PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

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Table of Contents

1. Introduction .................................... 2
   1.1 Purpose ................................................. 2
   1.2 Scope .................................................... 2

2. References ...................................... 2
   Industry Codes and Standards...................... 2

3. Definitions........................................... 3

4. Requirements ................................. 3

4.1 General .................................................. 3
4.2 Materials of Construction ......................... 4
4.3 Inspection and Testing ................................ 4
4.4 Shipping and Handling ................................ 4
4.5 Low Temperature or Cryogenic Service ............ 5
4.6 Oxygen Service ........................................ 5
4.7 Engineering Data Requirements ................. 5
4.8 Identification ......................................... 6
1. Introduction

1.1 Purpose
This Practice provides purchasing requirements for pipe.

1.2 Scope
This Practice describes the minimum requirements for the procurement of metallic pipe.

2. References
Applicable parts of the following industry codes and standards shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles will be used herein where appropriate.

Industry Codes and Standards

- American Petroleum Institute (API)
  - API RP 578 - Material Verification Program for New and Existing Alloy Piping Systems
- American Society of Mechanical Engineers (ASME)
  - ASME Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications
  - ASME B1.20.1 - Pipe Threads, General Purpose (Inch)
  - ASME B16.11 - Forged Fittings, Socket Welding and Threaded
  - ASME B16.25 - Butt welding Ends
  - ASME B31.3 - Process Piping
  - ASME B36.10M - Welded and Seamless Wrought Steel Pipe
  - ASME B36.19M - Stainless Steel Pipe
- American Society for Testing and Materials (ASTM)
  - ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- Compressed Gas Association (CGA)
  - CGA G-4.1 - Cleaning Equipment for Oxygen Service
  - CGA G-4.4 - Industrial Practices for Gaseous Oxygen Transition and Distribution Piping Systems
- Manufacturers Standardization Society (MSS)
  - MSS SP-25 - Standard Marking System for Valves, Fittings, Flanges and Unions
  - MSS SP-138 - Quality Standard Practice for Oxygen Cleaning of Valves & Fittings
- Pipe Fabrication Institute (PFI)
  - Standard ES-22 - Recommended Practice for Color Coding of Piping Materials
• Process Industry Practices (PIP)
  – VESPMI01 - Positive Material Identification Specification

3. Definitions

*manufacturer*: The party responsible for making the metallic pipe

*owner*: The party who owns the facility wherein the metallic pipe will be used

*supplier*: The party responsible for providing the metallic pipe

*positive material identification*: The verification process of alloy material to confirm chemical makeup of purchased material using one or more approved test methods

*purchaser*: The party who awards the contract to the supplier. The purchaser may be the owner or the owner’s authorized agent.

4. Requirements

4.1 General

4.1.1 Piping dimensions shall be in accordance with *ASME B36.10M* for wrought steel and wrought iron pipe and with *ASME B36.19M* for stainless steel pipe except where otherwise noted.

4.1.2 If galvanizing is specified, pipe shall be coated with zinc inside and outside by hot-dip process in accordance with *ASTM A153*.

4.1.3 Unless specified otherwise, NPS 2 through NPS 24 pipe shall be furnished in double random lengths, except galvanized pipe.

4.1.4 Galvanized pipe shall be furnished in 20-foot lengths maximum.

4.1.5 Circumferential weld joints (jointers) are not permitted without authorization.

4.1.6 Except where threaded pipe is specified, NPS 1-1/2 and smaller pipe shall be furnished with plain ends, cut square.

4.1.7 Except where threaded pipe is specified, pipe NPS 2 and larger shall be furnished with beveled ends in accordance with *ASME B16.25*.

4.1.8 Threaded pipe shall be furnished with taper-threaded ends in accordance with *ASME B1.20.1*.

4.1.9 If threaded and coupled pipe is specified, pipe shall be furnished with forged couplings in accordance with *ASME B16.11* with taper pipe threads in accordance with *ASME B1.20.1*.

4.1.9.1 Merchant or API couplings are not acceptable.

4.1.9.2 Couplings for galvanized pipe shall also be galvanized in accordance with *ASTM A153*.

4.1.10 Pipe not in accordance with the purchase order and this Practice shall be subject to rejection.
4.1.11 All conflicts between the requirements of the purchase order and this Practice shall be referred to the purchaser, in writing, for clarification and resolution before proceeding with the manufacture and/or procurement of the affected pipe.

4.1.12 The pipe purchase order description and this Practice shall be used in the purchase and specification of pipe. Any substitutions to, or variances from, this Practice require written approval from the purchaser before implementation.

4.1.13 Substitution of thicknesses greater than those specified in the item description shall not be acceptable unless approved by the purchaser.

4.1.14 An established, routine, and documented quality control program shall be implemented. If requested, the quality control program shall be provided to the purchaser for approval.

4.2 Materials of Construction

4.2.1 Materials shall be in accordance with the item description.

4.2.2 All materials shall be new and unused.

4.3 Inspection and Testing

4.3.1 All facilities, materials, and fabrication work shall be subject to inspection by the purchaser.

4.3.2 Pipe containing defects originating with the manufacturer/supplier design, materials, or workmanship, or which are not in complete compliance with the requirements of the purchase order and referenced documents shall be subject to rejection.

4.3.3 Inspection and acceptance of the pipe by the purchaser does not relieve the responsibility to comply with the requirements of this Practice and the purchase order.

4.3.4 All testing and examination required by the referenced standards and the purchase order shall be performed.

4.3.5 Impact testing, if required, shall be performed in accordance with ASME B31.3, Paragraph 323.3.

4.3.6 Positive Material Identification (PMI) of alloy material shall be performed by the supplier in accordance with PIP VESPMI01 and API RP 578 if specified in the purchase order.

4.4 Shipping and Handling

4.4.1 Pipe shall be prepared for shipment in a manner that damage or atmospheric corrosion of internal or external surfaces is avoided during storage and transport.

4.4.2 Pipe ends shall be protected with wood, plastic, or metal covers. These covers shall protect the ends and prevent dirt and other foreign matter from entering the interior.

4.4.3 If buttwelding bevels are protected with metal covers, a layer of nonmetallic material shall also be provided between the butt-welding bevel and the metal cover.
4.4.4 Tape shall not be permitted as the sole covering method.

4.4.5 Unless otherwise specified by purchaser, machined or threaded surfaces of ferritic pipe shall be coated with an easily removable rust preventative compound.

4.4.6 Pipe cleaned for special service shall not have rust preventative compound applied.

4.4.7 If specified by the purchaser, vapor-proof barrier material for austenitic stainless steel pipe shall be provided.

4.5 **Low Temperature or Cryogenic Service**

All pipe specified for use in either low temperature or cryogenic service shall be furnished in accordance with *ASME B31.3*, Paragraph 323.2.2 and Table 323.2.2.

4.6 **Oxygen Service**

4.6.1 Fittings used for oxygen service shall be in accordance with the applicable requirement in *CGA G-4.4*, Section 5.

4.6.2 Fittings shall be cleaned per appropriate method outlined in *MSS SP-138* and *CGA 4.1*. The method of cleaning is subject to the approval of the purchaser.

4.6.3 Packaging or protection post cleaning shall be per appropriate method outlined in *MSS SP-138*, Section 6, and *CGA 4.1*, Section 12.

4.6.4 The proposed method of sealed packaging shall be submitted to the purchaser for approval.

4.6.5 Labeling, or marking of packaging, shall be per *MSS SP-138*, Section 7.

4.7 **Engineering Data Requirements**

4.7.1 **General**

4.7.1.1 All records indicated herein shall be fully identified with the specific materials they represent.

4.7.1.2 All records shall be available for examination by the purchaser at the time and place of inspection, whether at the manufacturer’s or supplier’s location.

4.7.1.3 If engineering data beyond those listed in this Practice are required, a statement of those requirements shall be included, by the request of the purchaser, in the request for quotation and/or the purchase order.

4.7.1.4 All required engineering data shall be provided in English.

4.7.2 **Welding Procedures**

4.7.2.1 Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR), if applicable, shall be in accordance with *ASME Boiler and Pressure Vessel Code*, Section IX.

4.7.2.2 Individual WPSs and PQRs shall be provided for examination by purchaser upon request.
4.7.2.3 If specified on the purchase order, WPSs and PQRs shall be submitted to the purchaser for approval before the start of manufacturing.

4.7.3 Material Test Reports

4.7.3.1 If requested by purchaser, Material Test Reports (MTRs) shall be furnished that show actual results of chemical analyses, mechanical tests, impact test results (if applicable), and heat treatment (if applicable) in accordance with the referenced material specification.

4.7.3.2 The test reports shall be traceable to each production lot.

4.7.3.3 These documents shall be identified with purchaser’s purchase order number and shall be signed by the manufacturer’s authorized agent.

4.8 Identification

4.8.1 Pipe shall be marked in strict accordance with the specification referenced for manufacture.

4.8.2 If no marking is specified, the pipe shall be marked in accordance with MSS SP-25.

4.8.3 Alloy pipe shall be marked in strict accordance with PIP VESPMI01 or color coded if specified per PFI Standard ES-22 if specified in the purchase order.

4.8.4 All package markings shall be provided in English.