

MICROMETER QUALITY AND ACCURACY

Product quality and accuracy cannot be valid unless referenced to a quality and accuracy standard.

All Starrett precision measuring tool standards meet or exceed accuracy and performance specifications of national and international standards and are traceable to the National Institute of Standards and Technology.

The Starrett Company does not rely on statistical sampling inspection. Every precision measuring tool is individually inspected.

All Starrett micrometers have the same accurate heads as outlined in the chart. Inaccuracies because of size can be minimized if the tools are set accurately to standard, and measurements are carried out in a similar position with similar pressure.

HOW TO ADJUST STARRETT MICROMETERS

Adjustments to Starrett Micrometers are rarely needed; however, if it becomes necessary, they can be readily adjusted in two easy operations as follows:



1. If any play should develop in the spindle screw threads due to wear of the spindle nut after long use, first back off the thimble, insert the spanner wrench in the slot of the adjusting nut and tighten just enough to eliminate play. Illustration shows how easily this is done.



2. After carefully cleaning all dirt or grit from the measuring faces of anvil and spindle, bring them together and insert the spanner wrench in the small slot of the sleeve. Then turn the sleeve until the line on the sleeve coincides with the zero line on the thimble as shown.

Starrett Micrometer Accuracy Standards
(Unless Otherwise Noted on the Catalog Page)

Type	Range	Readout	Accuracy
Mechanical	1"	.001"	±.0001"
	1"	.0001"	±.00005"
	25mm	0.01mm	±0.002mm
	25mm	0.001mm	±0.002mm
Electronic	1"	.00005"	±.0001"
	25mm	0.001mm	±0.002mm

KEY TO STARRETT MICROMETER NUMBERING SYSTEM

Key to Starrett Micrometer Numbering System

Prefixes

R	Reverse Reading
S	Micrometer Set
T	.0001" Reading
V	0.001mm or 0.002mm Reading, as specified

Suffixes

F	Friction Thimble
L	Lock Nut
M	Metric
N	Non-Rotating
P	Plain
R	Ratchet Stop
S	Speeder
TN	Threaded Hub and Check Nut
W/SLC	Standard Letter of Certification
X	Micro-lapped Carbide Measuring Faces
Z	With Case
ZZ	Case Only

MEASURING TIPS FROM OUR EXPERIENCE

- Most obvious to everyone is to keep the work to be measured and the micrometer anvil and spindle faces clean.
- For very fine measurements, the micrometer should be set to zero or to a standard by your "feel", by the friction thimble, or by the ratchet, whichever you will be using.
- The most popular micrometer option has been the ratchet speeder because it does three things well: it speeds opening and closing, it applies uniform pressure from the ratchet, and it allows for using the thimble for individual "feel".
- The speeder is helpful because it takes forty turns to cover the range of a typical English-reading tool and fifty turns to cover the range of a metric-reading tool.
- Large micrometers especially should be set to a standard in the same approximate position in which they will be used, that is, vertical or horizontal, to minimize any frame flexure influence.
- Too much speed in approaching the work will result in an inaccurate measurement.
- If the micrometer has been set to a flat standard, you can get approximately .0001" (0.0025mm) difference when measuring over a round because the same pressure is being applied to a point or line contact.
- Carbide or hardened steel measuring faces are a matter of choice. Carbide wears longer but many craftsmen think they get a better "feel" with highly finished steel measuring surfaces.
- Insulating pads on micrometers are a matter of personal preference. With the Starrett balanced micrometer design, there is no need for insulation. Insulation from hand heat is usually more beneficial on long sections, such as end measuring rods.



HOW TO READ A STARRETT MICROMETER

GRADUATED IN THOUSANDTHS OF AN INCH

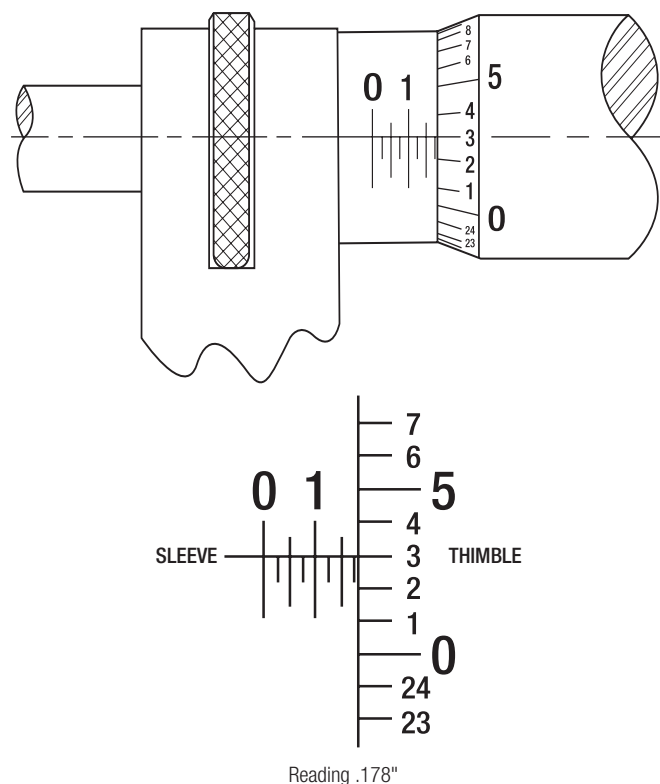
.001"

The pitch of the screw thread on the spindle is 40 threads per inch. One revolution of the thimble advances the spindle face toward or away from the anvil face precisely $1/40$ " or .025 inches.

The reading line on the sleeve is divided into 40 equal parts by vertical lines that correspond to the number of threads on the spindle. Therefore, each vertical line designates $1/40$ " or .025 inches. Lines vary in length for easy reading. Every fourth line, which is longer than the others, designates a hundred thousandth. For example: the line marked "1" represents .100" and the line marked "2" represents .200", etc.

The beveled edge of the thimble is divided into 25 equal parts with each line representing .001" and every line numbered consecutively. Rotating the thimble from one of these lines to the next moves the spindle longitudinally $1/25$ of .025", or .001". Rotating two divisions represents .002", etc. Twenty-five divisions indicate a complete revolution of .025" or $1/40$ of an inch.

To read the micrometer in thousandths, multiply the number of vertical divisions visible on the sleeve by .025", and to this add the number of thousandths indicated by the line on the thimble which coincides with the reading line on the sleeve.



EXAMPLE:

The "1" line on sleeve is visible, representing100"
 There are 3 additional lines visible, each representing .025"; $3 \times .025$ = .075"
 Line "3" on the thimble coincides with the reading line on the sleeve,
 each line representing .001"; $3 \times .001$ = .003"
 The micrometer reading is 178"

GRADUATED IN TEN-THOUSANDTHS OF AN INCH

.0001"

Starrett micrometers graduated in ten-thousandths of an inch read like micrometers graduated in thousandths, except that an additional reading in ten-thousandths is obtained from a vernier scale on the sleeve.

The vernier consists of ten divisions on the sleeve, which occupy the same space as nine divisions on the thimble (Fig. B). Therefore, the difference between the width of one of the ten spaces on the vernier and one of the nine spaces on the thimble is one-tenth of a division on the thimble, or one ten-thousandth (.0001").

To read a ten-thousandths micrometer, first obtain the thousandths reading, then see which of the lines on the vernier coincides with a line on the thimble. If it is the line marked "1" on the sleeve, add one ten-thousandth, if it is the line marked "2", add two ten-thousandths, etc.

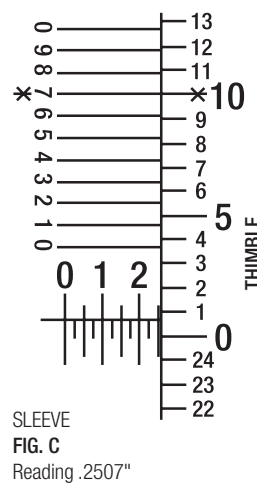
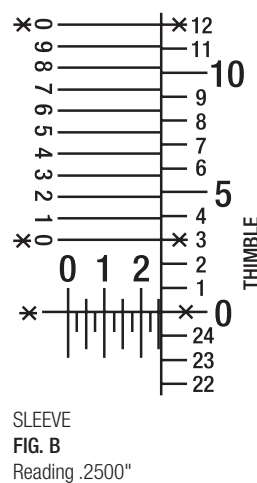
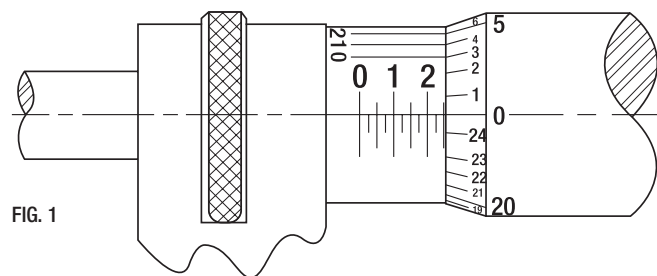


FIGURE C – READING .2507"

The "2" line on sleeve is visible, representing200"
 There are two additional lines visible, each representing .025"050"
 The reading line on the sleeve lies between the "0" and "1" on the
 thimble indicating that a vernier reading must be added ---
 The "7" line is the only line on the vernier that coincides with a line on
 the thimble, representing $7 \times .0001$ = .0007"
 The micrometer reading is2507"

MICROMETERS

788 ELECTRONIC MICROMETERS WITH ROUNDED ANVIL (WITH OUTPUT)

0-1"/0-25MM

This micrometer is similar to our 211, except that it has an electronic readout and the following extra features and benefits:

788 and 788M Electronic Micrometers

Cat. No.	EDP	Description
788XFL	66449	0-1"/0-25mm range, with standard inch graduations on shell and thimble
788MEXFL	66450	0-25mm/0-1" range, with standard millimeter graduations on shell and thimble

Cable Information for 788 Electronic Micrometers

Part No.	EDP	Description
733SCKB	69888	USB cable to PC (In focused window)
733SCU	69898	USB cable to computer running SPC Data Collection Software
733SCM	69893	Connection to Multiplexer (7612, 7613 or RMS 2704)
PT61963	66636	Computer Interface Cable Complete to PC (RS232C)
PT61120	65446	One 3-Volt Battery CR2450

Case for 788 and 788M Electronic Micrometers

Cat. No.	EDP	Description
949	63874	Case for 788 Micrometers

READABILITY FEATURES

- Large, high-contrast LCD digital readout reduces errors
- Resolution: .00005" and 0.001mm
- Conventional inch or millimeter graduations standard
- Attractive no-glare black wrinkle finish on the frame
- Starrett no-glare satin chrome finish on thimble and sleeve

ACCURACY AND LONG-LIFE FEATURES

- One 3-volt battery furnished for dependable power and over one year's normal usage
- Automatic OFF after 30 minutes of nonuse

FULL-FUNCTION ACTION FEATURES

- Instant inch/millimeter conversion
- "ME" millimeter model will turn on in the millimeter mode after installation of a new battery
- Measurement HOLD button
- Ability to zero tool at any position
- Ability to retain and return to the true zero reading of the micrometer
- PRESET button to install any reading at any position
- Ability to install minimum and maximum limits
- RS232 data output port
- Works well with Starrett DataSure® Wireless Data Collection Systems



788XFL