

ISO 16826 (2025): NON-DESTRUCTIVE TESTING – ULTRASONIC TESTING – TESTING FOR DISCONTINUITIES PERPENDICULAR TO THE SURFACE

The latest edition of ISO 16826 (2025), published in March 2025 by the ISO/TC 135/SC 3 committee, establishes a structured framework for the tandem technique and the longitudinal-longitudinal-transverse wave (LLT) technique in ultrasonic testing. Designed to enhance the detection of planar discontinuities perpendicular or nearly perpendicular to a material's surface, this standard refines nondestructive testing (NDT) methodologies for improved flaw characterization in critical applications.

Planar discontinuities, such as lack of fusion in welded joints, fatigue cracks, or delaminations in multilayer structures, pose significant risks to structural integrity, as they can serve as initiation points for catastrophic failure under mechanical stress. Detecting these defects is particularly important in industries where load-bearing components and safety-critical structures must meet stringent reliability standards. For example, in aerospace applications, pi-joint connections used in aircraft fuselage assemblies rely on flawless bonding, as any embedded cracks could compromise airframe

strength. Similarly, in oil and gas pipelines, perpendicular discontinuities in girth welds could lead to stress corrosion cracking, increasing the risk of leaks or ruptures under high-pressure conditions. These discontinuities are also critical concerns in nuclear power plant components, shipbuilding, and heavy industrial machinery, where failure could have severe safety and environmental consequences.

ISO 16826 (2025) provides specific guidelines for inspecting metallic materials with thicknesses between 40 mm and 500 mm, ensuring consistent detection and evaluation of embedded defects. While primarily developed for industrial metallic components, the standard allows for its application to other materials and smaller thicknesses, provided specialized testing procedures are followed. The inclusion of phased array ultrasonic testing (PAUT) as a complement to tandem and LLT techniques further enhances defect detection and evaluation capabilities, though additional verification steps may be necessary.

By incorporating the principles outlined in ISO 16810, this standard strengthens quality control, structural integrity assessment, and safety assurance across industries such as oil and gas, power generation, aerospace, and heavy manufacturing. It ensures that ultrasonic inspections maintain a high degree of accuracy, particularly in detecting internal planar defects that might be missed by conventional testing methods.

ISO 16826 (2025) underscores the evolving landscape of ultrasonic testing, offering a precise, standardized, and adaptable approach for industries that demand superior reliability in flaw detection. As a key resource for NDT professionals, this standard supports the continued advancement of ultrasonic inspection technology, enabling safer and more efficient asset management worldwide.

STANDARDS EDITOR

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IN DEVELOPMENT

The following section provides a summary of new standards, drafts, and revisions that may be of interest to the nondestructive testing and evaluation (NDT/E) community. This summary is provided in *Materials Evaluation* on a quarterly basis in January, April, July, and October. For the latest information, please visit the website of the standards provider.

PROJECT INITIATION

ANSI procedures require notification by ANSI-accredited standards developers of the initiation and scope of activities expected to result in new or revised American National Standards. The following is a list of proposed actions and new standards that have been received recently from accredited standards developers. To view information about additional standards for

which a project initiation notification has been submitted, and to search approved American National Standards, please visit ansi.org, which is a database of standards information. Note that this database is not exhaustive.

- **BSR S2.1/ISO 2041-202x, *Mechanical Vibration, Shock, and Condition Monitoring Vocabulary***. This is an identical national

adoption of ISO 2041:2018 and revision of ANSI/ASA S2.1-2009 (R2020), ISO 2041-2009 (R2020). It contains a collection of terms, expressions, definitions unique to the specialized areas of mechanical vibration, shock, and condition monitoring, and gives specific recommendations for use in national and international standards pertaining to those areas.

- **BSR/ASME MFC-22-202x, *Measurement of Liquid by Turbine Flowmeters***. This new standard describes the criteria for the application of a turbine flowmeter with a rotating blade for the measurement of liquid flows through closed conduit running full. It discusses: (a) considerations regarding the liquids to be measured; (b) turbine flowmeter system; (c) installation requirements; (d) design specifications; (e) the maintenance, operation, and performance; and (f) measurement uncertainties.
- **BSR/ASSP Z244.1-202x, *The Control of Hazardous Energy Lockout, Tagout, and Alternative Methods***. This revision and redesignation of ANSI/ASSP Z244.1-2024 establishes requirements for machines, equipment, and processes in which the unexpected energization or start-up of the machines or equipment, release of stored energy, or the actions of persons could result in harm to personnel. The standard specifies the use of lockout, tagout, or alternative methods to control hazardous energy associated with machines, equipment, or processes.
- **BSR/ASTM WK93040-202x, *New Specification for Oriented Poly (Vinyl Chloride), PVC, Pressure Fittings***. This new standard covers requirements for materials, dimensions, workmanship, pressure testing, and solvent cement joint testing for oriented poly (vinyl chloride) (PVC) fittings for pressure applications.
- **BSR/AWS A3.0M/A3.0-202x, *Standard Welding Terms and Definitions Including Terms for Additive Manufacturing, Adhesive Bonding, Brazing, Soldering, Thermal Cutting, Thermal Spraying, and Nondestructive Examination***. This standard, a revision of ANSI/AWS A3.0M/A3.0-2025, is a glossary of technical terms used in the welding industry. Since it is intended to be a comprehensive compilation of welding terminology, nonstandard terms are also included. All terms are designated as either standard or nonstandard.
- **BSR/AWS B5.1-202x, *Specification for the Qualification of Welding Inspectors***. This is a revision of ANSI/AWS B5.1-2025. This standard defines the qualification requirements to qualify welding inspectors. The qualification requirements for visual welding inspectors include experience and satisfactory completion of an examination, which includes demonstrated capabilities and proof of visual acuity. The examination tests the inspector's knowledge of welding processes, welding procedures, nondestructive examinations, destructive tests, terms, definitions, symbols, reports, welding metallurgy, related mathematics, safety, quality assurance, and responsibilities.
- **BSR/AWS B5.4-202x, *Specification for the Qualification of Welder Test Facilities***. This is a revision of ANSI/AWS B5.4-2025, defining the requirements for the qualification of welder test facilities.
- **BSR/EIA 364-26C (R202x), *Salt Spray Test Procedure for Electrical Connectors, Contacts, and Sockets***. This reaffirmation of ANSI/EIA 364-26-C-2014 (R2019) establishes a test method to assess the effects of a controlled salt-laden atmosphere on electrical connector components, finishes, and mechanisms and permit electrical readings to be taken after exposure when specified.
- **BSR/EIA 364-110A-202x, *Thermal Cycling Test Procedure for Electrical Connectors and Sockets***. This is a revision and redesignation of ANSI/EIA/ECA 364-110-2006 (R2019). This standard establishes a test method to expose connectors and sockets to extremes of high and low temperatures at a specified ramp-up and ramp-down rate.
- **BSR/IEEE 4-202x, *Standard for High-Voltage Testing Techniques***. This is a revision of ANSI/IEEE 4-2013, incorporating the newest technology and developments in standard methods to measure high-voltage and basic testing techniques, so far as they are generally applicable, to all types of apparatus for alternating voltages, direct voltages, lightning impulse voltages, switching impulse voltages, and impulse currents. This standard applies to high-voltage tests made on equipment with a rated voltage above 1000 V AC (RMS) or 1500 V DC. Procedures are given for applying correction factors to convert test data to standard atmospheric conditions and for testing equipment when external insulation of the test object is to be subjected to dry, wet, or contaminated conditions.
- **BSR/IEEE 421.2-202x, *Guide for Testing and Evaluation of the Dynamic Performance of Excitation Control Systems***. This new standard includes criteria, definitions, and test objectives for evaluating the dynamic performance of excitation control systems as applied by electric utilities. The term 'excitation control system' is used to distinguish the combined performance of the synchronous machine, power system, and excitation system from that of the excitation system alone. This guide applies to excitation systems used on all sizes and types of synchronous machines, including those in nuclear power facilities. Large signal performance is associated with equipment specification and acceptance testing, while small signal performance is associated with stability and model studies.
- **BSR/IEEE 7999-202x, *Standard for Integrating Organizational Ethics Oversight in Projects and Processes Involving Artificial Intelligence***. This new standard provides a base framework to determine the individual qualification of AI ethics oversight actors and organizational certification of AI developers using existing ethically aligned design standards developed for AI systems. It furthermore outlines best practices based on these standards for integrating ethics oversight in organizations of any scale for projects that use or develop AI and AI systems (at any stage of the AI system lifecycle).
- **BSR/IEEE 7999.1-202x, *Standard for Integrating Organizational Ethics Oversight in Projects and Processes Involving Artificial Intelligence – Qualification of Individuals***. This new standard defines a set of metrics that determine the certification criteria that qualify individuals to AI ethics oversight functions in organizational settings, and recommendations for the establishment of certification programs that enable individuals to specialize in specific aspects of AI ethics oversight (e.g., large language models [LLMs], autonomous driving systems, generative images/videos).
- **BSR/IEEE 7999.2-202x, *Standard for Integrating Organizational Ethics Oversight in Projects and Processes Involving Artificial Intelligence – Organizational Certification***. This new standard provides a set of metrics that can be used to certify that companies, manufacturers, and other organizational bodies employ a set of standard operating procedures that facilitate the effective deployment of an AI ethics oversight function at all stages of the AI system lifecycle. These metrics include auditable elements of quality management systems utilized by companies, manufacturers, and other organizational bodies (which do not replace other quality management system conformance criteria), and post-market surveillance feedback to support ethically aligned design control processes.

- **BSR/IEEE 48404.1-202x**, *Standard for Terminations and Joints used on Extruded and Laminated Dielectric Shielded Alternating-Current Power Cables Rated 2.5 kV through 46 kV*. This new standard establishes electrical ratings, test procedures, and requirements for joints and live front terminations installed on extruded or laminated dielectric shielded power cable systems rated 2.5 kV through 46 kV AC.
- **BSR/IEEE C37.122.4-202x**, *Guide for Application and User Guide for Gas-Insulated AC Transmission Lines, Rated 72.5 kV and Above*. This new standard provides guidance for planning, design, equipment specification, installation, testing, commissioning, operation, maintenance, and decommissioning of gas-insulated transmission lines (GIL). The guide addresses technical aspects only.
- **BSR/IEEE C37.122.9-202x**, *Guide for Condition Assessment of Gas-Insulated Substations Rated Above 52 kV*. This new standard helps to determine the condition of gas-insulated substation (GIS) equipment rated above 52 kV.
- **BSR/IEEE C62.36-202x**, *Standard Test Methods for Surge Protectors and Protective Circuits Used in Information and Communications Technology Circuits and Smart Grid Data Circuits*. This is a revision of ANSI/IEEE C62.36-2016 and applies to surge protectors for application on multiconductor balanced or unbalanced information and communications technology (ICT) circuits and smart-grid data circuits. These surge protectors are designed to limit voltage surges, current surges, or both. The surge protectors covered are generally multiple-component series or parallel combinations of linear or nonlinear elements, packaged or organized for the purpose of limiting voltage, current, or both. This standard describes the methods of testing and criteria (where appropriate) for the characteristics and ratings of surge protectors used in ICT circuits and smart-grid data circuits.
- **BSR/NFPA 72-202x**, *National Fire Alarm and Signaling Code*. This is a revision of ANSI/NFPA 72-2025, which covers the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire and carbon monoxide detection and warning equipment, and emergency communications systems (ECS), and their components. For the purposes of carbon monoxide detection, this

standard is primarily concerned with life safety, not property protection.

- **BSR/UL 6260-202x**, *Standard for Safety for Remotely Operated Inspection and Maintenance Equipment for Hazardous (Classified) Locations*. The requirements in this new standard cover remotely operated inspection and maintenance equipment for areas classified in accordance with the National Electrical Code (NEC), ANSI/NFPA 70.

CALL FOR COMMENT ON PROPOSALS LISTED

The public comment period has passed for the following draft American National Standards, which are currently in review.

- **BSR NEMA WC 27500-202x**, *Standard for Aerospace and Industrial Electrical Cable*. This revision of ANSI NEMA WC 27500-2020 contains requirements for finished cables. Component wires are covered by other referenced standards. These cables are intended for signal and low-voltage power applications with defined environment or temperature conditions found in commercial aircraft, military aircraft, and high-performance vehicles.
- **BSR/AASHTO/AWS D1.5M/D1.5-202x**, *Bridge Welding Code*. This revision of ANSI/AASHTO/AWS D1.5M/D1.5-2020 covers the welding requirements for welded bridges made from carbon and low-alloy constructional steels and designed to AASHTO or AREMA requirements. This 2025 edition contains dimensions in SI (metric) and US customary units. Clauses 1-9 constitute a body of rules for the regulation of welding in steel construction.
- **BSR/ANS 2.29-2020 (R202x)**, *Probabilistic Seismic Hazard Analysis*. This reaffirmation of ANSI/ANS 2.29-2020 provides criteria and guidance for performing a probabilistic seismic hazard analysis (PSHA) that is used in the design and construction of nuclear facilities, i.e., facilities that store, process, test, or fabricate radioactive materials in such form and quantity that a nuclear risk to the workers, to the off-site public, or to the environment may exist. These include, but are not limited to, nuclear fuel manufacturing facilities; nuclear material waste processing, storage, fabrication, and reprocessing facilities; uranium enrichment facilities; tritium production and handling facilities;

radioactive materials laboratories; and nuclear reactors.

- **BSR/APA PRG 320-2025**, *Standard for Performance Rated Cross Laminated Timber*. This revision of ANSI/APA PRG 320-2019 provides requirements and test methods for qualification and quality assurance for performance-rated cross-laminated timber (CLT), which is manufactured from solid-sawn lumber or structural composite lumber (SCL) intended for use in construction applications.
- **BSR/ASME B30.14-202x**, *Side Boom and Rotating Pipelayers*. This revision of ANSI/ASME B30.14-2015 (R2021) includes provisions that apply to the construction, installation, operation, inspection, testing, and maintenance of side boom and rotating pipelayers powered by an internal combustion engine used for pipe laying or lifting operations, utilizing a lifting boom, drum, steel wire or synthetic rope, and/or hydraulic cylinders. The requirements included in this volume are for side boom and rotating pipelayers with a rated load of 1 ton or more when used for lifting purposes.
- **BSR/ASME BPVC Section II-202x, Part A – Ferrous Material Specifications; Part B – Nonferrous Material Specifications; Part D – Materials Properties**. This revision of ANSI/ASME BPVC Section II-2023 provides material specifications for base metallic materials and material design values, and limits and cautions on the use of materials.
- **BSR/ASME BPVC Section V-202x**, *Nondestructive Examination*. This revision of ANSI/ASME BPVC Section V-2023 contains requirements, methods, and techniques for nondestructive examination (NDE), which are Code requirements to the extent that they are specifically referenced and required by other Code Sections or referencing documents.
- **BSR/ASME BPVC Section VIII-202x**, *Rules for Construction of Pressure Vessels*. This is a revision of ANSI/ASME BPVC Section VIII-2023. This Section contains mandatory requirements, specific prohibitions, and nonmandatory guidance for pressure vessel materials, design, fabrication, examination, inspection, testing, certification, and pressure relief. The Code does not address all aspects of these activities, and those aspects which are not specifically addressed should not be considered prohibited.

- ▶ **BSR/ASME BPVC Section X-202x, Fiber-Reinforced Plastic Pressure Vessels.** This revision of ANSI/ASME BPVC Section X-2023 establishes the requirements for the fabrication of fiber-reinforced thermosetting plastic pressure vessels for general service, sets limitations on the permissible service conditions, and defines the types of vessels to which these rules are not applicable.
- ▶ **BSR/ASME BPVC Section XI-202x, Section XI Rules for Inservice Inspection of Nuclear Reactor Facility Components.** This is a revision of ANSI/ASME BPVC Section XI-2023. Section XI, Division 1 provides requirements for examination, testing, and inspection of components and systems, and repair/replacement activities in a nuclear power plant. Section XI, Division 2 is a technology-neutral standard that provides requirements for protecting pressure integrity of structures, systems, and components (SSCs) that affect reliability. Application of Divisions 1 and 2 begins when the requirements of the Construction Code have been satisfied. It is applicable regardless of the Construction Code classification used for an SSC, if the SSC is designated as important to the safety and reliability of an operating facility.
- ▶ **BSR/ASME BPVC Section XII-202x, Rules for Construction and Continued Service of Transport Tanks.** The rules of this revision of ANSI/ASME BPVC Section XII-2023 constitute requirements for construction and continued service of pressure vessels for the transportation of dangerous goods via highway, rail, air, or water. Construction is an all-inclusive term comprising materials, design, fabrication, examination, inspection, testing, certification, and over-pressure protection. Continued service is an all-inclusive term referring to inspection, testing, repair, alteration, and recertification of a transport tank that has been in service.
- ▶ **BSR/ASME QME-1-202x, Qualification of Active Mechanical Equipment Used in Nuclear Facilities.** This revision of ANSI/ASME QME-1-2023 provides the requirements and guidelines for the qualification of active mechanical equipment whose function is required to ensure the safe operation or safe shutdown of a nuclear facility. In addition, the active mechanical equipment shall comply with the requirements of the applicable design and construction codes and standards. This standard does not apply to electric components such as motors, electric valve actuators, instrumentation, and controls,

which are qualified by conformance with appropriate IEEE standards.

- ▶ **BSR/ASSP A10.11-202x, Safety Requirements for Personnel Nets.** This revision and redesignation of ANSI/ASSE A10.11-2016 establishes safety requirements for the selection, installation, and use of personnel nets during construction, repair, and demolition operations.
- ▶ **BSR/AWS C2.20/C2.20M (R202x), Specification for Thermal Spraying Zinc Anodes on Steel Reinforced Concrete.** This reaffirmation of ANSI/AWS C2.20/C2.20M-2016 is a specification for thermal spraying zinc anodes on steel-reinforced concrete. This standard is formatted as an industrial process instruction. The scope includes job description, safety, pass/fail job reference standards, feedstock materials, equipment, a step-by-step process instruction for surface preparation, thermal spraying, and quality control. There are five annexes, including job control record and portable adhesion testing.
- ▶ **BSR/AWS C7.4/C7.4M-202x, Process Specification and Operator Qualification for Laser Beam Welding.** This revision and redesignation of ANSI/AWS C7.4/C7.4M-2017, a specification on laser beam welding, discusses applicable specifications, safety, requirements, fabrication, quality examination, equipment calibration and maintenance, approval of work, and delivery of work.
- ▶ **BSR/E1.56-202x, Rigging Support Points.** This revision of ANSI E1.56-2018 applies to stationary rigging points, attached to permanent facility structure, that are intended to be permanent, and provides minimum requirements for the design, fabrication, installation, inspection, and documentation of these rigging points for their use to support rigging loads.
- ▶ **BSR/EIA 364-46D-202x, Microsecond Discontinuity Test Procedure for Electrical Connectors, Contacts, and Sockets.** This is a revision and redesignation of ANSI/EIA 364-46C-2012 (R2019). This procedure is to define a method of detecting a discontinuity of one microsecond or longer in a mated electrical connector, contact, or socket. This procedure shall not be used for durations less than one microsecond; see EIA-364-87, *Test Procedure for Nanosecond Event Detection*.
- ▶ **BSR/ICC 1150-202x, Standard for 3D Automated Construction Technology for 3D Concrete Walls.** As an ANSI-accredited SDO, ICC is developing a new standard to establish

minimum requirements for the evaluation of structural performance of 3D concrete walls and proprietary concrete wall-to-floor connections designed in accordance with applicable building codes, including material and durability properties of proprietary 3D concrete.

- ▶ **BSR/NFPA 91-202x, Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids.** This revision of ANSI/NFPA 91-2020 provides minimum requirements for the design, construction, installation, operation, testing, and maintenance of exhaust systems for air conveying of vapors, gases, mists, and particulate solids as they relate to fire and/or explosion prevention, except as modified or amplified by other applicable NFPA standards. This standard does not cover exhaust systems for conveying combustible particulate solids that are covered in other NFPA standards.
- ▶ **BSR/NFPA 715-202x, Standard for the Installation of Fuel Gases Detection and Warning Equipment.** This revision of ANSI/NFPA 715-2023 covers the selection, design, application, installation, location, performance, inspection, testing, and maintenance of fuel gas detection and warning equipment in buildings and structures. It contains requirements for the selection, installation, operation, and maintenance of equipment that detects concentrations of fuel gases that could pose a life or property safety risk.

ISO DRAFT INTERNATIONAL STANDARDS

The following are standards that the International Organization for Standardization (ISO) is considering for approval. The proposals have received substantial support within the technical committee that developed them and are now being circulated to ISO members for comment and vote. Readers interested in reviewing or commenting on these standards should order copies from ANSI.

- ▶ **ISO/DIS 3210, Anodizing of aluminum and its alloys – Assessment of quality of sealed anodic oxidation coatings by measurement of the loss of mass after immersion in acid solution(s)**
- ▶ **ISO/DIS 4508, Surface chemical analysis – Scanning probe microscopy – Guideline for the method and procedure for determining**

the temperature effects on AFM dimensional measurements

- ▶ **ISO/DIS 6892-2**, *Metallic materials – Tensile testing – Part 2: Method of test at elevated temperature*
- ▶ **ISO/DIS 8000-220**, *Data quality – Part 220: Sensor data: Quality measurement*
- ▶ **ISO/DIS 8203-4**, *Fiber-reinforced plastic composites – Non-destructive inspection – Part 4: Laser shearography*
- ▶ **ISO/DIS 10303-62**, *Industrial automation systems and integration – Product data representation and exchange – Part 62: Integrated generic resource: Equivalence validation of product data*
- ▶ **ISO/DIS 10406-1**, *Fiber-reinforced polymer (FRP) reinforcement of concrete – Test methods – Part 1: FRP bars*
- ▶ **ISO/DIS 10406-2**, *Fiber-reinforced polymer (FRP) reinforcement of concrete – Test methods – Part 2: FRP sheets*
- ▶ **ISO/DIS 10406-4**, *Fiber-reinforced polymer (FRP) reinforcement of concrete – Test methods – Part 4: FRP grids*
- ▶ **ISO/DIS 11300-2**, *Piping systems for rehabilitation of underground drains, sewers and water supply networks – Part 2: Thermoset composite materials*
- ▶ **ISO/DIS 11997-2**, *Paints and varnishes – Determination of resistance to cyclic corrosion conditions – Part 2: Wet (salt fog)/dry/humidity/UV light*
- ▶ **ISO/DIS 16079-1**, *Condition monitoring and diagnostics of wind turbines – Part 1: General guidelines*
- ▶ **ISO/DIS 16159**, *Space systems – Launch pad and integration site – Facility, system and equipment failure analysis*
- ▶ **ISO/DIS 17934**, *Condition monitoring and diagnostics of machines – Reciprocating compressors*
- ▶ **ISO/DIS 18436-2**, *Condition monitoring and diagnostics of machines – Requirements for training and certification of personnel – Part 2: Vibration condition monitoring and diagnostics*
- ▶ **ISO/DIS 18726**, *Assessment, prevention, and repair for steel corrosion in reinforced concrete structures*
- ▶ **ISO/DIS 18900**, *Steel structures – Structural bolting – Test method for determining the slip factor for faying surfaces of slip-resistant connections*
- ▶ **ISO/DIS 18319-1**, *Fiber-reinforced polymer (FRP) reinforcement for concrete structures – Part 1: Specifications of FRP sheets*
- ▶ **ISO/DIS 18953**, *Steel structures – Structural bolting – Test method to determine loss of pretension from faying surface coatings*
- ▶ **ISO/DIS 18954**, *Steel structures – Structural bolting – Test method to determine parameters of bolt tightening procedures*
- ▶ **ISO/DIS 18957**, *Plastics – Determination of the aerobic biodegradation of plastic materials exposed to seawater using accelerated conditions in laboratory*
- ▶ **ISO/DIS 19067**, *Building and civil engineering sealants – Determination of changes in color after laboratory accelerated weathering procedures*
- ▶ **ISO/DIS 19674**, *Fine ceramics (advanced ceramics, advanced technical ceramics) – Methods of test for ceramic coatings – Determination of internal stress in ceramic coatings by application of the Stoney formula*
- ▶ **ISO/DIS 19691**, *Measurement method of corrosion for weathering steel structures*
- ▶ **ISO/DIS 21809-5**, *Oil and gas industries including lower carbon energy – External coatings for buried or submerged pipelines used in pipeline transportation systems – Part 5: External concrete coatings*
- ▶ **ISO/DIS 24690**, *Glass reinforced thermosetting plastic (GRP) pipes – Test method for determination of long-term pressure endurance strength*
- ▶ **ISO/DIS 25018**, *Corrosion of metals and alloys – Determination of resistance to stress corrosion cracking of copper and copper-zinc alloys in ammonia vapor*
- ▶ **ISO/DIS 32543-3**, *Non-destructive testing – Characteristics of focal spots in industrial X-ray systems – Part 3: Measurement of the effective focal spot size of mini and micro focus X-ray tubes* 

We want to hear from you! News releases for Scanner should be submitted to the ASNT press release inbox at press@asnt.org.

SOCIETYNOTES

LOGO WEAR SALE FOR ASNT FOUNDATION

Get your ASNT logo wear and support the future of NDT at the same time! Order from our special selection of ASNT apparel and accessories from 12-20 April at source.asnt.org, and a percentage of your purchase will go to the ASNT Foundation and its efforts to advance the next generation of aspiring NDT professionals through accessibility to education and industry research. From casual hoodies and sharp polos to ball caps and travel mugs, we've got you covered!

VOLUNTEER SUMMIT COMING IN MAY

Volunteer Summit 2025, a talent development summit for ASNT volunteers, will occur from 30 May-1 June in St. Louis, Missouri. The event aims to engage, recognize, and inspire ASNT volunteers through tailored workshops and sessions specific to their roles. The event will bring together volunteers from various levels, promoting collaboration and community within the organization. It will also strengthen connections between volunteers and leadership, enhancing engagement and fostering a shared vision for the organization's future.

The Summit will be hosted at the Hyatt Regency St. Louis at the Arch, offering a prime downtown location with stunning views of the iconic Gateway Arch. With its close proximity to major attractions like the Mississippi Riverfront, Busch Stadium, and the Old Courthouse, guests can easily explore the best of St. Louis. To register, visit asnt.org/events.



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CERTIFICATION PREP COURSES

Houston

Basic: 14-18 April
Basic: 23-27 June

Virtual

ET: 2-4 April
Básico en Español: 7-11 Abril
Basic: 5-9 May
UT en Español: 20-22 Mayo
MT: 4-6 June
VT: 11-13 June



ELEARNING

Spotlight: Penetrant Testing I/II

This course covers Liquid Penetrant Testing, a popular NDT method used to detect cracks and cavities open to the surface of nonporous metallic materials.

Additional courses are available 24/7 to be completed from the comfort of your home or office!



INSTRUCTOR COURSES

Neutron Radiography: 1-3 April
UT II/Elios 3 Drone: 2-6 June
MT Level II: 17-19 June



WEBINARS

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2025

NASCC: The Steel Conference

2-4 April, Louisville, KY
nascc.aisc.org

RAPID + TCT 2025

8-10 April, Detroit, MI
rapid3devent.com

1st Robo CT User Forum

11-12 April, Prague, Czech Republic
robotic-ct.com

The Assembly Show South

16-17 April, Nashville, TN
assemblymag.com

AIMCSAfrica 2025

28-30 April, Dubai
aimcsafrica.com

NDT Expo 2025

2-3 May, New Delhi, India
ndtexpo.nansoindia.org

20th Pipeline Technology Conference

5-8 May, Berlin, Germany
pipeline-conference.com

37th Control - Trade Fair for Quality Assurance

6-9 May, Stuttgart, Germany
control-messe.de

Automate Show

12-15 May, Detroit, MI
automate.org

Oil & Gas Digital Twin Conference and Exhibition 2025

14-15 May, Houston, TX
digital-twin-conference.com

SAMPE 2025

19-22 May, Indianapolis, IN
sampeamerica.org

Advanced Imaging for NDT

20-22 May, Virginia Beach, VA
asnt.org/events

MFPT Annual Conference 2025

20-22 May, Virginia Beach, VA
asnt.org/events

DGZfP Annual Conference 2025

26-28 May, Berlin, Germany
jahrestagung2025.dgzfp.de

ASNT Volunteer Summit 2025

30 May-1 June, St. Louis, MO
asnt.org/events

Pan-American Conference for Nondestructive Testing 2025

9-12 June, Niagara Falls, ON, Canada
panndt.org

NDT Days 2025

9-13 June, Sozopol, Bulgaria
bg-s-ndt.org/NDT_Days/2025/2025.html

International Conference on Digital Frontiers in Buildings and Infrastructure

11-13 June, Delft, Netherlands
dfbi.net

33rd ASNT Research Symposium

23-27 June, Indianapolis, IN
asnt.org/events

Dimensional X-Ray Computed Tomography (dXCT) Conference

24-26 June, Coventry, UK
dxct.co.uk

NDE in Nuclear Conference 2025

24-26 June, Los Angeles, CA
epri.com

10th International Symposium on Digital Industrial Radiology and Computed Tomography

1-3 July, Paris, France
dir2025.com

22nd International Symposium on Applied Electromagnetics and Mechanics

1-4 July, East Lansing, MI
portal.rsgis.msu.edu/isem

28th International Workshop on Electromagnetic NDE

6-9 July, Knoxville, TN
portal.rsgis.msu.edu/ende

21st International Conference on Experimental Mechanics

6-11 July, Bologna, Italy
icem-21.org

QIRT Asia 2025 - 5th Quantitative InfraRed Thermography Conference

14-18 July, Harbin, China
qirtasia2025.com

2025 Pressure Vessels & Piping Conference

20-25 July, Montreal, Quebec, Canada
event.asme.org

ICPIIT 2025

22-24 July, Sugar Land, TX
asnt.org/events

52nd Annual Review of Progress in Quantitative Nondestructive Evaluation

23-25 July, Montreal, Quebec, Canada
event.asme.org

63rd Defense Working Group on NDT

11-15 August, Fort Worth, TX
dwgndt.org

ICENDE 2025

20-22 August, Kochi, Kerala, India
icende.in

NDTX 2025

26-28 August, Cairo, Egypt
ndtcorner.com

Exhibition of Experimental Mechanics

2-3 September, London, UK
bssm.org

19th International Conference on Advances in Experimental Mechanics

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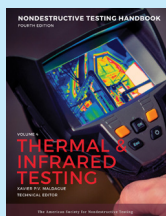
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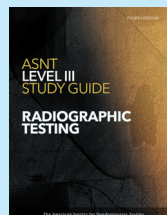
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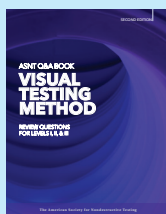
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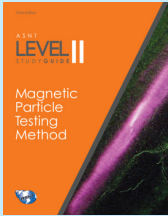
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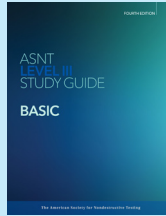
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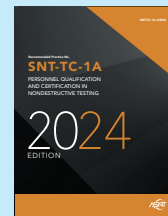
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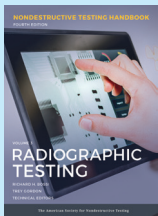
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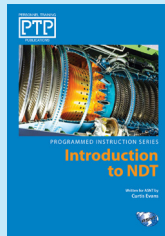
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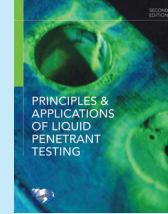
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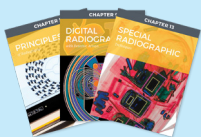
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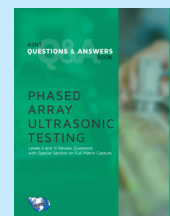
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BEYOND ROBOTICS, MATERIALS, AND SENSING: UNVEILING BIOINSPIRATION IN NONDESTRUCTIVE EVALUATION FROM "NATURE'S NDE SPECIALISTS"

BY EHSAN DEGHAN-NIRI

While bioinspiration research has led to advancements in fields such as robotics, materials, sensing, and neural computation over the past few decades, its application to more mission-oriented tasks, like nondestructive testing/evaluation (NDT/E), remains largely unexplored. Bioinspiration in NDT/E offers innovative approaches to advance current technologies by drawing inspiration from natural systems that perform similar tasks or processes. This paper explores three unique biological systems—aye-ayes, termites, and red/arctic foxes—referred to as “nature’s NDE specialists.” These organisms have evolved specialized food foraging processes to detect, characterize, assess materials, and detect targets in their environments without disruption, mirroring the goals of NDT/E methods such as tap testing and leakage detection. By studying these specialized processes, we can pioneer new NDT/E technologies or advance the current ones, by means of enhancing reliability, sensitivity, adaptability, and accessibility in challenging environments. Additionally, integrating bioinspiration into NDT/E education can attract a new generation of students, creating opportunities to address the workforce challenges in the NDT/E field.

1. Introduction

Biological systems have evolved over millions of years, exhibiting remarkable adaptations that enhance survival in diverse and sometimes harsh environments. Throughout this evolutionary journey, these systems have developed specialized capabilities that allow them to thrive in various conditions, positioning them as a rich source of inspiration to pioneer sophisticated tools, algorithms, and machines [1]. Bioinspiration involves understanding the principles underlying the behavior, structure, and sensory aspects of biological systems, and applying these principles to the development of engineering systems designed to serve specific purposes, mirroring the

functions of the biological systems. The key steps in transforming bioinspiration into practical NDT/E technologies or tools are outlined in Figure 1. These steps can be utilized for the development of robots, as well as advancements in materials, control systems, data processing algorithms, and sensing technologies.

Among various mechanisms, three aspects are particularly influential in the development of new technologies:

- sensing, sensory intelligence, and neural computation,
- materials and structures, and
- mobility, control, and autonomy.

The first key aspect is the evolution of advanced multifunctional sensing systems and neural computation that enable organisms to communicate, forage for food, and evade predators. Additionally, the development of unique structural and morphological features, along with the materials that constitute their bodies, contributes to their exceptional adaptability. Finally, the actuation and mobility mechanisms that allow them to perform essential tasks further highlight their success in the survival journey. These remarkable traits make biological systems a powerful source of inspiration for innovating and engineering new technologies.

1.1. Sensing, Sensory Intelligence, and Neural Computation

Since life first emerged on land hundreds of millions of years ago, reliable information has been essential for organisms across all biological systems to make reliable decisions critical for their

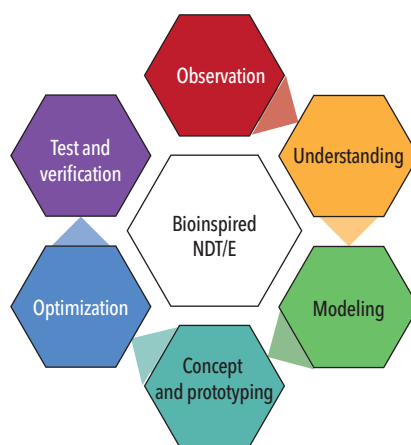


Figure 1. Key steps in transforming bioinspiration into nondestructive testing/evaluation tools and technologies.