

Plastics for fabrication

marlon fs

marlon fsx
LONGLIFE

marlon fs
HARD

marpax

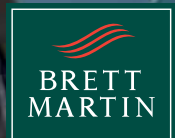
marcryl fs

marpet-g fs

marpet-afs



POLICE



Plastic Sheets

Plastics for fabrication

Brett Martin offers an extensive range of extruded thermoplastic engineering materials which are suitable for a wide array of applications in the sign and display, fabrication and building industries.

**In hard business times,
our prices soften the blow.**

Everyone needs to tighten their belts in this current economic climate and businesses are no different. Luckily, you don't have to stay at expensive hotels to get 1st class treatment. We've got comfy rooms at great low rates and on-site restaurants that are the envy of other hotels. And because we know you want to start the next working day feeling refreshed, we also include a 'Good Night Guarantee'.
Isn't it time you switched to Premier Inn?
Visit premierinn.com or call 0870 242 8000

Everything's Premier but the Price



BRETT MARTIN IS THE ONE STOP SHOP FOR ALL TRANSPARENT FLAT SHEET PRODUCTS INCLUDING POLYCARBONATE, ACRYLIC, PET-g AND aPET FLAT SHEETS. THE CHOICE OF MATERIAL FOR MANY FABRICATORS DUE TO EXCELLENT OPTICAL CLARITY, BROAD WORKING TEMPERATURE RANGE, OUTSTANDING FORMABILITY, EASE OF CUTTING AND MACHINING, FLEXIBILITY, IMPACT STRENGTH AND EXCELLENT FIRE PERFORMANCE OF THE PRODUCTS.

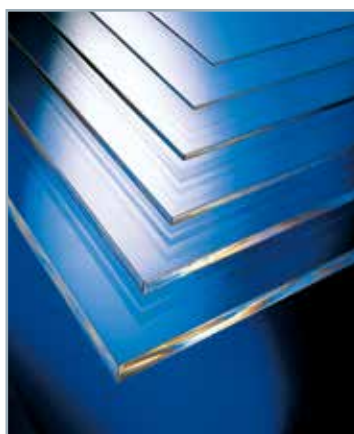
THE FOLLOWING MATERIAL OPTIONS ARE AVAILABLE IN THE FABRICATION RANGE:



marlon fs

FLAT POLYCARBONATE SHEET

Marlon FS is a clear extruded flat polycarbonate glazing sheet that provides 200 times more impact resistance than glass, with excellent fire resistance.



marcryl fs

FLAT ACRYLIC SHEET

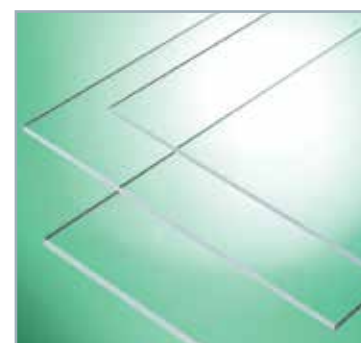
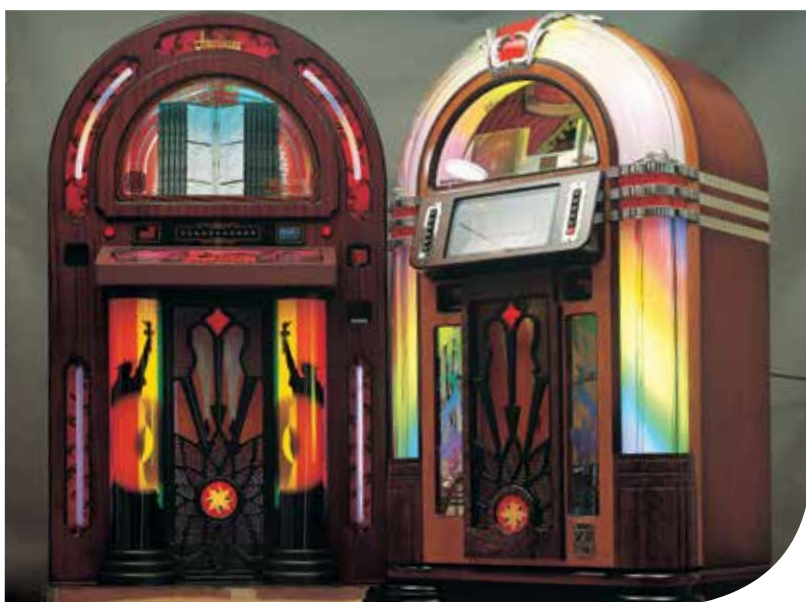
Marcryl FS is a premium flat extruded acrylic sheet with high gloss finish, offering brilliant optical clarity with its glass-like properties and high scratch resistance.



marpet-g fs

FLAT PETg SHEET

Marpet-g FS is a lightweight, durable, clear substrate with excellent optical clarity, thermoformability and light transmission properties. It offers exceptional ease of workability in print and display applications.



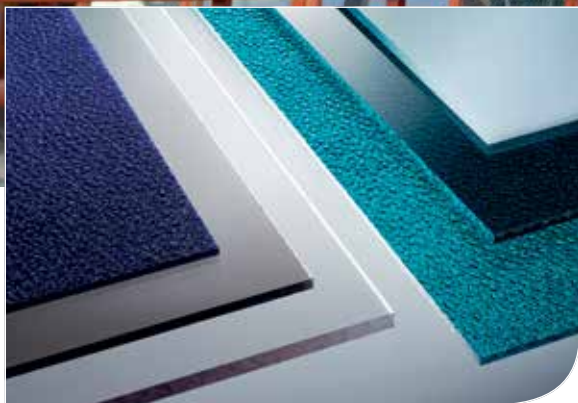
marpet-afs

FLAT aPET SHEET

Marpet-a FS aPET is a high optical grade amorphous polyester sheet that combines exceptional quality, excellent transparency, impact strength, chemical resistance and fire performance.

Polycarbonate

Brett Martin's range of extruded flat polycarbonate sheets offer ideal solutions for a wide range of applications in construction, fabrication and print & display industries. Durability and design freedom are two of the key features which designers seek when selecting modern materials. Marlon flat polycarbonate sheet offers both, plus many more benefits over traditional glazing and fabrication alternatives.



marlon fs

Marlon FS is available in a range of tints including bronze, green, blue opal and grey providing solar control, and with an embossed textured finish. Product options include double sided UV protection with Marlon FSX, advanced abrasion resistance with Marlon FS Hard and Strong Adhesion Film for heavy fabrication projects.



marlon fs

FLAT POLYCARBONATE SHEET

Marlon FS is a premium quality extruded flat polycarbonate sheet which provides 200 times more impact resistance than glass at only half the weight. The sheet is characterised by high optical clarity, light transmission, impact resistance, durability, design flexibility, thermal insulation and fire resistance.

Marlon flat polycarbonate sheet offers a superior glazing solution to that of other materials. It's available in clear to maximise light transmission and a range of tints including bronze, green, blue, opal and grey which offer additional solar control. All tints can be provided with an embossed textured finish.

Colours and tints:	Clear, Opal, Bronze and specials* including Green, Blue & Grey
Widths:	Widths up to 2050mm
Thicknesses:	0.75, 1, 1.5, 2, 3, 4, 5, 6, 8, 10, 12 & 15*mm
Options*:	Embossed texture, single sided UV protection, Strong Adhesion Film
Specials*:	Special transparent, translucent & opaque options are available on request
Sheet weight:	3.6kg/m ² (3mm)
U-value:	5.41 W/m ² °K (3mm)

*Subject to request. Minimum order quantities may apply.
Please contact Brett Martin for further information.



TYPICAL APPLICATIONS

- Vertical glazing
- Protective screens
- Poster covers
- Signage / Displays
- Illuminated signage
- Thermoforming

marlon fsx

LONG LIFE

UV PROTECTED FLAT POLYCARBONATE SHEET

Marlon FSX Longlife features co-extruded UV protection to both sides of the sheet cutting out 98% of harmful UV radiation. The UV protective layer provides longer sheet life expectancy, prevents yellowing and guards against loss of strength. Combined with high impact and chemical resistance, light weight and high light transmission, Marlon FSX is the superior glazing material for architectural rooflights, vertical glazing and other specialist glazing applications.

WARRANTY

Marlon FSX Longlife has a limited 10 year warranty against light transmission and breakage as outlined in the warranty statement, available separately.

Colours and tints:	Clear, Opal, Bronze and specials* including Green, Blue & Grey
Widths:	Widths up to 2050mm
Thicknesses:	0.75, 1, 1.5, 2, 3, 4, 5, 6, 8, 10, 12 & 15*mm
Options*:	Embossed texture, Strong Adhesion Film
Specials*:	Special transparent, translucent & opaque options are available on request
Sheet weight:	3.6kg/m ² (3mm)
U-value:	5.41 W/m ² °K (3mm)

*Subject to request. Minimum order quantities may apply.
Please contact Brett Martin for further information.



TYPICAL APPLICATIONS

- Rooflights
- Curved rooflights
- Canopies
- Covered walkways
- Exterior signage



COLOUR	LIGHT TRANSMISSION DIN 5036 (3mm)
Clear (S)	92%
Bronze (CE)	50%
Grey (IM)	27%
Green (CF)	38%
Opal (FH)	35%

Light transmission values for Marlon FS/FSX

FIRE PERFORMANCE

Marlon FS and FSX typically achieve Bs1-d0 in accordance to EN 13501, and Class I Surface Spread of Flame in accordance to BS 476:Part 7. Testing per other European standards has also produced high classifications. Contact the technical department for the most up to date certification.



Strong Adhesion Film

A Strong Adhesion Film (SAF) is available for the Marlon FS and Marlon FSX polycarbonate product ranges, specifically aimed at high-end engineering and fabrication projects that require extra protection during repeated processing, including drilling, 3D milling, warm & cold bending, thermoforming and cutting.

The polycarbonate sheets that are used for these heavy fabrication projects, often go through different or aggressive mechanical processes before the end product is made. SAF ensures that our polycarbonate sheet withstands these rigorous fabrication processes and protects the surface from scratching and abrasion at all times.

ULTIMATE SHEET PROTECTION

SAF is a durable and much heavier film that provides outstanding surface protection particularly for the thicker range polycarbonate sheets (5-15mm) that can be more difficult to handle and that have more potential to score during handling, fabrication and storage. The film is applied to both sides of the sheets, ensuring maximum protection.

HIGH ADHESION LEVEL

Offering an adhesion level that is three times higher than standard film, SAF remains in place and intact during fabrication. It maintains its adhesion level and offers sufficient tack for reapplication in case the film needs to be peeled back. The film offers a good joggability and is easy to remove, even after thermoforming, without leaving residue.

SAF is glue-free, enabling the polycarbonate sheets to be used for warm bending and shallow thermoforming. In addition it is particularly suitable for cutting, cold bending and digital printing. It has a clear finish so the product remains visible.

Combined with the benefits of SAF, the Marlon FS and Marlon FSX Longlife polycarbonate ranges that provide high impact resistance at only half the weight of glass, high natural light transmission, optical clarity and abrasion resistance now offer the ideal choice for high end mechanical engineering projects.

BENEFITS

- High adhesion level, 3 times higher than standard range
- Stays on during fabrication
- Ultimate sheet protection
- Good joggability
- Increased protection during heavy fabrication
- Glue-free, for use in warm bending and thermoforming
- Double sided film protects both sides

TYPICAL APPLICATIONS

- Machine protection
- Tanks
- High pressure applications around machine engineering
- Applications where high strength impact is required



STRONG ADHESIVE FILM (SAF)

Film Colour:	Transparent
Film Width:	2050mm
Thicknesses:	For use on 2, 3, 4, 5, 6, 8, 10, 12 & 15mm
Sheet Range:	For use on Marlon FS & Marlon FSX Longlife

*Subject to request. Minimum order quantities may apply.
Please contact Brett Martin for further information.*



marlon fs

HARD

ABRASION RESISTANT FLAT POLYCARBONATE SHEET

Marlon FS Hard is an extruded polycarbonate flat sheet combined with an abrasion and chemical resistant coating. The highly resilient and abrasion resistant surface coating resists marks and scratches, vandalism, graffiti and physical attack and also withstands contact from a wide range of cleaning agents, organic solvents and corrosive elements.

Marlon FS Hard offers a superior toughness to protect those areas where high performance and reliability are essential whilst providing high natural light transmission.

WARRANTY

Limited 10 year warranty relating to breakage, 5 year limited warranty in relation to light transmission and coating.

Colours and tints:	Clear and specials* including Opal, Bronze, Green, Blue & Grey
Widths:	Widths up to 2050mm
Thicknesses:	3, 4, 5, 6, 8, 10, 12 & 15mm
Options*:	Single or Double sided UV protection**
Specials*:	Special transparent, translucent & opaque options are available on request
Sheet weight:	3.6kg/m ² (3mm)
U-value:	5.41 W/m ² °K (3mm)

*Subject to request. Minimum order quantities may apply.
**Minimum order quantities apply to one side UV protection.
Please contact Brett Martin for further information.

CHEMICAL RESISTANCE

CHEMICAL RESISTANCE SOLVENT	MARLON FS HARD		
Ethanol (90%)	Long		
Propanol	Long		
Acetone	Short		
MEK	Long		
Petrol	Long		
Dilute Ammonia	Medium		
Dilute Caustic Soda	Short		
Concentrated Caustic Soda	Short		
Dilute Organic Acid	Long		
Dilute Inorganic Acid	Long		
Short Term Resistance Drop/spills, significant changes in physical properties	Medium Term Resistance Up to 8 hrs, some reduction in physical properties occurs	Long Term Resistance No attack, little or no reduction in physical properties	



TYPICAL APPLICATIONS

- Safety glazing
- Anti-vandal glazing
- Display anti-graffiti protection
- Protective visors
- Riot shields
- Prison windows
- Bus shelters
- Telephone kiosks
- Train windows
- Guard rails
- Thermoforming

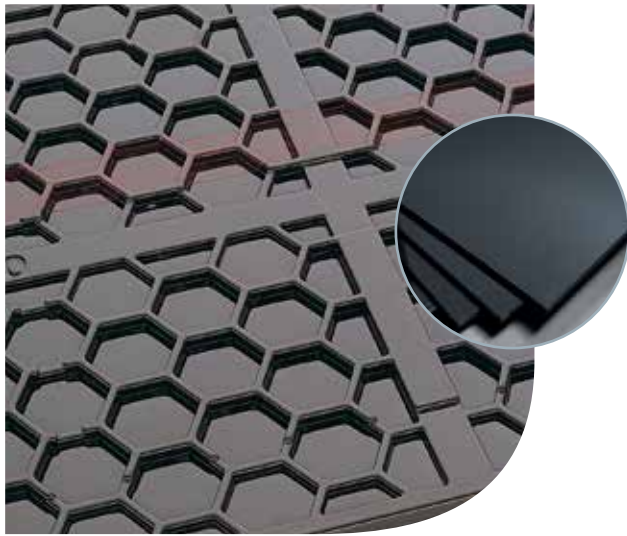


MARLON FS HARD ABRASION RESISTANCE (ASTM D 1003)

MATERIAL	CYCLES	HAZE CHANGE (%)
Uncoated	100	29.5
Hard coated	100	3 - 6
	500	<12
	1000	<20

MARLON FS HARD LIGHT TRANSMISSION

COLOUR	LIGHT TRANSMISSION (DIN 5036)
Clear (S)	92% (3mm)



marpax

OPAQUE FLAT POLYCARBONATE SHEET

Marpax is an extruded polycarbonate flat sheet manufactured by Brett Martin. The sheet is characterised by high impact resistance durability and excellent thermoformability. The standard texture is pinseal on one side and gloss on the other. For a minimum order quantity Marpax can be made gloss on both sides.

The product is available with a P.E. film on the gloss surface. A range of standard widths and thickness are available.

BENEFITS

- Outstanding impact resistance
- Durable and extreme versatile
- Easy to form and fabricate
- Cost-effective
- High stiffness
- Can be used in a variety of applications

TYPICAL APPLICATIONS

- Thermoformed trays
- Coloured Parts
- Signage
- Protective Screens where optical clarity is not required

Colours and thicknesses:	Grey (VZ) 4mm Black (XY) 3mm, 4mm
Widths:	Widths up to 2050mm
Options*:	Double sided gloss finish

**Subject to request. Minimum order quantities may apply. Please contact Brett Martin for further information.*

Polycarbonate Material Properties

The properties below apply across the whole polycarbonate flat sheet range including Marlon FS, Marlon FSX Longlife, Marlon FS Hard and Marpax.

PROPERTIES	TEST METHOD	VALUE	UNITS	
Physical Properties	Density	DIN 53479	1.2	g/cm ³
	Water absorption in water equilibrium, 23°C	DIN 53495:A	0.35	%
	Water permeability	DIN 53122	< 2.28	g/cm ²
Mechanical Properties	Tensile strength at yield	DIN 53455	> 60	MPa
	Tensile strength at break	DIN 53455	> 70	MPa
	Tensile modulus	DIN 53457	2300	MPa
	Impact strength @ 23°C (notched Charpy)	DIN 53453	50	kJ/m ²
Optical Properties	Light transmission 3mm clear	DIN 5036	92*	%
	Refractive index (D ₁₁)	DIN 53491	1.586	—
Thermal Properties	Coefficient of thermal expansion	DIN 53752	68	m/m.K × 10 ⁻⁶
	Thermal conductivity	DIN 52612	0.2	W/m.K

*Not applicable to Marpax



Polycarbonate Fabrication Guidelines

SERVICE TEMPERATURE

Marlon FS, Marlon FSX Longlife, Marlon FS Hard and Marpax can be installed in a diversity of applications, with varying temperatures. The materials mechanical performance is known to remain stable in prolonged service in temperatures ranging from -20°C to +100°C.

CUTTING/MACHINING

Polycarbonate flat sheet is easy to saw and cut on standard workshop equipment. It can be machined on conventional milling machines with standard high speed tools.

RECOMMENDATIONS	CIRCULAR SAW	BAND SAW	MILLING MACHINE
Clearance Angle	20 - 30°	20 - 30°	20 - 25°
Rake Angle	15°	0 - 5°	0 - 5°
Cutting Speed	1800 - 2400m/min	600 - 1000m/min	100 - 500 m/min
Feed Speed	19 - 25m/min	20 - 25m/min	0.1 - 0.5 mm/rev
Tooth Spacing	2 - 5mm	1.5 - 2.5mm	-

**Notches adversely affect the mechanical properties of polycarbonate and should be avoided.*

DRILLING

When drilling Marlon or Marpax metal drills without a specially ground bit can be used, though a thermoplastic specific bit would be preferential. Do not use cutting oils.

PARAMETER	VALUE
Clearance Angle	5 - 8°
Tip Angle	90 - 130°
Helix Angle	Ca 30°
Rake Angle	3 - 5°
Cutting Speed	0.1 - 0.5mm/rpm
Drill Tip Speed	10 - 60m/min

Countersink fixing is not recommended. Holes should be a minimum of 1.5 x hole diameter from the edge of the sheet. The hole diameter should be a minimum of 6mm larger than the fixing shank diameter for sheets up to 2m and an additional 3mm per meter length thereafter.

BONDING

Polycarbonate can be bonded using one of the following adhesives: Epoxy, Polyurethane, Hot Melt or Silicone. Ask your adhesive supplier for the most appropriate type of adhesive for your particular application. Solvents such as Methylene Chloride give a good bond but can lead to stress cracking and are therefore not recommended.

THERMOFORMING

Before thermoforming, remove masking films and pre-dry at 120°C to remove absorbed moisture. Air circulation ovens with accurate temperature control are most efficient; air must circulate between sheets. Sheet age and storage conditions determine drying time. Dry storage can reduce pre-drying time in oven by up to one third; some experimentation is usually necessary. As moisture re-absorption starts when the dried sheet temperature falls below 100°C, thermoforming should be performed immediately after drying. **NB. Marlon FS Hard is NOT recommended for thermoforming.**

VACUUM FORMING MARLON FS POLYCARBONATE

Components that are relatively simple and shallow in form are thermoformable from sheet heated to an elastic state. Most industrial press and vacuum formers for thermoplastics are suitable. Best results are achievable from machines that control heat on both sides of the sheet. Large area panels and thick panels need some air pressure support during heating to avoid sag. Male moulds are suitable for vacuum forming, female moulds for both vacuum and press forming. The following points should be taken into account when vacuum forming:

- Pre-drying is essential, remove film prior to drying.
- Sheets should be mounted vertically and air allowed to circulate.
- Pre-drying should be at about 120°C and the sheet thermoformed soon after, as moisture will gradually be re-absorbed when cooled below 100°C.
- Drying time*:
3mm: 8 hours, 4mm: 13 hours, 5mm: 18 hours, 6mm: 24 hours, 8mm: 28 hours, 10mm: 30 hours, 12mm: 33 hours.
**Approximate: drying time may vary depending on storage equipment.*
- If material has been correctly stored in a dry place, drying time can be reduced by one third.
- Pre-drying may be dispensed if fast and effective heating is used e.g. infra-red heaters.
- Secure clamping of material during forming is essential to avoid shrinking.
- Heating to thermoforming temperatures of 175-200°C should be evenly applied to both sides of the sheet.
- Parts should be allowed to cool in the mould to below 125°C and components must be completely rigid before removal from the mould.

LINE BENDING

- Pre-drying is not normally required.
- Recommended temperature between 155°C and 165°C.
- The area of material to be heated must be approximately five times as wide as the sheet thickness.
- Up to and including 4mm thick can be bent when heated from one side only.
- Over 4mm it is necessary to heat from both sides.
- Bending sharp internal corners should be avoided.
- Use a former radius at least equal to the sheet thickness.



Acrylic

Marcryl high gloss acrylic extruded sheet offers a combination of excellent optical clarity and weatherability. It is a versatile material that offers ease of fabrication and excellent scratch resistance making it suitable for a wide variety of applications including point of sale, poster covers, menu boards, displays, glazing, interior design projects, store fixtures, fabrication and signage.

marcryl fs

In addition to clear, Marcryl FS acrylic sheet is also available in opal, providing good light diffusion that can be used for dramatic lighting effects, and with a silica green edge which looks like tempered glass.



Plastic Sheets



marcrylicfs

FLAT ACRYLIC SHEET

Marcryl FS is a top quality extruded acrylic sheet with a high gloss finish that offers a combination of excellent optical clarity and weatherability.

Marcryl FS is manufactured in a clean production environment ensuring optimum quality. The versatility, ease of fabrication and scratch resistance of Marcryl FS rend it suitable for a wide variety of applications in interior design, point of sale and display, fabrications and building industries. Marcryl FS can be flame polished creating a bright, shiny edge finish.

Colours and tints:	Clear and specials* including Opal & Silica Green
Widths:	Widths up to 2050mm
Thicknesses:	2, 3, 4, 5, 6, 8, & 10mm
Options*:	Special options are available on request

*Subject to request. Minimum order quantities may apply. Please contact Brett Martin for further information.

Marcryl FS can be flame polished creating a bright, shiny edge finish.



TYPICAL APPLICATIONS

- Displays
- Glazing
- Point of Purchase/Sale
- Signage
- Fabrication



Acrylic Material Properties

Typical properties of Marcryl (Acrylic) Resin

PROPERTIES	TEST METHOD	VALUE	UNITS	
Physical Properties	Density	DIN 53479	1.19	g/cm ³
	Moisture absorption (24hours @ 23°C)	ISO 62	30	mg
Mechanical Properties	Tensile strength at yield (ambient 23°C)	DIN 53455	72	MPa
	Elongation at break	DIN 53455	4.5	%
	Flexural modulus	DIN 53452	105	MPa
	Notched izod impact	ISO 180	2.6	kJ/m ²
Optical Properties	Refractive index	ISO 489	1.491	%
Thermal Properties	Vicat softening temperature	ISO 306	102	°C
	Thermal conductivity, K	DIN 52612	0.19	W/m.K
	Thermal expansion coefficient	DIN 53752-A	0.07	mm/m°C
	Service temperature range	–	-20 to +60	°C
Electrical Properties	Dielectric strength	IEC 60243-1	30	kV/mm
	Surface resistivity	IEC 60093	5.10 ¹³	Ω

Acrylic Fabrication Guidelines

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 +80°C.

CUTTING/MACHINING

Marcryl FS is easy to saw and cut on standard workshop equipment. It can be machined on conventional milling machines with standard high speed tools. Notches adversely affect the mechanical properties of acrylic and should be avoided. If the feed rate is too low, unwanted heat build up may occur at the cut edges. The blades of circular saws should only protrude slightly beyond the sheet. Switch on the saw before starting the cut. Secure the sheet against fluttering or vibration.

RECOMMENDATIONS	CIRCULAR SAW	BAND SAW	MILLING MACHINE
Clearance Angle	10 - 15°	20 - 30°	2 - 10°
Rake Angle	0 - 5°	0 - 5°	0 - 5°
Cutting Speed	1800 - 2400m/min	600 - 1000m/min	1000 - 2000m/min
Feed Speed	10 - 25m/min	20 - 25m/min	0.1 - 0.5mm/rev
Tooth Spacing	9 - 20mm	1.25 - 3.3mm	—

DRILLING

Use only compatible cutting oils or emulsions for cooling when drilling Marcryl FS. Fixing threads should only be used if there is no alternative, the sheet may break as a result of notching. The hole should be at least 1.5 x hole diameter from the edge of the sheet. When drilling thin sheet it is advisable to clamp them to a flat solid surface. Do not punch a centre hole prior to drilling as this will cause stress to build up in the sheet. In order to locate the drill a pilot hole should be drilled first. Special ground bits are required when drilling Marcryl.

PARAMETER	VALUE
Clearance Angle	3°
Tip Angle	60 - 90°
Helix Angle	12 - 16°
Rake Angle	0 - 4°
Cutting Speed	0.1 - 0.3mm/rpm
Drill Tip Speed	10 - 60m/min

BONDING

Marcryl FS can be bonded using acrylic cements. It is imperative that the material selected is compatible and suitable for the intended end use. Care must be taken to avoid stress cracking. A cyanoacrylate adhesive is suggested for use when bonding Marcryl to other substrates such as metal, glass or wood.

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. Prior to pre-drying or thermoforming it is recommended that the protective film is removed as heating may result in it adhering to the sheet. Pre-drying is not normally required when line bending or if fast effective heating is used. If required pre-dry between 75 - 80°C for 24 hours for sheets with a relatively high moisture content. Thermoforming should be carried out as soon as possible after pre-drying, as re-absorption of moisture will occur.

When using thermoplastic moulding techniques the material should be heated to 140 - 170°C, some experimentation may be required to maintain the good optical quality of the surface.

FLAME POLISHING

Marcryl acrylic flat sheet can be flame polished. Normally the marks of the preceding sawing or milling operation are still visible after polishing unless an intermediate step of scraping the edge smooth is carried out. The edges must be free from notches, swarf or dust and oils or greases.

Thicker sheets cannot normally be flame polished because of the excessive surface stress that can build up during the treatment. Ensure that the flame does not touch the area behind the edge as this may result in thermal stress build up which could lead to cracking or crazing during further treatment or in use. A high temperature flame is most appropriate. Do not allow the flame to remain stationary otherwise the material may scorch, bubble, become discoloured and even catch fire.



IDEAL
 FOR THERMOFORMING
 APPLICATIONS

PETg

Marpet-g FS is a clear transparent thermoplastic co-polyester that offers excellent strength to weight ratio, superior chemical resistance, durability and outstanding thermoformability.

It is suitable for digital and screen printing and typical applications include point of sale, table holders, menu holders, lightboxes, sign & displays, graphic art, machine guards, vending equipment, protective screens and shower surrounds.

Everyone needs to tighten their belts in this current economic climate and businesses are no different. Luckily, you don't have to stay at expensive hotels to get 5th class treatment. We've got comfy rooms at great low rates and on-site restaurants that are the envy of other hotels. And because we know you want to start the next working day feeling refreshed, we also include a "Good Night Guarantee". Isn't it time you switched to Premier Inn? Visit premierinn.com or call 0870 242 8000

Everything's Premier but the Price



marpet-g fs

The excellent thermoforming properties of clear Marpet-g FS makes it the ideal product for sign, display and store fixture applications.

marpet-g fs

FLAT PETG SHEET

Marpet-g FS sheet is a clear transparent thermoplastic (polyethylene terephthalate glycol) co-polyester flat sheet that can be used as an alternative to polycarbonate, solid acrylic and PVC sheets. It offers excellent strength to weight ratio, outstanding optical clarity, superior chemical resistance, durability, fire resistance and is 100% recyclable.

Its key benefit is the exceptional ease of workability and thermoformability particularly at low temperatures, it offers in print and display applications. Marpet-g FS is available in thicknesses from 0.5 – 12mm and is the ideal graphics adhesion solution suitable for digital and screen printing.



Colours and tints:	Clear	
Dimensions & Thicknesses:	0.5, 0.75, 1 & 1.5mm	1250mm x 2500mm
	2, 3, 4, 5, 6, 8, 10 & 12mm	1250mm x 2500mm, 2050mm x 3050mm
Options*:	Special options are available on request	

**Subject to request. Minimum order quantities may apply.
Please contact Brett Martin for further information.*

TYPICAL APPLICATIONS

- Signage & displays
- Point of sale equipment
- Graphic art
- Thermoforming
- Vending equipment
- Protective screens
- Shower surrounds
- Lightboxes

PETg Material Properties

Typical properties of PETg (polyethylene terephthalate glycol comonomer) resin

PROPERTIES	TEST METHOD	VALUE	UNITS	
Physical Properties	Density	ISO 1183	1.27	g/cm ³
	Moisture absorption (24hours @ 23°C)	ISO 62-4	<0.2	%
	Water solubility	DIN 53122	Insoluble	–
Mechanical Properties	Tensile strength at yield	ISO 527	>50	MPa
	Tensile Strength at Break	ISO 527	>25	MPa
	Elastic modulus	ISO 178	2100	MPa
	Notched izod impact	ISO 180/1A	9	J/m
	Rockwell hardness (R-Scale)	–	115	J/m
Optical Properties	Refractive index	ASTM D 542	1.570	%
Thermal Properties	Vicat softening temperature	ISO 306(B)	82	°C
	Thermal expansion coefficient	ISO 75-2	0.068	mm/m°C
	Service temperature range	–	-20 to +60	°C
Electrical Properties	Dielectric strength	IEC 60243-1	16	kV/mm
	Surface resistivity	IEC 60093	10 ¹⁶	Ω



PETg Fabrication Guidelines

STORAGE & HANDLING

Marpet-g FS sheets are best stored indoors under ambient warehouse conditions up to 20°C, away from direct sunlight, in a cool dry store. Do not store indoors close to heat sources, for example, radiant heaters or boilers. Standing sheets on ends or sides should be avoided.

SERVICE TEMPERATURE

Marpet-g 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 +60°C.

CHEMICAL RESISTANCE

Marpet-g FS is resistant to many chemicals and atmospheric pollutants. Contact with solvents must be avoided.

FABRICATION

Marpet-g FS transparent sheet is easy to handle and very suitable for fabrication, heating and vacuum forming without whitening or cracking. It has a wide window of processing conditions enabling complex shapes, whilst maintaining good impact strength. Always ensure adequate allowance for thermal expansion.

CUTTING/MACHINING/SAWING

Marpet-g FS can be sawn using standard hand tools, circular saws and band saws with carbide-tipped blades that will produce the cleanest finish. Ensure that the blade is sharp and the material is clamped to prevent vibration which may result in cracking. Marpet-g FS is notch sensitive which can adversely affect the mechanical properties of the material.

DRILLING

When drilling Marpet-g FS it is recommended to use drill bits designed for plastics. To avoid overheating, it's best to use compressed air or wide and highly polished flutes. To prevent vibration, which may result in cracking, it's recommended to clamp the part securely.

DIE STAMPING

Marpet-g FS can be die-cut, with excellent results on thinner sheets. Sharpened steel blades up to 2.5mm can be used. The back board must be correctly aligned for a clean cut, with the blade completely traversing the sheet to avoid notches. Ensure adequate allowance for thermal expansion.

BENDING

Marpet-g FS is suitable for cold and hot bending techniques. Cold bending is ideal to create simple shapes. It is recommended to heat sheets above 3mm to produce more complex shapes. The best result is obtained by heating the sheet on both sides using an electric heater. When the optimum temperature is reached (+105°C) the sheet can be bent with a small radius.

THERMOFORMING

Marpet-g FS can be easily thermoformed using general forming techniques including thermoforming, vacuum forming and line bending. Marpet-g FS does not require pre-drying and forms between 120 - 160°C.

BONDING

Bonding Marpet-g FS can be achieved using suitable adhesive tape, mechanical fixing or welding. When using adhesives ensure they are chemically compatible with PETg. Adhesive types such as polyurethanes and two-component acrylics give good results.

EDGE FINISHING

Following cutting, a good edge finish can be obtained using a suitable polishing paste in conjunction with a medium density Reiter wheel, followed by a soft fabric polishing wheel without paste.

PRINTING

Marpet-g FS can be printed with standard screen and digital printers in conjunction with inks that are suitable for use with thermoplastic co-polyesters. It's recommended to protect the ink from scratches by applying a light coat of clear lacquer. Before printing ALWAYS clean the surface with a soft cloth and use ionized air to clear dust.

INSTALLATION

Applications of Marpet-g FS must make adequate allowance for thermal movement. Adequate clearance must be allowed in the holes drilled for fixing and sheet lengths have to be limited so that there is not excessive movement at the ends.



IDEAL
FOR FLAT & COLD
BENDING APPLICATIONS

aPET

Marpet-afs is a clear amorphous polyester sheet that offers excellent transparency, impact strength, chemical resistance, fire performance and is ideal for flat and cold bending applications.

Typical applications include point of purchase displays, shop fittings, poster covers, cold food storage, machine guards, screens and visors.



marpet-afs

The excellent flat and cold bending properties of Marpet-a FS makes it the ideal product for sign, display and machine guard applications.





marpet-afs

aPET FLAT SHEET

Marpet-a FS aPET is a high optical grade amorphous polyester sheet from Brett Martin. Combining exceptional quality, excellent transparency, impact strength, chemical resistance and fire performance, Marpet-a FS is ideal for applications which require its high performance characteristics and processability. Its ability to cost effectively machine, cold bend and print lends Marpet-a FS particularly well to fabrication of items for the visual communications sector including point of purchase display stands, poster glazing and illuminated signage. Marpet-a may be thermoformed and hot line bent within a controlled temperature range to avoid crystallisation. Due to its superior strength and resistance to breakage Marpet-a FS is also equally suitable for safety equipment such as machine guards and visors.

TYPICAL APPLICATIONS

- Point of purchase displays
- Shop fittings
- Poster covers
- Cold food storage
- Machine guards
- Protective screens
- Visors

Colours and tints:	Clear
Widths:	1220mm & 2050mm
Thicknesses:	2, 3, & 4mm
Options*:	Special options are available on request

**Subject to request. Minimum order quantities may apply.
Please contact Brett Martin for further information.*

aPET Material Properties

Typical properties of Marpet-a aPET (amorphous polyethylene terephthalate) resin

PROPERTIES	TEST METHOD	VALUE	UNITS
Physical Properties	Density	ISO 1183	1.33 g/cm ³
	Moisture absorption (24hours @ 23°C)	ISO 62-4	<0.2 %
	Water solubility	DIN 53122	Insoluble –
Mechanical Properties	Tensile strength at yield	ISO 527	56 MPa
	Flexural Strength	ISO 527	86 MPa
	Elastic modulus	ISO 527	2420 MPa
	Impact Resistance (Charpy test, un-notched)	ISO 179	No breakage –
	Rockwell hardness (R-Scale)	–	111 R
Optical Properties	Refractive index	ASTM D542	1.578 %
Thermal Properties	Vicat softening temperature @ 1kg load	ISO 306(B)	75 °C
	Thermal expansion coefficient	ISO 75-2	0.06 mm/m°C
	Service temperature range	–	-20 to +60 °C
Electrical Properties	Dielectric strength	IEC 60243-1	60 kV/mm
	Surface resistivity	IEC 60093	10 ¹⁶ Ω

aPET Fabrication Guidelines

CHEMICAL RESISTANCE

Marpet-a FS aPET sheets are resistant to most acids, alcohols, salts, plastifying agents and hydro carbons (aliphatic compounds limited). The material also resists chemical attack of acid rain, diesel engine fumes and air with some salinity. Aromatic compounds can cause reactions.

WEATHERING

Marpet-a FS aPET sheets are not UV protected. However the material does possess a limited resistance to weathering and it is possible to use in exterior applications where there is limited exposure to direct sunlight or where sunlight is of a low intensity.

CUTTING/SAWING

Sheets up to 3mm may be cut by guillotine. For thicknesses over 3mm standard hand saws may be used to cut Marpet-a FS sheets although circular saws with a carbide tipped blade produce the cleanest cuts. To avoid melting and cracking the sheet the blade should be sharp, the material clamped and the guide close to prevent vibration.

DRILLING

When drilling Marpet-a FS it is recommended to use drill bits designed for plastics. To avoid overheating, it's best to use compressed air or wide and highly polished flutes. To prevent vibration, which may result in cracking, it's recommended to clamp the part securely.

DIE STAMPING

Marpet-a FS can be die-cut with a sharpened steel blade up to 2mm. The blade must completely traverse the sheet to avoid notches. Ensure adequate allowance for thermal expansion.

BENDING

Cold Bending

Marpet-a FS sheets of less than 3mm can be cold bent using presses or bending machines. Excessive speed during the process may cause the sheet to stress and break.

Hot Bending

Marpet-a FS sheets may be heat bent using heating elements in a linear manner such as incandescent wire bending equipment. The sheet requires local heating to 100°C. Once the ideal temperature is reached the sheet is removed from the heating element placed in a mould or clamped into position until the material rigidifies. Excessive temperatures may cause crystallised whitening in the heated area.

CLEANING

Marpet-a FS sheets may be cleaned with a solution of warm water with a little neutral soap and rinsed with water using a soft cloth or sponge.

THERMOFORMING

Marpet-a FS may be thermoformed at temperatures between 100°C and 160°C. At these temperatures the sheets may crystallise resulting in whitening. Short heating times and rapid cooling of the moulded part is recommended to preserve the transparency of the material. Where possible sheets should be heated from both sides to minimise heating time and help prevent crystallisation. Very high temperatures can reduce the impact strength of the material. Mould temperature must not exceed 60°C. Pre drying is not required.

BONDING

Recommended adhesives include cyanoacrylates, and, two part component polyurethanes and epoxies. Refer to the adhesive manufacturers' guidelines for suitability of the adhesive to both the application and environment in which it will be used. For the surfaces to be joined adequately they must fit and be smooth and unpolished. Make allowance for adhesives which contact whilst drying. It is not possible to use adhesives with solvents due to chemical resistance.

EDGE FINISHING

Following cutting, a good edge finish can be obtained using a suitable polishing paste in conjunction with a medium density Reiter wheel, followed by a soft fabric polishing wheel without paste. Flame polishing the edge is also possible with a standard butane torch or a hot nitrogen welding torch. Ensure the torch is not too close to the edge to avoid crystallised-whitening or over softening the material. Minor scratches to the sheet surface may be successfully removed by careful application of a butane torch or hot nitrogen welding torch.

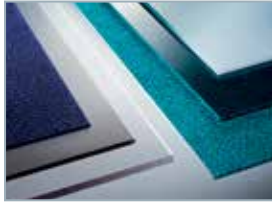
PRINTING

Marpet-a FS can be printed with standard screen and digital printers in conjunction with inks that are suitable for use with thermoplastic co-polyesters. The recommendations of the printing ink manufacturers should be followed closely. Application temperature should not exceed 60°C. It's recommended to protect the ink from scratches by applying a light coat of clear lacquer. Prior to printing ALWAYS clean the surface with a soft cloth and use ionized air to clear dust.



Typical applications

FLAT POLYCARBONATE SHEET



marlon fs

It can be used for:

- Vertical glazing
- Protective screens
- Curved rooflights
- Canopies / Covered walkways
- Signage / Displays
- Illuminated signage
- Thermoforming



FLAT ACRYLIC SHEET



marcryl fs

It can be used for:

- Menu boards
- Poster covers
- Glazing
- (Non)-illuminated signage
- Store fixtures
- Picture framing
- Fabrication



FLAT PET-G SHEET



marpet-g fs

It can be used for:

- Signage & displays
- Point of sale equipment
- Graphic art
- Vending equipment
- Protective screens
- Shower surrounds
- Thermoforming
- Light boxes



FLAT A-PET SHEET

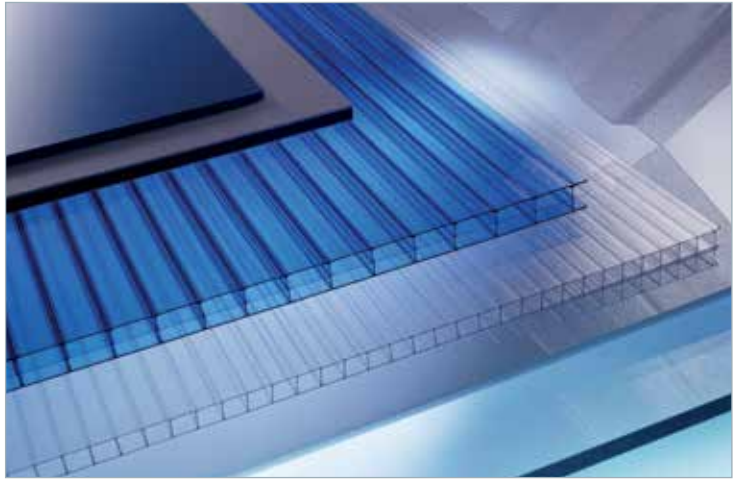


marpet-afs

It can be used for:

- Point of purchase displays
- Shop fittings
- Poster covers
- Cold food storage
- Machine guards
- Protective screens
- Visors





Brett Martin's plastic sheets product range includes extensive options in foam PVC, polycarbonate, PVC, acrylic, aPET, PETg, SAN and styrene.

DOWNLOAD
OUR FREE APP



Plastic Sheets

Head Office and Global Sales
Brett Martin Plastic Sheets
24 Roughfort Road,
Mallusk, Co. Antrim
Northern Ireland
BT36 4RB

Tel: +44 (0) 28 9084 9999
Fax: +44 (0) 28 9083 6666
Email: mail@brettmartin.com

For the latest information visit the company's web site:
www.brettmartin.com



Q09125



All reasonable care has been taken in the compilation of the information contained within this literature. All recommendations on the use of our products are made without guarantee as conditions of use are beyond the control of Brett Martin. It is the customer's responsibility to ensure that the product is fit for its intended purpose and that the actual conditions of use are suitable. Brett Martin pursues a policy of continuous product development and reserves the right to amend specifications without prior notice.