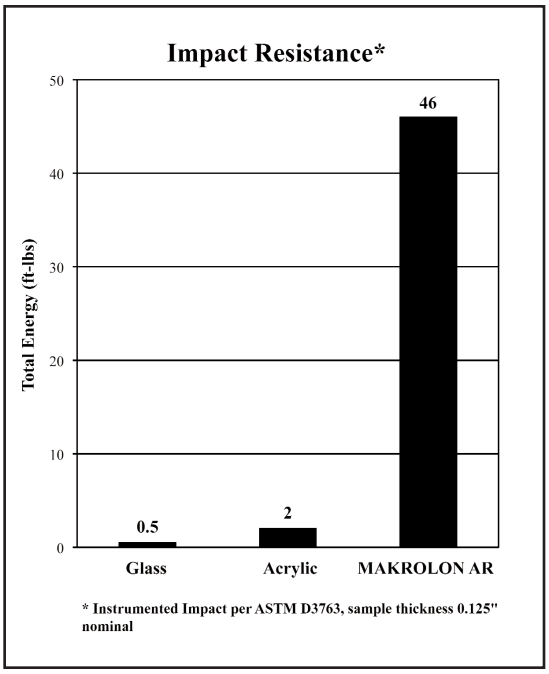
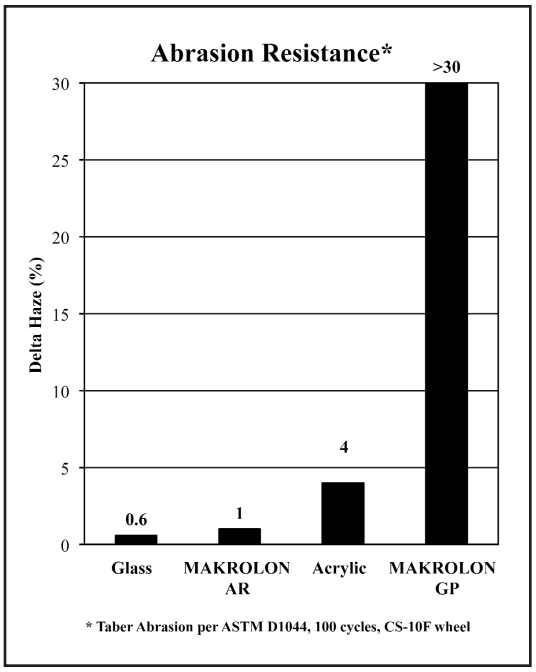
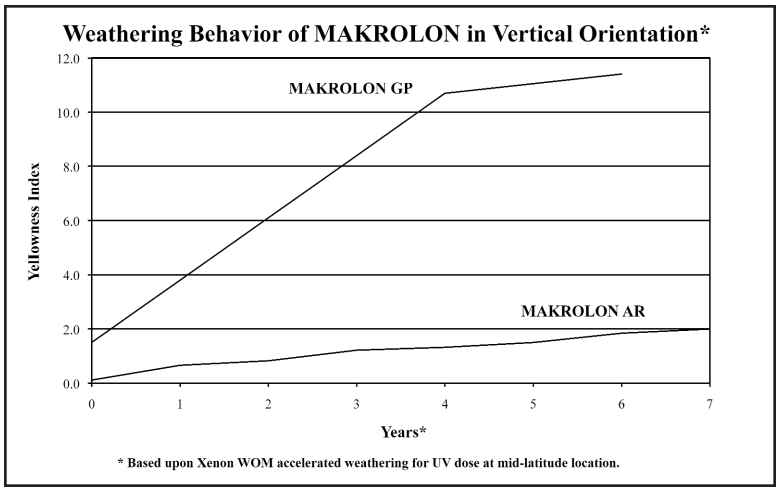


* Instrumented Impact per ASTM D3763, sample thickness 0.125" nominal



* Taber Abrasion per ASTM D1044, 100 cycles, CS-10F wheel



* Based upon Xenon WOM accelerated weathering for UV dose at mid-latitude location.

Chemical Resistance

Chemical Tested	Resistance Time
acetone	>24 hrs
ethylene dichloride (EDC)	>24 hrs
gasoline	>24 hrs
hydrochloric acid (10%)	>24 hrs
isopropyl alcohol (IPA, isopropanol)	>24 hrs
kerosene (paraffin)	>24 hrs
methyl alcohol (methanol)	>24 hrs
methylene chloride (DCM, dichloromethane)	>24 hrs
methyl ethyl ketone (MEK, butanone)	>24 hrs
nitic acid (100%)	<24 hrs
sodium hydrochloride (10%)	<24 hrs
sulfuric acid (1%)	>24 hrs
toluene (methlbenzene)	>24 hrs

* Tested in accordance to ASTM D 1308

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