

Application Note

Questions & Answers - Glass Machining - It's What We Do

Q. What type of Glass Machining can be performed by Abrisa Technologies?

A. As custom glass fabrication experts, Abrisa Technologies has a broad spectrum of machining services that can be offered to fit nearly every application-specific customer requirement. Our CNC processing and other glass fabrication equipment allows us to manufacture glass parts ranging from simple to the most complex. Notching, slotting, grooving, edge grinding, stepped surfaces, hole drilling, chamfers, circle grinding, surface lapping/polishing, edge polishing and sandblasting are just some of the processes performed in-house.

Q. When Cutting Glass, how does Abrisa Technologies determine the cutting method and/or machine system to utilize?

A. The goal is to provide the best, most cost effective solution to the customer. First we look at the product specifications, part size, glass thickness, type of edge treatment and quality needed, accuracy and shape of the cut, tolerances needed, volume, and post processing steps. Then we consider how the finished glass will be used, and may make recommendations for design improvements or cost reduction.

Q. Does Abrisa Technologies work only with flat glass?

A. We are flat glass specialist and can fabricate custom flat glass optics to suit a broad range of application specific customer requirements.



Q. What are the advantages to diamond CNC machining?

A. Diamond machined edges are the gold standard with which to compare. Highly precise, intricate shapes are possible with the highest quality surface finish, whether ground or polished. We routinely hold tolerances down to ± 0.1 mm. Difficult features such as stepped surfaces, precisely angled bevels, slots and grooves lend themselves best to CNC machining. Abrisa Technologies' CNC machining centers can handle glass thicknesses from 0.5mm to 50mm and sizes ranging from 0.5" x 0.5" up to 120" x 60".

Q. What type of surface finishing can be done at Abrisa Technologies?

A. For flat glass, we can provide surface grinding and polishing, or "lapping and buffing", to various thicknesses and finishes. We do not typically polish for flatness specifications but can polish to thickness and cosmetics. We can hold thickness tolerances down to ± 0.025 mm and can handle up to 14" diameters.

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Q. What are the advantages to water jet cutting?

A. Water jet cutting is used for more complex jobs than possible with traditional scribe cutting methods, when diamond machining may be unnecessary or cost-prohibitive. The fully capable and programmable CNC based system combines highly pressurized water and an abrasive substance allowing for extremely complex shapes to be cut on flat glass materials with a dimensional precision of $<0.25\text{mm}$ to 1.5mm , depending on the thickness of the glass. Water jet cutting provides an ideal and cost-effective solution for cutting thick glass, which often is challenging using other methods. Abrisa Technologies' water jet machining centers can handle glass thicknesses from 2mm to 50mm and sizes ranging from $1" \times 1"$ up to $90" \times 46"$.

Q. What types of edge finishing can be done at Abrisa Technologies?

A. Through various machining centers, we can grind circle parts as small as $0.200"$ in diameter and as large as $10"$ in diameter. We can edge grind parts with dimensions as small as $0.125"$ and as large as $120"$. In addition to our CNC machining centers, our semi-manual machining centers can be set up to handle nearly any task.

Q. What is the difference between water jet edges and diamond machined edges?

A. Water jet edges are typically rougher and less precise than diamond machined, and are limited to flat profiles. Diamond machining is used to smooth the edge surface, increase accuracy, or add features such as bevels and rounded profiles.

Q. How do I know what edge treatment to select?

A. Edge treatments are applied to glass to minimize chipping, for safe handling and for aesthetic purposes. Selecting the appropriate edge treatment for the end-use of the glass may be critical to the functionality, strength, and overall performance of the glass. When glass is cut it leaves a raw edge, so for safe handling and protection from chipping a safety or seamed edge is done. This treatment is not for aesthetics, and is generally used when the edge of the glass is not visible. When aesthetics and functionality come into play, Abrisa Technologies can provide nearly any edge or corner profile using a combination of cutting and machining. Grinding and polishing stations are set up to provide machine ground or polished edges, pencil or flat, dubbed corners, beveled edges, and stepped or routed surfaces, on glass as thin as 0.28mm and as thick as $2"$.

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Glass Fabrication



Coating Deposition



CNC Machining



Strengthening - Chemical & Heat



Screen Printing of Graphics



Abrisa Technologies, a member of HEF Photonics, is a globally recognized technology glass fabrication and optical thin film coating company with expertise in high volume manufacturing and engineering capabilities, delivering Total Solutions that provide excellent performance, fitness-for-use and economies of scale.

Our US based, state-of-the-art ISO 9001:2015 and ITAR registered facilities include Abrisa Industrial Glass in Santa Paula, CA and ZC&R Coatings for Optics in Torrance CA. These two divisions produce solutions from cut-to-order coated glass components to custom complex and ready-to-install fabricated, strengthened, optically coated, electronically enabled and branded sub-assemblies.

Our Total Solutions serve a variety of markets including Micro-Electronics, Defense and Avionics, Display, Industrial Automation, Optical Sensors, Imaging, Photonics, Medical & Dental, Life Science and more.



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