



LBP Optics

Mirrors for Industrial and Scientific applications

Prototype components

LBP Optics has the experience and manufacturing expertise to offer low cost production of small volume, highly complex optical components in a wide range of shapes and sizes from 5mm diameter up to 150mm maximum dimension.

Machining the blank

Our machine shop is very efficient for turning and milling a small number of components to customer's drawings. We can machine dowels, water cooling channels and tapped holes in to the mirror body. We also keep stocks of mirror grade metal so that we can keep costs to a minimum. Starting materials include copper, 6082 aluminium, 316 stainless steel, brass and nickel.

Over the years, we have built up large stocks of jigs, holders and tools so that we can offer precision machining for many shapes and sizes. To ensure dimensional stability we have developed a stress-relieving protocol, including cryogenic treatments for many metals. This can be done on just one or two mirrors very cost-effectively.

Polishing

We can polish single mirrors on our small polishing machines designed with prototyping in mind. We also polish customers' free issue material. Our surface profiler can measure surface texture and roughness of engineering surfaces.

Coating

Our gold coating is done using an immersion technique based around electro chemistry. Just one mirror can be gold coated in a few minutes, no special tooling is required. A tapped hole is useful for holding the mirror during operations. Unlike vacuum-deposited coatings there are no tooling costs so small numbers can be done very cost-effectively.

We regularly prepare substrates ready for our customers to arrange their own coatings.



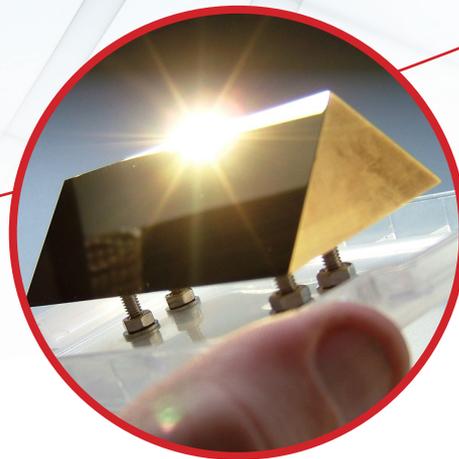
Some examples ...



A deeply concave copper mirror with gold coating, used in the infrared for gas sensing. The small central hole is 1mm diameter and the circularity of it was checked with our video microscope. We also made the mounting tube at the same time, guaranteeing the threads mated correctly. Making mirror and mount in one item saves money, reduces assembly time, and simplifies replacement in the field.



These hardened stainless steel mirrors are used in a scanning mirror mounting. The flat faces are consistently flat right up to the edge of the holes, measured with our phase shifting interferometer. The tooling needed to make these cost just a few Euros, and small batches of just 3 parts could be made at a time. The customer free issued the machined part to us. We made some slightly concave, and others slightly convex, to assist in the assembly of the final scanning unit.



This gold coated copper prism demonstrates why our gold coating is so flexible. The entire mirror was coated in a few minutes, no tooling was needed. The sharp apex is also coated, as it is used as a beam splitter with a high power CO₂ laser. Our electronic autocollimator measured the face angles to arc second accuracy. After lengthy use or accidental damage the mirror can be repolished and recoated by us to be as good as new.



These aluminium mirrors are used to save weight. The protected silver coating gives 99%R in the 800nm - 5 micron spectrum. The small lugs are designed for mounting. These were made to a few microns parallelism to ease alignment. The intermediate nickel plated layer we apply gives corrosion resistance to the mirror, and is polished to better than 1nm roughness. Polished surfaces eliminate scatter in the visible from diamond machining.



LBP Optics is an ISO 9001:2015 registered company, underlining our commitment to quality and customer service

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