PYSER – SGI

# STAGE MICROMETERS & CALIBRATION STANDARDS

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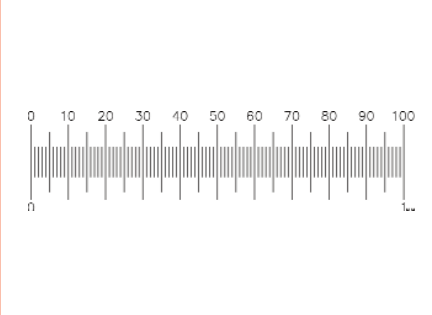
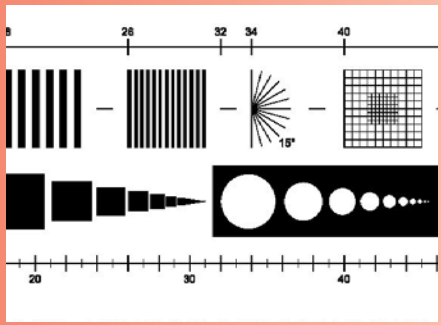
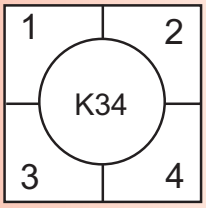
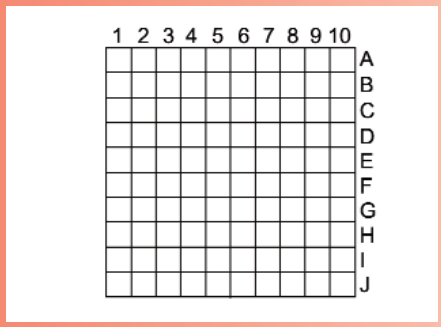







# Stage Micrometers and Calibration Standards

For over 60 years Pyser-SGI have been manufacturing precision micropattern products at our UK facility. Our stage micrometers and calibration standards are used all round the world for calibrating microscopes, imaging systems and co-ordinate measuring equipment. Where you need to have traceability of calibration, Pyser-SGI offer certificates of calibration, traceable to International standards.

## S-Range Stage Micrometers

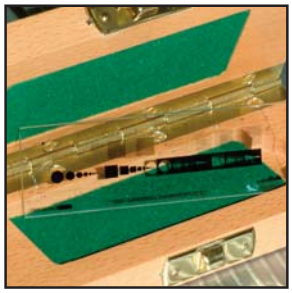
The scale or grid is chrome deposited centrally on a glass disc mounted in a black anodised aluminium slide mount 76mm x 25mm x 1.5mm thick. The metal mount gives these stage micrometers greater durability than those of all glass construction. These products are supplied in a plastic case with foam insert and are intended for general microscope calibration.

## PS-Range Stage Calibration Standards

The scale is chrome deposited centrally on a glass disc mounted in a stainless steel slide mount, 76mm x 25mm x1.5mm thick, with a unique serial number engraved in the top surface. These are the products of choice where you need certified scales to have unequivocal traceability for ISO, NIST, DIN or other standards. These products are supplied in a polished wooden case to indicate that they are superior calibration tools.

## PS Multi-Image Calibration Slide

This unique artefact provides the most comprehensive solution to calibrating image analysis systems. An array of 16 different patterns and scales to a very high resolution, is chrome deposited on a glass slide, 76mm x 25mm x 1.5mm thick. A unique serial number is etched into the slide



## Calibration Slides for Hardness Testers

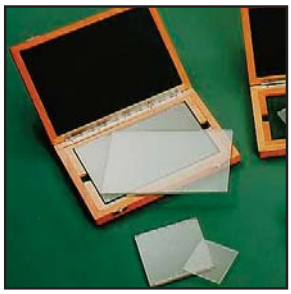
Whichever test method you use, be it Vickers, Rockwell or Brinell, Pyser-SGI have the ideal calibration slide for you. For many years companies have used products such as the Pyser S78 and S1R reflected light stage micrometer scales which give a very straightforward calibration on one axis. Following long discussions with manufacturers of Hardness Testing equipment Pyser has introduced two new products specifically designed for this calibration with shapes to accurately replicate the impression.

## PS-Range of Long Scales

Scales from 50mm to 1 metre in length, chrome deposited on glass substrate, and supplied in a polished wooden case (except 50mm version). Typically used for calibration of linear or two dimensional measuring systems.

## PGR Two Dimensional Calibration Standards

Glass plates with 10mm grid squares occupying either 100mm x 100mm or 140mm x 240mm, central area of 20mm further subdivided into 1mm squares. Typically used for calibration of co-ordinate measuring systems.



## High Precision Optical Dimension Standards

For customers requiring the ultimate in precision and calibration traceability, Pyser-SGI offer the NPL line scales, reference stage graticule, two dimensional position standard and photomask line width standard. These are all supplied with NPL's Internationally Traceable calibration certificate.

## Custom Made Calibration Products

For some customers a standard calibration product may not fulfil their requirements. In this case Pyser-SGI are able to offer cost-effective production to custom designs. Please send drawing/specification or contact us to discuss.

## Certificates of Calibration

Wherever there is a need for measurements to be traceable for quality purposes, Pyser-SGI offer UKAS and NPL certificates of calibration that are internationally traceable, so satisfy the requirements of NIST, DIN and National Metrology Institutes across the world.


CERTIFICATE OF CALIBRATION

DOWDING & MILLS

# Certificates of Calibration

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 traceable[1] to International or National measurement standards.

The technical infrastructure in each country that 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 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 world-wide 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. **This means that UKAS and NPL calibrations offered by Pyser-SGI will satisfy the requirements of NIST, DIN, Cofrac, Accredito Laboratory and all other NMI's across the world, and provide compliance for ISO17025.**

[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'.*

Pyser-SGI Limited offers calibration of its scales and grids from 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

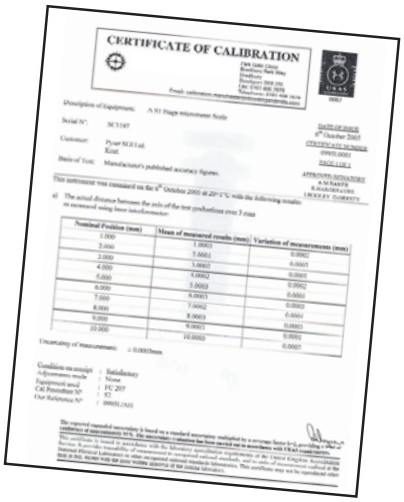
The National Physical Laboratory carries out measurements at selected points on the scales and grids and issues a traceable certificate of calibration.


NATIONAL PHYSICAL LABORATORY

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 traceable calibration certificate.


CERTIFICATE OF CALIBRATION

## c) Measurement by Graticules

For applications that do not require the accuracy provided by calibration 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. This certification is not traceable.


GRATICULES DIVISION of PYSER-SGI LIMITED

CERTIFICATE OF COMPARISON

When ordering any of the stage micrometers, grids or scales with a calibration certificate please add a suffix to the order code:

i.e.:- 05A01040/NPL for PS1 with NPL certificate
05A01040/UKA for PS1 with UKAS certificate
05A01040/GRA for PS1 with Graticules certificate.

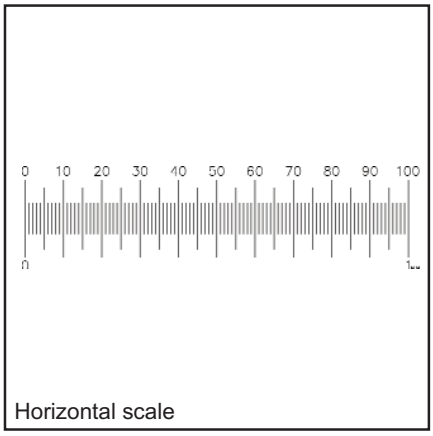
# S-Range Stage Micrometers

These stage graticules are intended for the routine calibration of eyepiece reticles particulary when alternating between objectives on one microscope or when using the same reticle in different microscopes.
Their robust construction, with metal slide mount, makes them ideal for student use and for instructional purposes. The scale or grid is centred on a glass disc mounted in a black anodised aluminium slide 76mm x 25mm x 1mm thick. The image is created using vacuum deposited chrome which is resistant to normal wear and tear. Note: S18 is all glass scale.

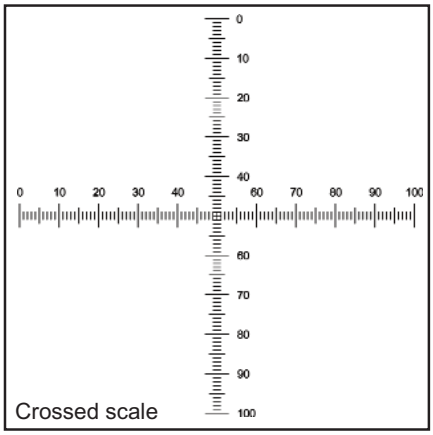
Versions are available for transmitted light and reflected (incident) light

## Horizontal and Crossed Scales - for Transmitted Light

| Pattern | Description | Line Width | Accuracy (overall) | Order Code |
|---|---|---|---|---|
| S1 | Micrometer scale 10mm in 0.1mm divisions | 0.005mm (5µm) | Within 0.002mm | **02A00400** |
| S2 | Micrometer scale 5mm in 0.05mm divisions | 0.005mm (5µm) | Within 0.0015mm | **02A00401** |
| S4 | Micrometer scale 0.1inch in 0 001inch divisions | 0.002mm (2µm) | Within 0.0001 inch | **02A00402** |
| S8 | Micrometer scale 1mm in 0.01mm divisions | 0.002mm (2µm) | Within 0.0015mm | **02A00404** |
| S11 | Micrometer scale 0.005inch in 0.0001inch divisions | 0.001mm (1µm) | Within 0.00005 inch | **02A00407** |
| S12 | Micrometer scale 0.1mm in 0.002mm divisions | 0.001mm (1µm) | Within 0.001mm | **02A00408** |
| S16 | Crossed micrometer scales 1mm in 0.01mm divisions | 0.003mm (3µm) | Within 0.001mm | **02A00429** |
| S22 | Micrometer scale vertical 2mm in 0.01mm divisions | 0.003mm (3µm) | Within 0.0015mm | **02A00411** |
| S48 | Micrometer scale 1mm in 0.01mm divisions, no coverglass | 0.0027mm (2.7µm) | Within 0.0015mm | **02A00414** |

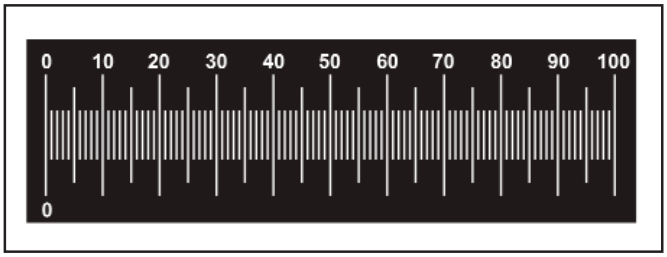




# Horizontal Scales - for Reflected Light

These scales are etched through highly reflective vacuum coated metal. When viewed under vertical illumination, as with a metallurgical microscope, the scale appears black against a bright background.

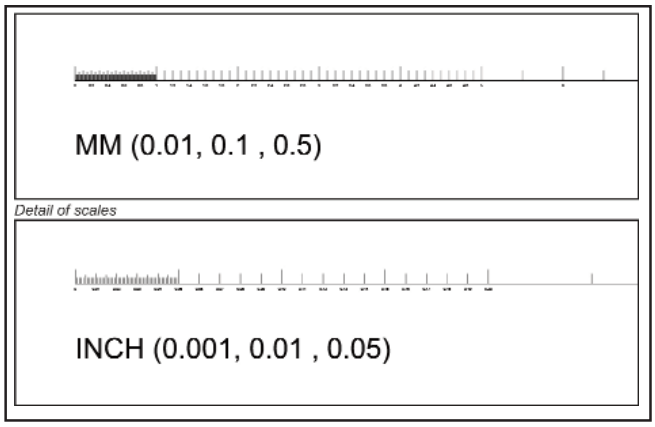
| Pattern | Description | Line Width | Accuracy (overall) | Order Code |
|---|---|---|---|---|
| S78 | Micrometer scale 1mm in 0.01mm divisions | 0.003mm (3µm) | Within 0.001mm | **02B00421** |
| S1R | Micrometer scale 5mm in 0.05mm divisions | 0.005mm (5µm) | Within 0.002mm | **02A00440** |
| S4R | Micrometer scale 0.1inch in 0 001inch divisions | 0.002mm (2µm) | Within 0.0001 inch | **02A00442** |

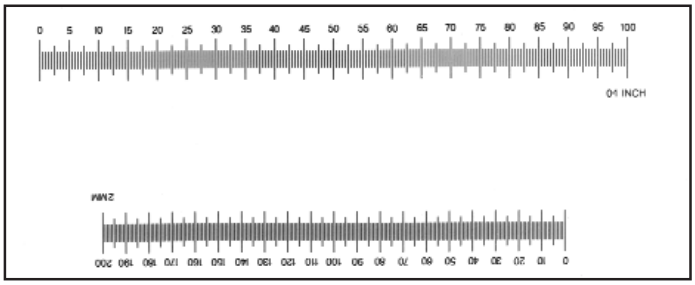

# Combined Metric/English Scales

| Pattern | Description | Line Width | Accuracy (overall) | Order Code |
|---|---|---|---|---|
| S20 | Double micrometer scale 2mm in 0.01mm divisions and 0.1inch in 0.0005inch divisions | 0.003mm (3µm) | Within 0.0015mm | **02A00409** |
| S18 | Graduated double micrometer scales: 25mm in 0.5mm, of which the last 5mm in 0.1mm and final 1mm in 0.01mm divisions. 1” in 0.05” of which the last 4/20 in 0.01” and final 1/20 in 0.001” divisions. All glass slide. | 0.0025mm (2.5µm) | Within 0.002mm | **02A00418** |

See also PS52 on page13




S18



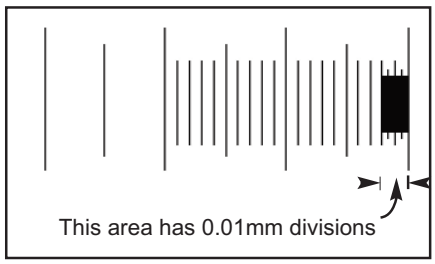

S20

## Grouped Graduation Scale

For speedy determination of a range of feature sizes within a given specimen.

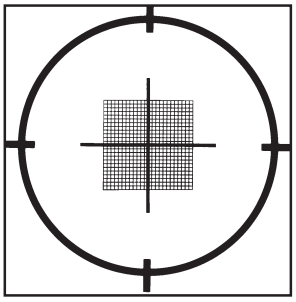
| Pattern | Description | Line Width | Accuracy (overall) | Order Code |
|---|---|---|---|---|
| S21 | Micrometer scale 5mm in 0.5mm divisions, 2mm in 0.1 divisions, and 0.2 in 0.01mm divisions | 0.0025mm (2.5µm) | Within 0.002mm | **02A00410** |

See also S18

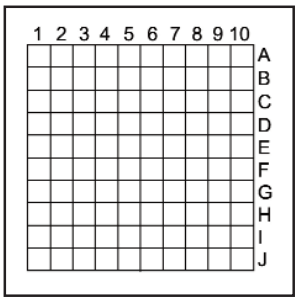



## Grids

| Pattern | Description | Line Width | Accuracy (overall) | Order Code |
|---|---|---|---|---|
| S9 | Counting slide 0.1mm squares | 0.005mm (5µm) | Within 0.0015mm | **02A00405** |
| S10 | Counting slide 0.05mm squares | 0.004mm (4µm) | Within 0.0015mm | **02A00406** |
| S28 | 0.01mm grid / 0.2 x 0.2mm overall | 0.003mm (3µm) | Within 0.0015 inch | **02B00428** |
| S29 | 0.01mm grid / 1.5 x 1.5mm overall | 0.003mm (3µm) | Within 0.0015 inch | **02B00429** |



S28/S29



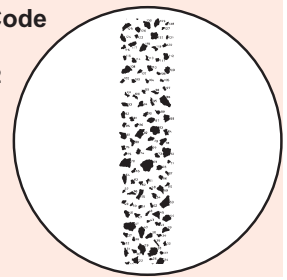

S9/S10

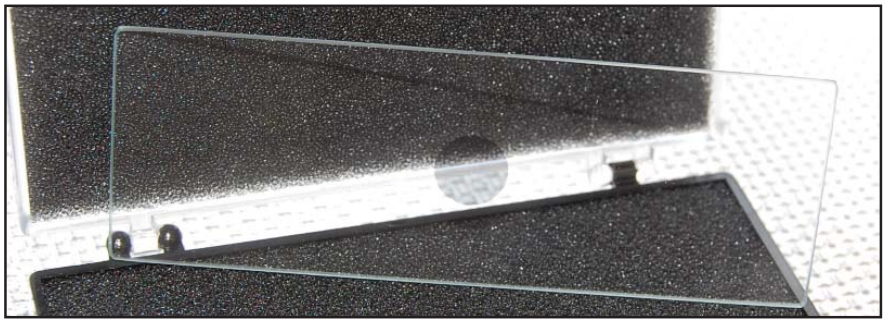
## Particle Analysis Test Slide

SG7
Ideal for staff training, this has 200 particles of various shapes and sizes. Each shape is numbered. Designed for comparing various shapes and sizes, and as a means for logging and communicating this information.

| Pattern | Description | Order Code |
|---|---|---|
| SG7 | Test slide for particle sizing. | **02A00422** |

This slide is now available with a Type Test Certificate, please enquire for details.





## H.S.E./N.P.L. MKIII Test Slide for Phase Contrast Microscopy

This test slide is made in the UK under licence from the National Physical Laboratory.

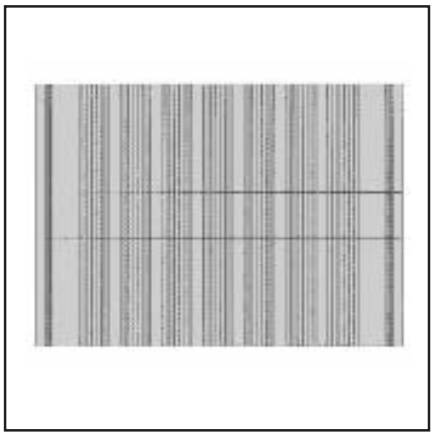
It is an epoxy replica of a master slide produced and certified by that laboratory. The replicas are mounted on microscope slides of 1.2 mm thickness with cover glass of 0.17 mm thickness.

The purpose of the slide is to provide a standard means to check the performance of phase microscopes prior to the analysis of asbestos. The pattern consists of seven bands of twenty lines with widths ranging from 0.25µ to 1.1µm.

A satisfactory system will detect block 5. Full details are supplied with the slide.

| Pattern | Description | Order Code |
|---|---|---|
| S84 | HSE Test slide for calibration in asbestos analysis (Band 5 version) | **02F00490** |

| Block No. | Ridge Width (Micrometers) | Maximum Calculated Phase Change (in degrees) for light rays (wavelength = 530 nanometers) passing through test objects. |
|---|---|---|
| 1 | 1.08 | 6.6 |
| 2 | 0.77 | 4.7 |
| 3 | 0.64 | 3.9 |
| 4 | 0.53 | 3.2 |
| 5 | 0.44 | 2.7 |
| 6 | 0.36 | 2.2 |
| 7 | 0.25 | 1.5 |

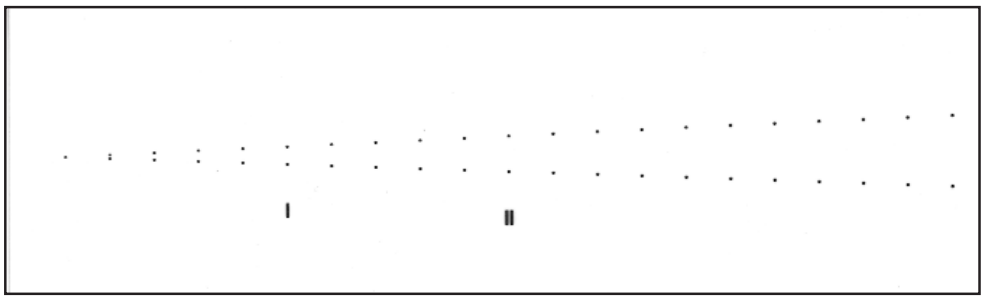



## Vibration (FOE PPL Dot)

The amount of vibration of the slide in the appropriate axis is determined by the pair of dots which appear to merge into a single dot.

The pattern on the S25 is an array of 20 pairs of dots converging on a single dot. The distance between each dot pair increases by 0.001 inch to a maximum of 00.2 inches, pairs being equispaced 0.25 inch. Supplied on 76 x 26mm glass slide.

| Pattern | Description | Order Code |
|---|---|---|
| S25 | FOE PPL Dot vibration test pattern | **02A00412** |



# Finder Graticules

Finder graticules are used to swiftly and accurately give a position of reference to an area of interest on a specimen slide.

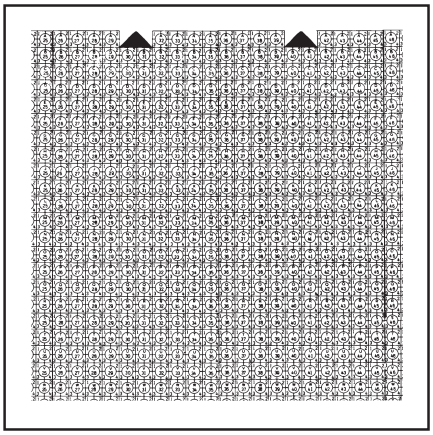
## The England Finder - 9045 Findable Locations

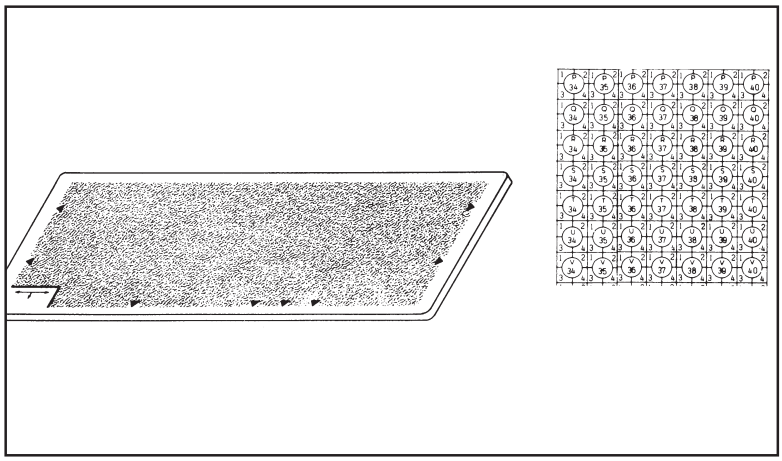
The England Finder is a glass slide marked over the top surface in a way that a referenced position can be directly read relative to the locating edges.

All England Finders produced by Graticules for over 40 years are identical. The purpose of the finder is to give the microscopist an easy method of recording the position of a particular field of interest, so that the same position can be re-located at a later date, or by another person in another laboratory, or when using any other England Finder on any other microscope.

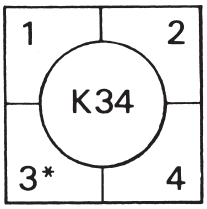
The location of the arrows is identical for all England Finder slides. The method of use is as follows: Mark a label on the left hand side of the specimen slide, indicating the orientation to be repeated. By replacing the specimen slide with the England finder, taking care not to disturb the position, the feature of interest can be noted. The feature can also be re-located at another place or time by reversing the procedure. A total of 9045 positions on a 76mm x 26mm slide can be accurately located.

| Pattern | Description | Order Code |
|---|---|---|
| S7 | The England Finder | **02A00403** |





The ruled area is approximately 73mm x 24mm, each square is approximately 1mm and line width is nominally 25µ




Example of Individual grid detail

## The Halton Finder

Pattern as per S7 but covers only a 5mm x 5mm area in the form of a stage graticule.

| Pattern | Description | Order Code |
|---|---|---|
| S30 | The Halton Finder | **02A00413** |

# PS-Range Stage Calibration Standards

Stage calibration standards differ from the stage micrometers in that they have a unique serial number etched into the surface of the slide mount, so they are fully traceable when supplied with a NPL or UKAS certificate of calibration. This means that they satisfy the requirements of ISO traceability.

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. This calibration is Internationally traceable.

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. This calibration is Internationally traceable.

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. This calibration is Internationally traceable.

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

ie:- 05A01040/**NPL** for PS1 with NPL certificate
05A01040/**UKA** for PS1 with UKAS certificate
05A01040/**GRA** for PS1 with Graticules certificate

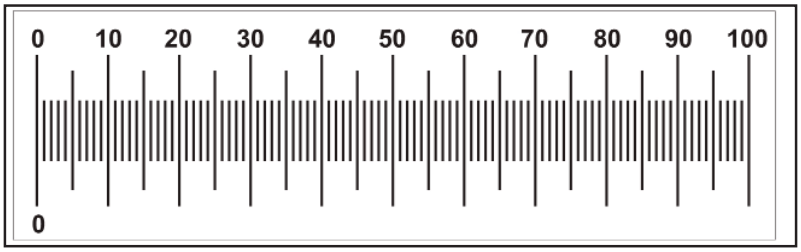
# Microscope Standards for Calibration of Eyepiece Reticles & Imaging Systems

The scale is created as a vacuum deposited chrome image on a glass disc. The glass discs are then 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.

## For Transmitted Light

| Pattern | Description | Line Width | Accuracy (overall) | Order Code |
|---|---|---|---|---|
| PS1 | Micrometer scale 10mm in 0.1mm divisions | 0.005mm (5µm) | Within 0.002mm | **05A01040** |
| PS4 | Micrometer scale 0.1 inch in 0.001 inch divisions | 0.002mm (2µm) | Within 0.0001 inch | **05A01041** |
| PS5 | Micrometer scale 20mm in 0.01mm divisions | 0.002mm (2µm) | Within 0.004mm | **05B01048** |
| PS8 | Micrometer scale 1mm in 0.01mm divisions | 0.002mm (2µm) | Within 0.001mm | **05A01042** |
| PS12 | Micrometer scale 0.1mm in 0.002mm divisions | 0.001mm (1µm) | Within 0.001mm | **05A01043** |
| PS16 | Crossed micrometer scale 1mm in 0.01mm divisions | 0.003mm (3µm) | Within 0.001mm | **05A01040** |

For longer scales see page 15

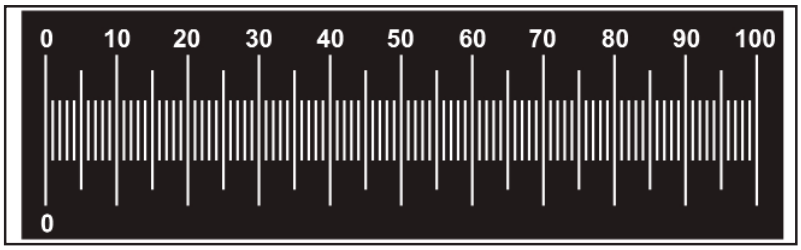



PS Micrometer slides (except PS5)

## For Reflected (incident) Light

| Pattern | Description | Line Width | Accuracy (overall) | Order Code |
|---|---|---|---|---|
| PS78 | Micrometer scale 1mm in 0.01mm divisions | 0.003mm (3µm) | Within 0.001mm | **05B01050** |
| PS1R | Micrometer scale 10mm in 0.1mm divisions | 0.005mm (5µm) | Within 0.002mm | **05A01047** |
| PS5R | Micrometer scale 20mm in 0.01mm divisions | 0.002mm (2µm) | Within 0.004 mm | **05B01046** |
| PS4R | Micrometer scale 0.1” in 0.0001” divisions | 0.002mm (2µm) | Within 0.0001 inch | **05A01049** |

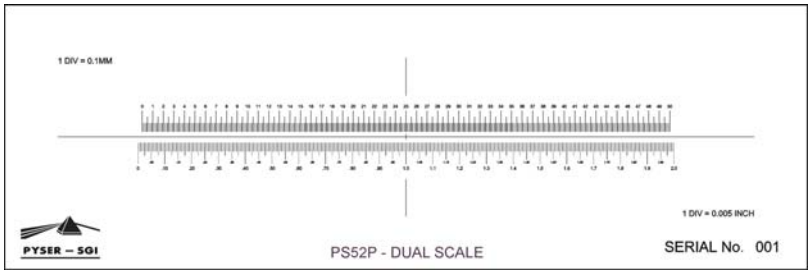
For longer scales see page 15

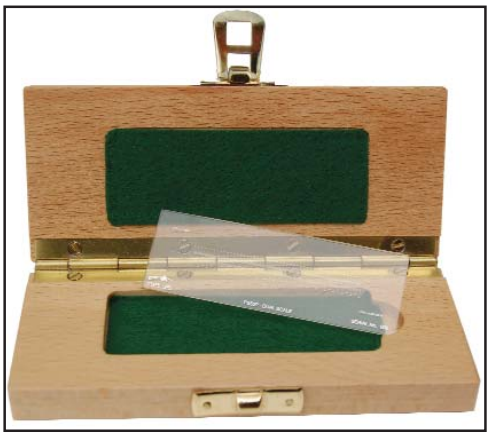


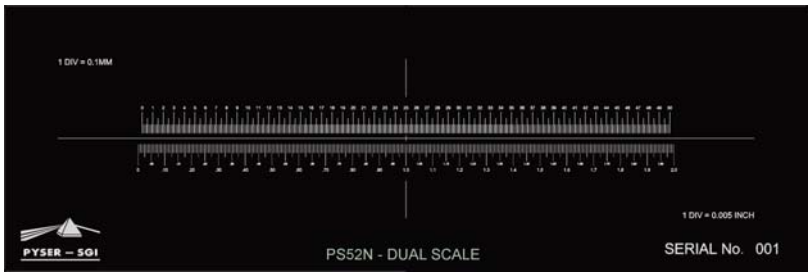

PS78

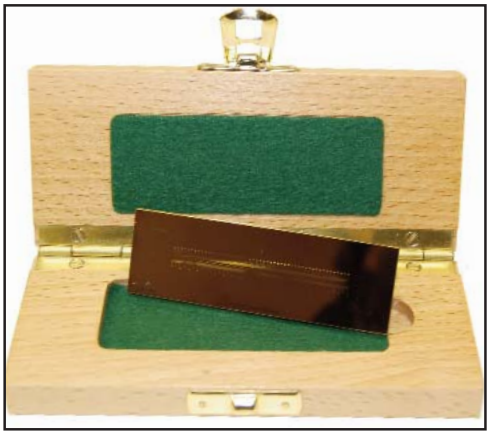
# New Dual Scale Calibration Slides

Pyser-SGI has introduced two new calibration slides that have the benefit of dual imperial/metric scales. The PS52P is for transmitted light applications and has a bright chrome positive image. The PS52N has a negative pattern, formed in low reflective chrome for incident light applications to give excellent contrast. Both are ideal for calibrating optical products with a large field of view, such as stereo microscopes or imaging systems.





## Highlights

- New Dual-Scale Calibration Slides
- 2” Imperial (English) and 50mm Metric Scales on a Single Slide
- Positive and Negative Versions
- Unique Serial Number for Traceability
- Available with Internationally Traceable Certificates of Calibration

## General Specification

| | |
|---|---|
| Metric scale | 50mm in 0.1mm divisions |
| Imperial (English ) scale | 2inch in 0.005inch divisions |
| Line thickness | 12 microns |
| Accuracy (overall) | Within ±0.005mm |
| Glass size/type | 76mm x 25mm x 1.5mm, B270 |
| Serial number | Unique serial number on slide surface |
| Case | Supplied in polished wooden box |
| Calibration certificate | Can be supplied with UKAS certificate of calibration which is internationally traceable and acceptable in all world markets |

| Pattern | Description | Order Code |
|---|---|---|
| PS52P | Dual calibration scale for transmitted light (positive image), 50mm in 0.1mm, 2” in 0.005”, serial numbered, supplied in wooden case | **05B01052P** |
| PS52P/UKA | As above but with UKAS certificate of calibration, 20 point check | **05B01052P/UKA** |
| PS52N | Dual calibration scale for incidental light (negative image), 50mm in 0.1mm, 2” in 0.005”, serial numbered, supplied in wooden case | **05B01052N** |
| PS52N/UKA | As above but with UKAS certificate of calibration, 20 point check | **05B01052N/UKA** |

# Universal Calibration Slide

Calibration of microscopes and image analysis systems is becoming more sophisticated, with the requirement being for a variety of image patterns to satisfy the numerous parameters. Pyser-SGI has introduced a new multi-function calibration standard specifically for these applications.

Multiple images on a single slide provide the most cost-effective solution to calibration and resolution checking of microscopes and image analysis systems. The combination of scales, dots, circles, squares, rulings, grids and angles can be supplied with an internationally traceable certificate of calibration for those who require ISO conformity.

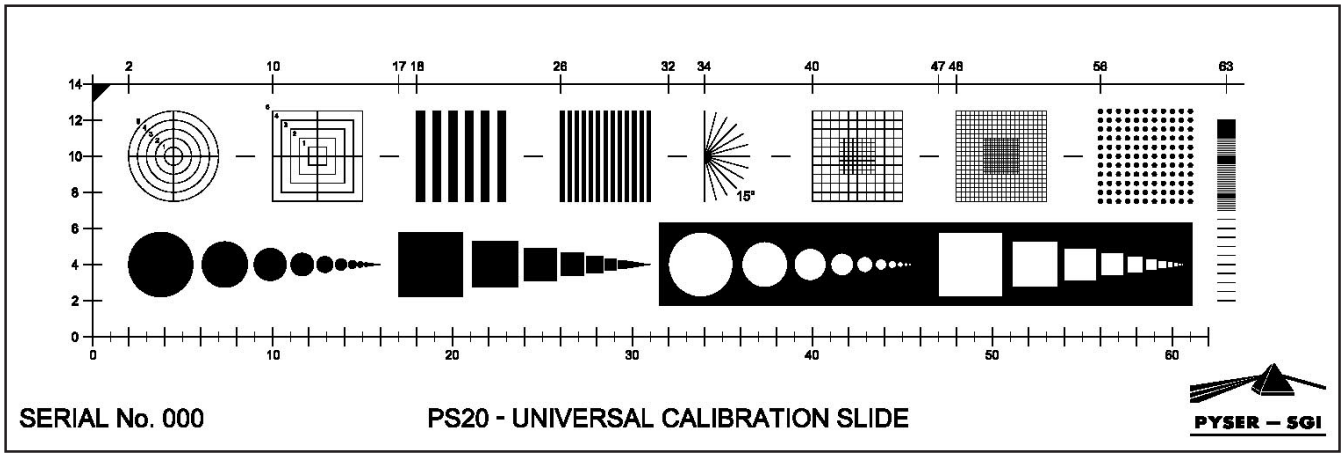
Each glass slide has a unique permanent serial number and can be supplied with full or partial UKAS certificate of accuracy.

Starting from a fixed 'Datum point' mark, each individual pattern or array can be located using X, Y coordinates. See table (over).

| Pattern | Description | Order Code |
|---|---|---|
| PS20 | Universal calibration slide | **05B01095** |

## General Specification

| | | |
|---|---|---|
| General tolerance (microns) | Feature size | Tolerance |
| | ≤ 10 | 0.5 |
| | 10-50 | 1.0 |
| | 50-127 | 1.3 |
| | 127-250 | 1.9 |
| | > 250 | 2.54 |
| 62mm scale overall accuracy | ± 0.003mm | |
| Coating | Enduring evaporated chrome image | |
| Optical density | >2.5 | |
| Substrate | Soda lime glass | |
| Size | 76mm x 25mm x 1.5mm | |
| Package | Polished wooden case | |




*For full details see over...*

## PS20 Universal Calibration Slide Image Details

| ID | Pattern Name | Location | Description |
|---|---|---|---|
| A | Concentric Circles | X=2<br>Y=10 | 1, 2, 3, 4, 5mm Circles with Cross Line and circle identifier. Line width 20µm |
| B | Concentric Squares | X=10<br>Y=10 | 1, 2, 3, 4, 5mm Squares with Cross Line and circle identifier. Line width 20µm |
| C | Line Grating 25 lines /mm | X=18<br>Y=10 | 12.5 Line Pairs per mm (40µ line 40µ space) |
| D | Line Grating 100 lines /mm | X=26<br>Y=10 | 50 line pairs per mm (10µ line 10µ space) |
| E | Half Protractor | X=34<br>Y=10 | 15°Spacing Line width 20µ |
| F | Grid Array Coarse | X=40<br>Y=10 | 5mm square array with 0.5mm divisions and central 2mm square with 0.25mm divisions. Line width 20µ |
| G | Grid Array Fine | X=48<br>Y=10 | 5mm square array with 0.1mm divisions and central 2mm square with 0.05mm divisions. Line width 8µ |
| H | Dot Array | X=56<br>Y=10 | Dot diameter 0.25mm, dot centre to centre spacing 0.50mm — 11x11 grid=121 dots |
| I | Geometric progression of Opaque Dots | X=2<br>Y=4 | Line array of dot or square shapes, of either clear or opaque. Reducing in size in a Root 2 progression for the purposes of edge threshold detection to enable an image analyser to measure the size correctly, or general shape size comparison.<br>Root 2 progression of 21 dots or square shapes, from 3.5µm to 3.5mm<br><br>Nominal size in mm<br>Dot/square size — Large to small in mm<br>**3.5833; 2.5338; 1.7917; 1.2669; 0.8959; 0.6335; 0.4479; 0.3167; 0.2240 0.1584; 0.1120; 0.0792; 0.0560; 0.0396; 0.0280; 0.0198; 0.0140; 0.0099; 0.0070; 0.0049; 0.0035** |
| J | Geometric progression of Opaque Squares | X=17<br>Y=4 | |
| K | Geometric progression of Clear Dots | X=32<br>Y=4 | |
| L | Geometric progression of Clear Squares | X=47<br>Y=4 | |
| M | Vertical Scale Fine Variable | X=63<br>Y=2 | Overall Scale length 10mm.<br>5mm in 0.5mm divisions. Line width 20µ<br>4mm in 0.1mm divisions. Line width 10µ<br>1mm in 0.01mm divisions. Line width 3µ |
| N | Horizontal Scale Coarse | X=0<br>Y=0 | Scale length 62mm long in 2mm divisions, subdivided in 1mm divisions with a 20µ line width |

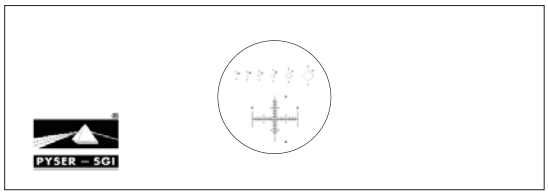
# New Calibration Slides for Hardness Testers

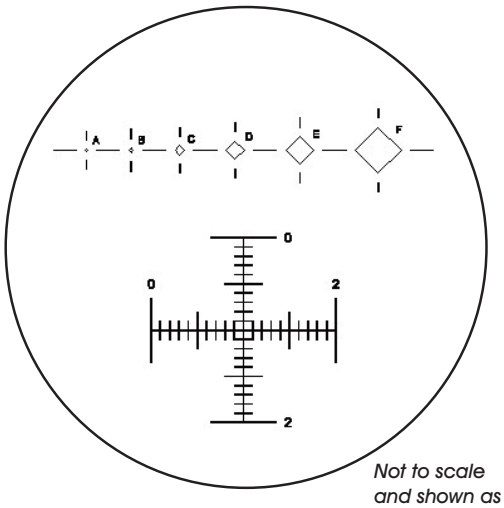
Whichever test method you use, be it Vickers, Rockwell or Brinell, Pyser-SGI have the ideal calibration slide for you. For many years companies have used products such as the Pyser S78 and S1R reflected light stage micrometer scales which give a very straightforward calibration on one axis. Following long discussions with manufacturers of Hardness Testing equipment Pyser has introduced two new products specifically designed for this calibration with shapes to accurately replicate the impression.

For Vickers and Rockwell methods we offer the PS25 which has a series of diamond shapes of varying size and x-y scales. Each of the markings on the slide is clearly identified with its size. The PS25 has a glass disc with the image precision marked in vacuum deposited chrome and this is cemented into a stainless steel slide mount, making the item very durable. The slide has a unique serial number indelibly marked on the slide mount and can be supplied with an Internationally traceable certificate of calibration.

For Brinell methods we offer the PS26 which has a series of circles, to represent the ball indentation shape, of varying size and x-y scales. The PS26 has a precision marked chrome deposition image on a glass slide. Each of the markings on the slide is clearly identified with its size. The slide has a unique serial number indelibly marked on the slide mount and can be supplied with an Internationally traceable certificate of calibration.

Both products are supplied in a polished wooden box.

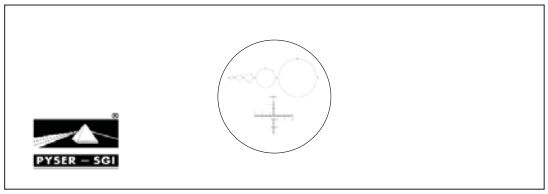


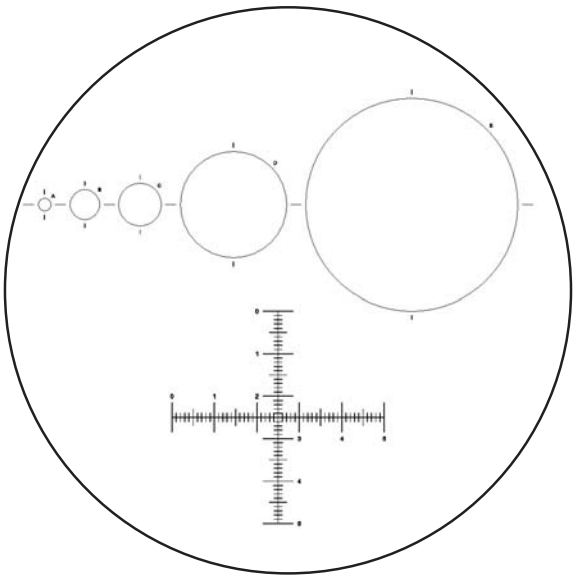




*Not to scale and shown as positive image for clarity*

## PS25 MKII Pattern Detail

Diamonds: (Point to point, mm's) 0.5, 0.3, 0.2, 0.1. 0.05. 0.02
Scales: Horizontal & vertical, 2mm in 0.1mm divisions
Accuracy (overall) ±0.0015mm



## PS26 MKII Pattern Detail

Circles: (Diameter, mm's) 5.0, 2.5, 1.0, 0.7, 0.3
Scales: Horizontal & vertical, 5mm in 0.1mm divisions
Accuracy (overall) ±0.0015mm

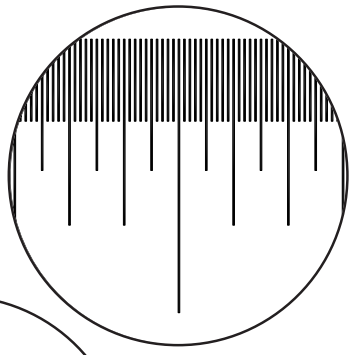
| Pattern | Description | Order Code |
|---|---|---|
| PS25 | PS25 MKII Calibration slide for Vickers and Rockwell hardness testers, serial numbered, supplied in wooden case | **05B01025** |
| PS25/UKA | As above with UKAS (Internationally traceable) certificate of calibration | **05B01025/UKA** |
| PS26 | PS26 MKII Calibration slide for Brinell hardness testers, serial numbered, supplied in wooden case | **05B01026** |
| PS26/UKA | As above with UKAS (Internationally traceable) certificate of calibration | **05B01026/UKA** |

Calibration is performed by a UKAS accredited laboratory, whose measurements are traceable back to the UK's National Metrology Institute, the National Physical Laboratory. All of the NMI's in the world work in harmony under the International diplomatic treaty, the Treaty of the Metre signed in 1875. This means that all measurements carried out by the UKAS accredited laboratory are Internationally traceable so acceptable to satisfy the requirements of NIST, DIN and all other NMI's across the world.

# High Definition Long Linear Combination Glass Scales

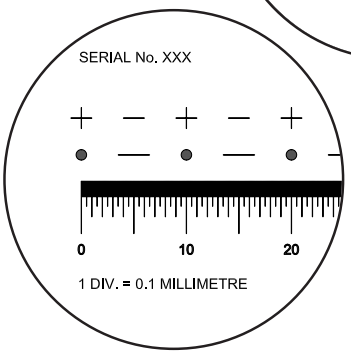
## Superior PS-XO Versions

- High definition images for accurate calibration – line edge or line centre
- Dots, Crosses and Scales
- 300mm, 200mm, 150mm and 100mm lengths, all in 0.1mm divisions
- Extended 0.5mm, 1.0mm and 5.0mm lines allow calibrations in those increments too

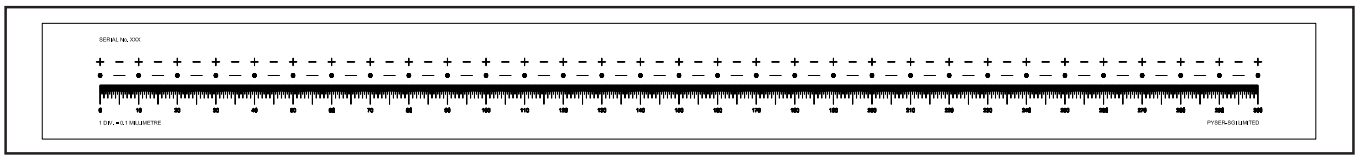


Also now available 70µ line width high definition 100mm, 150mm, 200mm & 300mm scales in 1mm divisions

All supplied in wooden cases. Alternative glass types and calibrations available to special order.




*Section images from PS-XO scales*



PS300XO

| Pattern | Description | Size | Order Code |
|---|---|---|---|
| PS300XO | 300mm combination scale, 300mm ruling in 0.1mm divisions, 1mm dots at 10mm centres, crosses at 10mm centres, line width 0.03mm | 330mm x 30mm x 6mm, green float glass, bright chrome image | 05B01064 |
| As above but with UKAS certificate of calibration, 10 points measured on scale | | | 05B01064/UKA |
| PS200XO | 200mm combination scale, 200mm ruling in 0.1mm divisions, 1mm dots at 10mm centres, crosses at 10mm centres, line width 0.03mm | 230mm x 30mm x 6mm, green float glass, bright chrome image | 05B01065 |
| As above but with UKAS certificate of calibration, 10 points measured on scale | | | 05B01065/UKA |
| PS150XO | 150mm combination scale, 150mm ruling in 0.1mm divisions, 1mm dots at 10mm centres, crosses at 10mm centres, line width 0.03mm | 180mm x 30mm x 6mm, green float glass, bright chrome image | 05B01063 |
| As above but with UKAS certificate of calibration, 10 points measured on scale | | | 05B01063/UKA |
| PS100XO | 100mm combination scale, 100mm ruling in 0.1mm divisions, 1mm dots at 10mm centres, crosses at 10mm centres, line width 0.03mm | 130mm x 30mm x 6mm, green float glass, bright chrome image | 05B01062 |
| As above but with UKAS certificate of calibration, 10 points measured on scale | | | 05B01062/UKA |

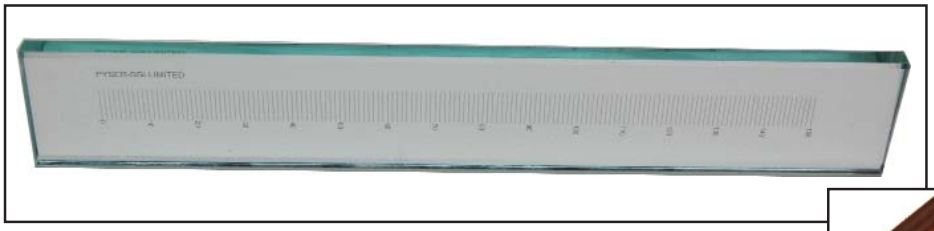
# High Definition Long Linear Glass Scales

Parallax free readings - ideal for measuring systems and CMM's

High levels of accuracy and pattern definition. Hard wearing scales in vacuum deposited chrome on substantial glass substrates. For measurement and calibration of instruments and standards.

| Pattern | Description | Line Width | Accuracy (overall) | Size (overall) | Order Code |
|---|---|---|---|---|---|
| PS100HS MKII | Long scale 100mm in 1mm divisions | 0.07mm | Within 0.007mm | 130mm x 30mm x 6mm | **05B01069** |
| PS150HS MKII | Long scale 150mm in 1mm divisions | 0.07mm | Within 0.008mm | 180mm x 30mm x 6mm | **05B01066** |
| PS200HS MKII | Long scale 200mm in 1mm divisions | 0.07mm | Within 0.008mm | 230mm x 30mm x 6mm | **05A01067** |
| PS300HS MKII | Long scale 300mm in 1mm divisions | 0.07mm | Within 0.008mm | 330mm x 30mm x 6mm | **05B01068** |

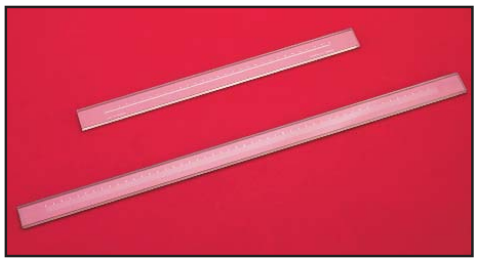
All available with Certificate of Calibration



# Measuring Scales

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<br>100mm in 0.1mm divisions.<br>Overall size 125mm x 25mm x 3.0mm<br>Line width 0.025mm | **22B01300** |
| P16 | Contact nonparallax scale<br>300mm in 0.5mm divisions.<br>Overall size 330mm x 30mm x 6.0mm<br>Line width 0.10mm | **22B01303** |



# Standard Definition Long Linear Glass Scales

| Pattern | Description | Line Width | Accuracy (overall) | Size (overall) | Order Code |
|---|---|---|---|---|---|
| PS50 | Micrometer scale 50mm in 0.1mm divisions | 0.012mm | Within 0.007mm | 75mm x 75mm x 3mm | **05B01051** |
| PS100 | Long scale 100mm in 0.1mm divisions | 0.03mm | Within 0.015mm | 130mm x 30mm x 6mm | **05B01053** |
| PS150 | Long scale 150mm in 0 1mm divisions | 0.03mm | Within 0.015mm | 180mm x 30mm x 6mm | **05B01055** |
| PS300 | Long scale 300mm in 0 1mm divisions | 0.03mm | Within 0.025mm | 330mm x 30mm x 6mm | **05B01056** |
| PS500 | Long scale 500mm in 1mm divisions | 0.07mm | Within 0.025mm | 530mm x 30mm x 6mm | **05B01057** |
| PS1000 | Long scale 1000mm in 1mm divisions | 0.07mm | Within 0.025mm | 1060mm x 30mm x 6mm | **05B01058** |

Parallax free readings - ideal for profile projectors

Hard wearing scales in vacuum deposited chrome on substantial glass substrates. For measurement and calibration of instruments and standards.

# Calibration Grids

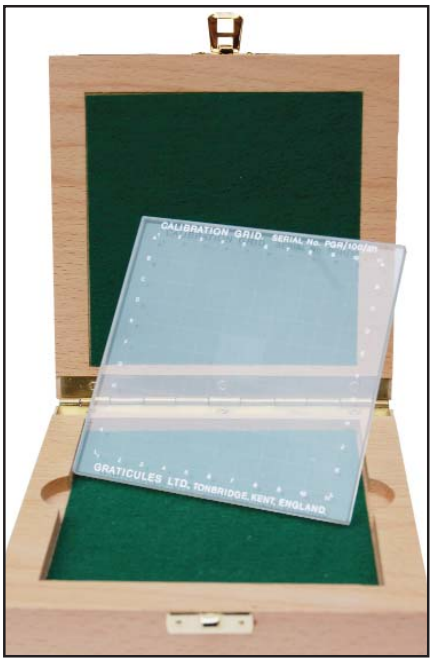
For checking two-dimensional instruments for straightness and accuracy. The patterns are produced in vacuum deposited chrome on glass.

- 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 | 100 x 100mm | 140 x 220mm |
| Glass size | 120 x 120mm | 160 x 240mm |
| Glass thickness | 6mm | 6mm |

| Pattern | Description | Order Code |
|---|---|---|
| PGR100 | Calibration grid | **05B01030** |
| PGR200 | Calibration grid | **05B01031** |

Available with Certificate of Calibration




PGR 100


PGR 200

## 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.

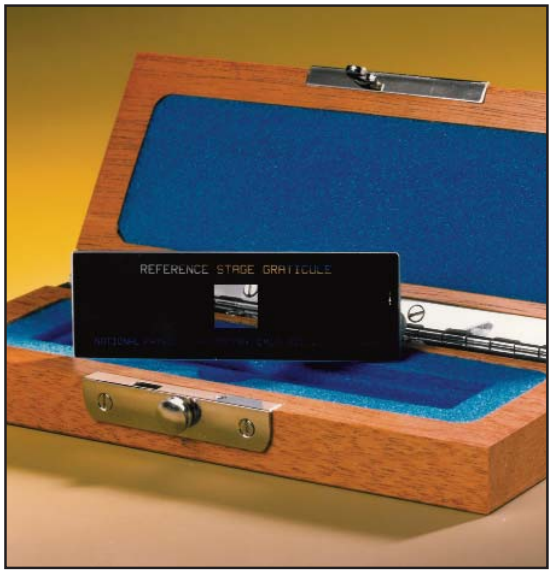
## Image Analysis Standard (Reference Stage Graticule)

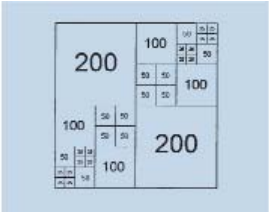
This calibration stage contains four test areas comprising; a 400 x 400 micron square grid, a 20 x 17 monosize array of 15 micron diameter spots, a Root-2 array of spots from 3 to 48 micron diameter, and a log normally distributed array of 100 spots ranging from 4.5 to 27 micron diameter. It is ideally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

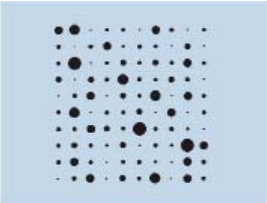
| Pattern | Description | Order Code |
|---|---|---|
| RSG | Reference stage graticule<br>75mm x 25mm slide | **05B01085** |

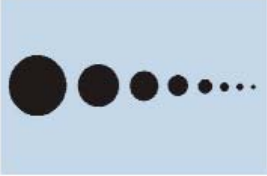
For all other NPL High Precision Dimensional Standards including:

- Two dimensional grid plate standards
- Line scale standards
- Line width standards
- Optical dimensional standards



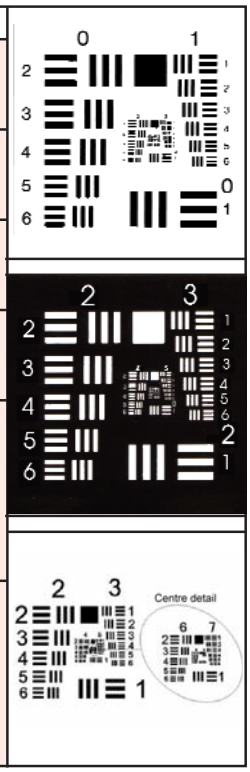


# USAF Test Chart

USAF resolution charts are recognised the world over as a universal standard for testing the vertical and horizontal resolution of imaging systems. Each element on the chart comprises three vertical bars and three horizontal bars, and the detail on these slides is as fine as 0.78microns (644 line-pairs per mm). The resolution of the imaging system is normally specified as the Group and Element of the finest bars that can be clearly defined - See further information on back page of brochure.

The six versions manufactured by Pyser are as follows:

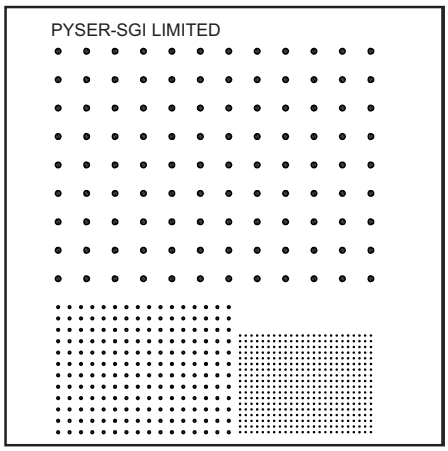
| Pattern | Description | Order Code |
|---|---|---|
| R70 | USAF Test Chart, positive image. Group 0, element 1 to Group 7, element 6. B270 glass, size 50mm x 50mm | 06B01096 |
| R71 | USAF Test Chart, positive image. Group -2, element 1 to Group 7, element 6. B270 glass, size 75mm x 75mm | 06B01097 |
| R75P | USAF Resolution Chart, positive version. Group 0, element 1 to group 9, element 3. Soda lime glass size 50mm x 50mm | 06B01102 |
| R75N | USAF Resolution Chart, negative version. Group 0, element 1 to group 9, element 3. Soda lime glass size 50mm x 50mm | 06B01103 |
| PS75P | USAF Resolution Chart, positive version. Group 2, element 1 to Group 9, element 3. Soda lime glass mounted in stainless steel microscope slide, with engraved serial number for traceability, 76mm x 25mm. Supplied in polished wood case. | 05B01090 |
| PS75N | USAF Resolution Chart, negative version. Group 2, element 1 to Group 9, element 3. Soda lime glass mounted in stainless steel microscope slide with engraved serial number for traceability, 76mm x 25mm. Supplied in polished wood case | 05B01091 |




# Grid Dot Arrays

- 3 image areas all on one plate
- Different dot size and pitch in each area
- Ideal for different magnifications to test field flatness, distortion and size

Sizes: 12 x 9 array of 1mm dots at 5mm pitch
16 x 12 array of 0.5mm dots at 2mm pitch
24 x 18 array of 0.2mm dots at 1mm pitch




| Pattern | Description | Size | Order Code |
|---|---|---|---|
| R76 | Grid dot array, 3 image areas, as detailed above | 101mm x 101mm x 2.2mm, green float glass, high reflective chrome image | 06B01104 |
| Available with certificate of calibration. | | | |

The grid dot array can be made on other substrates, other chrome finishes and white glass to special order.

# Other products


Please contact Pyser-SGI Limited


PYSER - SGI LIMITED
Fircroft Way, Edenbridge, Kent,
United Kingdom, TN8 6HA
Telephone: +44 (0)1732 864111
Facsimile: +44 (0)1732 865544
Email:sales@pyser-sgi.com
www.pyser-sgi.com


FM 30264

PYSER – SGI

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