
	<p>This set contains a selection of measuring tools most suitable for students and apprentices</p> <p>Set contents:</p> <p>Metric Set: 50-600-025 Fine Adjustment Vernier Caliper: 145mm / 5 1/2" Mechanical Micrometer: 0-25mm Satin Chrome Rule: 150mm/6"</p> <p>Inch Set: 50-600-001 Fine Adjustment Vernier Caliper: 145mm / 5 1/2" Mechanical Micrometer: 0-25mm Satin Chrome Rule: 150mm/6"</p>
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Vernier Caliper Fine Adjustment Style

	<p>Hardened stainless steel body Satin chrome finish Fine adjustment Depth Rod Four-way measurement: Outside Inside Step Depth Raised sliding surface to prevent wear to scale</p>
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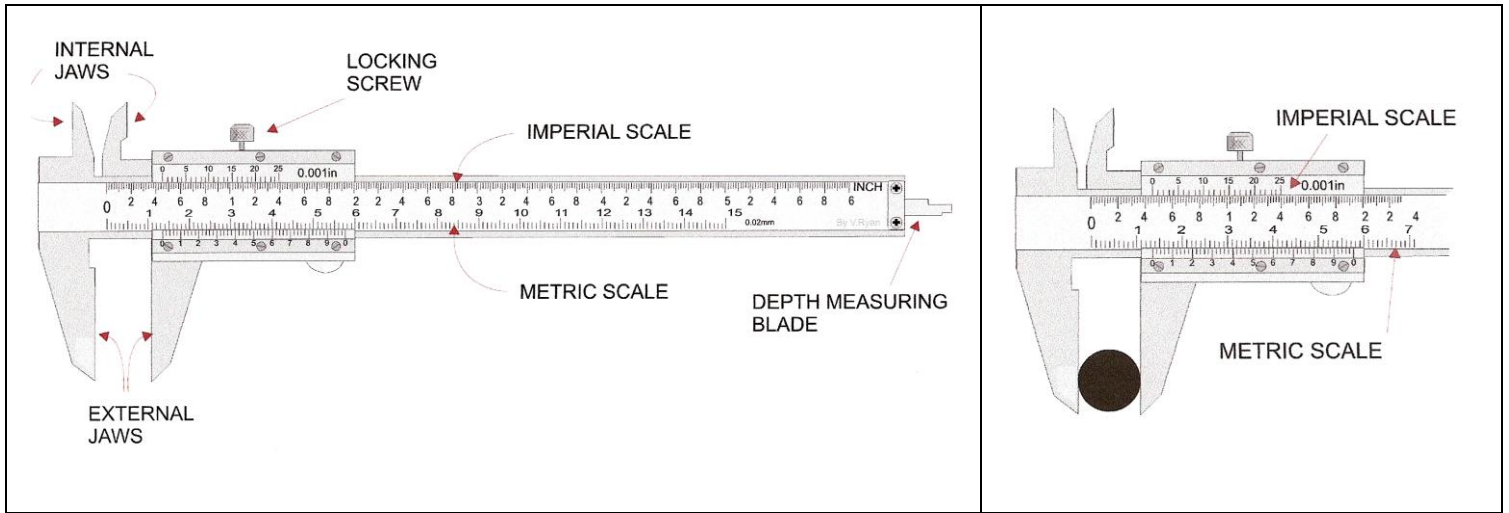
Code	Range	Metric Grads	Inch Grads	Accuracy	External Jaw Depth	Internal Jaw Depth
51-100-006	145mm/5 1/2"	0.02	0.001	±0.02mm	40mm	18mm

Vernier Caliper

A Brief History

The Vernier Caliper is an instrument for making very accurate linear measurements. The instrument was first introduced in 1631 by Pierre Vernier of France. It utilises two graduated scales: The main scale which is similar to that on a rule plus a specially graduated sliding scale (called the Vernier scale). The Vernier scale slides parallel to the main scale and enables readings to be made to a fraction of a division on the main scale.

Reading a Vernier



Example 1:

Example 1:

$$19 + 32 \times 0.02$$

$$19 + 0.64$$

$$19.64 = \text{Correct reading}$$

Example 2:

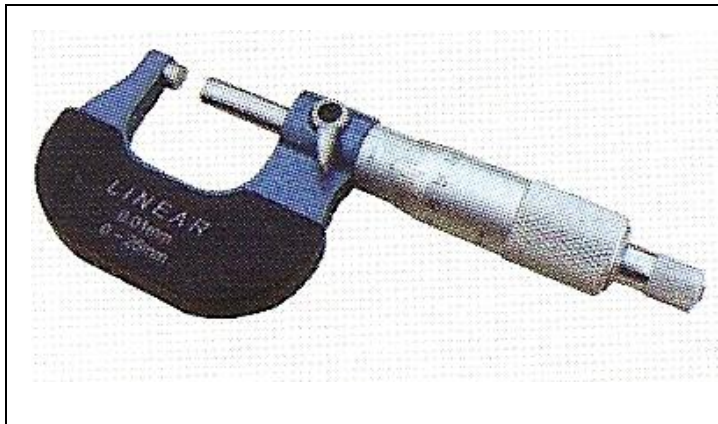
Example 2:

$$13 + 21 \times 0.02$$

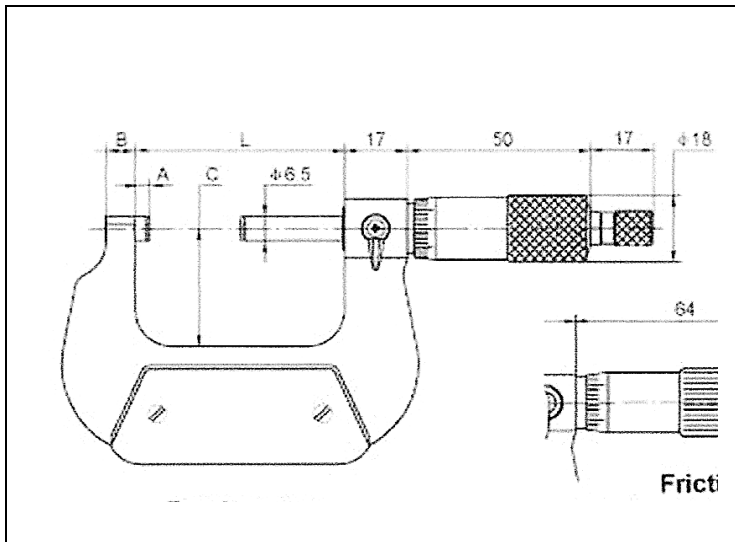
$$13 + 0.42$$

$$13.42 = \text{Correct reading}$$

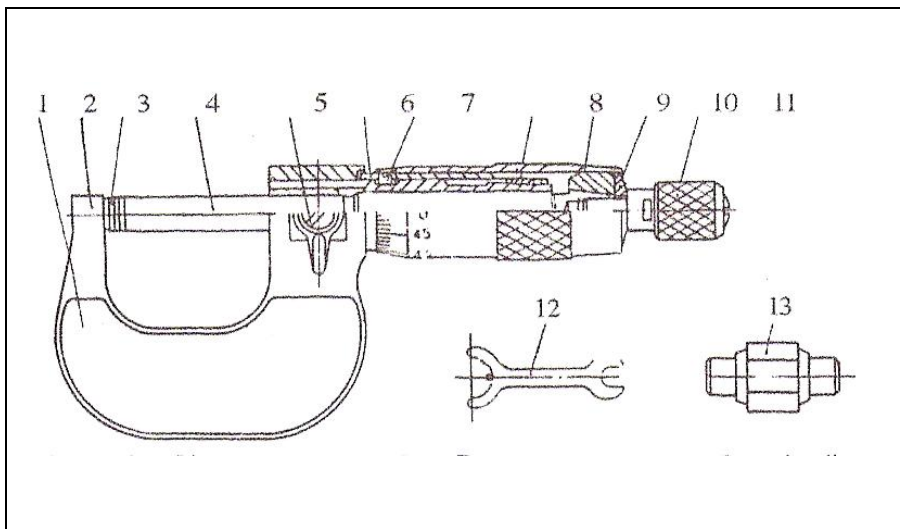
Mechanical Micrometers 50-100-Series



Accuracy conforms to DIN 863
 Resolution: Metric 0.01mm, Inch 0.0001"
 Models above 25mm / 1" supplied with setting rod
 Micro fine graduations for accurate reading
 Tungsten carbide measuring faces
 Spindle locking lever
 Ratchet stop
 Non-glare satin chrome barrel and sleeve
 Blue baked enamel hammer tone finish
 Supplied in fitted case with adjustment tools



Code	Range	Code	Range	Style	A mm	B mm	C mm	L mm	Accuracy mm
Metric	mm	Inch	inch						
50-100-025	0-25	50-100-001	0-1	A	3.0	6	24.0	32	0.004



- 1 Heat Resistant Plate
- 2 Frame
- 3 Anvil
- 4 Spindle
- 5 Spindle Lock
- 6 Sleeve
- 7 Thimble
- 8 Barrel
- 9 Taper
- 10 End Cap
- 11 Ratchet Stop
- 12 Spanner
- 13 Setting Standard

Mechanical Micrometers 50-100-Series

Cleaning and Basic Checking Procedure

Remove any oil, grease, dust or small particles which may cause damage to the micrometer or affect its accuracy when taking measurements. Use a soft lint free cloth or paper together with a proprietary instrument cleaning agent. Do not use acetone as this can damage parts of the micrometer

Zero Point Checking and Adjustment

Use the ratchet stop to move the spindle until it touches the fixed anvil. Allow the ratchet to turn 1 ½ to 2 revolutions for the final positioning

The zero point on the thimble should now coincide with the reference graduated base line on the sleeve
For micrometers above 25mm / 1” use the supplied setting standard or a gauge block to check the zero position
If the zero point does not line up as required, it can be corrected by using the following procedure

When the zero point deviation on the thimble is under 2 divisions from the graduated base line

Turn the sleeve using the “C” spanner provided until correct alignment is achieved

When the zero point deviation on the thimble is over 2 divisions from the graduated base line

Hold the frame and the thimble and loosen the ratchet stop using the spanner provided

Disconnect the coupling of the thimble to the spindle by giving a light shock to the side of the thimble

Turn the thimble until the zero point is in alignment with the base line on the sleeve

Press the thimble against the spindle and re tighten with the spanner to achieve a positive coupling

Re check the zero position, any final small adjustment can now be made using the “C” spanner to re position the sleeve to the thimble zero

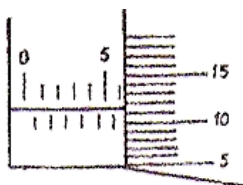
Reading the Micrometer

When reading the micrometer ensure that your line of sight is directly above the graduated scale on the sleeve and the thimble scale to avoid parallax reading errors

Ensure that the micrometer and the work piece are at the same temperature

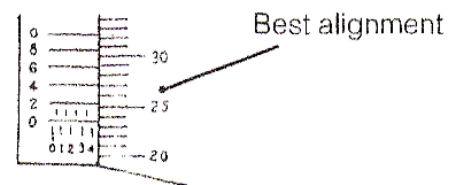
Handle the instrument with care, if it is dropped or knocked in any way it must be rechecked for correct working and accuracy as above

Reading Example: Metric



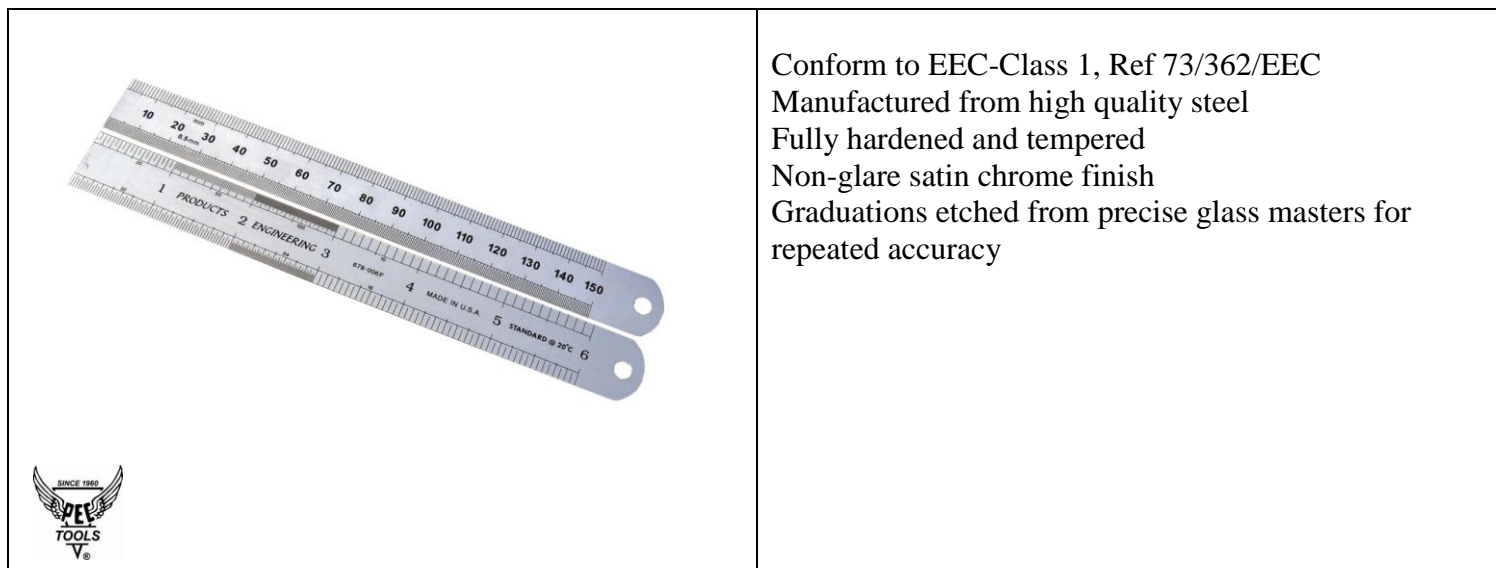
Example for division 0.01mm
Reading:
From Sleeve: 6mm
From thimble: 0.11mm
Final readings should be
 $6. + 0.11 = 6.11\text{mm}$

Reading Example: Inch



Example for division 0.002mm
Reading:
From Sleeve: 4mm
From thimble: 0.23mm
From vernier of sleeve: 0.004mm
Final readings should be
 $4 + 0.23 + 0.004 = 4.234\text{mm}$

Steel Rule Metric and Inch Two Sided with Round End



Conform to EEC-Class 1, Ref 73/362/EEC
 Manufactured from high quality steel
 Fully hardened and tempered
 Non-glare satin chrome finish
 Graduations etched from precise glass masters for repeated accuracy

Code	Length	Type	Width and Thickness	Rule Marking Front Face (inch)	Rule Marking Reverse Face Metric)	Style	End Style
678-006F	150mm / 6"	Rigid	19 x 0.5mm	16ths, 32nds, 64ths 10ths, 20ths, 50ths, 100ths	1.0mm and 0.5mm	64R	D End

Accuracy Specification

EEC Directive 73-362 / EEC: Rules Class 1 and 2

For Metric Scales Only: (there is no specification for Inch Scales)

Permissible Errors: For EEC Class 1 Rules

Maximum permissible error between 2 intervals upto 1mm = 0.1mm

Maximum permissible error between two intervals not exceeding 10mm = 0.2mm

From Rule End: Above tolerance increased by 0.1mm

Examples:

Rule End to 1mm graduation = Normal Tol. 0.1mm + Additional Tol. 0.1mm = 0.2mm

Rule End to 10mm graduation = Normal Tol. 0.2mm + Additional Tol. 0.1mm = 0.3mm

Overall Length Tolerance

$$\text{Tol} = [a + (b \times L)]$$

a = 0.1 for class 1

b = 0.1 for class 1

L = Length of scale rounded up to the nearest metre

Example for a 300mm rule, when measurement is taken from the 10mm graduation to the 300mm graduation:

$$\text{Tol} = [0.1 + (0.1 \times 1)] = 0.2\text{mm}$$