



Materials System Specification

04-SAMSS-049

11 October 2010

Inspection and Testing Requirements
for API SPEC 6A, 10000 PSI Valves

Document Responsibility: Valves Standards Committee

Saudi Aramco DeskTop Standards

Table of Contents

I	Scope.....	2
II	Conflicts and Deviations.....	2
III	References.....	2
IV	Definitions.....	3
V	Qualification of Equipment/Manufacturers.....	4
VI	Modifications to API SPEC 6A.....	4

Previous Issue: 25 October 2009 Next Planned Update: 11 October 2015

Revised paragraphs are indicated in the right margin

Primary contact: Shiha, Saad Mohammed on 966-3-8760163

Page 1 of 6

I Scope

This specification establishes the minimum quality control and testing requirements for API SPEC 6A, 10000 PSI Valves and Chokes, 1-13/16 inch and larger, which may be used in downstream of the wellhead and tree assembly.

II Conflicts and Deviations

- A. Any conflicts between this specification and other applicable Saudi Aramco Materials System Specifications (SAMSSs), Engineering Standards (SAESs), Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Consulting Services Department of Saudi Aramco, Dhahran.
- B. Direct all requests to deviate from this specification in writing to the Company or Buyer Representative, who shall follow internal company procedure [SAEP-302](#) and forward such requests to the Manager, Consulting Services Department of Saudi Aramco, Dhahran.

III References

The selection of material and equipment, and the design, construction, maintenance, and repair of equipment and facilities covered by this specification shall comply with the latest edition of the references listed below, unless otherwise noted.

A. Saudi Aramco References

Saudi Aramco Engineering Procedure

[SAEP-302](#)

*Instructions for Obtaining a Waiver of a
Mandatory Saudi Aramco Engineering
Requirement*

Saudi Aramco Inspection Requirements

Form [175-045600](#)

*Inspection and Testing Requirement for
API SPEC 6A, 10000 PSI Valves*

B. Industry Codes and Standards

American Petroleum Institute

API SPEC 6A

*Specification for Wellhead and Christmas Tree
Equipment*

Commentary Note:

This Specification also includes by reference, either in total or in part, other standards listed in Table ID1 of API SPEC 6A.

American Society for Testing and Materials

<i>ASTM A388</i>	<i>Standard Practice for Ultrasonic Examination of Heavy Steel Forgings</i>
<i>ASTM A609</i>	<i>Standard Practice for Castings, Carbon, Low-Alloy, and Martensitic Stainless Steel</i>
<i>ASTM E140</i>	<i>Standard Hardness Conversion Tables for Metals</i>
<i>ASTM E428</i>	<i>Standard Practice for Fabrication and Control of Steel Reference Blocks Used in Ultrasonic Inspection</i>

National Association of Corrosion Engineers/International Standardization Organization

[*NACE MR0175/ISO 15156*](#) *Petroleum and Natural Gas Industries – Materials for Use in H₂S Containing Environments in Oil and Gas Production*

IV Definitions

Buyer or Purchaser: is the Company (Saudi Aramco, ASC or AOC) actually placing the order for the material.

Vendor: is the other party to the order for the material who may or may not be the manufacturer of the equipment.

Saudi Aramco's Engineer: is the Saudi Aramco Engineering Organization with the authority to waive Standards, or its delegate who shall act through the Buyer.

Buyer's Representative: is the person acting on behalf of the Buyer, who may be from the Engineering, Inspection, Purchasing or User organization.

Non-Compliance Item: is one in which one or more characteristic does not comply with procurement requirements. Examples include physical defects, test failures, incorrect or inadequate documentation, deviation from prescribed or approved process, inspection or test procedures.

V Qualification of Equipment/Manufacturers

- A. The Vendor's plant shall be API-approved for the Product Specification Level specified in the P.O.
- B. The Vendor shall impose all the requirements of this Specification on his sub-Vendors. Buyer's Representative reserves the right of approval of sub-Vendors.

VI Modifications to API SPEC 6A

The following paragraph numbers refer to API SPEC 6A, "Specification for Wellhead and Christmas Tree Equipment," which is part of this specification. The text in each paragraph below is an addition, exception, modification, or deletion to API SPEC 6A as noted. Paragraph numbers not appearing in API SPEC 6A are new paragraphs to be inserted in numerical order.

Section 6

- 6.1 (Addition) All welding procedure specifications (WPS) and procedure qualification records (PQR) shall be submitted to Saudi Aramco's Engineer for review and approval prior to the start of production. The PQR shall include all required hardness test results.
 - 6.3.4.2.3 (Modification) Hardness testing locations and frequency shall be by the Vickers 10 kg Method only.
 - 6.4.2 (Addition) Only minor weld repairs are permitted, subject to approval by Saudi Aramco's Engineer. The procedure outlined in 7.5 (Addition) shall be followed.

(Addition) Hardness tests across the repair weld, base metal and heat affected zone shall be performed and recorded as part of the PQR. Hardness testing locations and frequency shall be by the Vickers 10 kg Method only, as described in 6.3.3.1.3.b. The maximum allowable Vickers hardness shall be equivalent (as converted using ASTM E140) to the Rockwell C hardness value specified in [NACE MR0175/ISO 15156](#).
 - 6.5.2 (Addition) Hardfacing and overlay procedure qualification tests shall be made, including hardness testing. Hardness testing locations and frequency shall be by the Vickers Method (1 to 10 kg), generally as described in 6.3.3.1.3.b. The maximum allowable Vickers hardness shall be equivalent (as converted using ASTM E140) to the Rockwell C hardness value specified in [NACE MR0175/ISO 15156](#). Unless waived by Buyer's Inspection Representative, these tests shall also be conducted on
-

one sample piece (per order) which is representative in size and geometry of actual hardfaced or overlaid production components.

Section 7

- 7.1 (Addition) The items manufactured to this specification are subject to verification by the Buyer's Inspection Representative per Saudi Aramco Inspection Requirements Form [175-045600](#) attached to the Purchase Order.
- (Addition) A Pre-Inspection meeting is required between the primary manufacturer and Buyer's Inspection Representative. The meeting's objective will be to discuss the assigned specification, identify, clarify and document any technical areas of question or difficulty. The meeting must be held before any action against the order is taken by the manufacturer. It is initiated by the primary manufacturer as soon as possible after receipt date of the order. As a minimum, the meeting shall include the manufacturer's representatives of Production, Engineering and Quality Assurance Departments and the Buyer's Inspection Representative.
- 7.4 (Addition) Except as specified, all equipment shall be supplied to the quality control requirements of PSL-3 as a minimum.
- (Addition) Vendor shall report all non-compliance items along with the proposed disposition in writing to the Buyer's Inspection Representative. Execution of disposition requires the written approval of Saudi Aramco's Engineer and Buyer's Inspection Representative.
- 7.4.2.3.8 (Addition) For non-ferromagnetic materials, all liquid penetrant inspections shall be performed using fluorescent penetrant.
- 7.4.2.3.10 (Addition) For non-ferromagnetic materials, all liquid penetrant inspections shall be performed using fluorescent penetrant.
- 7.4.2.3.15 (Addition) Volumetric testing of castings shall be done by radiography; forgings shall be ultrasonically tested. In the event the prescribed test method is impractical, the Buyer's Inspection Representative shall approve an alternate method of testing during the Pre-Inspection meeting.
- (Modification)** Hot Worked Parts. Ultrasonic examination of hot worked parts shall be performed in accordance with both the flat bottom hole procedures (straight beam examination) and applicable angle beam examinations specified in ASTM A388 (except immersion method may be used) and ASTM E428.
-

(Addition) Castings. When ultrasonic examination has been approved, angle beam examination in accordance with ASTM A609 shall be applied when any area of the casting cannot be effectively examined using a longitudinal beam due to casting design or possible discontinuity orientation.

(Addition) Acceptance Criteria-Castings. Castings examined in accordance with ASTM A609 Procedure A shall meet Quality Level 1 (Table 2 "Rejection Level") requirements, with the exception of flanges, which shall meet Level 2 (Table 2) requirements. When angle beam examination is conducted, castings shall meet the acceptance criteria of paragraph S 1.4.1.

- 7.4.9.5.6 (Addition) Functional tests of all valves shall be conducted at full differential pressure between the first and second seat tests. Valves ordered with actuators shall be tested with the actuator installed.
- 7.4.9.5 (Addition) Gas tests in accordance with PSL-4 requirements stated in 7.5.9.6.6, 7 and 8 as applicable, shall be performed.
- 7.5.1.3 (Addition) Additional records may be required by the Saudi Aramco Inspection Requirements Form [175-045600](#) or elsewhere in the P.O.

Revision Summary

- 11 October 2010 Revised the "Next Planned Update." Reaffirmed the contents of the document, and reissued with editorial revision to reflect the changes in committee members list.