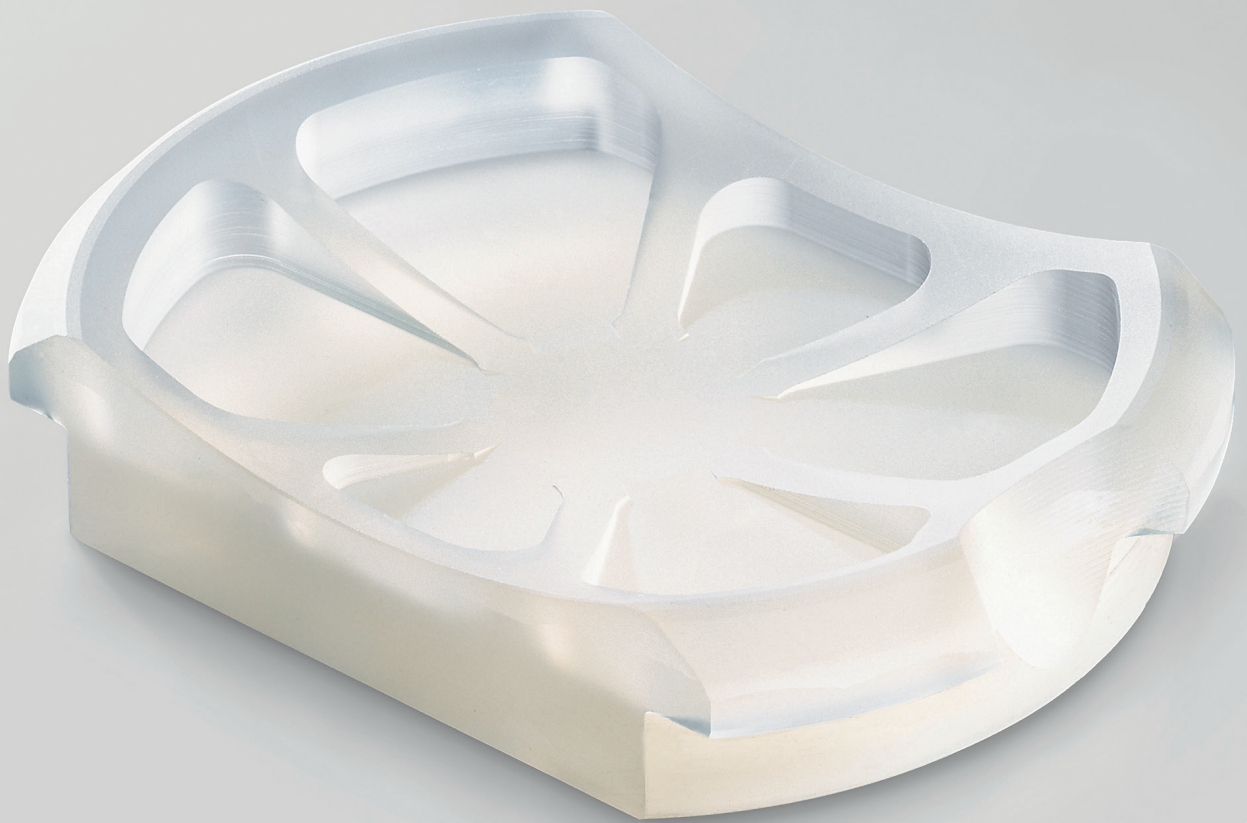


3D GLASS & CERAMIC COMPONENTS

FUNCTIONAL DESIGN WITH THE HIGHEST ACCURACY



3D GLASS & CERAMIC COMPONENTS

Swiss Optic AG, a Jenoptik Group company, manufactures components for technical and optical use by state-of-the-art computer-controlled machines (3- and 5-axis) to offer our customers new possibilities for shaping glass. All profiles consisting of smoothly integrated straight or curved lines or arbitrary shapes can be manufactured with high precision permitting new functional design perspectives. In the most common file formats (DXF, IGES, VDA, STP) we can take the data directly from any CAD system by disc or E-mail.

Specifications*

Material	optical glass, quartz, glass ceramics, ceramic, borosilicate glass and filter glass
Outside dimensions	up to 600 x 600 x 600 mm
Repeating accuracy	up to ± 0.002 mm
Length tolerance	± 0.002 mm
Diameter tolerance	± 0.002 mm
Shape and position tolerance	0.002 mm
Angle tolerance	5"
Path controlled shape	any radius or shapes which are digitized can be describes mathematically (acc. to value listing)
Inside shapes	bores up to 0.25 mm, steps, elongated holes, pockets, grooves and indentations of any size
Edges	C-edges, seamed and ground edges, bevels at any angle
Roughness of ground edge	RA up to 0.6 μ m
Edge chips	acc. to customer specification (ISO 10110, part or DIN 3140, part 7)
Surface structure	grounded, lapped/blasted, stress-free etched, gloss etched

In addition SwissOptic manufactures components with lightweight structures with a weight reduction of up to 90 %.

QUALITY ASSURANCE

Because the machine tool always follows the computer program, maximum accuracy is ensured (all parts are identical). The accuracy of the machine-tools are checked regularly by a high efficient Renishaw-Quick-Check-System. Furthermore we use machines which are able to compensate for temperature.

Well trained experts are programming and setting the machine tools and controlling production.

NOTES

On request 3D shapes may be manufactured as well (e.g. helical lines by using round tables). Finished glass components can be subsequently strengthened and etched. Glass parts may also be coated or printed or receive a micrometer scale.

METROLOGY

Wavefront	interferometer (4-12"), radii metrology, multiple area metrology, stitching-interferometer
Form deviation	3D coordinate measuring devices, caliper, CCD micrometers, interferometer
Angle precision	goniometer, interferometer, autocollimators
Transmission/reflection	spectral photometer, diode array
Surface defects	various microscopic methodes
Micro roughness	white light interferometer
Imaging/performance/resolution	computer-supported MTF measurement, microscopic image resoluion
Centering	objective metrology system, laser centering station
Fine correcting procedure	mechanical fine correction, robotic polishing
Additional functional measurement	Enviromental/climatic test acc. to ISO and MIL standards, abrasion and adhesion, various chemical and resistance testing, auto-claving, surface measurement, resistance measurement, assembly-specific metrology station

* The following error and tolerance data indicates possible limit values. Specified and assessed according to ISO/MIL/DIN.