

CO-EX
POLYCARBONATE
MACRO
EX
CORPORATION

ON AIR

ADSPACE

ADSPACE

MACROLUX C FLAT SHEET POLYCARBONATE

BY **CO-EX**
CORPORATION

OUTSTANDING LIGHT
TRANSMISSION

IMPACT STRENGTH

LONG TERM
CHEMICAL-PHYSICAL
STABILITY

HEAT RESISTANT

PERFECT FOR
CONSTRUCTION,
SIGNAGE, SAFETY
SHIELDS, VEHICLES,
ELECTRIC PANELS &
MORE!



A SOLID CHOICE IN POLYCARBONATE PANELS



APPLICATIONS A unique combination of properties in the Macrolux C sheet provides the outstanding levels of light transmission, impact strength, resistance to mechanical stresses and exceptional long term chemical-physical stability that builders and fabricators crave.

CONSTRUCTION - Macrolux C is perfect for safety glazing, protective screens, skylights/domes and tunnels. The superior breakage resistance of Macrolux C makes it an ideal choice where vandal proofing and safety are concerns.

SIGNAGE - With exceptional impact resistance and ease of fabrication, it is possible to obtain an infinite range of shapes and sizes by thermoforming, cold curving, or machining. Macrolux C is perfect for billboards, illuminated signs and street signs.

ELECTRICITY - Macrolux C meets the requirements for heat resistance, dimensional stability, shock resistance, resistance to atmospheric humidity, ease of fabrication and transparency that the electrical industry demands. It is ideal for lampshades, electrical panels and chassis fabrication.

MACHINERY - Due to its resistance to breaking and cracking, a Macrolux C Sheet is easy to cut or drill and can be simply secured with nuts and bolts. It can easily be made into machine guards, shock resistant shields and shatterproof containers.

VEHICLES - With its ease of machining, transparency and dimensional stability, the solid Macrolux C sheet can be fabricated into windscreens, glazing, interior finish components, and electrical parts.

HELMETS - Macrolux C can be effectively thermoformed and with its lightweight characteristics, it's ideal for body shields and visors.

INDUSTRY - Shatterproof containers, with or without sterilization requirements, both transparent and opaque can be formed from the Macrolux C sheet. With its outstanding impact resistance, dimensional stability, and ease of fabrication, a huge range of shapes and sizes are obtainable.

PRODUCT SPECIFICATIONS

Product options include standard Macrolux C or Macrolux C (UV1) or Macrolux C (UV2)
Colors: Standard in Clear, however, custom colors available upon request. ISO Certification

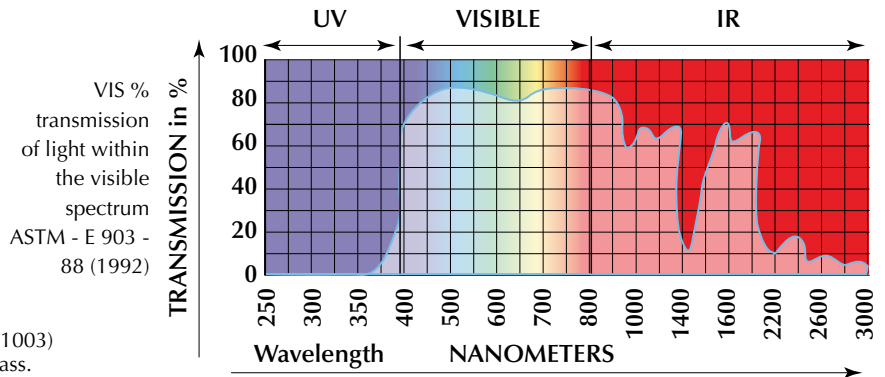
PRODUCT	INCHES	MM	LB./SF	COLOR	WIDTH	LENGTH	PALLET QUANTITY
FLAT SHEET POLYCARBONATE	.110" (7/64")	2.8mm	0.69	CLEAR	4'	8'	115
	.118" (1/8")	3.0mm	0.74				96
	.177" (3/16")	4.5mm	1.11				62
	.220" (1/4")	5.6mm	1.37				50
FLAT SHEET POLYCARBONATE	.110" (7/64")	2.8mm	0.69	CLEAR	5'	8'	96
	.118" (1/8")	3.0mm	0.74				79
	.177" (3/16")	4.5mm	1.11				52
	.220" (1/4")	5.6mm	1.37				42
FLAT SHEET POLYCARBONATE	.110" (7/64")	2.8mm	0.69	CLEAR	6'	8'	76
	.118" (1/8")	3.0mm	0.74				64
	.177" (3/16")	4.5mm	1.11				42
	.220" (1/4")	5.6mm	1.37				34

MACROLUX C - TECHNICAL DATA

LIGHT TRANSMISSION AND HAZE

THICKNESS (mm)	COLOR	% LIGHT TRANSMISSION	% HAZE
3	Clear	87.3%	0.6%
4	Clear	87.6%	0.8%
6	Clear	84.2%	0.6%
8	Clear	82.3%	1.3%

Typical light transmission and haze (tested with ASTM D-1003)
Macrolux C sheet displays light transparency similar to glass.



SOUND TRANSMISSION

THICKNESS (mm)	STC Rating
3	25
4	29
6	31
8	34

SHADING COEFFICIENT - THERMAL PROPERTIES

THICKNESS (mm)	COLOR	U-Value Winter (Btu/hr-ft²F)	U-Value Summer (Btu/hr-ft²F)	% Solar Energy Rejected	Relative Heat Gain (Btu/hr-ft²F)	Shading Coefficient
4	Clear	1.01	0.96	18	203	0.95
2	Opal	1.08	1.04	45	142	0.64
4	Bronze	1.02	1.05	51	128	0.57

Macrolux C sheets can be used as an acoustic barrier in glazing applications by itself or in combination with glass

PHYSICAL PROPERTIES OF MACROLUX C

PROPERTY	METHOD	UNITS	VALUE
Tensile Strength at Break	ASTM D638	MPa	78
Elongation	ASTM D638	%	9-95
Flexural Strength	ASTM D790	MPa	95
Density	ASTM D792	g/cm³	1.2
Water Absorption	ASTM D570	%	0.08
HDT	ASTM D648	°C	137
Coefficient Thermal Expansion	ASTM D696	U mm C	72.7
Coefficient Thermal Conductivity	ASTM D785	Mw/cm K	2.1
Rockwell Hardness	ASTM D635	M	75
Flammability	UL 94	—	HB
Burning Time Damage	ASTM D635	20mm in 65 sec.	
Durolon polycarbonate resin	UL-94-HB		1.5mm



CHEMICAL	RESISTANCE or EFFECT
Acids	Almost no change in appearance and physical properties
Alcohol	Ethanol, Isopropyl and ethylic do not cause damage. Methanol alcohol causes damage to polycarbonate
Alkalis	May cause decomposition, swelling or dissolution
Aliphatic hydro carbonates	Does not cause damage to polycarbonate
Amino	May cause decomposition, swelling or dissolution
Aromatically hydro carbonates	May cause decomposition, swelling or dissolution
Detergents	Neutral soap solutions do not cause damage. However, light alkaline detergents must be avoided
Ether	May cause decomposition, swelling or dissolution
Grease and Oils	Avoid. Many additives used in these materials cause severe chemistry damage to polycarbonate
Halogen hydro carbonates	At 85°C of maximum temperature does not cause damage. However, these products should be avoided as they may have aromatic hydro carbonates in their composition.



FABRICATION

For most efficient fabrication, we recommend you use the following guideline. It is possible for the friction and heat of your cutting blade to weld your sheet back together as you cut, so keep it simple and safe with these recommendations.

CUTTING

Saw	Circle	Tape
Angle i	20° - 30°	20° - 30°
Angle s	15°	0.5°
Cut	10 - 15 mm/min.	2 - 2.5mm/min.
Blade vel.	1800 - 2000 m/min.	450-800 m/min.
Pitch	6 - 8mm	1.5 - 3mm
For thickness of 3mm we suggest a circular saw		

DRILLING

Use steel, carbon or high speed tips.
 $l = 15^\circ$, $s = 0$ to 15° , $i = 150^\circ$ to 180°

Hole Diameter	Speed/min	Progress mm/turn
3 mm		0.03 - 0.07
6 mm	1000 - 1500mm	0.03 - 0.07
9 mm	650mm	0.02 - 0.07
12 mm	300 - 600mm	0.07
18 mm	300mm	0.07

SHEARING

We suggest a maximum 3mm thickness for shearing
 $l > 45^\circ$, $s = 0.051$ to $0.03mm$

TURN - $l = 20^\circ$, $s = 5^\circ$, Speed = 500 - 1000 m/min.

BENDING to 20"

Sheet Thickness	Bending Radius	Bending Angle
1 - 2 mm	2 mm	90°
3 - 4 mm	3 mm	90°
5 - 6 mm	5 mm	90°

MAINTENANCE

Clean the sheets at least once a month. Adjust the cleaning schedule as needed for your application. If the cleaning schedule is maintained, water should be sufficient to clean the sheet. Do not use chemical cleaners, bleach or household cleaning products. If dirt has accumulated, you may apply a mild soap and use a soft cloth or soft bristle brush. For heavy cleaning use isopropyl alcohol with a soft cloth. Rinse thoroughly with plenty of water to avoid soap or alcohol residue spotting. Cleaning in shaded areas, early morning or late afternoon produces the best results for drying.

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 FOR MORE INFORMATION
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MILLING

We recommend using metal working tool for milling. $i = 20^\circ$ to 25° , $s = 0^\circ$ to 5°
 Tool speed: 100 to 500 n/min.
 Cutting speed: 0.1 to 0.5 m/turn

GRINDING

We recommend you use water to avoid overheating the sheet. A manual orbital type grinder may be used with a paper grit from 150 to 500.

POLISH

Polish with cloth disks which should be clean and dry, and rotated at 1450 rpm. A chrome oxide abrasive paste may be used to start the polishing process.

WELDING

Welding is only effective for small items. It can be achieved using hot air at 887° to $940^\circ F$. For most efficient welding, we suggest using a desiccate to dry the joint.

GLUING

A wide variety of adhesives may be used to fit your needs. The operating temperature, the materials being glued and the final use of the finished piece all need to be considered. Please check with a CO-EX professional for the proper adhesive.

THERMOFORMING

All thermoforming techniques may be applied utilizing the following guidelines:

Drying: $120^\circ C$
 $2mm=4h$, $3mm=8h$, $4mm=13h$, $5mm=18h$, $6mm=24h$
 Heating: $185^\circ C$
 Extraction Angle 7°
 Retirement: 0.5-1%



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