ARCHITECTURAL CURVED TOUGHENED GLASS

INTRODUCTION

In Golden Glass the strength of toughening with the latest in curved safety glass technology to offer architects, specifiers and interior designers a range of innovative and exciting design options.

The continuous manufacturing process involves heating, then curving the glass to the required shape before finally toughening. By employing movable platens in the quenching process, the need for expensive press moulds has been eliminated. This technology allows each shape to be precisely moulded to customer specifications providing cost effective building solutions.

TERMINOLOGY

To assist designers and clients when seeking quotations or placing orders the following terminology should be used:

Height: The straight edge length of the glass.
Depth: The distance between two parallel lines which enclose the curved glass.
Radius: The distance from the center of the circle to the circumference of the circle.
Degree: The angle of a segment in a circle expressed in degrees.
Tangent: A straight line extending from the arc of the curve.
Chord: The straight distance between the edges of the curve.
Girth: The distance around the surface of the curve.
(See Figures a and b)

AVAILABLE CURVES

(See Figures c)

It should be noted that the maximum bending angle is 90°, therefore a full circle (360°) can only be achieved using four pieces of glass.

MAXIMUM SIZES

As height increases, the glass becomes more difficult to curve and therefore the minimum radius must be increased. Similarly as the glass weight and thickness increases, the maximum height must be decreased and the minimum radius increased (See Table a).
CURVED TOUGHENED GLASS

Cut-outs: As per flat toughened glass
Holes/ Spacings: As per flat toughened glass
Tolerances
Curve: To fit within ±3mm of the specified shape of 6mm thick and 3mm for glass over 6mm.

STANDARDS

The appropriate standard for Architectural curved toughened glass covering the thickness range of 5mm-25mm is AS/NZS 2208, BS6202.

As 3mm and 4mm are only available in heat strengthened and not fully toughened, such panels are not covered by the above standards as heat strengthened is not classified as a Grade A safety material.
APPLICATIONS

Curved toughened safety glass has many and varied applications including:
- Architectural curtain glass wall
- Shopfronts and internal partitions
- Balconies, Balustrades and pool Fencing
- Revolving Doors
- Elevators and Lifts
- Skylights and Covered Walkways
- Bay Windows
- Showerscreens
- Display Cases, Deli bends and Food Cabinets
- Glass Furniture
- Windscreens

It is also possible to incorporate Colourlite onto the surface of curved toughened glass panels.

GLAZING

Golden Glass can also supply, curved aluminium channels for head and sills if required.

ACCEPTANCE CRITERIA

Limitations
Curved toughened glass can only be curved in one plane (dimension).
The manufacturing limitations are as follows:
- Maximum girth or curved dimension-2500mm(3mm-25mm)
- Maximum height
-3000mm(4mm/5mm/6mm/8mm/15mm/19mm/22mm/25mm)
-3600mm(10mm/12mm)

For other thicknesses see Table a
- Minimum height 400mm
Edgework: As per flat toughened glass
CURVED TOUGHEND GLASS

MEASURING

Providing accurate dimensions for the purpose of manufacturing curved toughened in crucial to the whole process. In particular, the radius and girth dimension must be clearly stated as being measured from either:

a) the inside edge of the glass,
b) the centre of the glass,
c) the outside of the glass.

The preferred dimension is the radius from the inside edge of the glass, particularly for cylindrical shapes.

Where the chord and depth dimensions can be supplied, a computer program will be used to print out all necessary dimensions for clients checking and sign off.

Templates would be preferred for cylindrical shapes but are must for cylindrical shapes with flats. All templates must be of a hard material such as plywood and remember the minimum possible radii as previously listed in Table a.
### Table a

#### Maximum Sizes

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Glass type</th>
<th>Girth</th>
<th>Height</th>
<th>Minimum radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>5mm</td>
<td>Toughened</td>
<td>2500mm</td>
<td>3200mm</td>
<td>1000mm</td>
</tr>
<tr>
<td>6mm</td>
<td>Toughened</td>
<td>2500mm</td>
<td>3200mm</td>
<td>1000mm</td>
</tr>
<tr>
<td>8mm</td>
<td>Toughened</td>
<td>2500mm</td>
<td>3200mm</td>
<td>1500mm</td>
</tr>
<tr>
<td>10mm</td>
<td>Toughened</td>
<td>2500mm</td>
<td>3200mm</td>
<td>1500mm</td>
</tr>
<tr>
<td>12mm</td>
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<td>2500mm</td>
<td>3200mm</td>
<td>1500mm</td>
</tr>
<tr>
<td>15mm</td>
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<td>2500mm</td>
<td>3200mm</td>
<td>2000mm</td>
</tr>
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<td>2500mm</td>
<td>3200mm</td>
<td>2000mm</td>
</tr>
<tr>
<td>22mm</td>
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<td>2500mm</td>
<td>3200mm</td>
<td>3000mm</td>
</tr>
<tr>
<td>25mm</td>
<td>Toughened</td>
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<td>3200mm</td>
<td>3000mm</td>
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</table>

#### Minimum Sizes

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Glass type</th>
<th>Girth</th>
<th>Height</th>
<th>Minimum radius</th>
</tr>
</thead>
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<tr>
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<td>400mm</td>
<td>1000mm</td>
</tr>
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<td>600mm</td>
<td>400mm</td>
<td>1500mm</td>
</tr>
<tr>
<td>15~19mm</td>
<td>Toughened</td>
<td>600mm</td>
<td>400mm</td>
<td>2000mm</td>
</tr>
<tr>
<td>22~25mm</td>
<td>Toughened</td>
<td>600mm</td>
<td>400mm</td>
<td>3000mm</td>
</tr>
</tbody>
</table>
CURVED TOUGHEND GLASS

Figure a  Dimensional Specification  No.1

- Depth
- Height
- Girth
- Degree
- Radius
- Chord
- Tangent