

Non-Destructive Testing

Exam Information	Description
Exam number 598 Items 41 National Career Cluster Advanced Manufacturing Digital Technology Certification available Yes	The Non-Destructive Testing industry certification exam assesses understanding of the five major non-destructive testing methods, certification requirements, and inspector responsibilities. Learners demonstrate their knowledge of visual testing and the use and operation of gauges.

Exam Blueprint and Performance Skills

Standard	Percentage of exam score
1. History of Non-Destructive Testing*	5%
2. Introduction to Methods*	5%
3. Uncommon Methods*	5%
4. Functions of Non-Destructive Testing*	11%
5. Applications of Non-Destructive Testing*	44%
6. Quality Control/Quality Assurance*	7%
7. Economic Factors*	5%
8. Qualification of Personnel*	11%
9. American Society for Non-Destructive Testing*	5%
10. Future Growth & Expansion*	2%

*Includes performance skill evaluation

Standard 1 - History of Non-Destructive Testing (5% of exam score)

Candidates will understand the history of non-destructive testing (NDT).

Objective 1 Describe the origins of the six basic methods of Non-Destructive Testing.

1. Visual inspection
2. Penetrant inspection
3. Magnetic particle and eddy current inspections
4. Ultrasonic inspection
5. X-rays Radiography
6. Liquid penetrant

Optional: Standard performance evaluations on the final page of this document

Standard 2 - Legal Issues of Clinical Practice (5%)

Candidates will identify the legal issues governing the clinical practice of physical therapy.

Objective 1 Perform a simple inspection using the basic five inspection methods.

1. Use of ultrasound in thickness gauging
2. Use of eddy current in crack detection
3. Use of radiography in locating weld defects
4. Use of magnetic particle in weld inspection
5. Use of penetrant in crack detection

Optional: Standard performance evaluations on the final page of this document

Standard 3 - Professional Standards and Values (5%)

Candidates will be able to understand uncommon non-destructive testing methods.

Objective 1 Compare the uses of uncommon methods to the methods in wide use today.

1. Thermal inspection in defect detection
2. Acoustic inspection
3. Changes with regard to computers

Optional: Standard performance evaluations on the final page of this document

Standard 4 - Medical Terminology (11%)

Candidates will be able to understand the functions of non-destructive testing.

Objective 1 List the uses and functions of NDT.

1. Five primary forms of NDT used in a given industry

Optional: Standard performance evaluations on the final page of this document

Standard 5 - Musculoskeletal Conditions and Injuries (44%)

Candidates will be able to understand applications of non-destructive testing.

Objective 1 List and describe applications of NDT methods.

1. Visual inspection
2. Penetrant inspection
3. Magnetic particle and eddy current inspections
4. Ultrasonic inspection
5. X-rays Radiography
6. Liquid penetrant

Optional: Standard performance evaluations on the final page of this document

Standard 6 - Neuromuscular Pathologies (7%)

Candidates will be able to understand quality control/quality assurance.

Objective 1 Describe the structure of quality control.

1. Chain of command flow
2. Flow diagram
 - a. Flow diagram for liquid penetrant
 - b. Pre-cleaning
 - c. Penetrant application
 - d. Penetrant dwell time
 - e. Removal of excess surface penetrant
 - f. Development application
 - g. Inspection
 - h. Post cleaning
3. NDT inspection
4. Visual inspection

Optional: Standard performance evaluations on the final page of this document

Standard 7 - Cardiovascular and Pulmonary Pathologies (5%)

Candidates will be able to understand economic factors.

Objective 1 Judge the economic factors involved in selecting a particular NDT.

1. Lowest cost
2. Compare costs of the five basic methods
3. Economic advantages to NDT over *not* inspecting a product

Optional: Standard performance evaluations on the final page of this document

Standard 8 - Integumentary Pathologies (11%)

Candidates will be able to understand the qualifications of personnel.

Objective 1 List the documents that govern NDT inspectors.

1. Two major documents governing NDT certification
 - a. ASNT SNT-TC-1 American Society of Non-Destructive
 - b. NAS 410 – National Aerospace Standard
2. Most widely used qualification/certification document in aviation industry
3. Three procedures widely used in NDT

Optional: Standard performance evaluations on the final page of this document

Standard 9 - Therapeutic Exercises and Modalities (5%)

Candidates will be able to understand the American Society for Non-Destructive Testing.

Objective 1 Describe the advantages of a national society of inspection.

1. Quality control department
2. Advantage to a national organization

Objective 2 Ascertain the need for various assistive devices.

1. Identify different NDT societies in different countries

Optional: Standard performance evaluations on the final page of this document

Standard 10 - Pediatric Patients (2%)

Candidates will be able to understand future growth and expansion.

Objective 2 State the projected growth and expansion of NDT.

1. Infrastructure is the fastest growing area

Optional: Standard performance evaluations on the final page of this document

Performance Skills Evaluation

Exam name: Non-Destructive Testing

Candidate Name: _____

Performance assessments may be completed and evaluated any time before the certification is issued. The following performance skills can be used in connection with the associated standards and exam. The evaluator will function as the subject matter expert to determine if the candidate meets the skills requirements with a Yes/No for passing.

Standard 1 – History of Non-Destructive Testing • List the year and industry that originated penetrant inspection. • List the year and industry that originated magnetic particles, and eddy current inspections. • List the year and country that originated ultrasonic inspection. • List the year and person that discovered x-rays. • List the industry that originated liquid penetrant.	Pass:
Standard 2 – Introduction to Methods • Demonstrate the use of ultrasound in thickness gauging. • Demonstrate the use of eddy current in crack detection. • Demonstrate the use of radiography in locating weld defects. • Demonstrate the use of magnetic particle in weld inspection. • Demonstrate the use of liquid penetrant in crack detection.	
Standard 3 – Uncommon Methods • Explain the use of thermal inspection in defect detection. • Assess the value of acoustic inspection as related to cost and the use of the more common methods of defect detection. • Summarize in a short statement the changes taking place in the inspection field with regard to computers.	
Standard 4 – Functions of Non-Destructive Testing • Rank in order five primary forms of Nondestructive Testing used in a given industry.	
Standard 5 – Applications of Non-Destructive Testing • Name one application of ultrasonics in a specific industry. • Name one application of radiography in a specific	

industry.

- Name one application of penetrant in a specific industry.
- Name one application of magnetic particle in a specific industry.
- Name one application of eddy current in a specific industry.
- Show how each of the above applications if not used could lead to a failure of materials.

Standard 6 – Quality Control/Quality Assurance

- Determine the chain of command flow in quality control.
- Construct a flow diagram of a typical quality control system.
- Compare Nondestructive Testing inspection to visual inspection.

Standard 7 – Economic Factors

- Select an inspection that would be of lowest cost for the company.
- Compare the costs of the five basic methods and rank in order of least to most expensive.
- Understand the economic advantages of Nondestructive Testing over not inspecting a product.

Standard 8 – Qualification of Personnel

- Compare the differences between the two major documents governing Nondestructive Testing certification.
- Summarize the materials in the two documents in a two-paragraph statement.
- List the most widely used qualification/certification document in the aviation industry.
- Summarize information found in three procedures that are widely used in Nondestructive Testing.

Standard 9 – American Society for Non-Destructive Testing

- Construct and illustrate a flow chart showing the links in a quality control department.
- List one advantage a technician would have if he/she joined a national organization.

Standard 10 – Future Growth and Expansion

- Point out and explain why infrastructure is the fastest growing Nondestructive Testing area in the country.
- Compare three areas, assess the growth potential, and list them in order of most likely to grow to least likely to grow.

Evaluator Name:

Date: