

Ceramic 3D Printing

Contract
Manufacturing



Yugyokuen Ceramics offers a contract manufacturing service using ceramic 3D printers with stereolithography technology. This technology enables the manufacturing of intricate and complex shapes that are difficult to achieve using conventional molding and cutting methods, as well as precise customization.

Also providing an integrated system for combining with metallization and special processing

By utilizing our system for completely in-house manufacturing of ceramics, we also support processing such as Mo-Mn (molybdenum-manganese) metallization, brazing, welding, polishing, and cutting.



Industrial Usage

Ceramic stereolithography enables the creation of products that are impossible to mold or assemble through other methods. By exploring new designs, we can improve product functionality and develop value-driven applications.



Micro-sized heat exchangers



Abrasion-resistant nozzles



Parts for chemical manufacturing processes



Corrosion-resistant mixers

Small Parts

Extremely complex and intricate ceramic parts can be produced at sub-millimeter dimensions and with high degree of accuracy and repeatability that was not possible through injection molding. Stereolithography does not require a mold, which eliminates the problem of shear forces that can occur when pouring into a mold.

For example, even for extremely small parts with wall thicknesses and hole diameters of only 100 μm , or parts that require high surface quality, we can achieve a high level of quality that exceeds that of parts manufactured with conventional ceramic 3D printers.



General Materials

Alumina (LithaLox 350)	
Color	Ivory
Purity	99.8%
Surface roughness (Ra)	0.9 μm
Four-point flexural test	400 MPa

Zirconia (LithaCon 3Y 210/230/280)	
Theoretical density	6.088 g/cm ³
Surface roughness (Ra)	<1.0 μm
Hardness HV10	1,250
Four-point flexural test	930 MPa

Aluminum nitride	
Density	3.3 kg/dm ³
Layer thickness	25 μm
Min. wall thickness	0.3 mm
Max. wall thickness	4 mm

Alumina (LithaLox 360)	
Color	White with hints of red
Purity	99.8%
Surface roughness (Ra)	0.9 μm
Four-point flexural test	396 MPa

Silicon nitride (LithaNit 782)	
Compressive strength	> 3,500 MPa
Fracture toughness	7.7 MPa·m ^{1/2}
Hardness HV10	1,500
Four-point flexural test	760 MPa

Zirconia reinforced alumina (LithaLox ZTA 1080)	
Relative density	98.8%
Three-point flexural test	708 MPa
Theoretical density	4.39 g/cm ³
Hardness HV10	1,640

Alumina (LithaLox HP 500)	
Color	White
Purity	99.99%
Surface roughness (Ra)	0.4 μm
Four-point flexural test	430 MPa

Silica Base (LithaCore 450)	
Chemical leaching properties	Very good
Porosity	28%
Surface roughness (Ra)	< 3 μm
Three-point flexural test	10 MPa

Alumina-reinforced zirconia (LithaCon ATZ 980)	
Relative density	99%
Three-point flexural test	993 MPa
Max. wall thickness	20 mm
Thermal expansion coefficient	13.5 ppm/K