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Precision Tools

Basic Curriculum Module



Funding provided by Department of Labor, Employment & Training Administration: WIRED Initiative





Course Purpose

- **To teach how to use the precision measuring tools needed to make accurate measurements for verification of quality requirements**



Course Objectives

Upon completion of this course you will be able to read the scales and use the following tools to layout, measure product dimensions.

1.Six inch scale

2.Micrometer

3.Dial caliper

4.Depth Gage

5.Trulock Gage



Review of the Number Line and Decimal Numbers

- $1/10$ of an Inch = 0.1
- $1/100$ of an Inch = 0.01
- $1/1000$ of an Inch = 0.001
- $1/10,000$ of an Inch = 0.0001



PRECISION RULES, STRAIGHT EDGES AND SCALES

- FLEXIBLE & RIGID

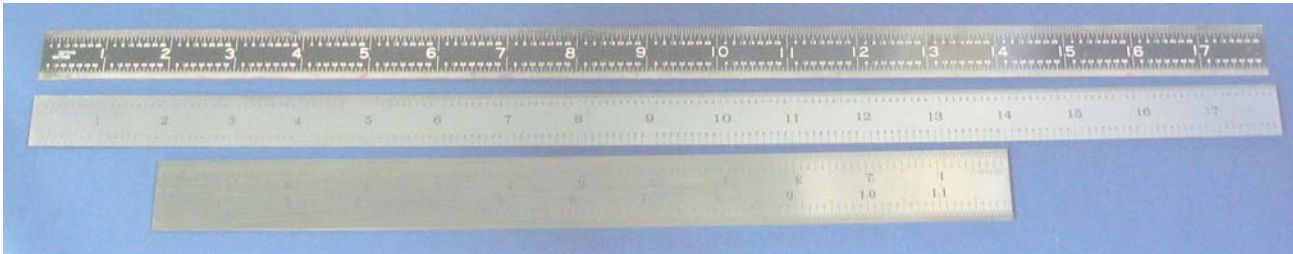


- 6 Inch, 12 Inch and 18 Inch scales
- Fraction and Decimal Reading
- Combination Sets



PRECISION RULES, STRAIGHT EDGES AND SCALES

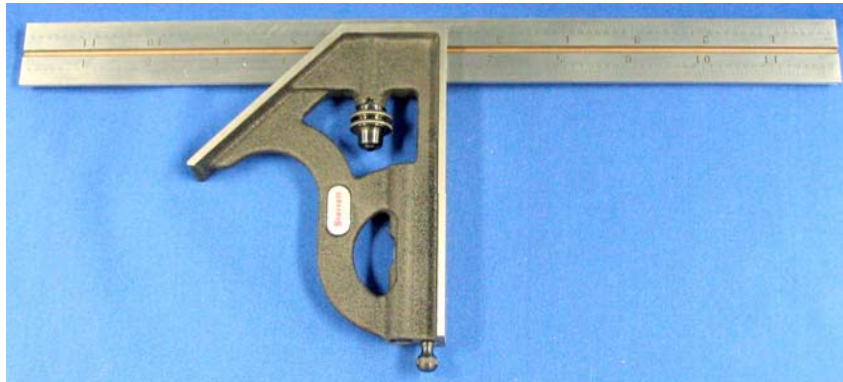
- FLEXIBLE & RIGID



- 12 Inch and 18 Inch scales
- Satin Face
- Fraction and Decimal Reading
- Combination Sets

PRECISION RULES, STRAIGHT EDGES AND SCALES

- Scales
- Application



T-Square



Protractor



MICROMETERS

- Nomenclature
- Mechanical or Digital
- .001 or .0001 Readings
- Ratchet or Friction Stop





DIGITAL MICROMETERS

- Nomenclature
- Mechanical or Digital
- .001 or .0001 Readings
- Ratchet or Friction Stop





DEPTH MICROMETERS



- 0 to 4 Inch Depth Micrometer
- Nomenclature
- Inch Rod Measurement
- .001 Readings
- Ratchet or Friction Stop



DIAL CALIPERS

- 6 " Inch Mechanical Dial Caliper



- Nomenclature
- Inch, Tenths, Hundredths and Thousandths
- 100 or 200 Thousandths Dial Reading
- Inside or Outside Measurements
- Depth and Step Measurement



DIGITAL CALIPERS

- **Nomenclature**
- **Inch, Tenths, Hundredths, Thousandths and Ten Thousandths**



- **Digital Reading**
- **Inside or Outside Measurements**
- **Depth and Step Measurement**



MASTER VERNIER CALIPER

- **Nomenclature**
- **Inch, Tenths, Hundredths and Thousandths**
- **25 or 50 Thousandths Vernier Scale**
- **Inside or Outside Measurements**
- **Depth and Step Measurement**



FLUSHNESS/COUNTERSINK GAGES

Federal Dial Flushness Gage



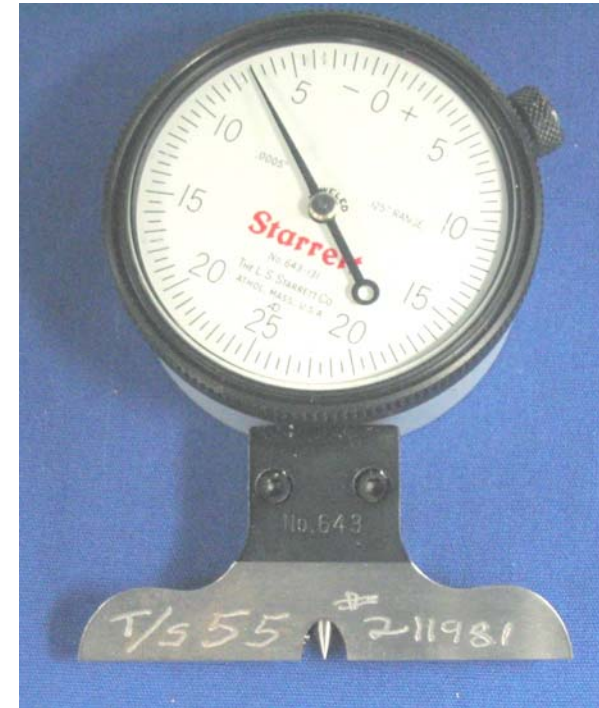
- .0005, .001, .005 Graduation Readings
- Zeroing Out the Dial
- Plus or Minus Indicators
- Clockwise or Counterclockwise



FLUSHNESS/COUNTERSINK GAGES

Starrett Flushness Gage

- .0005, .001, .005 Graduation Readings
- Zeroing Out the Dial
- Plus or Minus Indicators
- Clockwise or Counterclockwise





TRULOK DIGITAL FLUSHNESS GAGE

- **Power On/Off Buttons**
- **Bi-Pod or Tri-Pod Screw-On Legs**
- **Zeroing the Digital Display**
- **Digital Display Range / Readings**
- **Inch vs. Millimeters**
- **Concave or Convex Direction of Reading**





Trulok Graduated Countersink Gage



- **.005 Inch Graduated Scale**
- **.360 to .560 Range (100 degree Standard)**

- **Spring Pull Reset**





Trulok Graduated Countersink Gage



- **.005 Inch Graduated Scale**
- **.160 to .360 Range/.360 to .560 Range**
- **Checking .260/.460 Reading (100 degree Standard)**

- **Spring Pull Reset**



- **Concave or Convex Direction of Reading**

- **Power On/Off Buttons**





Trulok Graduated Countersink Gage



- **Bi-Pod Legs**
- **Pre-Setting the Digital Display**
- **Digital Display Range/Readings**
- **Inch vs. Millimeters**
- **Concave or Convex Direction of Reading**



Gages

Mic. & Ball Gage Combination



**.002 to .006
Feeler Gage**





Other Tools

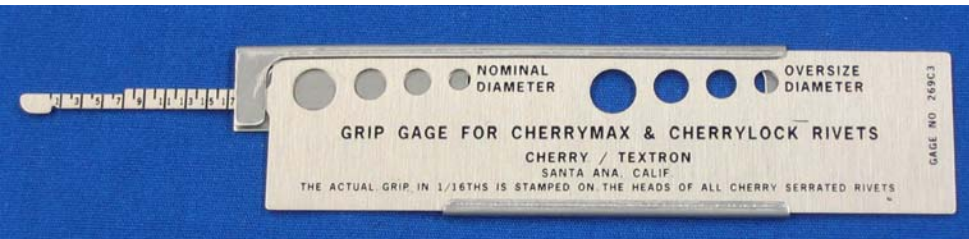
Radius Gages



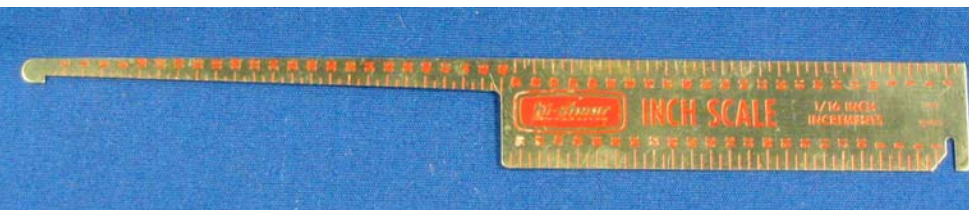
Grip Gages



Composi-Lok



Cherry Rivets



Inspection Tools



Pin Protrusion



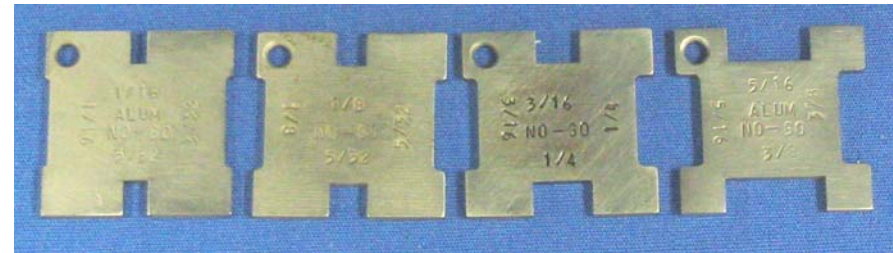
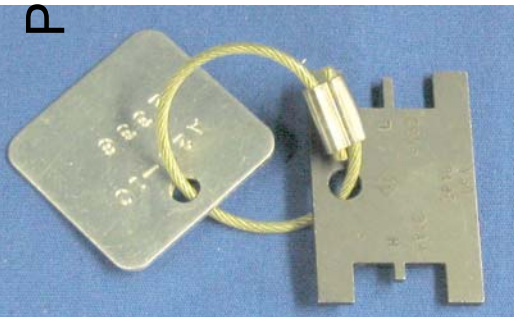
HiLok



GnG



Eddie Bolt2



Rivet Gage



Inspection Tools

Hardness Gage





Summary

- **Review and verify that each student can use each of these tools to make measurements.**
- **Verify course objectives are met**



Evaluation

- Practical



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