

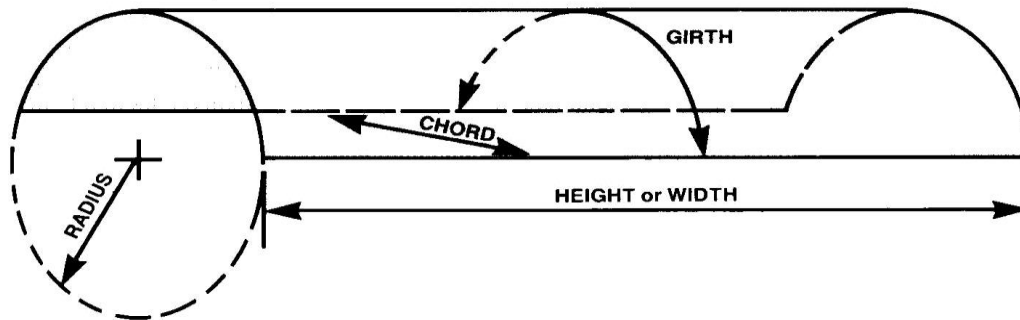
Tech Talk: Bent Glass

Bending Basics

Unlike the length and width dimensions required to order a piece of flat glass, the fabrication of curved glass requires precise dimensions of the shape of the glass. There are two ways to describe the shape. The first consists of the girth, height or width, and radius dimensions. When the radius is not known, the chord and depth dimensions can be provided.

A flexible tape measure is needed to measure the outside girth. A flat measurement is used to measure the height/width, inside chord, and inside depth.

A hardboard or mylar template is required with all the dimensions noted above if an accurate radius dimension cannot be provided.



DEFINITIONS

Height or Width—Vertical or horizontal dimension.

Radius—Any line extending from the center of a circle to the circumference.

Girth or Arc—Distance around the bend, including any flat areas, taken to either the convex or concave face of the glass (specify which). Measure-

ment should be taken with flexible tape.

Chord—Distance straight across the curve, measuring from point to point. Use a flat ruler to measure. To measure depth of curve, take one-half of the chord measurement and at that point measure to the top of the curve.

Manufacturing

Various types of steel molds are used for slumping the flat glass into desired shapes. Glass is placed on top of a pre-heated mold and then placed into a kiln. At about 700 °C, the glass begins to melt and bend, melding into the shape of the mold. The kiln is very slowly cooled down, completing the bending glass. In some cases, two or more pieces of glass are bent at the same time to ensure high quality laminating and insulating following the bending process.

Edgework



The following edge finishes are available: Seamed, Ground (pencil polish), Flat ground (ground with chamfer), and Flat polished (polished with chamfer)

Shapes

The illustration below shows different shapes that are available.





Descriptions of Bent Glass

TYPE A

Shallow cylindrical bend; arc not to exceed 58°.

TYPE B

Cylindrical bend; arc exceeds 58° but not 90°.

TYPE C

Curve-plus-tangent with curve limited to 60°. Tangent may not constitute more than 1/3 of the total girth.

TYPE D

Curve-plus-tangent with curve not exceeding 38 1/2° of arc. Tangent may not exceed the arc.

TYPE E

Curve-plus-tangent type has a tangent not more than twice the curve and curved portion not exceeding 90° of arc.

TYPE F

Curve exceeds 90° but not 128°.

TYPE G

Non-circular curve. Shape is that of a shallow letter S.

TYPE H

Central curve flanked by tangents which may be equal or unequal. The curve may not exceed 90°, and both tangents together in length may not exceed 1/4 the total girth.

TYPE J

Tangent-plus-arc-plus-tangent; curve 90° or less, the tangents together, equal or unequal not to exceed three-fourths of the total girth.

TYPE K

Curve exceeds 128° but not 180°.

TYPE L

Two curves of like radius and each not exceeding 90° with a common tangent between them.

TYPE M

Deep-curve-plus-tangent; curve will exceed 90° of arc.



Clear and low iron glass, tinted glass, Low-E coatings, patterned glass

Safety and Thermal Performance Glass Options

Laminated, Insulated glass, and Tempered glass

Additional Fabrication

Hole drilling is available. Interior notches can be pattern cut. Complex shapes are accomplished via waterjet cutting.

Standards

ASTM C1464-16 Standard Specification for Bent Glass covers the requirements for bent glass used in general building construction, furniture, display, and various other non-automotive applications. The standard includes tolerances for dimension, shape accuracy and crossbend, and twist. In addition, process surface blemishes, pock marks and ring marks, are addressed. This standard can be purchased at www.astm.org.

Tolerances are also included in ISO 11485-Parts 1 Glass in Buildings-Curved Glass-Part 1: Terminology and Definitions; Part 2: Quality Requirements; Part 3: Requirements for Curved Tempered and Curved Laminated Safety Glass. These standards can be ordered at www.iso.org.

For more information, contact Customer Service, 215-441-9101.