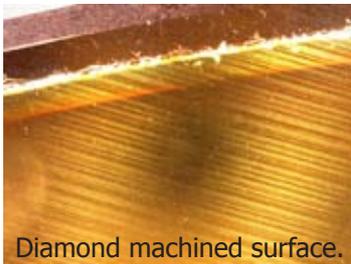


NEWSLETTER June 2013

Supersmooth Mirror Surfaces

Some problems with diamond-machined mirrors

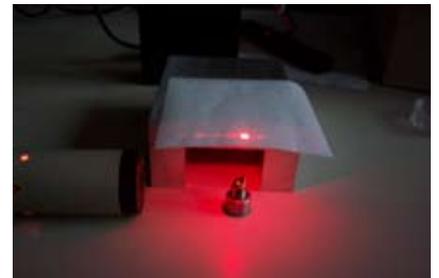
We were asked many times at the Laser Show in Munich, "How do you make your mirrors?" After further discussion we discovered that with higher power lasers and complex systems, diamond-machined mirrors have started to cause problems. The diamond machining process leaves the mirror with a high surface roughness value, and an irregular grating structure.



Diamond machined surface.

These surface artefacts cause scatter and diffraction, especially in the near infrared and visible. Sometimes this can reduce the power of a red alignment beam to near zero after a few reflections. In resonators, "mode coupling" of the diffracted radiation causes complex problems in the mode structure. To complicate things more, the roughness and scatter can often be directional, so performance can vary depending on which direction the mirror is mounted.

The image on the right shows the scatter and diffraction from a diamond machined copper mirror reflecting a red laser beam.



Why are our chemically polished mirrors better?

Our chemically polished mirrors have the "super smoothness" needed for very high quality UV grade mirrors. There are no repetitive cutting arcs, or periodic patterns on our polished mirrors. The surface quality is high enough, and the roughness so low, that they can be used in the near IR, the visible, and the UV!



Supersmooth polished surface

Towards the end of the show, one visitor told us how his spherical diamond machined mirrors continually burnt out in the exact centre of the mirror. With a microscope he saw that the diamond flycutting process had left a tiny "spike" of copper sticking out of the centre. This spike comes from trying to centre any object being flycut 'on axis'. We have seen the same thing on diamond machined mirrors as well.

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June 2013 Newsletter

Very small mirrors for medical applications

Our range of standard mirrors starts at just 5mm diameter, 1mm thick. Gold coated Copper mirrors of this size are ideally suited for, and well-established for use with Er:YAG lasers in dental and surgical applications.

They are reflective in both the UV and visible, highly adaptable with long operating lifetimes and have high laser damage resistance.

The visible reflectivity of Gold is important because it allows simple alignment of complex multi-mirror systems for dental lasers.



Reworking Mounted Mirrors

It can be costly to replace mirrors with mounts, so it is always worth considering reworking. We have the ability to measure the alignment of mirrors that are already mounted. We can then disassemble, polish and coat and reassemble the mirrors, meeting the original specifications of the mirror. This can save €500 or more over the cost of a new mirror and mount.



Industrial Mirrors for Machine Vision

There are some applications that demand our all-metal mirrors because glass mirrors just can't be used, for example in food or pharmaceuticals manufacture. Our all-metal mirrors, such as Stainless Steel or Aluminium, can be used for barcode scanning, process monitoring and other general machine vision tasks.

This photograph shows the versatility of our all-metal mirrors, with mounting holes and alignment surfaces to make assembly of the final product simpler.



Laser World of Photonics, Munich 2013

We exhibited once again at the laser show in Germany this year, the 11th time in 22 years! It was a busy few days and we were pleasantly surprised by both the number and quality of visitors to our stand.

Thank you to everyone that popped by to see us. We have booked a stand at the Photonics West show in San Francisco for February 2014, so please come and see us there.



AILU

The Association of Industrial Laser Users is our industry trade body, established to advance laser technology worldwide. Mark Wilkinson is taking an active role with AILU after being voted on to the Committee for a 3 year term earlier this year.

If you use industrial lasers you should think about becoming a member, see their website for more detail at www.ailu.org.uk

Whatever your requirements, contact us for help, information & prices:

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