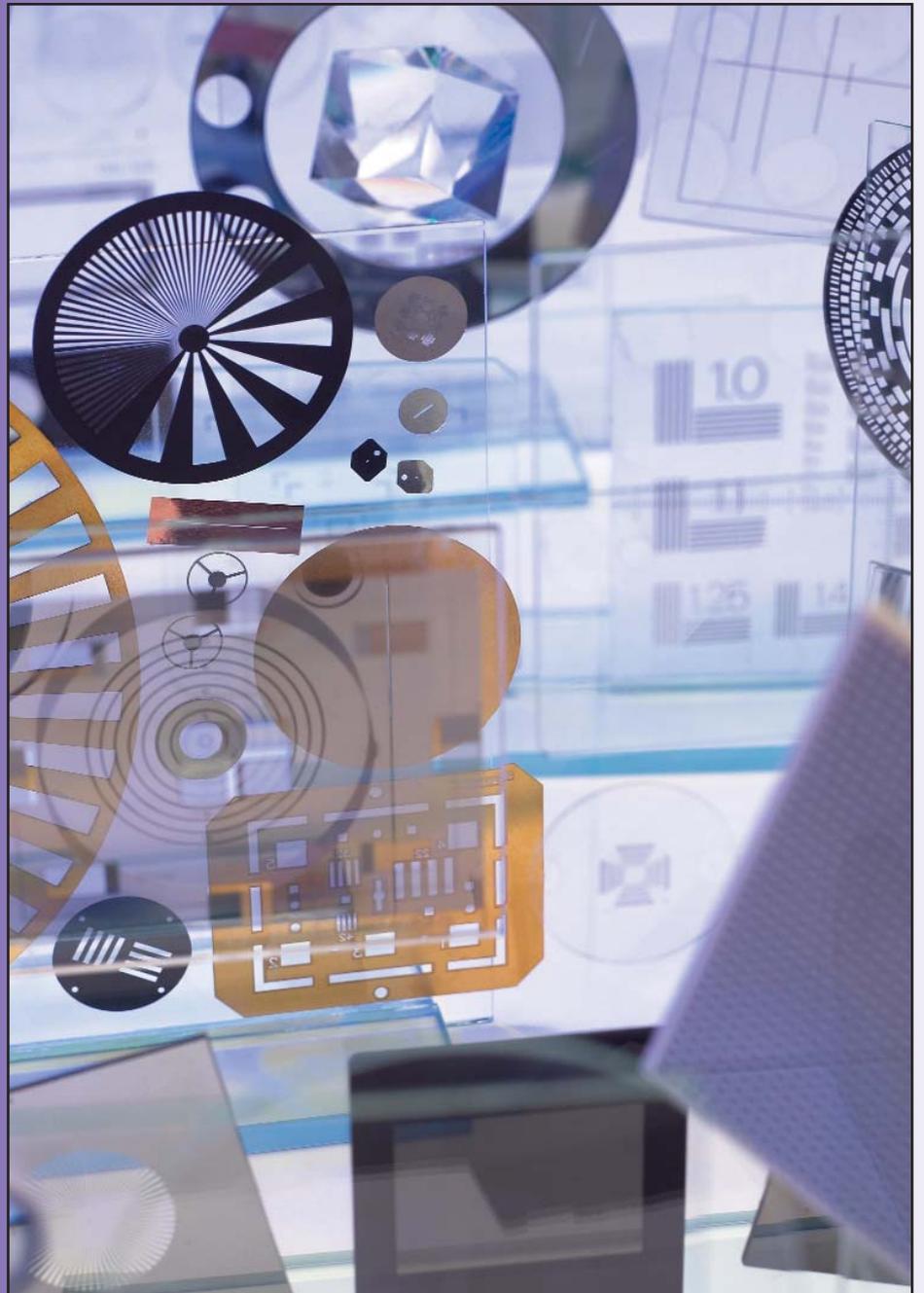




CUSTOM RETICLE SOLUTIONS
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Special Micro Structures

Pyser-SGI has over 60 years experience in producing high quality micro structure products. These products are supplied worldwide to industries including defence, metrology, medical, microscopy, analytical instruments, education, and many more.

Over the years Pyser-SGI have developed specialised processes to manufacture the most complex of products.

Whether you are looking for a one-off prototype or a production run of thousands, Pyser-SGI has the experience and capability to help you.

Precision images are available on glass, ceramic and film or in metal foil to suit the exact application needs.

Typical products:

- Targets
- Eyepiece reticles
- Stage slides
- Resolution testing charts
- Gray scales
- Electroformed apertures
- Military sights
- Calibration scales
- Air slits
- Transmission gratings
- TEM grids
- Encoder disks

More Processes Means Greater Capability from One Supplier

Pyser-SGI now offer an expanded range of solutions and services:

Traditional:

- Chrome and Chrome Oxide Reticles
- Etch and Fill Reticles
- Film Reticles
- Electroformed Foil Products
- Etched Foil Products
- Silver and Aluminium Coatings
- Single Layer A/R Coating
- Gray Scales
- Optical Assembly and Alignment
- Precision Glass Grinding
- Cementing

Recently Added:

- Multi-Layer A/R Coating
- Neutral Density Filters
- Narrow Band-Pass Filters
- Beam Splitters
- Printed Scales on Optical Grade Plastic



Applications

Here are just a few examples of the applications where Pyser products are being used.

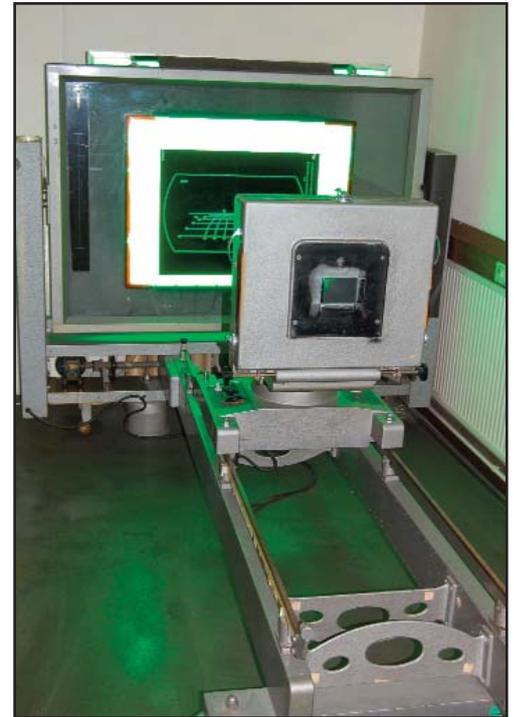
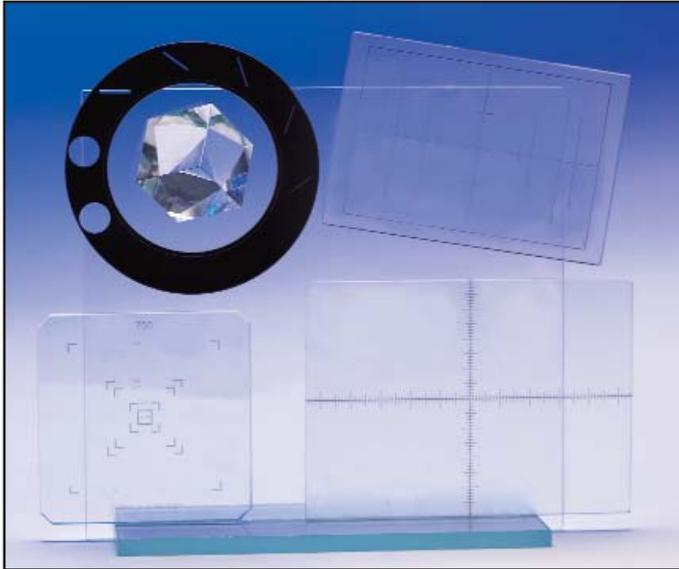
- Metrology:** Encoder disks, linear gratings, positional calibration plates, calibration scales and grids, screens
- Analytical Instrumentation:** Calibration targets, precision slits, pinholes
- Military:** Binocular reticles, gunsight reticles (day and night), boresights, targets, resolution charts
- Microscopy:** Eyepiece reticles, stage micrometers, calibration standards
- Research:** Resolution charts, targets, precision apertures, bacterial examination and culture growing.
- Quality Control:** Calibration standards, scales and grids, precision apertures, asbestos analysis.
- Electron Microscopy:** TEM grids, aperture plates



Photolithography

The photolithography process is used to transfer very high definition images from a master onto a resist-coated substrate. Once exposed and developed the image is subjected to an etching solution to either remove the pattern itself or leave the pattern and remove the surrounding areas – thus creating positive or negative images.

It is the same technique that is used to create printed circuit boards.



Deposition Coating

The deposition of materials onto the surface of substrates is vital to the manufacture of optical imaging products. Over many years Pyser has continued to invest in equipment and techniques to enable the offering of such coatings as bright chrome, lower reflectance chrome (chrome oxide), gold, silver, copper, aluminium with silicon monoxide and carbon – in some cases on substrates up to 1 metre in length.

Due to an increased demand within the market for semi-coated chromium Pyser are able to offer various transmission values to meet customers individual application needs



Etching

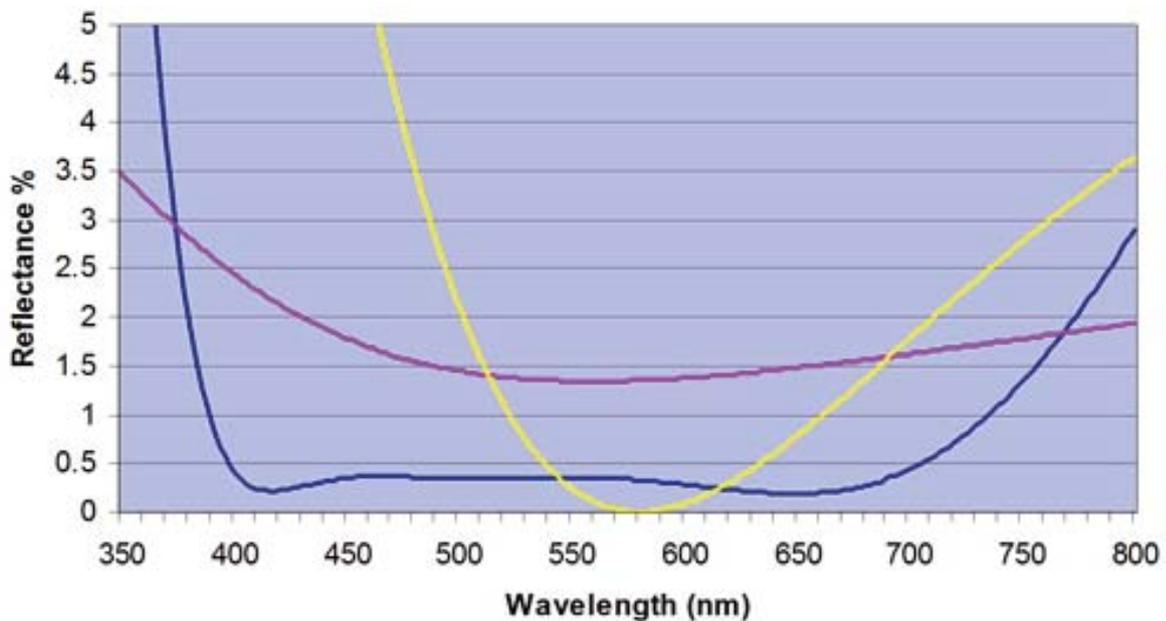
Pyser-SGI has advanced facilities for the precision manufacture of glass etched components. Although the applications for this process vary from the growing of cultures to analysing of foreign bodies in liquids – the main use is military based. After the creation of the etched image it can be filled with pigments to enable the reticle to be illuminated for day/night use.



Anti-Reflective Coatings

To improve light throughput and prevent unwanted reflection in reticle products, Pyser-SGI are able to offer anti-reflection coatings to suit many applications, from single layer MgF₂ to multi-layer coatings ranging from the visible to the infra red spectrum. These coatings can be applied to different refractive glasses as well as doublet assemblies for military specifications.

Typical Reflectance Curves for Various Coatings

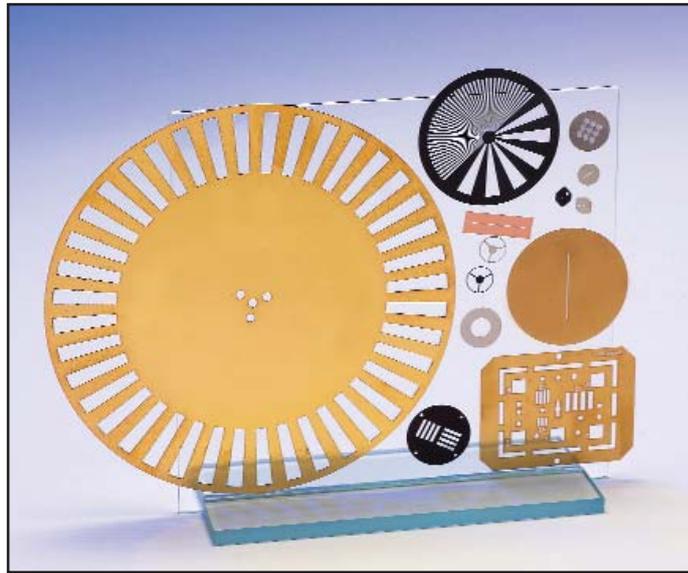


Electro-Forming and Etching

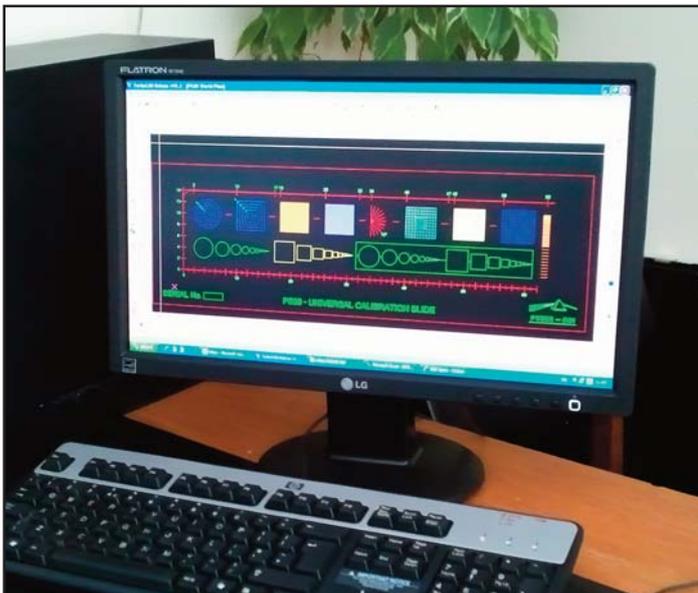
Electro-forming and etching are specialised processes used in the manufacture of precision metal products, most commonly in copper or nickel. A choice of two methods are available to us, electro-deposition in a plating bath to deposit a thin film of metal over a mandrel or the ability to etch away unwanted material creating an image in various materials.

The pattern is produced into a conductive layer on the mandrel using photographic techniques. This technique has been perfected by Pyser over the last 40 years and gives extremely high definition foils with excellent edge definition and shape. Pyser have also perfected a double plating technique to give extra thickness and rigidity to complex and larger patterned foils.

Materials that can be worked are copper, nickel, gold, aluminium, stainless steel, molybdenum and titanium.



Photomask Master Creation



Pyser-SGI has a wide range of photomasking and artwork processes available to suit all application needs. Using CAD programmes every product design can be evaluated and, dependent on criteria such as overall size, smallest features, accuracy and tolerance, Pyser can confidently recommend a solution to achieve the customers desired specification.

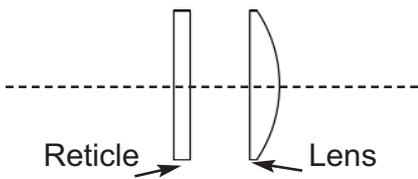
Glass Grinding and Cutting

There are many products that demand very tight tolerances on the pattern position with respect to glass edge. Over the years Pyser have perfected and modified glass working machinery to allow these tight tolerances to be achieved.



Optical Assembly and Cementing

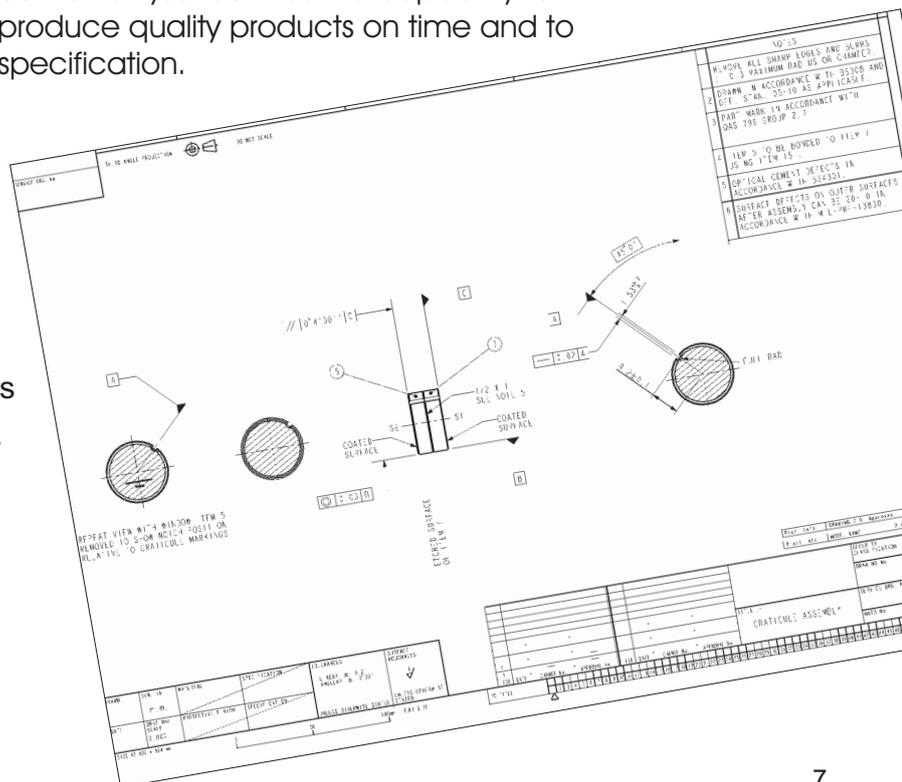
Pyser-SGI has extensive optical manufacturing facilities and can undertake optical assembly work using components made in house. Typically these may include mounting of apertures into housings, cementing of lens doublets and alignment of reticles into optical assemblies.



Using conventional, thermal and UV curing cements Pyser-SGI has the capability to produce quality products on time and to specification.

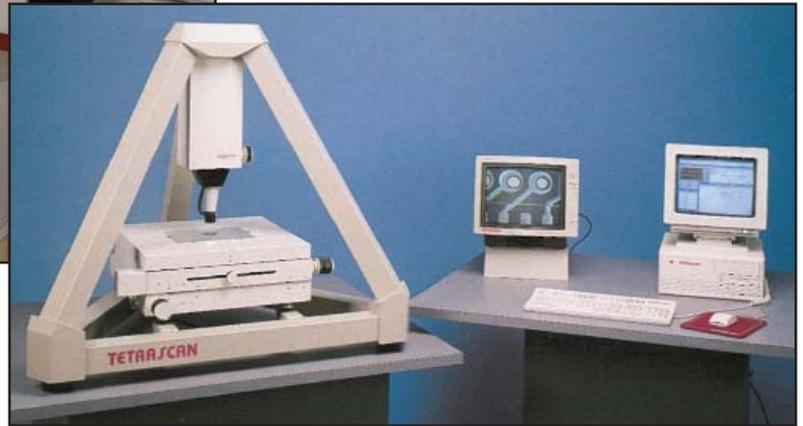
Typical products/applications include:-

- Encoder discs onto hubs
- Calibration reticles into housings
- Micro-coverglass onto day/night reticles
- Pinholes into mounts for laser systems
- Screens into surrounds
- Lens/reticle assemblies
- Reticles in optical imaging products



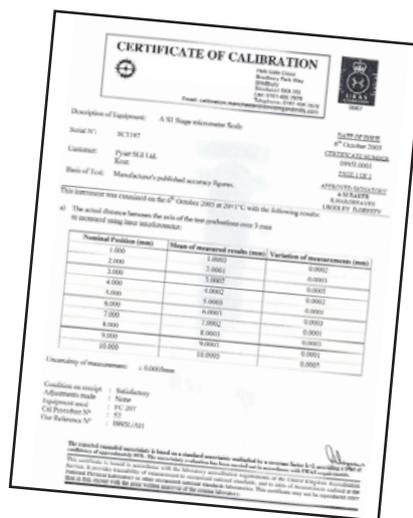
Inspection and Quality Control

All processes and procedures at Pyser-SGI's factories are certified to ISO 9001:2008. Precision microscopes and non-contact measuring systems are used to inspect each part individually to ensure the products you receive are 100% perfect and meet with your design specifications.



Certification

For many applications it is necessary for products to be supplied with certifications. These can be as simple as a certificate of conformity where we confirm that the product is made according to the specifications. Where traceability is required there is often need for a certificate of calibration or full test report to be produced.



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