

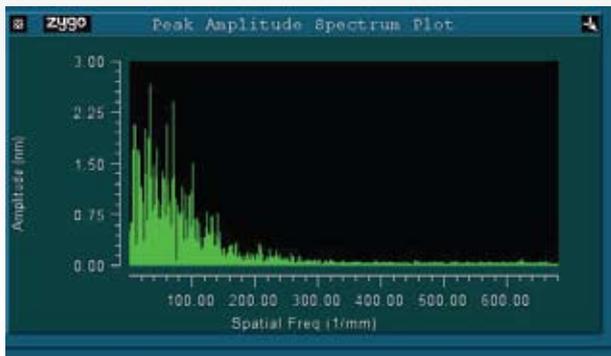
LBP Newsletter June 2014

Lapping and polishing capabilities

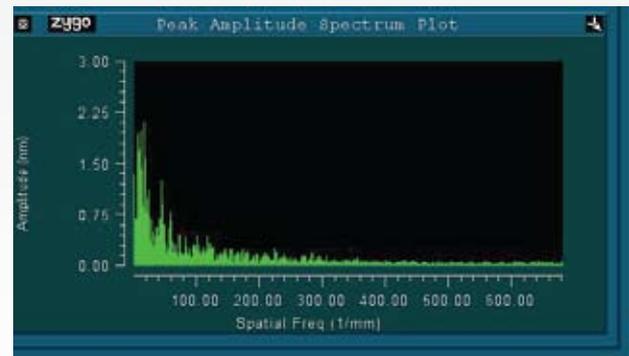
Over the last 25 years we have lapped and polished many different materials such as: Stainless Steel, Tungsten, Graphite, Bronze, Brass, Titanium, Ceramics, Mild Steel, Nickel, Arcap Alloy, Graphite, Electroless Nickel and Crystals. Our double sided lapping and polishing equipment can produce parts with just 1 micron variation in edge thickness.

Chemical Polishing: our chemical polishing technique doesn't include any mechanical abrasive action and it leaves a flaw free, ultra smooth mirror surface of sub nanometer surface roughness. Because no abrasive is used, there are no embedded particles in the surface to act as absorbing sites.

Our polished metal surface quality is far superior to anything even the very best diamond machining can offer. Where surface quality is important, many diamond machined optics have to be "post polished" to improve the surface quality. With LBPs chemically polished surfaces there are no cutting arcs, target patterns or chatter marks that are so easily visible on the surface of a diamond machined mirror.



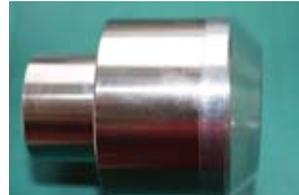
Diamond machined surface showing roughness



Improved surface smoothness after polishing

These unwanted surface faults can initiate laser damage and cause diffraction of the laser beam. Sometimes on diamond turned concave or convex mirrors a spike of metal can be left in the centre of the spherical mirror due to poor proof of centre during machining.

Plating and coating: we have our own custom made Electroless Nickel plating equipment, we do not sub-contract this operation. We monitor and control the plating process quality and just as crucially the substrate preparation for plating, in laboratory conditions. Our Electroless nickel plated parts are bright, stain free and low in porosity.



Contact us for help,
information and prices:

www.lbp.co.uk
+44 (0)1767 600877
sales@lbp.co.uk

Precision Lapping and Polishing

We have had several orders for metal parts that are not being used as traditional mirrors, but still need optical precision. That means sub micron flatness, sub arc minute parallelism, and Angstrom levels of surface roughness. Typical applications are in alignment and positioning systems, test equipment, Formula 1 and scientific instruments.

Getting LBP to produce these precision metal parts has proved useful for customers in overcoming some common problems with both glass and diamond machined metal parts.

Glass or metal?

Glass mirrors lack the facility to have dowel pins, datum surfaces and threads machined into them, making stable mounting far more problematic. With metal mirrors this is not a problem. Unlike glass our metal mirrors can have the same or similar thermal expansion coefficient as the equipment it is mounted on.

Diamond machined metal mirrors, unlike our polished mirrors, have surfaces that can scatter and diffract red or green lasers, or even white light to an unacceptable level. For example a camera system may not be able to compare a reference beam with the distorted reflected beam, or reliably locate the centroid of a reflected beam amongst the spurious reflections from the grating like surface of diamond machined mirrors.

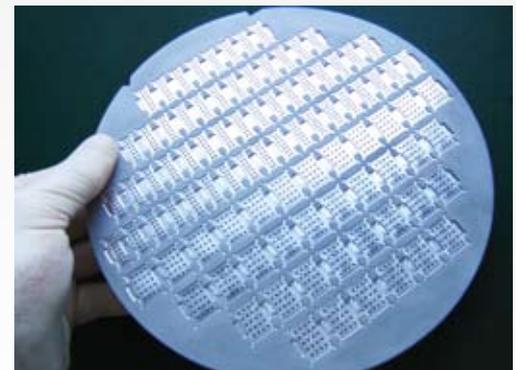
The ultra-smooth surfaces we achieve with our chemically polished metal mirrors can avoid these problems.



Gold coated brass



Stainless Steel prisms



Lapped Aluminium chuck

How to contact us:

Tel: +44 (0) 1767 600877 Fax: +44 (0)1767 600833
Email: sales@lbp.co.uk Web: www.lbp.co.uk
BLOG: laserbeamproducts.wordpress.com

Laser Beam Products Ltd, Units B&C Stratton Park, Dunton Lane,
Biggleswade, Bedfordshire SG18 8QS, United Kingdom

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