

December 2018



**LBP Optics**

Metal mirrors, applications,  
coatings & materials

# Newsletter

## Spherical mirrors for collimation

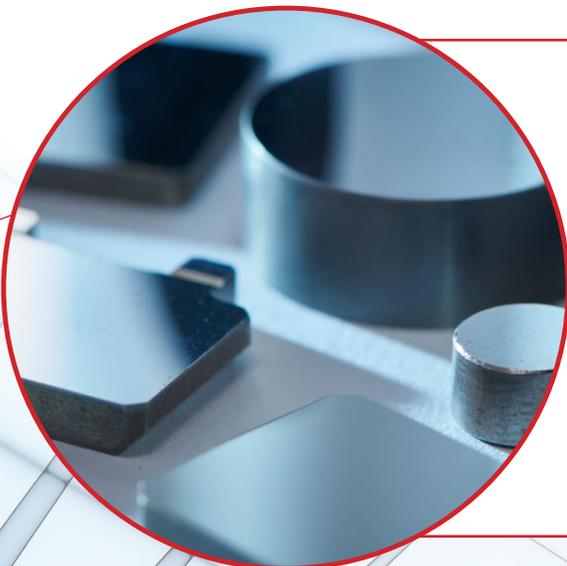
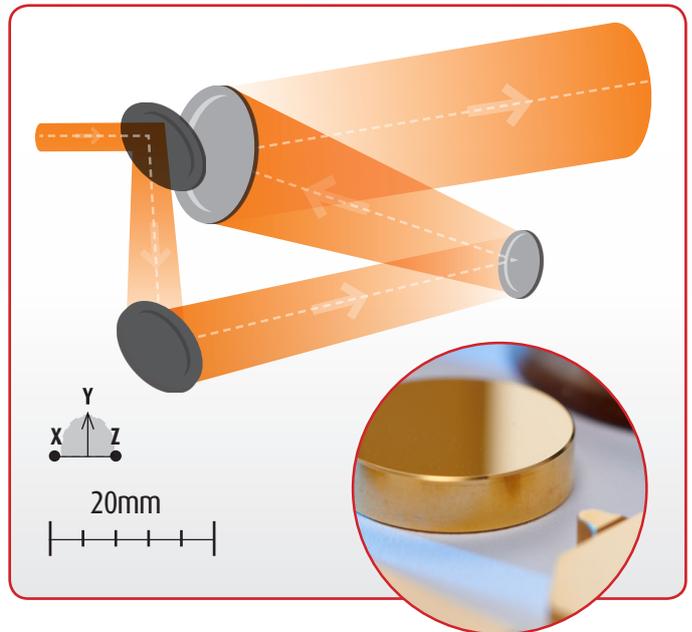
For collimating infrared lasers, such as CO<sub>2</sub> flying optics cutting systems, a reflective beam expander is a robust device and is simple to align and adjust. With careful optical design, inexpensive spherical mirrors can be used and still give near diffraction limited results.

Gold coated mirrors have high reflectivity in the visible and across the infrared, so a visible alignment laser can be used to safely align the beam expander.

### Software design tools for beam expanders

We have designed and assembled beam expanders with magnifications from X1.2 to X10, and apertures as large as 125mm. For customers who have their own mechanical capability, we can simply supply the Zemax optical design and optical components.

Spherical concave and convex mirrors are also used as rear mirrors in resonators, and in "trombones" (adjustable beam path devices). Along with optical design software we have a wide range of tooling for curved mirrors from 10mm radius of curvature out to 100 metres, and transmission spheres for interferometric measurement.



### Polishing Titanium

We were recently given the challenge of polishing a small flat section on a titanium tube, to a mirror finish.

Flatness as well as polish quality were important for the customer and we achieved <1µm flatness with a bright mirror finish. Over the years we have polished a wide range of materials including stainless steel, tool steel, electroless nickel, tungsten carbide, brass and ceramics.

Typical flatness achieved is 0.5 micron or better on lapped parts up to 220mm diameter.

# Tellurium/Copper

## A discussion about our unique chemical polishing capabilities during the Photonics West 2018 exhibition led to an interesting job.

A fellow exhibitor in the British Pavilion was using a range of copper heatsinks, but was finding the softness of copper didn't allow the repeated mounting and unmounting of his electrical components. We suggested manufacturing them from C14500 Tellurium/Copper, which would lap and polish to a mirror grade flatness and surface finish.

Tellurium/Copper alloy is 99.5% copper and 0.5% tellurium. It offers nearly the same high electrical and thermal conductivity of pure Copper, but is harder and more fatigue resistant. It's commonly used to make MIG welding nozzles and electrical sockets. As a free cutting alloy, it's ideal for high speed machining, and widely available.

According to the customer, **"The surface finish is a dramatic improvement to previous methods we have used and we foresee that in future jobs of this type that require good thermal contact then we will be going for this method. We really appreciate the help Mark and LBP Optics have given us and we look forward to working with you in the future."**

### Beneficial exchange rates

The British Pound is currently great value for customers who buy from us in Euros and US Dollars, it's worth checking out the exchange rates to see the savings that can be made. British manufactured goods are currently even better value!



### Come on you reds!

This year we are very proud to be sponsoring Biggleswade United's U12 football teams. Mostly run by volunteers, sponsorship is vital to the club to enable them to provide high quality training, facilities, physiotherapy and kit to local children.



Biggleswade United U12s  
2018-19 sponsored by:

  
LBP Optics



### Christmas shutdown

Please note that we will be closed for national holidays from 24 December to 2 January 2019 inclusive.

We would like to wish you all a very Happy New Year and we look forward to working with you in 2019.



### And finally ...

### Come and see us at Photonics West 2019

LBP Optics will be attending the SPIE Photonics West exhibition in San Francisco from **5 - 7 February 2019**, co-exhibiting with our long-term distributors Electro Optical Components. We will be exhibiting samples of our wide range of metal laser mirrors, including gold coated copper and aluminium.

**We are looking forward to catching up with customers old and new, please come along and see us at booth #4874**

**SPIE. PHOTONICS WEST**