



## Newsletter December 2013

### Unique gold coating



We have known for a long time that our gold coating is in many ways better than other gold coatings available. If you've had a bad experience with gold coated mirrors, try ours and you will see the difference.

Almost uniquely we make our gold mirror coatings galvanically, by complete immersion of the mirror in our custom made plating tanks. Nearly all other vendors will vacuum deposit their thin gold films. Our gold coating out-performs these vacuum deposited coatings in just about every area:

**Adhesion** - our gold coating never peels, flakes, or delaminates; it is chemically bonded to the mirror.

**Coverage** - our gold coating covers all the mirror. Giving 100% clear aperture and coating through holes and all internal surfaces.

**Broad spectrum** - no overcoat is needed, so reflectivity is truly broad-band from 1 $\mu$ m - 300 $\mu$ m.

**Pulsed laser damage** - for TEA lasers LIDT for 80ns is 46.7J/cm, typically 10 X better than vacuum coatings.

**CW laser damage** - for a typical 4KW CO<sub>2</sub> laser our gold coated copper mirrors work at 5% of their laser damage threshold.

**Cost** - no tooling is needed, and no batch charges apply, a single mirror is easily and quickly coated.

**Why isn't this type of coating more widely used?** It has taken us 20 years of development and we are confident of the high quality of our gold coating. It is limited in its use to a small number of metals, most usefully copper and aluminium.

### How to contact us:

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### SPIE Photonics West 4-6 Feb 2014

We will be exhibiting again in San Francisco from 4 - 6 February 2014 as part of the UK Pavilion.

We are looking forward to a busy few days and would love to see you. Come and visit us at Booth Number **5319** if you are there. We will have a wide range of products on show.



You can also follow us on Twitter, on Facebook and on our blog



## Spherical or parabolic mirror?

We have had a few customers ask us for parabolic mirrors such as 25mm diameter with 50mm focal length. Given that a spherical mirror costs 90% less than a paraboloidal one, it's worth asking us if a spherical mirror would do the job.

It does seem at first that a "fast" mirror like this should have an expensive to produce parabolic form. However if the beam being focussed is say 14mm diameter then over the working part of the mirror the difference between the surface curvature of a paraboloidal and a spherical mirror is just 0.3um, an insignificant 1/30 of a wavelength for a CO<sub>2</sub> laser. PLEASE NOTE this doesn't apply to off axis paraboloids and spheres, the difference here is very significant.



spherical copper mirror

## NEW High accuracy L/4 phase retarder coating



Every metal cutting laser will contain a L/4 phase retarder, sometimes called a 90 degree phase shift or polarising mirror. This mirror circularises the laser beam polarisation to give even cut quality across all axes of motion.

In the early 1980s coating technology could only offer a polarising mirror with 45 degrees (or L/8) of phase shift, so two mirrors were needed to give the 90 degrees of phase shift used to circularly polarise the beam. Anyone remember the Ferranti MFK or Coherent EFA lasers?

The first 90 degree phase shift coatings were offered with 90 degrees +/- 6 degrees phase shift, then the market demanded +/- 3 degrees, and now +/- 1 degree is becoming widespread. This was in response to ever more demanding edge cut quality. LBP's current phase shift coating meets the most demanding specification of 90 Degree +/- 1 degree and each mirror has it's exact phase shift measured.

## Laser Safety

Mark Wilkinson is a member of the new SIG in Machine Safety in AILU. Its principal activity at this time will be to address safety concerns with desktop laser machines and especially their use in schools and colleges. Contact us for more details if you have one of these machines and are concerned.

## Christmas Closing

We will be closed from 24th December 2013 until 2nd January 2014. If you are looking for a delivery in January, please be sure to place your orders soon. We wish you all a very happy new year and look forward to working with you in 2014.

