Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems

Downstream Segment

API 570
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It is the intent of API to keep this publication up to date. All piping system owners and operators are invited to report their experiences in the inspection and repair of piping systems whenever such experiences may suggest a need for revising or expanding the practices set forth in API 570.

This edition of API 570 supersedes all previous editions of API 570, *Piping Inspection Code: Inspection, Repair, Alteration, and Rating of In-service Piping Systems*. Each edition, revision, or addenda to this API Code may be used beginning with the date of issuance shown on the cover page for that edition, revision, or addenda. Each edition, revision, or addenda, to this API standard becomes effective six months after the date of issuance for equipment that is rerated, reconstructed, relocated, repaired, modified (altered), inspected, and tested per this standard. During the six-month time between the date of issuance of the edition, revision, or addenda and the effective date, the user shall specify to which edition, revision, or addenda, the equipment is to be, rerated, reconstructed, relocated, repaired, modified (altered), inspected and tested.

Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

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1 Scope

1.1 General Application

1.1.1 Coverage

API 570 covers inspection, rating, repair, and alteration procedures for metallic and fiberglass reinforced plastic (FRP) piping systems and their associated pressure relieving devices that have been placed inservice.

1.1.2 Intent

The intent of this code is to specify the in-service inspection and condition-monitoring program that is needed to determine the integrity of piping. That program should provide reasonably accurate and timely assessments to determine if any changes in the condition of piping could possibly compromise continued safe operation. It is also the intent of this code that owner-users shall respond to any inspection results that require corrective actions to assure the continued safe operation of piping.

API 570 was developed for the petroleum refining and chemical process industries but may be used, where practical, for any piping system. It is intended for use by organizations that maintain or have access to an authorized inspection agency, a repair organization, and technically qualified piping engineers, inspectors, and examiners, all as defined in Section 3.

1.1.3 Limitations

API 570 shall not be used as a substitute for the original construction requirements governing a piping system before it is placed inservice; nor shall it be used in conflict with any prevailing regulatory requirements. If the requirements of this code are more stringent than the regulatory requirements, then the requirements of this code shall govern.

1.2 Specific Applications

The term non metallics has a broad definition but in this code refers to the fiber reinforced plastic groups encompassed by the generic acronyms FRP (fiberglass-reinforced plastic) and GRP (glass-reinforced plastic). The extruded, generally homogenous nonmetallics, such as high and low-density polyethylene are excluded. Refer to API 574 for guidance on degradation and inspection issues associated with FRP piping.

1.2.1 Included Fluid Services

Except as provided in 1.2.2, API 570 applies to piping systems for process fluids, hydrocarbons, and similar flammable or toxic fluid services, such as the following:

a) raw, intermediate, and finished petroleum products;

b) raw, intermediate, and finished chemical products;

c) catalyst lines;

d) hydrogen, natural gas, fuel gas, and flare systems;

e) sour water and hazardous waste streams above threshold limits, as defined by jurisdictional regulations;

f) hazardous chemicals above threshold limits, as defined by jurisdictional regulations;

g) cryogenic fluids such as: LN_2, LH_2, LOX, and liquid air;

h) high-pressure gases greater than 150 psig such as: GHe, GH_2, GOX, GN_2, and HPA.

1.2.2 Optional Piping Systems and Fluid Services

The fluid services and classes of piping systems listed below are optional with regard to the requirements of API 570.

a) Fluid services that are optional include the following:

   1) hazardous fluid services below threshold limits, as defined by jurisdictional regulations;

   2) water (including fire protection systems), steam, steam-condensate, boiler feed water, and Category D fluid services, as defined in ASME B31.3.

b) Other classes of piping systems that are optional are those that are exempted from the applicable process piping construction code.

1.3 Fitness-For-Service and Risk-Based Inspection (RBI)

This inspection code recognizes Fitness-For-Service concepts for evaluating in-service damage of pressure-containing components. API 579 provides detailed assessment procedures for specific types of damage that are referenced in this code. This inspection code recognizes RBI concepts for determining inspection intervals. API 580 provides guidelines for conducting a risk-based assessment.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Publication 510, *Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration*

API Recommended Practice 571, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*

API Recommended Practice 574, *Inspection Practices for Piping System Components*

API Recommended Practice 576, *Inspection of Pressure-relieving Devices*

API Recommended Practice 577, *Welding Inspection and Metallurgy*

API Recommended Practice 578, *Material Verification Program for New and Existing Piping Systems*

API Standard 579-1/ASME FFS-1, *Fitness-for-service*

API Recommended Practice 580, *Risk-based Inspection*

API Recommended Practice 581, *Risk-based Inspection Technology*

API Standard 598, *Valve Inspection and Testing*

API Recommended Practice 651, *Cathodic Protection of Aboveground Petroleum Storage Tanks*

API Recommended Practice 750, *Management of Process Hazards*

API Publication 2201, *Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries*

ASME B16.34 [1], *Valves—Flanged, Threaded, and Welding End*

ASME B31.3, *Process Piping*

ASME B31G, *Manual for Determining the Remaining Strength of Corroded Pipelines*

ASME B31, *Code Case* 179/181

ASME *Boiler and Pressure Vessel Code* (*BPVC*), Section V, *Nondestructive Examination*

ASME *BPVC*, Section VIII, Divisions 1 and 2

ASME *BPVC*, Section IX, *Welding and Brazing Qualifications*

ASME PCC-1, *Guidelines for Pressure Boundary Bolted Flange Joint Assembly*

ASME PCC-2, *Repair of Pressure Equipment and Piping*

ASNT SNT-TC-1 [2], *A Personnel Qualification and Certification in Nondestructive Testing*

ASNT CP-189, *Standard for Qualification and Certification of Nondestructive Testing Personne*l

ASTM G57 [3], *Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method*

MTI 129 [4], *A Practical Guide to Field Inspection of FRP Equipment and Piping*

NACE RP 0169 [5], *Control of External Corrosion on Underground or Submerged Metallic Piping Systems*

NACE RP 0170, *Protection of Austenitic Stainless Steels and Other Austenitic Alloys from Polythionic Acid Stress Corrosion Cracking During Shutdown of Refinery Equipment*

NACE RP 0274, *High-voltage Electrical Inspection of Pipeline Coatings Prior to Installation*

NACE RP 0275, *Application of Organic Coatings to the External Surface of Steel Pipe for Underground Service*

NACE Pub 34101, *Refinery Injection and Process Mixing Points*

NFPA 704 [6], *Standard System for the Identification of the Hazards of Materials for Emergency Response*

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1 ASME International, 3 Park Avenue, New York, New York 10016-5990, www.asme.org.
2 American Society for Nondestructive Testing, 1711 Arlingate Lane, P.O. Box 28518, Columbus, Ohio 43228, www.asnt.org.
3 ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428, www.astm.org.
4 Materials Technology Institute, 1215 Fern Ridge Parkway, Suite 206, St. Louis, Missouri 63141-4405, www.mti-link.org.
5 NACE International (formerly the National Association of Corrosion Engineers), 1440 South Creek Drive, Houston, Texas 77218-8340, www.nace.org.
6 National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169-7471, www.nfpa.org.