

# Materials Technology eLearning | Quality Control, Tensile Strength Analysis, & Data Acquisition Systems

**Material Quality and Testing - WB782-CB01UEN-E1**

Objective 5: Describe the Function and Construction of a Cause and Effect Diagram

**Six Main Causes**

A dispersion C&E diagram organizes the causes into six main categories. This helps solve more complex problems by triggering you to think of more ideas in each category. The categories are:

- Man (or Operator)
- Machines
- Materials
- Measurement
- Methods
- Environment

Because of these categories, this diagram is often called a 5M&E diagram.

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## eLearning Course: MB782

The Materials Technology 1 eLearning course (MB782) covers material quality control, tensile strength analysis, and data acquisition systems. Learners will study topics like: the function and construction of a cause and effect diagram; the application and types of destructive testing; the types of tensile testing machines; how to plot and analyze a stress/strain diagram given a set of data for a tensile test; the operation of a linear potentiometer; and the function of a data acquisition formula.

## Teach Material Quality Control

### How are Material Characteristics Maintained?

During the manufacturing process, a material goes through many changes from raw to finished material. The finished material must have certain properties or characteristics when complete. Inspections are done during each step of the manufacturing process to ensure that the final material has the needed characteristics. In addition to checking dimensions, inspection tests may include checking properties of the material, such as strength or hardness. Just like dimensional measurements, these test product measurement data and can be analyzed using SPC charts.

### What Happens When a Component Fails?

A component, or part, is considered to have failed when it can no longer perform its intended function. Changes in the material's characteristics, due to manufacturing processes or the application, often cause component failures to occur. There are three types of component failures: fracture, distortion, and wear. A **fracture** occurs when a part breaks, and it the most serious type of component failure because of safety concerns. **Distortion** is a change in the shape or size of a component. Often, this can make the part unable to perform its function. Finally, **wear** is the result of two surfaces rubbing against each other, which removes material from one (or both) of the surfaces.

## Interactive eLearning

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### Materials Technology eLearning Features Engaging Multimedia Curriculum

Amatrol's unmatched multimedia utilizes text, audio, and stunning 3D animations that engage learners in theoretical knowledge and concepts. This thorough, exceptionally detailed curriculum is built to begin with the basics and steadily advance to more complex concepts. Through partnerships with key industry leaders and leading edge educators, Amatrol developed the right balance of knowledge needed to train learners to work in their chosen field.

### Additional Info

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#### Requires:

- Computer [\(see Computer Requirements\)](#)

#### Options:

- Materials Technology 1 Learning System (96-MT1)

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