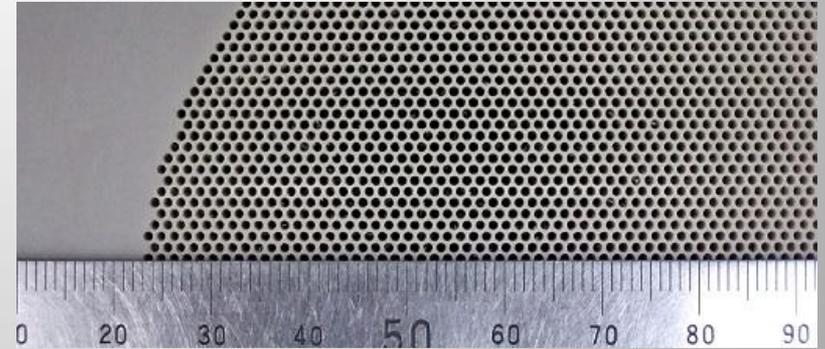


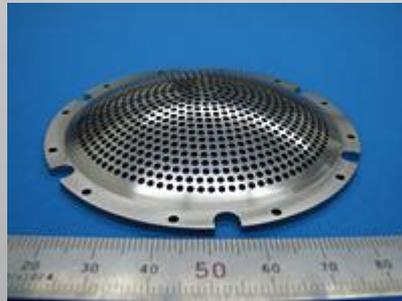
Solutions to Your Material Problems

- Need to stop thermal deformation?
- Need better thermal resistance?
- Need better thermal conductivity?
- Need better corrosion resistance?
- Need better wear resistance?

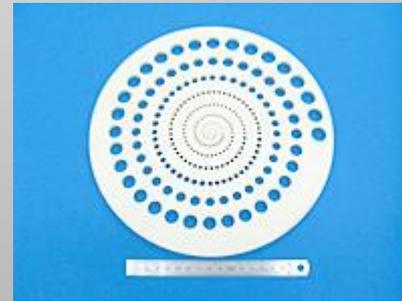
Let us help solve your problem!



Molybdenum



Tungsten



Alumina



Quartz Glass



TOP SEIKO CO., LTD.
For High Precision Machining of
Refractory Materials

<https://top-seiko.com/>

info@top-seiko.co.jp

Materials we machine:

Ceramics

Alumina (Al₂O₃)

*Electrical Insulation, High Hardness, High Heat Resistance, Wear Resistance

Zirconia (ZrO₂)

*Wear Resistance, Low Thermal Conductivity

Aluminum Nitride (ALN)

*High Thermal Conductivity, Electrical Insulation

Silicon Nitride (Si₃N₄)

*Electrical Insulation, Thermal Shock resistance, Wear Resistance

Silicon Carbide (SiC)

*Electrical Insulation, High Hardness, High Thermal Conductivity, Chemical Resistance

Machinable Ceramics(Macor, Photoveel, Macerite etc...)

*Electrical Insulation, Heat Resistance

MMC (Metal Matrix Composites)

*Electrical Conductivity, Heat Resistance, High Thermal Conductivity

CMC (Ceramic Matrix Composites)

*Heat Resistance, Lightweight, High strength

Glass

Quartz Glass / Fused Silica

*Electrical Insulation, Heat Resistance, Low Thermal Conductivity, Thermal Shock resistance, Chemical Resistance

Refractory Metals

Molybdenum (Mo)

*High Melting Point, Low Thermal Expansion

Tungsten (W)

*High Melting Point, High Density, High Rigidity

Tantalum (Ta)

*High Melting Point, Corrosion Resistance

Material Replacement Examples

Based on our rich machining experience of difficult-to-machine materials such as Ceramics, Glasses, Tungsten, Tungsten Carbide, Molybdenum, and Tantalum, we always try to suggest our clients the best material that suits their purpose.

Resin materials such as Acryl, Steel, Stainless Steel, Aluminum can be replaced with Ceramics or above mentioned Refractory Metals for higher heat resistance, higher or lower heat conductivity, and better wear resistance.

We are the expert of machining these difficult-to-machine materials to tight tolerances. Given below 8 cases of successful material replacement.

<Case1> Quartz Glass solves an issue with welding components burnt by laser.

Problem: An Acrylic component used for laser welding machine has to be grinded twice a week.

Solution: Our engineers helped our customers replacing the material of the component from Acryl to Quartz Glass.

Result: After replacing material from Acryl to Quartz Glass, there has been no longer any need for regrinding. Moreover, because of better laser transmittance through quartz glass, laser output power could be lowered. “We saved time and electricity!”, our customers said.

<Case2:> Machinable Ceramics stopped thermal deformation problem.

Problem: Fixtures made of Aluminum deform themselves at the temperature of 480 degrees F.

Solution: Our engineers suggested to replace material from Aluminum to Machinable Ceramics.

Result: After material replacement, the fixtures stopped thermal deformation and yield ratio has improved by approximately 20%.

<Case3> Molybdenum's high thermal conductivity has incredibly improved crimping quality.

Problem: Crimping stage made of Stainless Steel did not conduct sufficient heat, therefore, did not crimp very well.

Solution: Because Molybdenum has approximately 9 times higher thermal conductivity than that of Stainless Steel, our engineers suggested to replace material from Stainless Steel to Molybdenum.

Result: "The replacement enhanced the crimping quality dramatically as expected."

<Case4> Zirconia Ceramic prolonged a life of a cutting tool.

Problem: A cutting tool made of Alloy Tool Steel(SKD) was used to machine metals. Because of the heat caused by machining, it was worn off quickly and needed to be replaced frequently. "It was very costly as well as time consuming", our customer complained.

Solution: Zirconia Ceramic was proposed to make the tool because zirconia ceramic has high wear resistance as well as heat resistance.

Result: Zirconia improved wear quality significantly when compared to steel. "Most importantly, we can now machine metals with less downtime", our customer appreciated.

<Case5> A radiation shield made of High Purity Tungsten prolonged the life of Gamma Camera

Problem: A Gamma Camera made of Heavy Metal broke down easily because of the radiation.

Solution: To improve the ability to block off radiation, we made the shield, the protection of the camera, in Tungsten because Tungsten has high density.

Result: Tungsten shield was successful and the camera went into mass production.

<Case6> Tungsten Heavy Metal reduces the size of automotive component processing equipment

Problem: A balancing weight made of Stainless Steel was too big in order to reach the appropriate weight required. “It takes up too much space”, our customer was complaining.

Solution: Because the component needs to have corrosion resistance to chlorine and sulfur, we decided to make it in Tungsten Heavy Metal for its high gravity as well as the corrosion resistance.

Result: The equipment became more compact and resistant against those chemicals.

<Case7> Alumina Ceramic improved heat resistance of the mold and significantly increased the productivity.

Problem: To manufacture activated carbon for water purification system, our customer employed Heat Resistant Resin as material for molds. Because they were not heat resistant enough, yield rate was bad.

Solution: Because Alumina can withstand high temperature up to 1,800 F, and relatively cheap compared to other ceramics, we suggested our customer to make molds in Alumina,

Result: “We could speed up the process with stable production. We are making more activated carbons than ever before! ”, our customer happily told us.

<Case8> Metal Ceramic Composite Material improved the heat resistance as well as durability of Soldering Nozzles.

Problem: A nozzle used for soldering equipment was having a problem with thermal deformation when it was made with Copper. The manufacturer was looking for a material which is more durable than copper.

Solution: We proposed replacing Copper with Metal Ceramic Composite Material for its superb heat resistance as well as its high hardness.

Result: Nozzles made of Metal Ceramic Composite Material could withstand and conduct the heat without thermal deformation. This customer is now a leading soldering equipment manufacturer serving mainly automotive industry.

Our Services;

- CAPABILITIES;

Our Precision Machining Services include;

SLICING, GRINDING, MILLING (micro grooves, complicated shapes etc),
HOLE DRILLING (micro hole drilling, deep hole drilling), SCREW MACHINING,
WIRE EDM, Micro Hole EDM Drilling

- MACHINES;

3-Axis Machining Centers, 5-Axis Machining Centers, NC Lathes, Grinding Machines,
NC Cylinder Grinder, Slicing Machines, Wire EDM, Micro EDM

- INDUSTRY WE SERVE;

Aerospace, Automotive, Research Institutions, Electronics, Semiconductor,
Analytical Instrument, Optical Instrument , Medical, Nuclear Power

Contact us now!

Top Seiko specializes in precision machining of ultra-hard materials such as ceramics and refractory metals.

For any machining needs of these highly functional materials, please contact us at info@top-seiko.co.jp.



Download our Material Guides
<http://top-seiko.com/common/pdf/guide.php>