# Macrolux®

## MULTIWALL POLYCARBONATE SHEET

by COEX CORPORATION

# Macrolux® MULTIWALL
## POLYCARBONATE SHEET

## CO-EXTRUDED THERMOGLAZING

*Multiwall (Twin, Triple, Four, Five and M-wall) polycarbonate sheets from CO-EX Corporation are assuming a more and more important role in the transparent building materials market. To meet your growing requirements and to serve you more efficiently, we have expanded our customer service department. Let us show you what an enjoyable experience it can be to work with CO-EX Corporation!*

- **APPLICATIONS**

Macrolux is perfect for applications requiring material which offers high light transmission, thermal insulation, light in weight yet strong, high shock resistance, flame retardance, great economy, vandal resistance and design flexibility. Consider using Macrolux panels in your project.

HORTICULTURAL: for greenhouse coverings where good thermal insulation is necessary together with high light transmission.

INDUSTRIAL BUILDING: for various glazing applications, skylights, walkways, windows, shelters, and insulated roofing.

ARCHITECTURAL GLAZING: with the ability to be cold-formed into arches, Macrolux offers architects design freedom that is not possible with other glazings. Consider the possibilities of using Macrolux for walkways, indoor shopping centers, swimming pool coverings, skylights, and other space enclosures.

HOME IMPROVEMENT: for easy do-it-yourself projects like window replacements, shower enclosures, hobby greenhouses, partitions, light covers, patio covers, carports and more.

Macrolux sheeting has been designed as a glazing or wall forming material. If use is contemplated for some other purpose, it is recommended that the user submit to CO-EX details concerning the proposed application for review as to the suitability of the sheeting for the application.

- **VIRTUALLY UNBREAKABLE**

Able to stand extreme abuse, its impact strength is 200 times greater than glass and 10 times greater than acrylic.

- **CONDENSATION CONTROL**

A factory applied condensation control is available on 8 mm, 4 foot wide Macrolux panels. Reducing surface tension, the condensation control allows water to spread into a thin sheet rather than form into droplets. It is available for all applications from greenhouses to backyard patio covers.

- **EASY TO INSTALL**

Macrolux won't crack or split when cut or drilled.

- **EXTRA WIDE PANELS**

Standard widths of 4 feet and 6 feet are available with lengths up to 39'.

- **TRANSPARENT**

Offering up to 83% light transmission in its clear form it is also available in bronze, opal, and special order custom colors.

- **LIGHTWEIGHT**

Weighing just one-eighth the weight of glass, these panels are self supporting and do not require the extensive structural support that a heavier glass wall or skylight needs.

- **HIGHLY FLEXIBLE**

Unlike glass and acrylic, Macrolux panels can be readily cold formed to many bending radii and can be fabricated on site to precise dimensions.

- **SAVES ENERGY**

The walled construction of these panels gives excellent thermal insulating values while blocking UV transmission.

- **WARRANTY**

Macrolux is backed by a 10 year limited warranty on light transmission and breakage caused by hail.

# TECHNICAL DATA

Immediate delivery of sheets in 4 and 6 foot widths. Sheets may be supplied cut to your exact size specifications with no extra cutting charges.

| SHEET | MM | 4 | 4.5 | 6 | 8 | 10 | 10 | 16 | 16 | 16 | 20 | 25 | 25 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THICKNESS | INCH | 5/32 | 3/16 | 1/4 | 5/16 | 3/8 | 3/8 | 5/8 | 5/8 | 5/8 | 3/4 | 1 | 1 | 1 - 1/4 |
| WALL TYPE | | Twin | Twin | Twin | Twin | Twin | Triple | Triple | Five | M | Triple | Five | Five/M | Five/M |
| RIB SPACING | INCH | .236 | .236 | .236 | .354 | .354 | .787 | .787 | .787 | — | .787 | .787 | N/A | N/A |
| STRUCTURE TYPE | Twin Wall Version | | Triple Wall Version | | | M-Wall Version | | | Five M-Wall Version | | | | Five Wall Version | |
| WEIGHT (lbs./ft.$^2$) | | .18 | .20 | .27 | .35 | .41 | .41 | .55 | .57 | .57 | .64 | .70 | .70 | .80 |
| LIGHT TRANSMISSION ASTM-D1003 (%) | CLEAR | 83% | 83% | 82% | 81% | 80% | 79% | 76% | 50% | 70% | 76% | 60% | 60% | 45% |
| | BRONZE | 55% | 55% | 54% | 52% | 46% | 40% | 31% | 32% | 28% | 32% | 20% | 26% | 10% |
| | OPAL | 71% | 71% | 70% | 66% | 50% | 48% | 35% | 36% | 35% | 32% | 30% | 30% | 13% |
| MINIMUM BENDING RADIUS (FT./1 INCH) | | 1' – 11" | 2' – 2" | 2' – 11" | 3' – 11" | 4' –11" | 4' – 11" | 7' – 10" | 7' – 10" | 7' – 10" | 9' - 10" | 12' - 5" | 12' - 5" | 15' - 8" |
| U FACTOR (BTU/hr.– ft.$^2$F).70 | | .69 | .63 | .60 | .56 | .54 | .40 | .37 | .49 | .37 | .28 | .29 | .31 | .28 |
| R-VALUE | | 1.43 | 1.45 | 1.59 | 1.67 | 1.79 | 1.85 | 2.50 | 2.93 | 2.70 | 2.70 | 3.57 | 3.26 | 3.58 |

Tolerances: Thickness ± 5% , Length O + 1", Width ±1%

# Macrolux

## CO-EXTRUSION

Macrolux co-extruded thermoglazing incorporates new technology which results in exceptional resistance to ageing. Macrolux multiwall is a high performance polycarbonate sheet. During manufacture, a layer of U.V. absorber is co-extruded onto the surface of the sheet, forming a barrier against U.V. radiation. This gives Macrolux multiwall exceptional resistance to ageing without affecting the mechanical properties and impact strength.

## ENERGY SAVING

Macrolux multiwall sheets also offer high thermal resistance, promoting energy savings of up to 60% over traditional glazing.

## IMPACT RESISTANCE

Among the thermoplastic products used in the building industry, Macrolux co-extruded thermoglazing has the highest impact resistance. You can be assured that from transport to installation, Macrolux will maintain its durability. Even when exposed to elevated temperatures over a long period of time, it will maintain its structural integrity. On-site, it will not crack or splinter during fabrication, assuring you a high degree of safety.

Macrolux is so strong it withstands the impact of 16 lbs. dropped 25 feet on an 8 mm panel with no breakage. It will maintain its impact strength over a wide temperature range from – 40F to 250F.

## FLAMMABILITY

Macrolux polycarbonate sheets are classified as self-extinguishing. Compared with other plastic products used in the building industry, Macrolux multiwall sheets have an exceptional fire performance and most importantly, do not give off toxic gasses.

| COMPARATIVE WEIGHTS (lb/ft²) | | | | | |
|---|---|---|---|---|---|
| Thickness (mm.) | Macrolux Panels | Acrylic Sheet | Glass Single Glazing | PVC Sheet | Glass Double Glazing |
| 6 | 0.266 | 1.45 | 3.02 | 1.72 | 6.15 |
| 8 | 0.350 | 1.93 | 4.10 | 2.29 | 8.19 |
| 10 | 0.410 | 2.92 | 5.12 | 2.87 | 10.24 |
| 16 | 0.555 | 3.87 | 8.20 | — | — |

# MULTIWALL POLYCARBONATE SHEET

## CHEMICAL RESISTANCE OF POLYCARBONATE at 73°F

The list below indicates the resistance of polycarbonate to chemicals and various products. Resistance can be effected by the chemicals concentration, duration of exposure, degree of pressure and temperature at time of contact.

### CHEMICALS

- Acetone
- Ammonia
- Carbon Dioxide, moist
- Citric Acid 10%
- Ethyl Alcohol, 96% pure
- Hydrochloric Acid, 20%
- Isopropyl Alcohol
- Kerosene
- Ozone
- Petroleum
- Propane Gas
- Sulphur Dioxide
- Sulfuric acid, 50%

### DETERGENTS

- Ajax Cleanser
- Laundry Soap
- Soft Soap

### LUBRICATING OILS

- Automatic Switch Grease
- Silicone Oils
- Brake Fluid
- Cable Insulating Oil IG 1402
- Cable Insulating Oil KH 190
- Diesel Oil
- Drilling Oil
- Fish Oil
- Heating Oil
- Jet Fuel (JP4)
- Paraffin
- Silicone Fluid
- Turpentine
- Varnish

### ADHESIVES

- All-purpose Glue
- Gypsum
- Insulating Tape
- Putty
- Rubber

### VARIOUS

- Battery Acid
- Cement
- Floor Polish
- Natural Rubber
- Ocean Water

### SYMBOLS

Resistant — Conditionally Resistant — Non-Resistant

# Macrolux® MULTIWALL POLYCARBONATE SHEET

## RECOMMENDED LOADING

### Guidelines for Selecting Sheet Thickness and Purlin Spacing (Sheet Supported on the Four Sides)

**MAXIMUM PURLIN SPACING (inches) DEFLECTION – 1"**

| LOAD PER GAUGE (lb./ft.²) | 4' WIDTH | | | |
|---|---|---|---|---|
| | 15 | 30 | 45 | 60 |
| 6 mm 1/4" | 32" | 22" | 12" | — |
| 8 mm 5/16" | 38" | 28" | 18" | — |
| 10 mm 3/8" | 45" | 34" | 28" | 24" |
| 16 mm 5/8" | 75" | 43" | 36" | 30" |
| 20 mm 3/4" | 80" | 48" | 41" | 35" |
| **LOAD PER GAUGE (lb./ft.²)** | **6' WIDTH** | | | |
| | **15** | **30** | **45** | **60** |
| 6 mm 1/4" | 26" | 12" | — | — |
| 8 mm 5/16" | 36" | 26" | 12" | — |
| 10 mm 3/8" | 44" | 33" | 27" | 22" |
| 16 mm 5/8" | 60" | 40" | 36" | 30" |

**MAXIMUM PURLIN SPACING (inches) DEFLECTION - 3"**

| LOAD PER GAUGE (lb./ft.²) | 4' WIDTH | | | |
|---|---|---|---|---|
| | 15 | 30 | 45 | 60 |
| 8 mm 5/16" | 80" | 54" | 46" | 40" |
| 10 mm 3/8" | 96" | 69" | 58" | 54" |
| 16 mm 5/8" | 120" | 110" | 104" | 84" |
| 20 mm 3/4" | 125" | 115" | 109" | 89" |
| **LOAD PER GAUGE (lb./ft.²)** | **6' WIDTH** | | | |
| | **15** | **30** | **45** | **60** |
| 8 mm 5/16" | 60" | 44" | 38" | 34" |
| 10 mm 3/8" | 80" | 56" | 44" | 38" |
| 16 mm 5/8" | 120" | 78" | 72" | 62" |

## LOAD RESISTANCE

A wide range of applications is available with Macrolux multiwall polycarbonate sheet. In order to evaluate the loads for each application, a reference diagram has been prepared for sheets supported on 4 sides with purlin spacing. This diagram is valid only when the following conditions are followed:

- Correct calculation of expansion in order to provide for the necessary allowance in the framing. The thermal expansion coefficient is 0.0000375 in/in °F.
- Install the sheets with the ribs running vertically and follow bending specifications.
- Washers and sealing materials must be compatible with polycarbonate.

## PRACTICAL ADVICE

Macrolux is supplied with a protective PE film on both sides which should be kept on until work is completed. The U.V. protected side is to be faced towards the sun and is marked with a white printed film or light blue film or a sticker saying Macrolux multiwall polycarbonate sheet. Macrolux crates or sheets should be stocked in an area not exposed to the sun or direct heat from the sun which could make the removal of protective film difficult.

Stiff fixing by means of adhesive or putty is to be avoided. Top and bottom ends of a sheet must always be sealed by means of the proper polycarbonate profiles or an adhesive aluminum tape to prevent dust or dirt penetrating the inside of the ribs.

## BENDING RADII

Macrolux multiwall sheets can be cold formed and used in many curved applications e.g. arched walkways. Sheets must always be bent longitudinally, never across the width of the sheet.

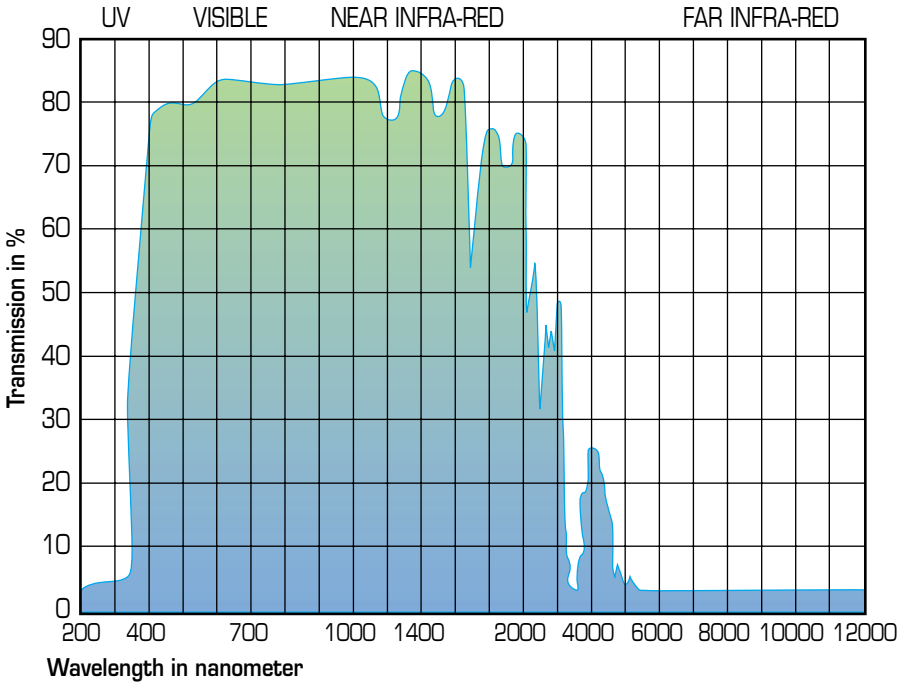
In applications of this nature it is important to avoid over tensioning of the sheet. Therefore, when Macrolux multiwall is cold formed, the minimum radius should not be less than 150 times the thickness of the sheet.

## LIGHT TRANSMISSION

Macrolux multiwall sheets provide a wide variety of thicknesses and colors providing up to 83% visible light transmission.

Macrolux multiwall sheets are essentially opaque at all wavelengths below 385 namometers limiting the damaging effects of UV light. They have a clear co-extruded outer surface which provides high stability against the effects of UV radiation and gives excellent durability to outdoor weathering. This unique protection insures long term optimal quality under intensive UV exposure.

## LIGHT TRANSMISSION SPECTRUM OF THE CLEAR PANEL

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## SPECIFICATIONS

GENERAL - The contractor shall supply window/skylight materials complete with related extruded profiles. The system shall be available in sizes ranging from 4 mm (5/32") to 35 mm (1-3/8"). The system shall be Macrolux multiwall polycarbonate structured sheet with all necessary extruded polycarbonate accessories as manufactured by CO-EX Corporation, Wallingford, CT.

Application by other manufacturers for "approved equal" status must be received at least 20 days prior to the bid date and must include sample units of a size representative of those to be used on this project and must state any intended deviation or exclusion from this specification.

**MANUFACTURE** - The Macrolux polycarbonate sheet shall be manufactured in a continuous co-extrusion process with a layer of U.V. stabilizer coextruded into the sun facing surface which will protect the sheet from excessive weathering. The Macrolux sheet shall be classified as a light transmitting plastic.

**GLAZING** - Glazing material shall be Macrolux as manufactured by CO-EX Corporation, Wallingford, Connecticut. Glazing sheet shall be joined by Macrolux extruded polycarbonate profiles. Sheets shall be installed with their protective U.V. stabilizer layer placed towards the exterior. Extruded ribs shall be installed in a vertical direction for drainage. Exposed ends shall be properly enclosed to prevent dirt from entering the sheet.

Glazing shall be supplied in clear, bronze, and opal polycarbonate material. Macrolux material shall be warranted for a period of 10 years. For complete information regarding thermal expansion or required supporting structure for your specific application, contact CO-EX Corporation.

**CLEANING AND HANDLING** - Macrolux should be protected from abrasion by the installer. After installation, panels shall be washed with mild soap or detergent and lukewarm water using only a clean sponge or soft cloth, then rinsed with clean water. Fresh paint, grease, and smeared glazing compounds may be removed before drying by rubbing lightly with a good grade of naptha or isopropyl alcohol followed by a final wash with mild soap or detergent and final rinse.

Macrolux shall be stored in warehouse areas not exposed to direct heat or light, with sloped stacking recommended. All panels shall be shipped with protective polyethylene film.

**U PROFILE**
**End Cap**

**SNAP H PROFILES**
**Joins 2 sheets**

**H PROFILE**
**Joins 2 sheets**

**CORNER PROFILE**
**Joins 2 sheets at 90°**

CO-EX CORPORATION

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