

Welding Inspection & Testing

Media Type: Video

Duration: 72 minutes

Goal: To describe the importance, types and processes associated with welding inspection and testing.

Description:

This presentation features Pete Stracener, Chairperson, Industrial Technology Department, Program Coordinator and Professor of Welding Technology at South Plains College. Follow along as he explains the importance and processes of welding inspection, types of welding defects and discontinuities, preparation of welder qualification test plates and performance of the guided bend tests on the test coupons.

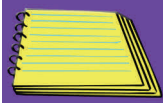
Objectives:

1. To define welding inspection and quality control.
2. To describe weld discontinuities and defects.
3. To explain the process of preparing welder qualification test plates and coupons.
4. To demonstrate guided bend tests.

Horizontal Alignment

Core-Subject Area	Foundation Concept	Basic Understanding
Language Arts	<i>Application of Writing Skills</i>	<ul style="list-style-type: none">• Editing/proofreading• Vocabulary enhancement
	<i>Analysis of Text & Information</i>	<ul style="list-style-type: none">• Drawing inferences and generalizations• Developing listening and comprehension skills• Creating visual representations
	<i>Technology Applications in Literature</i>	<ul style="list-style-type: none">• Utilizing document processing software• Utilizing presentation processing software• Internet-based research
	<i>Scientific Thinking & Investigating</i>	<ul style="list-style-type: none">• Field and laboratory investigations• Real-world investigations and applications• Technology-based research• Classification/organization skills

Welding Inspection & Testing



Lesson Plan

Class 1: Distribute the *Welding Inspection & Testing Worksheet* and *Vocabulary Handout*. Show the *Welding Inspection & Testing - Introduction to Welding Inspection & Testing*, *Welding Inspection & Testing - Weld Joints & Positions* and *Welding Inspection & Testing - Codes, Standards & Specifications* segments. Assign students the *Code Requirements Project*.



13 min.

Class 2: Remind students to use their *Worksheet* and *Vocabulary Handouts* as references throughout the presentation. Show the *Welding Inspection & Testing - Discontinuities & Defects* and *Welding Inspection & Testing - Quality Control* segments. Distribute the *Discontinuities & Defects Identification Activity* for students to work on in class.



14 min.

Class 3: Present the *Welding Inspection & Testing - Destructive Testing* and *Welding Inspection & Testing - Non-Destructive Testing* segments. Have students follow along with the *Worksheet* and *Vocabulary Handout*. Allow students to turn in their papers from the *Code Requirement Project*. Review previous days materials with students and make sure all information is understood.



19 min.

Class 4: Show the *Welding Inspection & Testing - 2G Welding Certification Test Preparation*, *Welding Inspection & Testing - Coupon Preparation* and *Welding Inspection & Testing - Performing the Guided Bend Test* segments. Have students follow along with the *Worksheet* and *Vocabulary Handout*. Discuss any questions students may have, then assign the *Welder Qualification Test Project*. Coupon preparation will take several class periods.



26 min.

Class 5: Review with students and answer any questions they may have. Assign the *Word Search*. Once students have completed the *Word Search*, distribute the *Welding Inspection & Testing Assessment*. Distribute the *Destructive vs. Nondestructive Project* and allow the remainder of the class for students to work.

Class 6: Allow students time to complete their test plates and coupon preparation. Once coupons are complete, have students perform the *Visual Inspection Activity* with their peer's projects. If equipment is available, allow students to perform guided bend tests on their coupons. If equipment is not available, collect coupons and visually inspect all coupons.

Class 7: Allow the class for students to finish and turn in all *Projects* and *Activities*.

Lesson Links

American Welding Society

- <http://aws.org>

American Society of Mechanical Engineers

- <http://www.asme.org>

Career & Technical Student Organizations

FFA

- Agricultural Mechanics

Skills USA

- Welding
- Welding Fabrication
- Welding Sculpture Demo

Welding Inspection & Testing



Career Connections

Using the *Career Connections Activity*, allow students to explore the various careers associated with this lesson. See the *Activity* for more details. *If student licenses have been purchased:* Students will select the interviews to watch based on your directions. *If only a teacher license is purchased:* Show students all the career interviews and instruct them to only complete the interview form for the required number of interviews.

- iCEV50535, Mary Jo Emrick, Adjunct Welding Professor, Austin Community College
- iCEV50773, Dennis Klingman, Manager of Technical Training, Lincoln Electric Welding School
- iCEV50001, Howard Alford, Welder, Self-Employed



Lab Activities

Discontinuities & Defects Identification

Directions:

Using the *Discontinuity & Defects Identification Activity*, students will match the picture of the discontinuity or defect with the proper name. To add difficulty to the worksheet, instructor may require students to list the cause of the discontinuity as well.

Visual Inspections

Directions:

Once test coupons have been prepared, allow students to choose a test coupon to inspect. Students will evaluate the coupons for the presence of any visual defects or discontinuities. After inspection of the coupon, students will write down three pros and three cons about the coupon they inspected and turn it in along with the coupon they evaluated. If the student observes any discontinuities or defects, they should note it on the sheet, along with ideas as to what caused the defect or discontinuity and how it could be repaired. View the *Visual Inspections Activity Teacher Instruction Sheet*



Projects

Welder Qualification Test

Directions:

Students will preform a welder qualification test using a welding process available in the shop. Follow all instructions and have students cut test coupons as instructed, even if equipment is not available to perform guided bend tests. Have students number their test coupons with a number of their choosing. Make sure numbers are not repeated.

Code Requirements

Directions:

Welding codes are important not only to the welding industry, but to all people. Students will choose a career they wish to pursue in the future and write a short paper of two to three pages discussing the career they chose and at least two welding codes which pertain to their future career. Remind students to cite their sources and include a bibliography with their paper.

Destructive vs. Nondestructive

Directions:

Using the Internet, library or other available resources, students should research and write a report explaining the relationship between discontinuities and defects. Describe various examples of defects found in welded products. Also identify and explain both destructive and nondestructive tests used as quality control techniques to prevent manufacturing defects in welding. Compare and contrast these techniques and provide specific examples when they are most appropriately used.