

**AXGARD-MSR<sup>®</sup>**

## Virtually Unbreakable Scratch-Resistant **Mirror** Technical Guide



# The Problem Solving Mirror Solution

Imagine glass that doesn't smash... plastic that doesn't scratch... a surface spray paint doesn't really stick to... a plastic that doesn't melt like wax when burned. Couldn't you really go to town with a unique mirror like this?

AXGARD®-MSR is the answer. Combining unbreakable polymer resilience with a specially formulated, tough, UV protected, scratch-resistant coating, it holds the key to success for many projects globally.

Very much at home in highly destructive and impact-prone environments, the core strength of AXGARD®-MSR lies at the heart of its success, and the added benefit of tough abrasion resistance and anti-graffiti properties makes it a favourite with specifiers and contractors alike.

Fixing is simple; AXGARD®-MSR can be bonded to any flat substrate, or mechanically fixed. In demanding, high-security applications, a combination of both provides an extra safeguard.

In sensitive locations, anti-ligature edge-finishing can be applied with ease.

AXGARD®-MSR samples are readily available on request.



## Common uses:

- ✓ Mental Healthcare
- ✓ Hospitals and Clinics
- ✓ Schools
- ✓ Prisons
- ✓ Public Amenities
- ✓ Shop Fitting
- ✓ Dance Halls
- ✓ Gyms and Sports Centres
- ✓ Swimming Pools
- ✓ Food Preparation

## Qualities:

- ✓ Virtually Unbreakable
- ✓ Excellent Scratch Resistance
- ✓ Anti-graffiti Properties
- ✓ Excellent Class 1/0 Fire Rating
- ✓ UV resistant - Suitable for Internal and External Use
- ✓ Reduced Maintenance Costs
- ✓ Anti-ligature Options Available
- ✓ Can be Bonded for Hidden Fixing



## AXGARD®-MSR : Thicknesses and Codes

AXGARD®-MSR is manufactured in 3mm and 6mm thicknesses. The 3mm option provides a cost effective solution and is very popular for smaller size mirror options. The 6mm provides greater strength and rigidity where required.

The tables below shows the AXGARD®-MSR standard manufactured sizes on a width-by-length basis. Additionally, AXGARD®-MSR can be manufactured to bespoke sizes from any of the standard sizes. There are optional edge options, radius corners and corner holes.

3mm

6mm

### AXGARD®-MSR: 3mm

AX3MSR	320mm	390mm	495mm	660mm	1000mm	2000mm
360mm	AX3MSR01	AX3MSR02	AX3MSR03	AX3MSR04	AX3MSR05	AX3MSR06
490mm	AX3MSR07	AX3MSR08	AX3MSR09	AX3MSR10	AX3MSR11	AX3MSR12
740mm	AX3MSR13	AX3MSR14	AX3MSR15	AX3MSR16	AX3MSR17	AX3MSR18
1500mm	AX3MSR19	AX3MSR20	AX3MSR21	AX3MSR22	AX3MSR23	AX3MSR24

AXGARD®-MSR can be cut to any size you require, from the above stock sizes.

### AXGARD®-MSR: 6mm

AX6MSR	320mm	390mm	495mm	660mm	1000mm	2000mm
360mm	AX6MSR01	AX6MSR02	AX6MSR03	AX6MSR04	AX6MSR05	AX6MSR06
490mm	AX6MSR07	AX6MSR08	AX6MSR09	AX6MSR10	AX6MSR11	AX6MSR12
740mm	AX6MSR13	AX6MSR14	AX6MSR15	AX6MSR16	AX6MSR17	AX6MSR18
1500mm	AX6MSR19	AX6MSR20	AX6MSR21	AX6MSR22	AX6MSR23	AX6MSR24

AXGARD®-MSR can be cut to any size you require, from the above stock sizes.

### AXGARD®-MSR: Examples of 6mm Square and Rectangular Shaped Mirror Codes

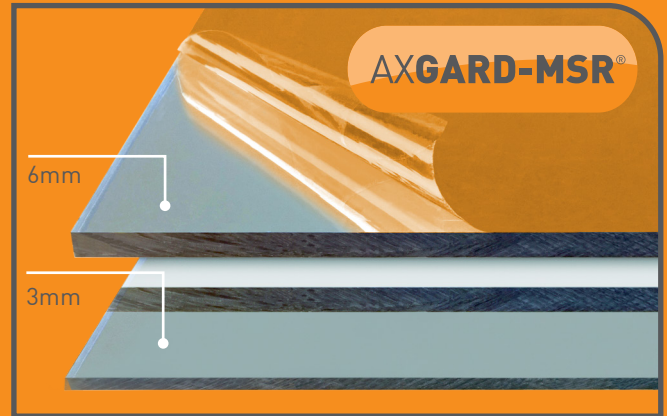
Saw Cut	AX6MSR01
Flat CNC Edge Finish	AX6MSRFE01
Flat CNC Edge Finish & Corner Holes	AX6MSRFEH01
Flat CNC Edge Finish & Radius Corners	AX6MSRFERC01
Flat CNC Edge Finish, Radius Corners & Corner Holes	AX6MSRFERCH01
Quarter Round CNC Edge Finish	AX6MSRQR01
Quarter Round CNC Edge Finish & Corner Holes	AX6MSRQRH01
Quarter Round CNC Edge Finish & Radius Corners	AX6MSRQRRC01
Quarter Round CNC Edge Finish, Radius Corners & Corner Holes	AX6MSRQRRC01

### AXGARD®-MSR: Example of 6mm Circle or Oval Shaped Mirror Codes

Flat CNC Edge Finish	AXO6MSRFE01
Flat CNC Edge Finish & Holes	AXO6MSRFEH01
Quarter Round CNC Edge Finish	AXO6MSRQR01
Quarter Round CNC Edge Finish & Holes	AXO6MSRQRH01

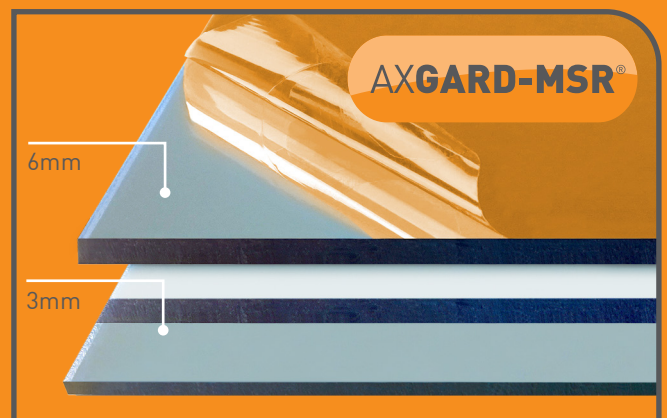
## AXGARD®-MSR : Edge Finishing – Saw Cut

Where AXGARD®-MSR is being installed in a frame, or where the edges are not seen, then the standard machine saw cut edge is the most cost effective option. The Saw Cut edge is a machine cut edge and will have slight serrations as with standard machine cutting of plastic sheet products.



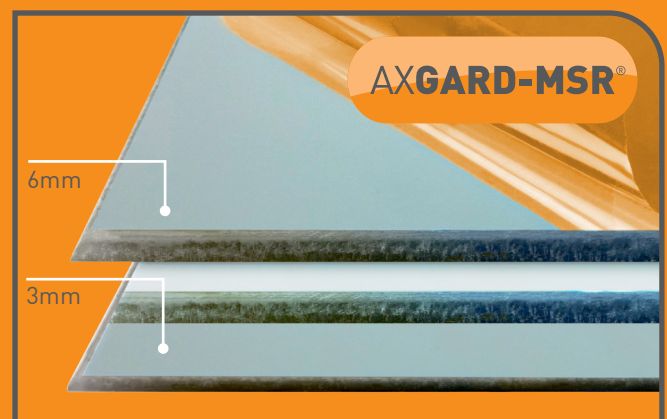
## AXGARD®-MSR : Edge Finishing – Flat CNC

The AXGARD®-MSR Flat Edge Finish provides a smooth flat edge that is acceptably finished where the edge is exposed. This is processed on the latest automated CNC machinery, and choosing this type of edge finish allows extra options of radius corners or fixing holes to be added if required.



## AXGARD®-MSR : Edge Finishing – Quarter Round

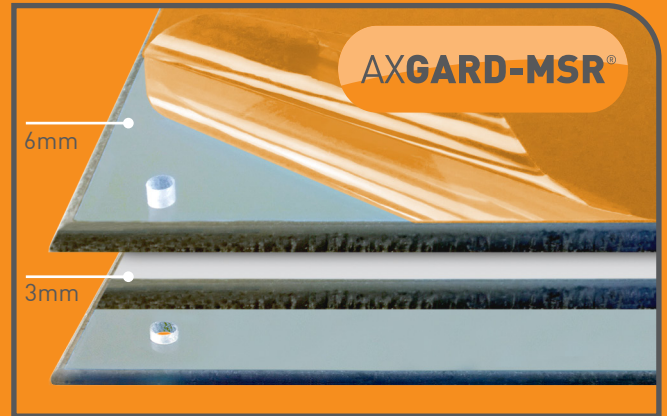
Our most popular solution the AXGARD®-MSR Quarter Round Edge Finish option provides a possible Anti-Ligature solution. This option is essential in Mental Health areas or High Secure areas where vulnerable individuals need to be protected. The Quarter Round Edge Finish provides a safe and aesthetically pleasing finish which can eliminate the need for any additional framing.





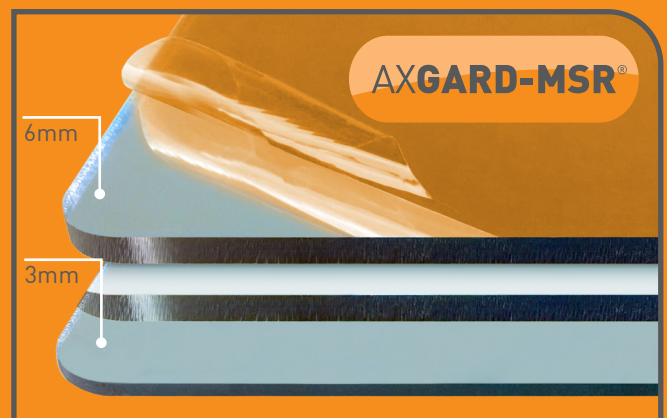
## AXGARD®-MSR : Corner Holes

Holes for fixing AXGARD®-MSR can be drilled during production as shown in these images. Corner holes and edge holes for fixing the AXGARD®-MSR are normally 6mm diameter and 20mm from edge of panel to centre of hole. However these can be any diameter and any chosen position, which can be specified at point of order.



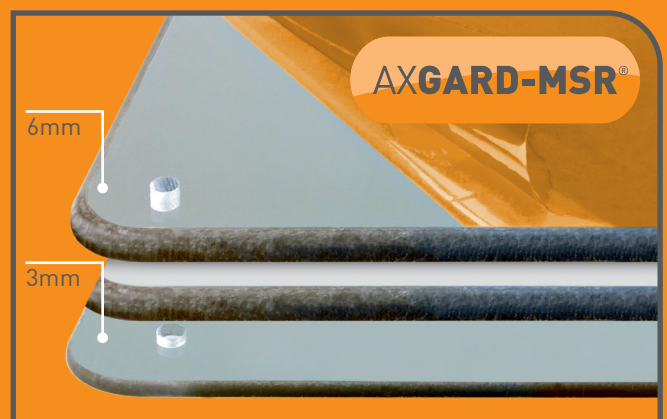
## AXGARD®-MSR : Radius Corners

The addition of Radius Corners adds further style and also safety to the look for the AXGARD®-MSR mirrors. Radius corners are normally manufactured as 20mm radius corners, however any bespoke radius corner size can be manufactured at no extra cost.



## AXGARD®-MSR : Quarter Round Edge, Radius Corners and Holes

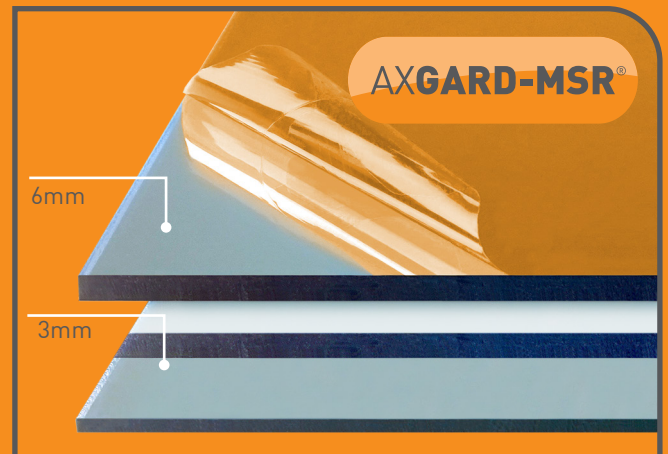
This image shows the options of having a possible anti-ligature style edge solution, with the addition of radius corners and corner fixing holes. Once again the size specification for the radius and hole sizes can be varied to suit almost any requirements or specification.



## AXGARD®-MSR : Squares, Rectangles, Circles and Ovals

AXGARD®-MSR is available in squares, rectangles, circles and ovals in standard and bespoke sizes. Any shape option chosen is available with edge finishing and fixing holes. In addition using the latest automated CNC machining, AXGARD®-MSR Mirrors can be created in almost any chosen shape using templates provided.

### Square / Rectangular Shapes



### Circle / Oval Shapes



## AXGARD®-MSR : Technical Data

AXGARD®-MSR is the ultimate solution for virtually unbreakable mirrors combining specially formulated, scratch-resistance coating with incredible strength; it holds the key to success for many projects globally.

### AXGARD®-MSR: Scratch Resistant Crust Properties: Physical

AXGARD®-MSR surface gloss level	Gloss level percentage	Approximately 80%	Similar to standard AXGARD® surface
AXGARD®-MSR operating temperature	The operating temperature will be governed by the AXGARD® core	See properties in AXGARD® brochure	
AXGARD®-MSR impact strength	The impact strength will be governed by the AXGARD® core	See properties in AXGARD® brochure	
AXGARD®-MSR pencil hardness	5H - 6H		
AXGARD®-MSR surface protection adhesive	Method: Cross hatch test on dry AXGARD®-MSR	Result: GT0 / GT1	
KEY: Cross hatch results	GT0 = the edges are completely smooth, none of the squares of the lattice is detached	GT1 = detachment of small flakes of the coating at intersections of the cuts. A cross hatch area not distinctly greater than 5%	
AXGARD®-MSR fire resistance	The resistance to fire will be mainly governed by the AXGARD® core	See properties in AXGARD® brochure	
AXGARD®-MSR water resistance: immersed in water at 40 degrees	Water temperature: 40°C	Duration: 7 days	Observation: Zero top surface delamination
AXGARD®-MSR stain resistance:	Substances applied: Coffee, marking pen, stamping ink	Duration: 24 hours	Observation: No staining observed

### AXGARD®-MSR: Bonded Mirror Layer: Physical

Axgard-MSR mirror surface properties	Material used:	Aluminium and protection compound
Axgard-MSR reflective properties	Reflective substance:	Aluminium
Axgard-MSR mirror surface process	Application process	High vacuum chamber application process
Axgard-MSR mirror surface method	Mirror application	Sublimation of Aluminium evaporation and even vacuum deposition
Axgard-MSR mirror chemical hardening	Oven cured and dried	Sheets cured in oven at approx 50°C

The table below shows AXGARD®-MSR mirrors have improved resistance to a wide range of cleaning agents and organic solvents.

### AXGARD®-MSR: Scratch Resistant Crust Properties: Chemical

Chemical	Standard PC Mirror	AXGARD®-MSR
Acetone	N	M
Ethanol	L	L
Petrol	N	L
10% Caustic Soda	S	L
10% Sulphuric Acid	M	L
5% Ammonia	L	L
L = Long term resistance (up to 24 hours)		M = Medium term resistance (8 up to hours)
S = Short term resistance (1 hour) spills / drips		N = Not recommended

**Disclaimer:** AXGARD®-MSR is manufactured with processes to provide a virtually unbreakable mirror solution, with a scratch resistant surface. Some of these processes mean that there will be some imperfections and distortions in the mirrors as an inherent part of the product solution which are an accepted phenomenon.

## **WARNING : REGISTERED DESIGNS & PATENTS**

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