

CALIBRATION STANDARDS

CALIBRATION STANDARDS

The Graticules Division of Pyser-SGI have a wide range of Calibration Standards available to ensure accurate calibration of optical measuring systems and microscopes.

Each day industrial companies carry out a vast range of physical measurements, the accuracy of which must satisfy their business requirements. It is well known that accurate measurements are needed not only to achieve an acceptable level of quality and efficiency of manufacturing but also to allow the testing of products to satisfy both the demands of direct customers and the broader requirements for international trade (such as ISO). To be consistent with measurements made elsewhere such measurements should also be traceable¹ to International or National measurement standards.

The technical infrastructure in each country which underpins the measurement requirements of industry and ensures that measurements are consistent and traceable, is termed the National Measurement System. In the UK for example, this system comprises the hierarchy of calibration and testing laboratories, many of which are accredited by the United Kingdom Accreditation Service (UKAS). These laboratories carry out measurements and calibrations for industry which are traceable to National measurement standards held in the UK's National Metrology Institute, the National Physical Laboratory (NPL). In addition to providing measurement standards for use by other laboratories, the NPL also offers traceable measurements for industry when the highest accuracy is required.

To ensure worldwide consistency of measurements, all the National Metrology Institutes (NMI's) in the world work in harmony. This is carried out under the auspices of the International diplomatic treaty, the Treaty of the Metre, signed in 1875 whereby Nations agreed, amongst other things, to the setting up of the International Committee of Weights and Measures (CIPM). Besides establishing the worldwide definitions of physical units, the CIPM organises an ongoing series of key comparisons between NMI's to support the mutual recognition of measurement standards and calibration certificates. These key comparisons also involve regional metrology organisations, such as EUROMET (EU + EFTA + European Commission), APMP (Asia Pacific Metrology Programme) and SIM (Canada, USA, Mexico plus most Latin, South American and Caribbean states), which act as regional focuses for the growing number of NMI's throughout the world.

¹ BS5233 : 1986 defines traceability as 'The property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons'.

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We manufacture components (encoder discs, graticules, metal foils, resolution standards) to custom design, if it is not in the catalogue please contact us for pricing information.

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CALIBRATION STANDARDS

Pyser-SGI Limited, Graticules Division can arrange for the calibration of its scales and grids to be carried out by the most appropriate laboratory to suit the customer requirements – the choice of laboratory is normally dependent on the nature of the calibration and the accuracy required.

a) Calibration by NPL

The National Physical Laboratory carries out measurements at selected points on the scales and grids and issues a certificate of calibration.

b) Calibration by UKAS accredited laboratory

A UKAS accredited laboratory carries out measurements at selected points on the scales and grids and issues a calibration certificate.

c) Measurement by Graticules

For applications which do not require the accuracy provided by calibrations carried out by NPL or a UKAS accredited laboratory, Graticules can provide a Certificate of Comparison. The scale or grid is compared with NPL calibrated in-house standards and a statement is provided on the accuracy of the item with respect to these standards.

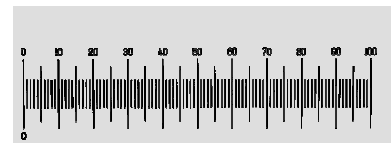
When ordering any of the following parts with a calibration certificate please add a suffix to the order code:

i.e.:- 05A01040/**NPL** for PS1 with NPL certificate
05A01040/**NAM** for PS1 with UKAS (NAMAS) certificate
05A01040/**GRA** for PS1 with Graticules certificate.

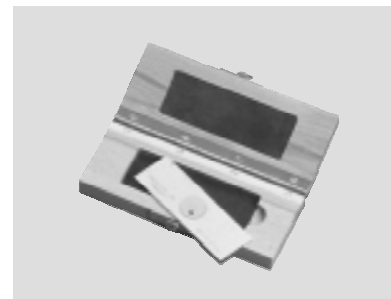
Microscope Standards - PS1, PS4, PS8, PS12, PS16, PS78

For calibration of eyepiece graticules.

The glass discs are mounted in stainless steel slides with engraved serial numbers. Each slide is supplied in a polished wooden presentation and storage box to distinguish it as a traceable standard of high value.



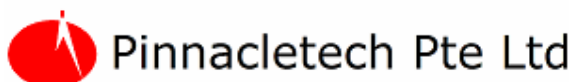
Pattern	Description	Order Code
PS1	Micrometer scale 10mm in 0.1mm divisions.	05A01040
PS4	Micrometer scale 0.1inch in 0.001inch divisions.	05A01041
PS8	Micrometer scale 1mm in 0.01mm divisions.	05A01042
PS12	Micrometer scale 0.1mm in 0.002mm divisions.	05A01043
PS16	Crossed micrometer scale 1mm in 0.01mm divisions.	05A01045
PS78	Micrometer scale 1mm in 0.01mm divisions.	05B01050



see page 31 for details of line widths and accuracy

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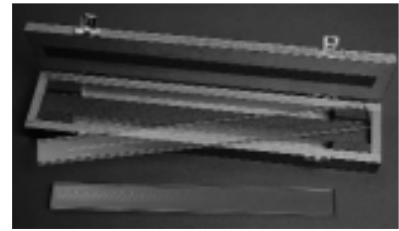
CALIBRATION STANDARDS

Long Linear Glass Scales – PS50, PS150, PS300, PS500, PS1000

Parallax free readings

High levels of accuracy. Hard wearing scales in vacuum deposited chrome on substantial glass substrates.

For measurement and calibration of instruments and standards.



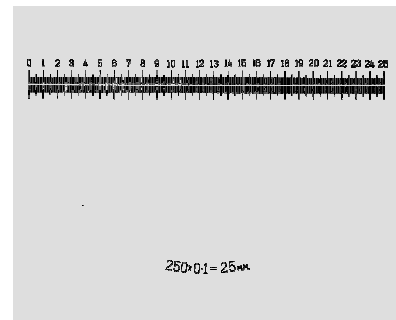
Pattern	Description	Order Code
PS50	Micrometer scale 50mm in 0.1mm divisions.	05B01051
PS150	Long scale 150mm in 0.1mm divisions.	05B01055
PS150HS	Long scale 150mm in 1mm divisions.	05B01060
PS300	Long scale 300mm in 0.1mm divisions.	05B01056
PS300HS	Long scale 300mm in 1mm divisions.	05B01061
PS500	Long scale 500mm in 1mm divisions.	05B01057
PS1000	Long scale 1000mm in 1mm divisions.	05B01058

Pattern	Specification	Line Width	Accuracy (overall)
PS50	50mm in 0.1mm	0.03mm	Within 0.002mm
PS150	150mm in 0.1mm	0.03mm	Within 0.015mm
PS150HS	150mm in 1mm	0.07mm	Within 0.01mm
PS300	300mm in 0.1mm	0.03mm	Within 0.015mm
PS300HS	300mm in 1mm	0.07mm	Within 0.01mm
PS500	500mm in 1mm	0.07mm	Within 0.01mm
PS1000	1000mm in 1mm	0.07mm	Within 0.01mm

Measuring Scales – P6, P16

These are standard glass scales for in-contact measurements. Ideal for direct vision, for pocket magnifiers and for use in measuring profiles on projector screens.

Pattern	Description	Order Code
P6	Contact nonparallax scale 100mm in 0.1mm divisions.	22B01300
P16	Contact nonparallax scale 300mm in 0.5mm divisions.	22B01303



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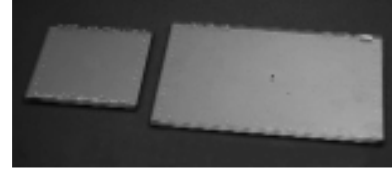
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CALIBRATION STANDARDS

Calibration Grids – PGR100, PGR200

For checking two-dimensional instruments for straightness and accuracy. The patterns are produced in vacuum deposited chrome on glass.

- Lines every 10mm.
- Central 20mm subdivided in 1mm rulings.
- Line width 0.008mm.
- Linear straightness 0.002mm.
- Angular accuracy within 5 seconds.



	PGR 100	PGR 200
Overall divided area.	100x100mm	140x220mm
Glass size.	120x120mm	160x240mm
Glass thickness.	6mm	6mm

Pattern	Description	Order Code
PGR100	Calibration grid.	05B01030
PGR200	Calibration grid.	05B01031

NPL HIGH PRECISION OPTICAL DIMENSIONAL STANDARDS

This range of high precision optical dimensional standards are supplied complete with internationally traceable certificates of calibration from NPL. For full technical information please contact Pyser-SGI Limited, Graticules Division.

Line Scales

Designed for calibrating a wide range of optical measuring systems, these high precision scales are available in 1mm, 10mm, 50mm and 100mm lengths calibrated to 0.1micron uncertainty. Custom scales from 100 micron to 400mm and higher precision calibrations, are available to special order.

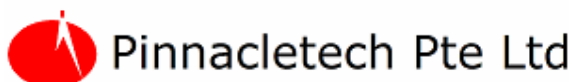
Description	Length	Order Code
High precision line scale.	1mm	05B01075
	10mm	05B01076
	50mm	05B01077
	100mm	05B01078



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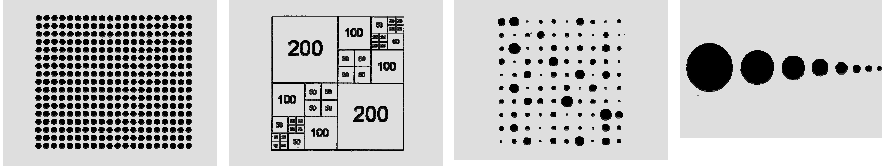
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CALIBRATION STANDARDS

Image Analysis Standard (Reference Stage Graticule)

This calibration stage contains four test areas comprising; a 400 x 400 micron square grid, a 20 x 17 monosize array of 15 micron diameter spots, a Root-2 array of spots from 3 to 48 micron diameter, and a log normally distributed array of 100 spots ranging from 4.5 to 27 micron diameter. It is ideally suited for calibrating image analyser systems and can also be used as a high precision micrometer.

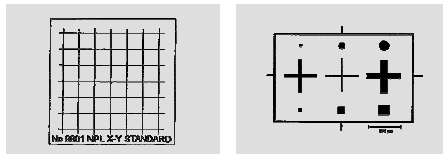
Description	Order Code
Reference stage graticule 75mm x 25mm slide.	05B01085



Two Dimensional Optical Position Standard

This two-dimensional optical position standard is a glass or quartz plate with a reflective chromium coating bearing a pattern consisting of 7 x 7 matrix crosses on a 20mm pitch. With an overall working area of 120mm x 120mm and a choice of calibration uncertainty ranging from 5 microns to 60 nanometres, this standard can be used to calibrate vision inspection systems, or co-ordinate measuring machines which use a viewing system to locate features.

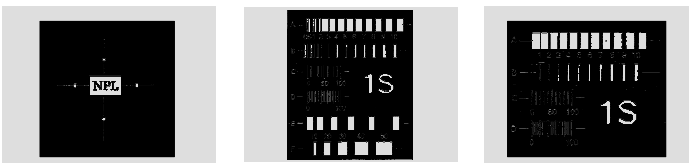
Description	Uncertainty	Order Code
Two-dimensional optical position standard. 150mm x 150mm plate 120mm x 120mm working area	$\pm 5\mu$	05B01080
	$\pm 1\mu$	05B01081
	$\pm 0.5\mu$	05B01082
	$\pm 60\text{nm}$	05B01083



Photomask Linewidth Standards

These photomask linewidth standards are available in two versions with line widths in the range 1 micron to 10 microns, or 0.5 micron to 50 microns. Both versions also contain 100 micron long line scales of 4 micron and 10 micron pitch. These standards are particularly suitable for use in the microelectronics industry and can also be used in image analysing measuring systems, fibre sizing and for the measurement of micro-engineered components.

Description	Range	Order Code
Photomask line width standard.	1 μ to 10 μ	05B01070
	0.5 μ to 50 μ	05B01071



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