

A **GUIDE** TO PERSONNEL QUALIFICATION & CERTIFICATION



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**The American Society for
Nondestructive Testing Inc.**



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ASNT Mission Statement:
ASNT's mission is to advance the field of nondestructive testing.

ASNT *Code of Ethics*:
The ASNT *Code of Ethics* was developed to provide members of the Society with broad ethical statements to guide their professional lives. In spirit and in word, each ASNT member is responsible for knowing and adhering to the values and standards set forth in the Society's *Code*. More information, as well as the complete version of the *Code of Ethics*, can be found on ASNT's website, asnt.org.

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Introduction

The world of nondestructive testing (NDT) is complex. We utilize highly scientific processes to nondestructively evaluate a variety of materials and components for virtually every industry.

Because of the complex nature of NDT and the vast variety of testing methods at our disposal, it quickly becomes a daunting task to ensure technicians are both highly competent and highly capable. It is paramount that NDT technicians are proficient at performing complicated tests both accurately and consistently.

This results in qualification and certification schemes that can be equally complex. This guide was developed by NDT experts to help assist those seeking to better navigate the complexities of NDT qualification and certification.

Within this guide we will review the most common certification and qualification means as developed by the American Society for Nondestructive Testing (ASNT) as well as review international certification schemes and various specific industries' certification programs.

Definitions

As with most specialized occupations, NDT has its own set of terms, definitions, and acronyms that the reader should be familiar with to properly understand the qualification and certification processes. The definitions below were extracted from several different reference documents which are listed at the end of this section.

- ▶ **Basic Examination¹:** Written examination, at Level III, which demonstrates the candidate's knowledge of the materials science and process technology and types of discontinuities, the specific qualification and certification system, and the basic principles of NDT methods as required for Level II.
- ▶ **Certification²:** Written testimony that an individual has met the applicable requirements of this standard.
- ▶ **Certification Procedure²:** A written procedure, developed by the employer, that details the requirements for qualification and certification of an employee to a national standard.
- ▶ **Certification Standard:** A document that provides *requirements* for the establishment of a qualification and certification program. The requirements may not be modified but must be followed as written.

- ▶ **Education²:** An institutionalized program, prescribed by appropriate authorities, that is offered by schools, institutes, organizations, colleges, or universities established for the sole purpose of providing instruction in an orderly, planned, and systematic fashion.
- ▶ **Employer²:** The corporate, private, or public entity, which employs personnel directly or indirectly for wages, salary, fees, or other considerations. This would include organizations which obtain their qualified supplemental workforce personnel through third-party agencies, provided the use and certification of those supplemental employees is addressed in the employer's certification procedure.
- ▶ **Examination²:** A formal, controlled, documented assessment of knowledge or skills conducted in accordance with a procedure.
- ▶ **Experience²:** Actual performance of an NDT method conducted in the work environment resulting in the acquisition of knowledge and skill. This does not include formal classroom training but may include laboratory and on-the-job training (OJT) as defined by the employer's certification procedure.
- ▶ **Formal Training²:** An organized and documented program of activities designed to impart the knowledge and skills required to be qualified to this standard. Formal training may be a mix of classroom, practical, and programmed self-instruction as approved by the responsible NDT Level III.
- ▶ **General Examination²:** A written examination addressing the basic principles of the applicable NDT method.
- ▶ **Method²:** One of the disciplines of NDT; for example, ultrasonic testing, within which various test techniques may exist.
- ▶ **Method Examination¹:** Written examination, at Level III, which demonstrates the candidate's general and specific knowledge, and the ability to write procedures for the NDT method as applied in the industrial or product sector(s) for which certification is sought.
- ▶ **NDT, NDE, NDI:** These initialisms stand for nondestructive testing, nondestructive examination, and nondestructive inspection, respectively. Usage varies among industries, but all relate to the same processes, and all have the same meaning. For simplicity, NDT will be used throughout this guide.

- **Nondestructive Testing³**: A process that involves the inspection, testing, or evaluation of materials, components, and assemblies for materials' discontinuities, properties, and machine problems without further impairing or destroying the part's serviceability. Throughout this document the term NDT applies equally to the NDT inspection methods used for material inspection, flaw detection, or predictive maintenance (PdM) applications.
- **Practical Examination²**: An examination used to demonstrate an individual's ability in conducting the NDT methods that will be performed for the employer. For Practical examinations, questions and answers need not necessarily be written, but observations and results must be documented.
- **Qualification²**: The education, skills, training, knowledge, and experience required for personnel to properly perform to a specified NDT level.
- **Recommended Practice³**: A set of guidelines to assist the employer in developing uniform procedures for the qualification and certification of NDT personnel to satisfy the employer's specific requirements.
- **Specific Examination²**: A written examination to determine an individual's understanding of procedures, codes, standards, specifications, and equipment or instrumentation for an NDT method used by the employer.
- **Technique²**: A category within an NDT method; for example, immersion ultrasonic testing.
- **Written Practice³**: A written procedure developed by the employer that details the requirements for qualification and certification of its employees.

REFERENCES

1. ISO, 2012, ISO 9712:2012 *Non-destructive testing—Qualification and certification of NDT personnel*, International Organization for Standardization, Geneva, Switzerland
2. ASNT, 2020, ANSI/ASNT CP-189: *ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel*, American Society for Nondestructive Testing, Columbus, OH
3. ASNT, 2020, Recommended Practice No. SNT-TC-1A: *Personnel Qualification and Certification in Nondestructive Testing*, American Society for Nondestructive Testing, Columbus, OH

Other common references that contain common NDT definitions

ASTM, latest edition, ASTM E1316 – *Standard Terminology for Nondestructive Examinations*, Section A – *Common NDT Terms*, ASTM International, West Conshohocken, PA

ASME, latest edition, ASME Boiler and Pressure Vessel Code, Section V: *Nondestructive Examination*, Article 1, *Mandatory Appendix I: Glossary of Terms for Nondestructive Examination*, American Society for Mechanical Engineers, New York, NY

ISO, 2019, ISO/TS 25107:2019 *Non-destructive testing—NDT training syllabuses*, International Organization for Standardization, Geneva, Switzerland

The Process of Personnel Qualification and Certification

As will be discovered, qualification and certification as an NDT technician can be rather complicated. The document or organization governing certification will affect the various requirements necessary to meet Level I, II, or III status.

Luckily, the vast majority of governing documents/organizations outline the same general path to achieving various NDT levels. All certification schemes will require a visual acuity and color/grayscale examination, though the specific examinations may vary.

- **Education/Training**: It is necessary to obtain a certain number of training hours in each NDT method for each level. The number of training hours will vary for each NDT method and those hours may vary depending on the certification scheme, but all require a specific amount of training. Training topical outlines should be written to a recognized standard such as ANSI/ASNT CP-105: *ASNT Standard Topical Outlines for Qualification of Nondestructive Testing Personnel*. Note: ASNT Recommended Practice No. SNT-TC-1A: *Personnel Qualification and Certification in Nondestructive Testing* does not require additional training for Level III qualification; however, ISO 9712: 2012 *Non-destructive testing—Qualification and certification of NDT personnel* does.
- **Experience**: Each NDT level requires a specific amount of experience for each method. Again, this experience will vary for each certification scheme, but all require some level of experience. This experience is typically OJT where the individuals work alongside a certified technician (Level II or III) gaining knowledge and practice in real-world situations.
- **Examination**: Before becoming certified, each prospective NDT technician is required to take a series of exams, typically a General, Specific, and Practical. The number of questions for these exams will vary depending on the certification scheme and method.

Education/training, experience, and examination comprise the fundamental base to all NDT programs and every standard/organization follows this format with some slight variations. Most schemes do not specify the completion order for the training, experience, and examinations. One common sequence is for a trainee to receive their initial training in a method first, then take the General, Specific, and Practical examinations. Assuming all examinations are passed, the trainee will work with a certified technician until the minimum experience hours are met. Another option is for an individual to gain some or all supervised (by a Level II or Level III) experience hours prior to structured training and examinations.

