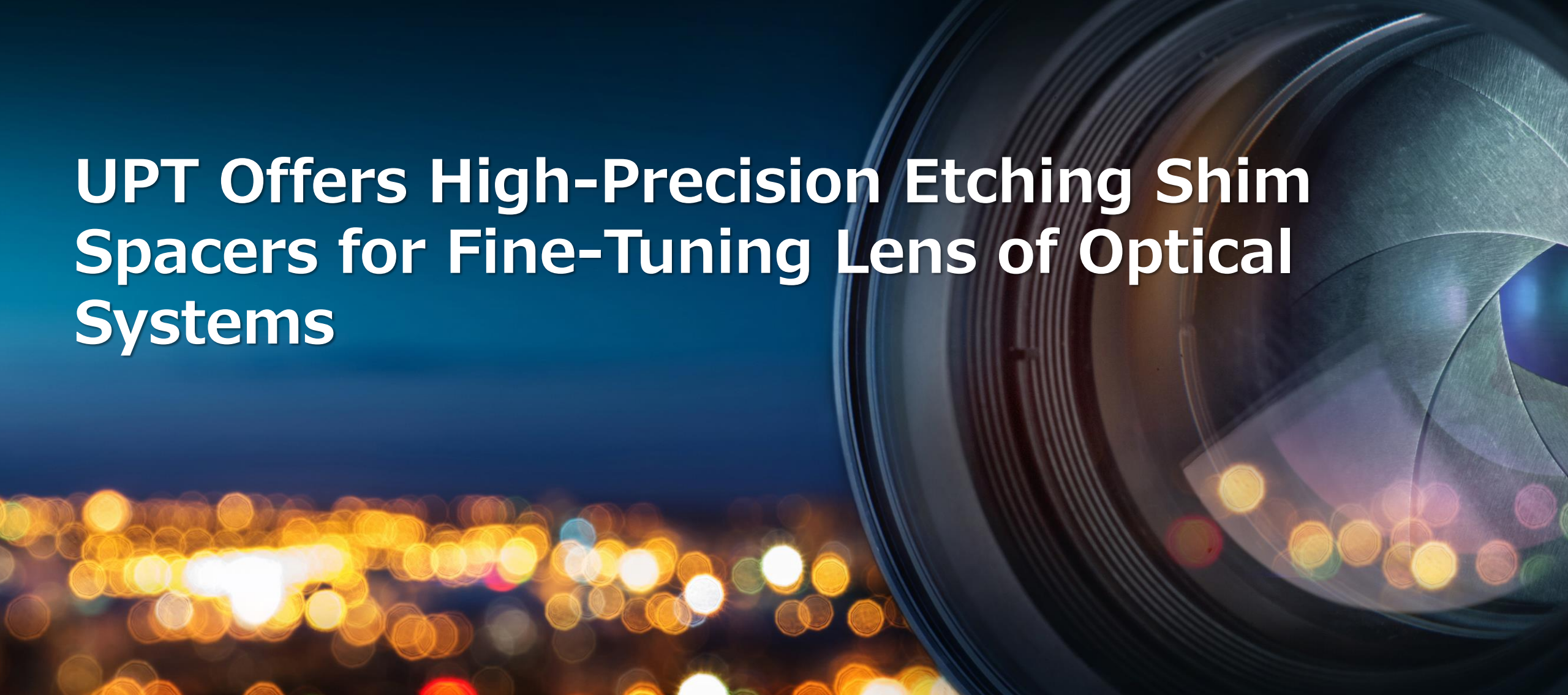


UPT Offers High-Precision Etching Shim Spacers for Fine-Tuning Lens of Optical Systems



The Shim spacers are essential for Optical Applications

The Lens spacers and shims are required to have best performance of the lens. Generally, the spacers are used for fixed-focus lenses, while the shims are used to adjust the moving distance of fixed-magnification lenses.





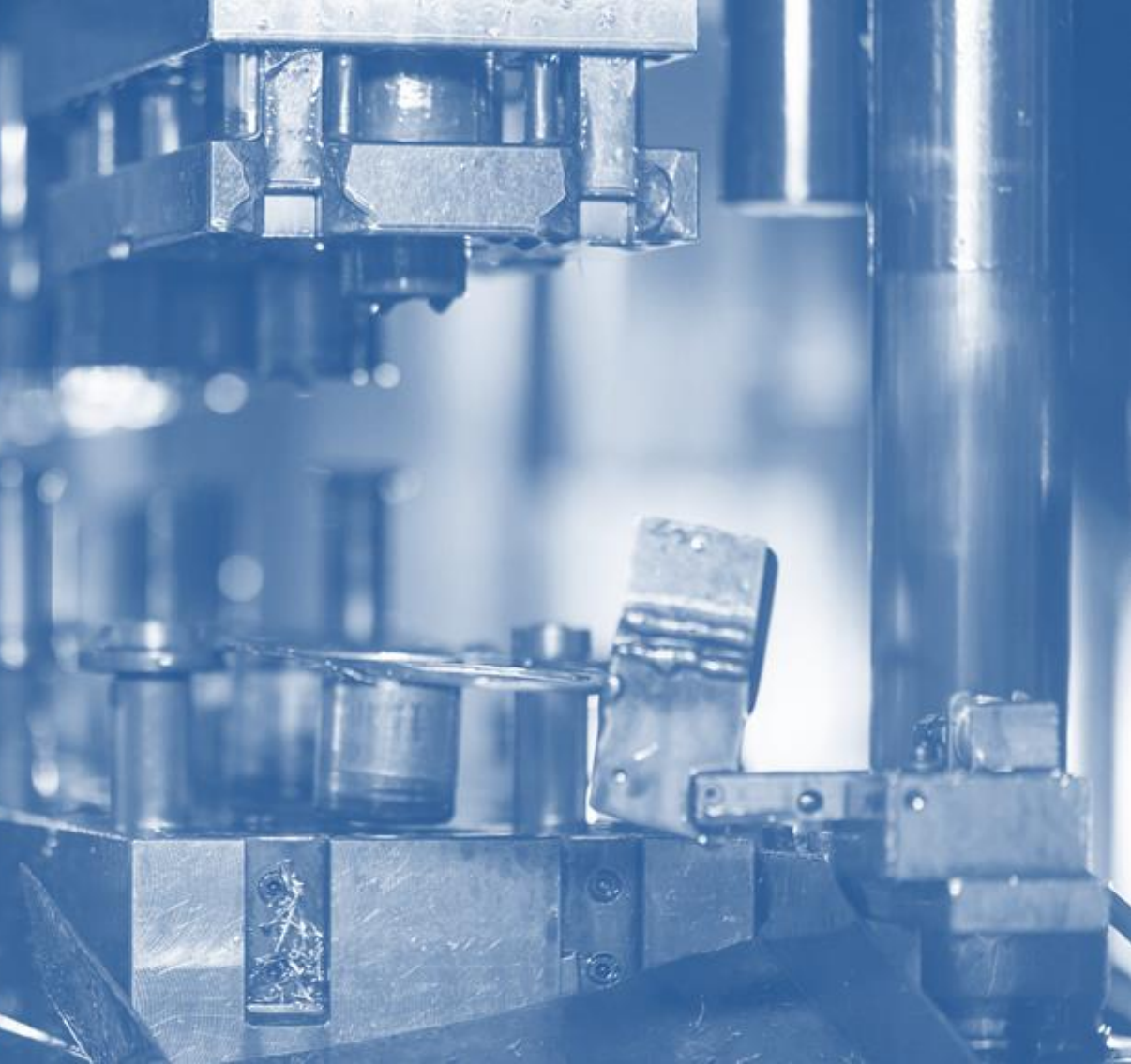
The Spacers for Lenses

The best image/photo can be taken by inserting a spacer between camera and the lens and the moving distance of the lens can be v

The Shims for Lenses

The Shims are used for fixed magnification lenses. The Shims are very thin stainless steel spacers that help improve image quality by controlling the lens movement distance more precisely. By placing the shim between the lens and camera, this distance difference, caused by variations in lens and camera manufacturing tolerances, is adjusted, resulting in better image quality.

Selection of shim spacers

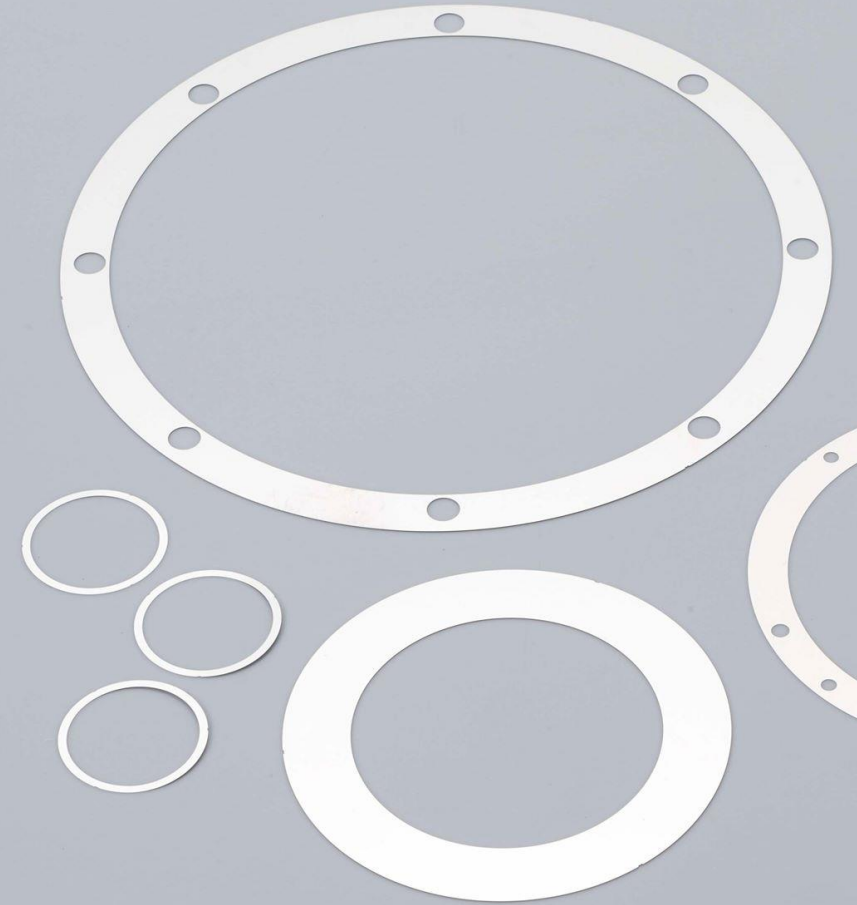


Stamping Technology :

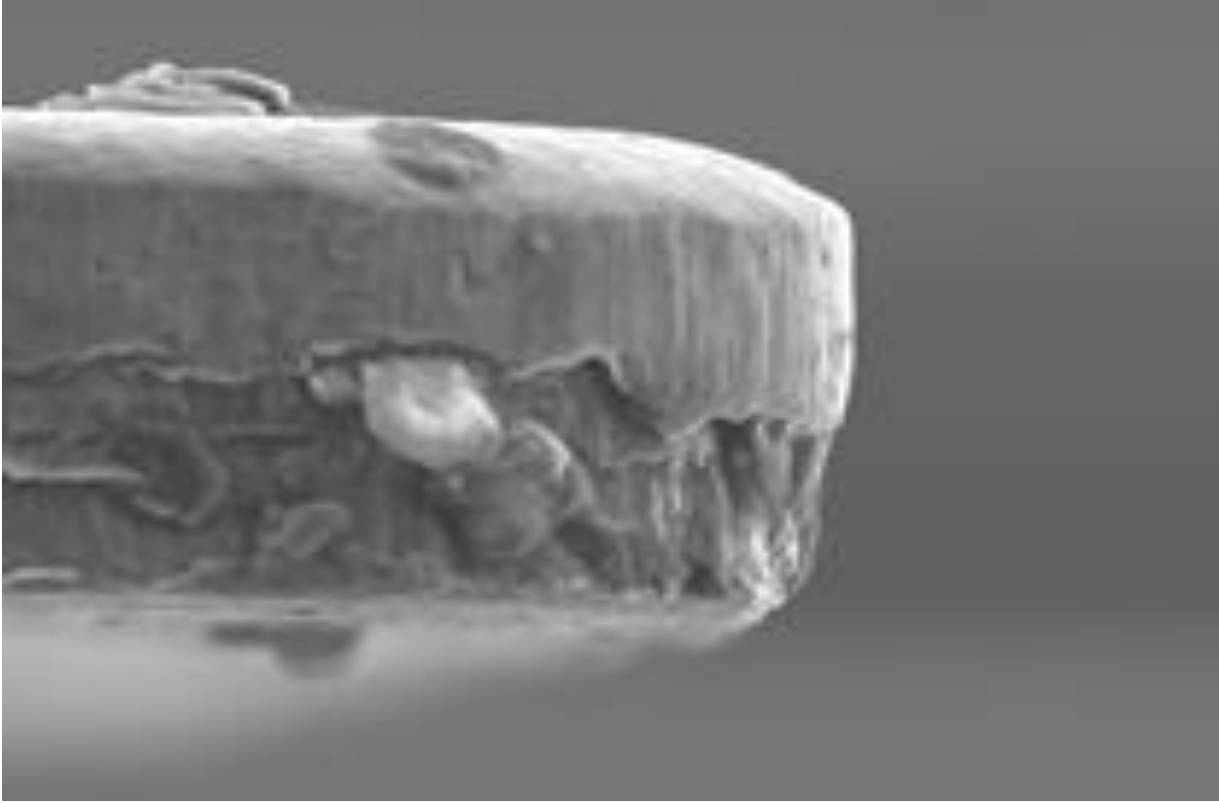
This is a technology of stamping out thin metal sheets using a press. Although a press die is required, this technology is effective for high volume production. However this technology has the burrs and distortion issues, so not suitable solution for precise dimensional control is required. And the leadtime of this technology is around 12 weeks to produce a press die, so it is necessary to schedule production plan well in advance.

Etching product :

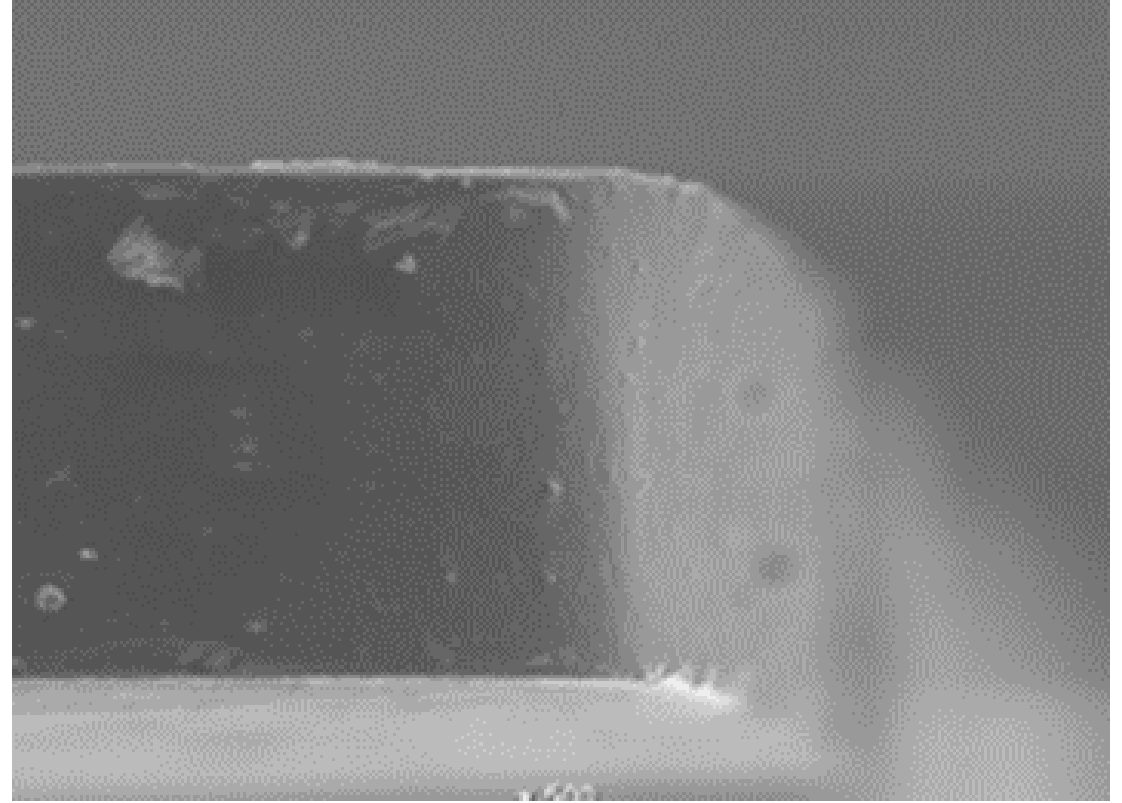
The etching technology is cost effective solution because it does not need expensive mold. There are no metal burrs, and it is possible to produce shapes that are difficult to produce by stamping technology. Depending on the size of the object, the process can be used for a wide range of applications, from a single prototype to high volume mass production. The standard lead-time is around one week, and this etching technology is ideal solution for applications which is required high accuracy design.



Machined cross section of Stamped and Etched



Stamping products



Etched products

Proposal

■ Proposal

For optical applications, we offer shims and spacers made by etching technology with high processing accuracy.

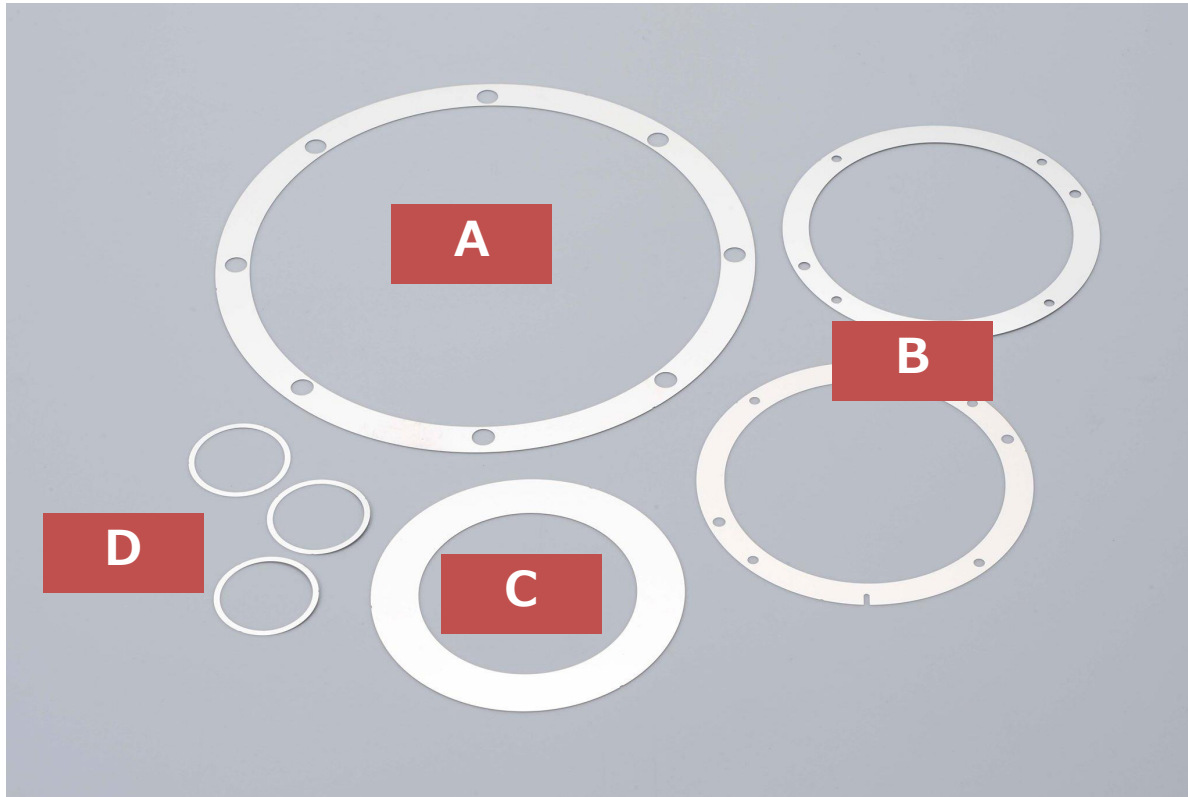
■ Advantage

- Short lead-times because of UPT's wide range stock of material types.
- Initial investment for etching technology is only a few hundred of dollars for mask cost.
- This low-cost process can be less workload with low cost, such as ordering multiple types of product dimensions and tuning them on the actual machine to determine the final dimensions.



■ Example of Optical Shim and Spacer

unit : mm



	A	B	C	D
Material	SUS 304	SUS 304	SUS 304	SUS 304
Thickness	0.1t	0.075t	0.03t	0.005t
Surface treatment	N/A	N/A	N/A	N/A
Size	φ100	φ60	φ50	φ20

Shim Spacer Specification List

Specification Items	Contents
Target Metal Type	All etchable metals (Excluding tungsten-based, gold and silver)
Target Metal Thickness	Available in any thickness (0.004mm~)
Machining accuracy	±10% of thickness (Min tolerance ±0.01mm)
Surface Treatment	Black treatment and also various treatments are available

Value 1



Enough Inventory

We have 500 kinds inventory of materials and thicknesses in stock. For example, we can order 5 types of SUS304 material in $5\mu\text{m}$ steps based on $50\mu\text{m}$.

Value 2



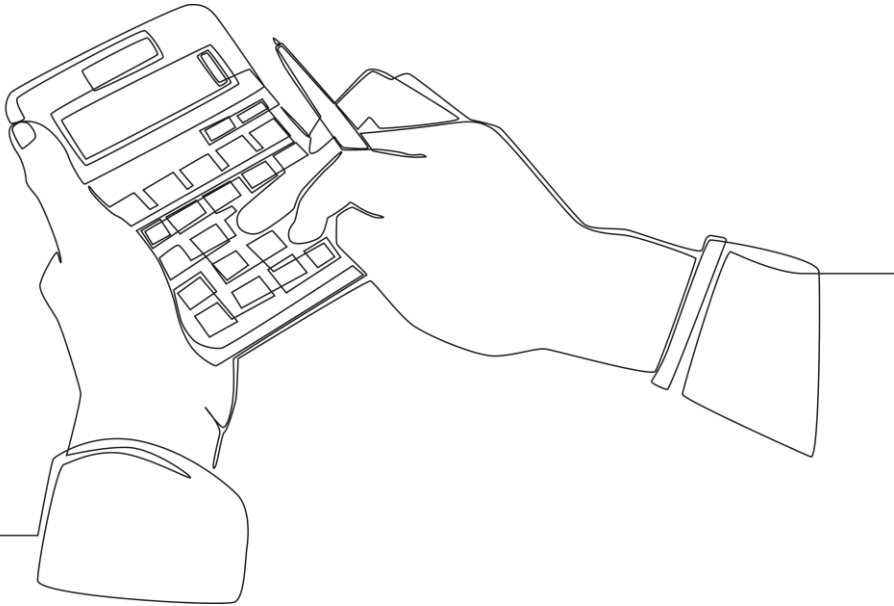
UPT's etching factory in Japan

High dimensional accuracy of $\pm 10\%$ of plate thickness

The accuracy of etching technology for dimension/design is $\pm 10\%$, and it meet with the requirement of shim spacers which need to have high accuracy design.

When etching on both sides

Value 3



Easy ordering with only mask fee

The etching technology does not require the expensive molds and can be multiple cut-try with only the cost of mask fee.