Inspection Practices for Piping System Components

Downstream Segment

API RECOMMENDED PRACTICE 574
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Foreword

This recommended practice (RP) is based on the accumulated knowledge and experience of engineers, inspectors, and other personnel in the petroleum and petrochemical industry. It is intended to supplement API 570, *Piping Inspection Code: Inspection, Repair, Alteration, and Rerating of In-service Piping Systems*.

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1 Scope

This recommended practice (RP) supplements API 570 by providing piping inspectors with information that can improve skill and increase basic knowledge and practices. This RP describes inspection practices for piping, tubing, valves (other than control valves), and fittings used in petroleum refineries and chemical plants. Common piping components, valve types, pipe joining methods, inspection planning processes, inspection intervals and techniques, and types of records are described to aid the inspector in fulfilling their role implementing API 570. This publication does not cover inspection of specialty items, including instrumentation and control valves.

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 570, *Piping Inspection Code: Inspection, Repair, Alteration, and Rerating of In-service Piping Systems*

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

API Recommended Practice 577, *Welding Inspection and Metallurgy*

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

API 579-1/ASME FFS-1 [1], *Fitness-For-Service*

API Recommended Practice 580, *Risk-Based Inspection*

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

API Specification 5L, *Specification for Line Pipe*

API Standard 594, *Check Valves: Flanged, Lug, Wafer and Butt-welding*

API Standard 598, *Valve Inspection and Testing*

API Standard 599, *Metal Plug Valves—Flanged, Threaded and Welding Ends*

API Standard 600, *Steel Gate Valves—Flanged and Butt-welding Ends, Bolted Bonnets*

API Standard 602, *Steel Gate, Globe and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries*

API Standard 603, *Corrosion-resistant, Bolted Bonnet Gate Valves—Flanged and Butt-welding Ends*

API Standard 608, *Metal Ball Valves—Flanged, Threaded and Welding Ends*

API Standard 609, *Butterfly Valves: Double Flanged, Lug- and Wafer-Type*

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

API Recommended Practice 751, *Safe Operation of Hydrofluoric Acid Alkylation Units*

API Recommended Practice 932-B, *Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems*

API Recommended Practice 936, *Refractory Installation Quality Control Guidelines—Inspection and Testing Monolithic Refractory Linings and Materials*

API Recommended Practice 941, *Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants*

[1] ASME International, 3 Park Avenue, New York, New York 10016, www.asme.org.

API Recommended Practice 945, *Avoiding Environmental Cracking in Amine Units*

API Publication 2217A, *Guidelines for Work in Inert Confined Spaces in the Petroleum and Petrochemical Industry*

ASME B1.20.1 [2], *Pipe Threads, General Purpose (Inch)*

ASME B16.20, *Metallic Gaskets for Pipe Flanges—Ring-Joint, Spiral-Wound, and Jacketed*

ASME B16.25, *Buttwelding Ends*

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

ASME B16.47, *Large Diameter Steel Flanges*

ASME B16.5, *Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard*

ASME B31.3, *Process Piping*

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

ASME B36.10M, *Welded and Seamless Wrought Steel Pipe*

ASME B36.19M, *Stainless Steel Pipe*

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

ASME *Boiler and Pressure Vessel Code (BPVC*), *Section V: Nondestructive Examination; Article 11: Acoustic Emission Examination of Fiber Reinforced Plastic Vessels*

ASME RTP-1, *Reinforced Thermoset Plastic Corrosion Resistant Equipment*

ASTM A53 [3], *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless*

ASTM A106, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service*

ASTM A530, *Standard Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe*

ASTM B88, *Standard Specification for Seamless Copper Water Tube*

ASTM D2583, *Standard Test Method for Indentation Hardness of Rigid Plastics By Means of a Barcol Impressor*

ASTM E1118, *Standard Practice for Acoustic Emission Examination of Reinforced Thermosetting Resin Pipe (RTRP)*

ASTM G57, *Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method*

MTI Project 129-99 [4], *Self-help Guide for In-service Inspection of FRP Equipment and Piping*

MTI Project 160-04, *Guide for Design, Manufacture, Installation & Operation of FRP Flanges and Gaskets*

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

NACE RP 0274, *Standard Recommended Practice High-Voltage Electrical Inspection of Pipeline Coatings*

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

OLF [6], *Recommended Guidelines for NDT of GRP Pipe Systems and Tanks*

Title 29 Code of Federal Regulatiosn (*CFR*) Part 1910.119 [7], *Process Safety Management of Highly Hazardous Chemicals*

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[2] ASME International, 3 Park Avenue, New York, New York 10016-5990, www.asme.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] Norwegian Oil Industry Association, P.O. Box 8065, 4068 Stavanger, Norway, www.olf.no.
[7] The *Code of Federal Regulations* is available from the U.S. Government Printing Office, Washington, DC 20402.