



曲面 / Curved
退火 / Annealed

CRISUNID®



传统退火曲面玻璃
Traditional curved annealing

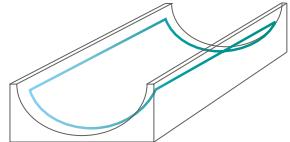
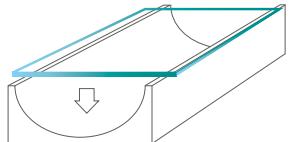
产品简介

曲面玻璃的构想始于20世纪初,这种新产品让建筑师和设计师能够提升项目的功能性、美观性和附加价值。

曲面退火玻璃的制造过程是将平板玻璃缓慢加热至软化温度,让玻璃因重力坍落在定制模具上。

玻璃形成所需的几何形状后即开始缓慢冷却。退火」是整个过程的关键,决定了产品的视觉品质和结构特性。

一百年后的今天,曲面玻璃已广泛应用于日常建筑中。除单曲玻璃外,更有球形、波浪形截面,扭曲状等各种形状,室内外皆可使用。



Definition

Curved glass was originally conceived at the beginning of the 20th century to provide architects and designers with new ways to bring functionality, elegance and added value to their projects.

Curved annealed glass is manufactured by slowly heating flat glass up to the softening temperature when the flat panel starts slumping by gravity on the customized mold.

Once the desired geometry has been achieved, starts the slow cooling of glass known as "annealing", a key process as it will determine the visual and structural properties of the final product.

Almost a hundred years later, curved glass has become common in the everyday architecture, asking not only for single curved glass but also compound curves (spheres, corrugated sections, twisting shapes, etc.) either for interiors or exteriors of buildings.



模具 Molds

曲面玻璃制造过程
Diagram showing the manufacturing process of curved glass



曲面玻璃 Curved glass

曲面退火玻璃
Curved Annealed



曲面玻璃 Curved glass

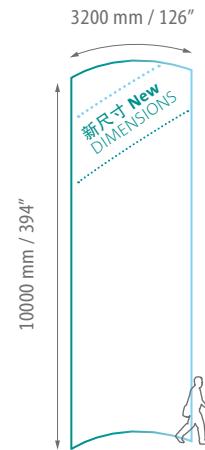
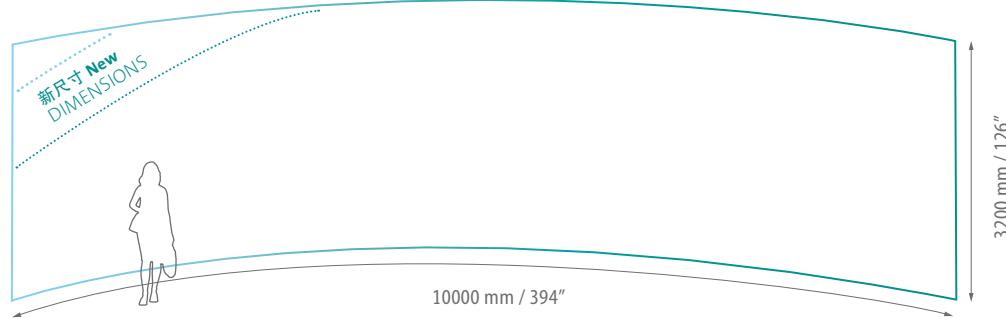
CRISUNID®

M L A

曲面退火玻璃
Curved Annealed

尺寸 Dimensions

欢迎垂询定制更大尺寸
For larger dimensions, please contact Cricursa

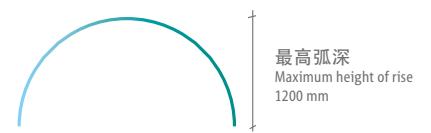


©Frank Kretschmann

不同尺寸下最小半径
MINIMUM RADII ACCORDING TO GLASS THICKNESS

厚度 Thickness	半径 Radius
4 a 6 mm	100 mm
6 a 8 mm	150 mm
8 a 10 mm	250 mm
> 10 mm	300 mm

玻璃工业技术展上的玻璃滑梯,
德国杜塞尔多夫
Dusseldorf, Germany 2016



最高弧深
Maximum height of rise
1200 mm



进行真空袋夹胶的无尘室
Cleanroom for vacuum bag lamination



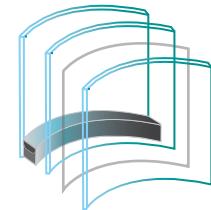
曲面退火玻璃
Curved Annealed

玻璃类型

Crisunid®曲面退火玻璃可制成：

- 非镀膜玻璃：透明浮法玻璃、超白玻璃、本体着色玻璃、拉制玻璃、压延玻璃、压花玻璃、窑烧玻璃、蚀刻玻璃和磨砂玻璃。也可制成丝印玻璃、彩釉可覆于任意面、无需经过钢化或半钢化烧结。

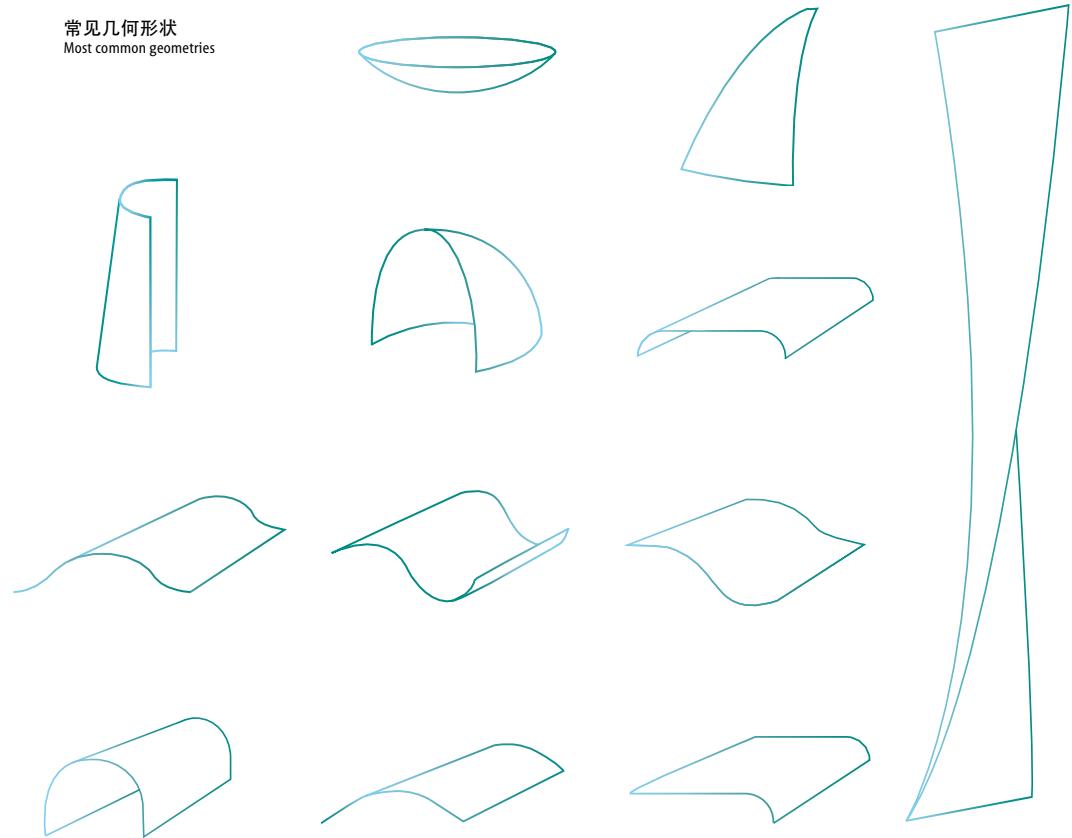
- 非镀膜玻璃：曲面退火玻璃可使用硬涂层、热解涂层、在线涂层、以及若干软涂层、磁性涂层、离线涂层。涂层是否可用取决于其种类、玻璃半径、特定弯曲截面、玻璃厚度以及玻璃形状。涂层可覆于任意面。如需了解更多涂层相关信息，欢迎垂询。

曲面退火玻璃
Curved Annealed Glass曲面退火夹胶玻璃
Curved Annealed Laminated曲面退火中空玻璃
Curved Annealed Double-Glazing

Glass type

Curved Annealed Crisunid® feasible in:

- Non-coated glass: clear float, low iron, body-tinted, drawn/rolled/patterned and kiln cast glass, acid etched or sandblasted. Also screen-printed glass, with the ceramic frit on any surface and no need for tempering or heat strengthening to bake enamelling.
- Coated glass: curved annealing process allows for hard/pyrolytic/on-line coatings but also some strong soft/magnetronic/off-line coatings. Feasibility depends on the type of coating but also on the radius, specific curved section, glass thickness and shape. Coating can be placed on any face desired. For further information on coatings feasibility, please get in touch with Cricursa.

常见几何形状
Most common geometries



M L A

特色

- 重力作用下弯曲过程缓慢, 加热和冷却时间长
- 设计自由度大。从单曲到复杂几何形状, 乃至任何立体造型皆有可能
- 玻璃组合选择多, 包括但不限于:
 - 夹胶片之间尺寸相差较大的夹胶玻璃 (如6mm拉制玻璃 + 19mm超白玻璃)
 - 彩釉可用于任何表面, 但在凹面较佳。
 - 适用于所有硬膜, 软膜只有部分适用。有关更多详细信息, 请与Cricursa联络
 - 彩色PVB夹胶层、图案PVB夹胶层、高安全型夹胶层
- 适用于超大玻璃片。如项目需要特制产品, 可为可按需设计定制加工炉
- 坎落工艺缓慢精确, 产品具有高等级的光学质量
- 高严格控制公差, 将边缘偏移降至最小
- 弯曲后无残留应力
- 破碎后: 大块碎片, 胶玻璃破裂后仍具有结构性能
- 如需要, 可于全部工序结束后对边缘进行手工处理人手磨边

Characteristics

- Slow bending process (by gravity), with long heating up and slow cooling down
- Design freedom or free-form is feasible. From single radius to organic complex geometries. Any 3D shapes can be studied
- Wide range of compositions available. Among them we point out:
 - Extremely different thicknesses can be laminated together (for instance, 6mm drawn glass +19mm low iron)
 - Ceramic frits can be used, on any surface, however better if these are placed on concave surface
 - All hard coatings but just some soft ones. For further more detailed information, please get in touch with Cricursa
 - Coloured and printed PVB. High security interlayers
- Oversized panels available. New bespoke furnaces can be engineered and fabricated if the uniqueness of the project requires it
- Excellent optical quality resulting from precise and slow slumping
- High control of tolerances with minimal edge off-setting in laminated lites
- No post-bending residual stress
- Breakage pattern: large parts with structural behaviour if laminated
- Edge working can be done afterwards, manually, if required

曲面退火玻璃
Curved Annealed中空玻璃
INSULATING GLASS

铝质、不锈钢、暖边间隔条
Aluminium, stainless steel and
WarmEdge Spacers

一般标准 General Criteria

	Aluminum Spacer	Thermix	Chromatech	Edgetech*	Edgetech Flex
最小半径 Min. radius (间隔条 spacer <12 mm)	600 mm	500 mm	700 mm	任何半径 Any radius	任何半径 Any radius
最小半径 Min. radius (12 ≤ 间隔条 spacer ≤16 mm)	800 mm	700 mm	1800 mm	任何半径 Any radius	任何半径 Any radius
最小半径 Min. radius (间隔条 spacer >16 mm)	2700 mm	2000 mm	2500 mm	任何半径 Any radius	任何半径 Any radius
IGU weight > 200 kg	√	无 no	√	√	√
暖边间隔条 WarmEdge	无 no	√	√	√ Better Edgetech Flex	√
氩气 Argon gas	无 no	√	√	√ Better Edgetech Flex	√
球体及复杂几何形状 Spherical & complex geometries	无 no	无 no	无 no	√ Better Edgetech Flex	√
认证 Cekal certification (硅胶Silicone DC 3363)	无 no	无 no	无 no	√	无 no
玻璃清边 Edge Deletion	尺寸 Size 硅胶Silicone+9mm	硅胶Silicone+9mm	硅胶Silicone+9mm	硅胶Silicone+9mm	硅胶Silicone+12mm
	公差 Tolerance -0/+2 mm	-0/+2 mm	-0/+2 mm	-0/+2 mm	-0/+2 mm
硅胶公差 Silicone Tolerance	-0/+2 mm	-0/+2 mm	-0/+2 mm	-0/+2 mm	-0/+2 mm

间隔条尺寸: 大部分间隔条尺寸为10至22mm。如有特别需求, 请联络Cricursa

Spacer size: from 10 to 22mm available in the most of the spacer types. In case of special requirements, contact Cricursa

Grosor: disponible de 10 a 22mm para la mayoría de los casos. Para grosores especiales contactar Cricursa

(*) 艾杰三道密封加强版超级间隔条 Edgetech Super Spacer Triseal Premium Plus