Bent Tempered Bentemp® Glass

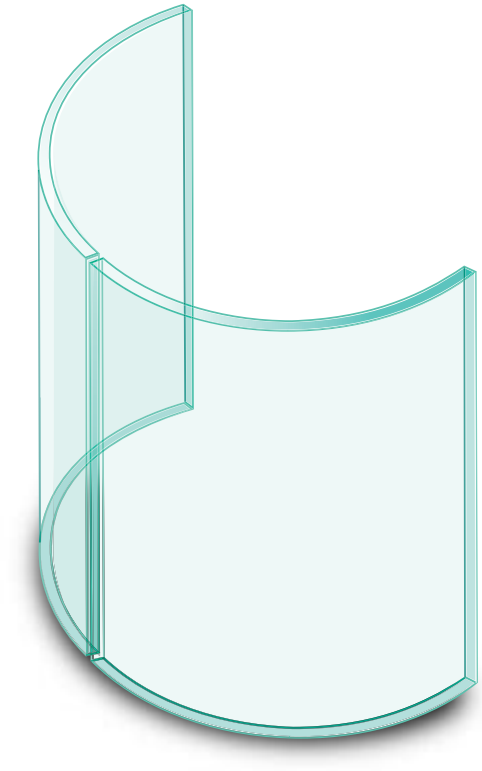
Bentemp®

bent tempered glass

The LAX Gateway
Los Angeles, California
Architect: Ted Tokio Tanaka Architects

Oldcastle Glass®

Where glass becomes architecture™



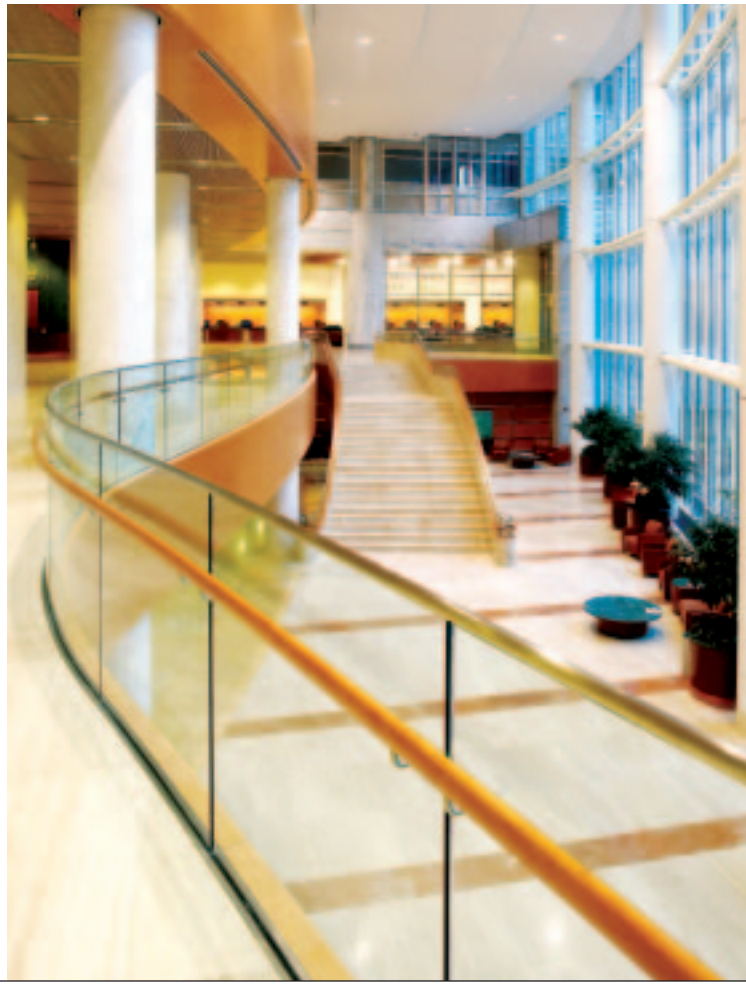
A creative alternative for architects and designers, Bentemp® is tempered or heat-strengthened glass that is bent, during the heat-treating process, to a specified radius to create unique profiles for installations in commercial and residential applications.

Bentemp® Applications

Bentemp® is used in a wide range of applications including:

- Handrails
- Spiral Staircases
- Shower Enclosures
- Partitions
- Elevator Enclosures
- Commercial/Residential Windows
- Curtain Walls
- Storefronts

Gonda Building, Mayo Clinic
Rochester, Minnesota, Architect: Ellerbe Becket



Bentemp® Glass

Introduction

Bentemp® bent tempered glass is a creative alternative for building designers and engineers. Bentemp® glass is heat-treated and bent or curved to create a unique profile for installations in commercial and residential applications.

Description

Bentemp® glass is custom-tempered by heat-treating glass through a horizontal tempering furnace. Although Bentemp® glass is usually specified as fully tempered, Bentemp® glass can be heat-strengthened for applications where fully tempered glass is not required.

Heat-strengthened and tempered Bentemp® glass is available for insulating glass (IG) units using clear, tinted, reflective, Low-E glass (including the new generation of post-temperable Low-E coatings) or spandrel. Low-E and reflective glass may only be manufactured with the coating on surface #2 of the unit. Inverted bends in the manufacturing process are not possible and therefore do not allow a surface #3 application.

Fabrication Options

Holes, notches, hinge cutouts; polished, ground and mitered edges; pattern cuts and sandblast designs–these are all available. Guidelines for hole size and positioning must be considered during the design phase, and fabrication processes must be completed prior to heat-treating/bending. Fabrication can be done with any thickness of glass intended for use in a bent glass application. With this capability, Bentemp® glass is ideal for unique and elegant shower enclosures. Oldcastle Glass® also has the capability to perform fabrication on your glass products by using transferred CAD files in a DXF. file format.

Glass Options

Bentemp® is offered in a large variety of glass products, including clear, low iron, Low-E's, standard or high performance (spectrally selective) tints and reflectives, to achieve desired aesthetics and to meet design criteria.

For a list of glass products/colors, go to the White Glass Options Tab.

All but a few of the sputtered Low-E and reflective glass products are available as Bentemp® vision or spandrel glass.

For more information on spandrel glass, go to the Green Spandrel Tab.

For glass optical and thermal performance data, log on to www.oldcastleglass.com. or email bentemp@oldcastleglass.com.

For glass availability information, call 1-866-OLDCASTLE(653-2278).

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Bentemp® Glass

Capabilities

Thickness: inches (mm)

1/4 (6), 5/16 (8), 3/8 (10), 1/2 (12), 5/8 (15), 3/4 (19).

Size:

Monolithic: inches (mm)
Maximum,(1) 82 (2,083) x 142 (3,067)
Minimum, 20 (508) x 20 (508)
(1) This does not apply to all glass thicknesses.

Insulating Glass: inches (mm)
Maximum, 82 (2,083) x 140 (3,067)
Illinois customers
Maximum Out of state (Illinois),
82 (2,083) x 130 (3,067)

Spandrel: inches (mm)
Maximum, 72 (1,828) x 120 (3,048)
Minimum, 20 (508) x 20 (508)
1/4 (6) substrates only

Spandrel Colors

Standard colors available include: warm gray, Solargray®, Solarbronze®, black, Solex®, EverGreen™, Ford Blue and lava bronze. Custom colors are available.

Minimum Radius(1)

Rectangles

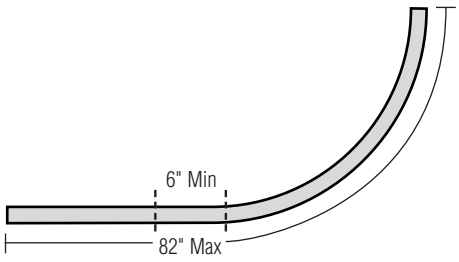
Glass Thickness inches (mm)	Minimum Radius inches (mm)
1/4 (6)	**25** (635)
3/8 (10)	**30** (762)
1/2 (12)	**35** (889)
5/8 (15)	**100** (2540)
3/4 (19)	**106** (2692)

Parallelograms

Glass Thickness inches (mm)	Minimum Radius inches (mm)
1/4 (6)	**25** (635)
3/8 (10)	**30** (762)
1/2 (12)	**35** (889)
5/8 (15)	**100** (2540)
3/4 (19)	**106** (2692)

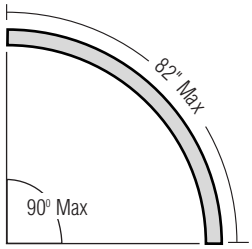
(1) For each thickness with a tangent, add 5" to the minimum radius.

Types of Bends



Cylindrical with Flats (Tangents)

The minimum length is 6" (152 mm). The total maximum width (arc + flat) cannot exceed 82" (2,083 mm). The length of the tangent should not exceed the length of the arc.



Cylindrical–90° or less

Maximum capabilities are a 90° angle or an 82" (2,083 mm) arc length, whichever comes first.

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Bentemp® Glass

Applications

Typical applications include glass handrails, spiral staircases, custom shower enclosures, curved ceramic frit spandrel glass, revolving doors, partitions and insulating glass units.

Depending on the application design, there is specific information that will be required to ensure accuracy.

When designing applications similar to shower enclosures, storefronts, partitions or curtain walls refer to Figure 1. If the design incorporates a slope rise staircase condition, you can refer to Fig. 2 for additional information that will be required due to the complexity of this type of design.

See the White Glass Selector Tab for some typical applications.

Terminology

OAL	Outside Arc Length
IAL	Inside Arc Length
O	Degree of Bend
C	Chord (Inside Chord)
T	Thickness
D	Depth of Bend
R_i	Inside Radius
R_o	Outside Radius
AL(1)	Centerline Arc Length
HT	Height
AOR	Angle of Rise
OS	Offset Dimension

(1) Measured perpendicular to vertical edges. Centerline arc length is identical to glass width before glass is curved.

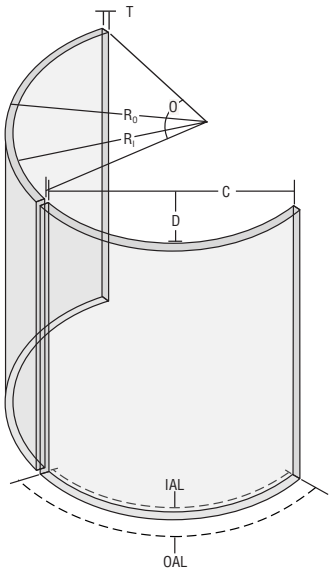

Figure 1.
Cylindrical Bend

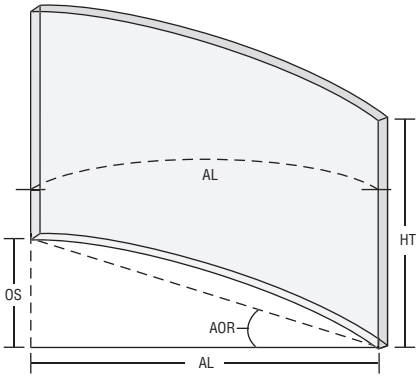

Figure 2.
Curved Railing with
Rise/Slope Condition

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Bentemp® Glass

Characteristics

Glass Thickness inches (mm)	Radial Tolerances inches (mm)
1/4 (6) to **1/2** (12)	+/- **1/8** (3)
5/8 (15) to **3/4** (19)	+/- **3/16** (5)

Glass Thickness inches (mm)	Dimensional Tolerances inches (mm)
1/4 (6)	+/- **1/16** (1.6)
5/16 (8) to **1/2** (12)	+/- **1/8** (3)
5/8 (15) to **3/4** (19)	+/- **3/16** (5)

Distortion

Distortion exists in all tempered and heat-strengthened glass, and bent configurations may even exaggerate it. Bent tempered or heat-strengthened glass is not recommended for vision areas, where distortion is not an acceptable characteristic. Minor departures from exact straightness are inevitable, and some linear distortion may also exist.

Strain Pattern

Under certain lighting conditions, both tempered and heat-strengthened glass may exhibit a strain pattern or an iridescent color, which is not normally visible. A regional strain pattern, not visible under many lighting conditions, may be detected when polarized light is reflected or transmitted by the glass. All of these are characteristics of bent tempered and heat-strengthened glass and are not defects.

Additional Important Information

Design Criteria

Details on the following important topics can be found in the Black Design Criteria Tab: Glazing Instructions, Thermal Stress, Deflection, Glass Design Loads, Glass Thickness Selection, Spontaneous Breakage of Tempered Glass, Roller Wave Distortion in Heat-treated Glass, Mock-ups and Warranties.

Specifications

A sample Section 08800 Specification for North America can be found in the Black Specifications Tab. Information specific to bent glass can be found in Part 2 Products, 2.02 Materials.

Contact Us

For any additional information, including details, technical data, specifications, technical assistance and samples, or to speak with an architectural specialist, call 1-866-OLDCASTLE(653-2278).

Visit Us on the Web

Log on to www.oldcastleglass.com for project photos, product colors, general inquiries and project assistance.

To view performance data on a wide range of glass makeups, or to build your own product specification, log on to www.oldcastleglass.com and choose GlasSelect™.