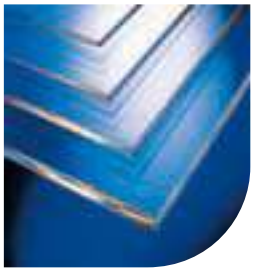
September 2007

durracryl®

acrylic translucent sheeting



marcryl fs®

Solid Acrylic Sheet

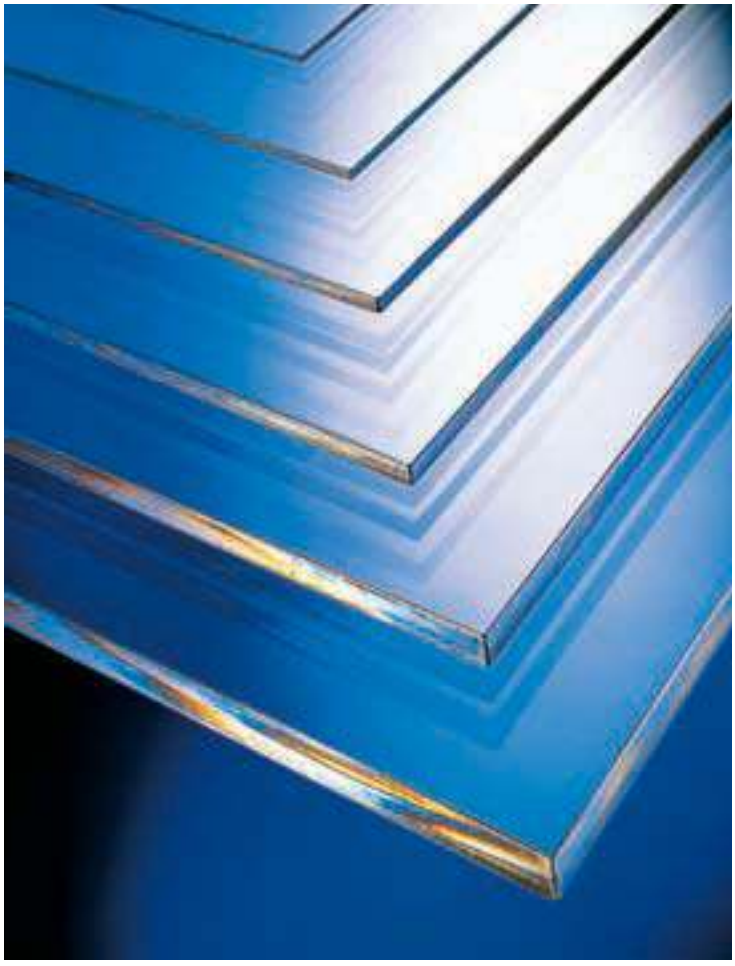
DUROplastic

Certified distributor of Brett Martin

marcryl fs®

SOLID ACRYLIC SHEET

Marcryl FS is a top quality extruded acrylic sheet with a high gloss finish, good optical clarity and excellent weatherability. Brett Martin is one of the world's leading thermoplastic sheet producers and this expertise ensures Marcryl FS is a superb acrylic sheet. Strict production and quality control mean that the sheet's physical properties are always the same, ensuring consistent results when the material is fabricated. The versatility, ease of fabrication and scratch resistance of Marcryl FS render it suitable for a wide variety of applications in the display, fabrication and building industries.



BENEFITS

- Good optical clarity with light transmission up to 92%
- Easy to fabricate with excellent thermoforming capabilities
- Good scratch resistance
- Simple scratch removal - polishing removes scratches easily
- Outstanding weatherability and resistance to high temperatures
- UV stable
- Weight savings over glass
- Exceptionally long life and resistance to natural ageing
- Inert to many corrosive materials
- Full range of sheet sizes available for optimum economic usage

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STANDARD TINTS

Clear sheet has excellent optical clarity and a glossy finish, suitable for a wide range of applications, whilst **opal** option provides good light diffusion and can be used for dramatic lighting effects.

NON-STANDARD TINTS

Silica green sheet is available with a green edge which looks like tempered glass. Also available in the range is **dense white** sheet that provides an opaque option.

APPLICATIONS

Protective covers

- Lighting
- Machinery
- Posters
- Automotive
- Menu boards

Design

- Glazing
- Light fittings
- Decoration
- Furniture
- Interior design projects

Signage

- Illuminated
- Non-illuminated

POS & POP displays

- Store fixtures
- 3-Dimensional

A range of diverse and unusual applications

- Sun beds
- Overhead projectors
- Picture framing


IN A BASKET
Chicken Balti
SPRING ROLLS
CHIPS
Large
Regular
MEAL DEAL COMEDY
ON A PLATE
Steak
Fish and Chips
NACHOS
Main dish
Side dish
Need access to electoral legislation?
FAMILIAR?
A BETTER WAY
quick and easy access
Access to the text for copying and emailing
ballotlaw

marcryl fs®

PRODUCT RANGE

COLOUR	SHEET SIZE (mm)	SHEET THICKNESS (mm)
Clear (S)	1250 x 2500	2, 3, 4, 5 & 6
	2050 x 3050	2, 3, 4, 5, 6, 8 & 10
Opal 30 (AG)	2050 x 3050	2, 3, 4 & 5
Silica Green (GM†)	2050 x 3050	3, 5, 6, 8 & 10
Dense White (FL†)	2050 x 3050	3 & 5

† Non-standard product - minimum order quantities, please contact the Sales Office

PROPERTIES	TEST METHOD	VALUE
Physical		
Density	DIN 53479	1.19g/cm³
Water absorption	DIN 53495: A	30mg
Weight		3.57kg/m² (3mm)
		7.14kg/m² (6mm)
Thermal		
Heat distortion temperatures		
Method B (0.45 MPa)	DIN 53461	95ºC
Method A (1.81 MPa)	DIN 53461	90ºC
Thermal conductivity	DIN 52612	0.19W/K.m
Coefficient of thermal expansion	DIN 53752: A	70m/m.K x 10⁻⁶
U value		5.6W/m²K (3mm)
Fire Performance		
Material thickness 3mm	DIN 4102	B2
Service Temperature		
Marcryl FS can be installed in a diversity of applications, with varying temperatures. The material's mechanical performance is known to remain stable in prolonged service in temperatures ranging from -20 to +80ºC.		
Mechanical		
Tensile strength @ -40ºC	DIN 53455	100MPa
Tensile strength @ 23ºC	DIN 53455	72MPa
Tensile strength @ 70ºC	DIN 53455	35Mpa
Light Transmission		
Clear S (3mm)	DIN 5036	92%
Opal AG (3mm)	DIN 5036	34%
Opal AG (5mm)	DIN 5036	33%
Tolerance		
Width up to 2050mm		+/- 5mm
Length up to 5m		-0, +10mm
Length over 5m		-0, +25mm
Thickness: 2-10mm		+/- 0.05mm

FABRICATING

MACHINING & MILLING

Marcryl FS is easy to work with using most standard workshop equipment and can be machined on conventional high-speed milling machines. To ensure the best quality results, tool speed should be kept at the optimum level possible without causing the sheet to overheat (cooling measures can also be taken, such as an air jet directed at the cutting edge), with cutting tools always kept sharp.

SAWING & CUTTING

Hand, band, circular and jigsaws can be used to cut Marcryl FS.

- **Hand saw** It is difficult and time-consuming to produce good edge finishes with a hand saw but it is possible.
- **Band saw** Useful tool for cutting Marcryl FS before final finishing, or to cut thick sheets.
- **Circular saw** Accurate and smooth edges are possible with the material being fed through slowly.
- **Laser cutting** Allows complex shapes to be cut accurately to produce a finished product, with little or no need for any final polishing.

DRILLING

Drill bits specially designed for acrylic are recommended but any commercially available drill for wood or metal can also be used. When these are being used, it is advisable to grind small flat areas on to the two cutting edges and use a slower speed and feed rate. Always ensure the material is well clamped to prevent movement.

BENDING & ANNEALING

Straight line bends are possible using electrical strip heaters applied locally along the bend line, then allowing the sheet to cool naturally in its new shape. Before any further processes such as printing occur, annealing in an air circulation oven may be required to relieve internal stresses.

THERMOFORMING

Marcryl FS can be highly stretched at relatively low temperatures. The forming process can occur more slowly, as it is of a rubbery nature and the surface quality of the semi-finished material is largely retained.

Methods of thermoforming that can be used on Marcryl FS include:

- **Vacuum forming**
  A versatile method of forming, generally used for simple shapes.
- **Drape forming**
  Can be used to produce designs of greater depth than vacuum forming.
- **Mould forming**
  Uses two moulds, producing more accurate shapes.
- **Free forming**
  No mark-off is created with this method.

IT IS RECOMMENDED THAT THE PROTECTIVE FILM IS REMOVED BEFORE PRE-DRYING OR THERMOFORMING AS HEATING MAY RESULT IN IT ADHERING TO THE SHEET.

- It may be possible to dispense with pre-drying if the protective film remains intact and the material has been stored correctly.
- Pre-drying is not normally required when line bending or if fast, effective heating is used.
- If required, pre-drying at 90-95ºC for 24 hours is adequate.
- Thermoforming should be carried out as soon as possible after pre-drying, as re-absorption of moisture will occur.
- Material should be heated to 140 - 170ºC - some experimentation may be required to maintain the good optical quality of the surface.
- Material should be heated for as short a time and to the lowest temperature practicable - the material begins to degrade at temperatures above 200ºC, which can lead to flammable gases.
- Uniform heating over the whole sheet will help achieve good results.
- Stress can be generated by thermoforming at too low a temperature or poor mould design.
- Inherent stress can be relieved by heating the component from room temperature slowly (18ºC per hour) to 70 - 85ºC.
- This temperature should be maintained for 1 hour up to 3mm thickness, 2 hours up to 6mm thickness and 3 hours up to 12mm thickness.
- The component should then be cooled slowly (12ºC per hour) to room temperature.

BONDING

Marcryl FS sheets can be joined together using a variety of methods and tools. These include solvents, cements and adhesives. The sheets can also be welded using many of the standard methods - nuts, bolts and screws are also frequently used to join sheets.

ROUTING, ENGRAVING & SANDING

Excellent results can be achieved on Marcryl FS with routing and engraving techniques, and sanding will easily and effectively remove any scratches that occur during the fabrication process.

POLISHING

Various methods of polishing can be used on Marcryl FS. This can simply be abrasive or hand polishing to restore Marcryl FS' high gloss appearance after fabrication or sanding, or more intensive machine polishing. Flame polishing creates a bright, shiny edge finish and is particularly effective on silica green material.

PRINTING & VINYL APPLICATION

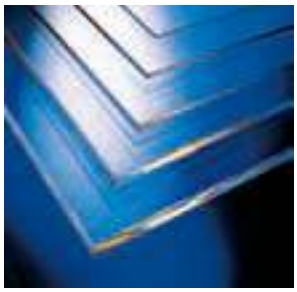
Screen printing is a common method of printing on flat surfaces of Marcryl FS sheets which gives clear, bright colours and which still allows the sheets to be thermoformed afterwards. As the ink will not soak into the sheets as it would with paper or board, the printing can be damaged by scratching and abrasion and it is recommended that a light coat of clear lacquer is used to protect the surface print. Only inks and varnishes suitable for acrylic should be used. This also applies to the use of adhesive vinyls, and care should be taken to prepare the sheet surface correctly before proceeding.

INSTALLATION

Marcryl FS sheets are often mounted into frames and care must be taken to avoid breakage or distortion. The sheets have a high coefficient of thermal expansion and therefore sufficient space must be left for expansion, both of the sheet itself and any fixing holes needed.

STORAGE

The edges of Marcryl FS sheets can be quite sharp and gloves should be worn when handling. Sheets should be kept in a dry storage area and preferably covered, to avoid any absorption of moisture. Although they can be stored on their edges, it is recommended that they are kept flat on their delivery pallets.



Brett Martin's semi-finished product ranges include foam PVC, gloss foam PVC, solid sheet acrylic and solid sheet polycarbonate.

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