

# Measurement Tools 1 | Quality Assurance Interactive eLearning

Basic Measurement - V19017-CA01XEN-E1

Objective 3: Describe the Function and Construction of a Machinist's Rule

Function

The machinist's rule is the most common measuring instrument in manufacturing because it can easily be carried in a pocket and provides quick measurement of approximate dimensions.

Machinist's rules are available in many different lengths. Common lengths include: the 6-inch machinist's rule, the 12-inch machinist's rule, the 150-millimeter machinist's rule, and the 300-millimeter machinist's rule.



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## eLearning Course: M19017

Amatrol's Measurement Tools online training introduces basic measurement, precision measurement tools, and dimensional gauging. Learners will cover concepts such as S.I. Measurement, U.S. Customary Measurements, Tape Measure and Measurement Conversion. Applications taught include using a dial caliper, digital caliper, English micrometer, and metric micrometer. Dimensional Gauging will include an introduction to gauging as well as indicator measurement and data collection. Measurement Tools 1 provides an overview of concepts in control chart analysis and operation, geometric dimensioning and tolerance, and location, orientation, and form tolerances.

## Measurement Tools

### Basic Measurement

Learners begin with an introduction to basic measurement, including SI measurement, US customary measurement, tape measures, and measurement conversion. Individual lessons focus on topics like two systems of dimensional measurement, function and construction of a Machinist's Rule, measurement accuracy and resolution, function and construction of a tape measure, and converting measurements between US Customary System and the SI Metric System. Learners will also practice skills, such as using a metric Machinist's Rule to measure an outside length of a part, mastering a decimal-inch Machinist Rule, using a tape measure to measure a length, and converting between common fraction inches and decimals.

### Precision Measurement Tools

Learners using Amatrol's measurement tools eLearning course will study various aspects and components of precision measurement tools, including dial calipers, digital calipers, English micrometers, and metric micrometers. Individual lessons focus on topics like function of a dial caliper, how to use a digital caliper, function of a micrometer, and typical accuracy of an outside micrometer. Learners will also practice skills, such as calibrating a dial caliper, using a digital caliper to measure dimension of a part, mastering an outside micrometer graduated in English units, and using a micrometer to measure the outside diameter of a cylindrical part.

### Dimensional Gauging

Learners will study various aspects and components of dimensional gauging, including an introduction to gauging,

indicator measurement, and data collection. Individual lessons focus on topics like the importance of tolerance, function of two methods of gauging, how to use a digital indicator to measure a dimension, and three ways to collect process data. Learners will also practice skills, such as mastering a dial indicator, measuring a dimension using a dial indicator, collecting and displaying data using data acquisition software, and deleting a file.

## **Orientation Tolerances**

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### **Control Chart Analysis**

Learners will study various aspects and components of control chart analysis, including control chart setup, data import, and control chart analysis. Individual lessons focus on topics like X-Bar and R Chart construction, how to apply control charts to process operation, and how to analyze an X-Bar and R Chart. Learners will also practice skills, such as manually constructing an X-Bar and R Chart, constructing an X-Bar and R Chart using SPC software with a gauge input, and analyzing an X-Bar and R Chart.

### **Geometric Dimensioning and Tolerancing**

Advancing through Amatrol's measurement tools online training course, learners will study various aspects and components of geometric dimensioning and tolerancing, including general tolerancing, assembly tolerances, fundamentals of geometric dimensioning and tolerancing, and feature control frames. Individual lessons focus on topics like maximum/least material condition, baseline dimensioning, five types of geometric features, and functions of the three parts of a feature control frame. Learners will also practice skills, such as calculating the limits of a dimension given its tolerance, identifying baseline dimensions, identifying the correct datum to use a reference point, and selecting a feature control frame for a part drawing.

### **Orientation Tolerances**

In this module, learners will study various aspects and components of orientation tolerances, including length measurement, parallelism tolerances, perpendicularity tolerances, and full indicator movement measurement. Individual lessons focus on topics like how to fixture a plate and disk, orientation and parallelism tolerances, how to interpret a perpendicularity tolerance of a surface, and full indicator movement. Learners will also practice skills, such as setting up and measuring diameter of a disk using an indicator, measuring parallelism of a rectangular part, determining if a rectangular part meets a perpendicularity tolerance, and measuring perpendicularity of a rectangular part using a free-standing indicator.

## **Additional Info**

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### [Computer Requirements](#)

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#### **Address**

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