

Quality Requirements for Ball Valves (API)

Revision history

VERSION	DATE	PURPOSE
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Acknowledgements

This IOGP Specification was prepared by a Joint Industry Programme 33 Standardization of Equipment Specifications for Procurement organized by IOGP with support by the World Economic Forum (WEF).

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Foreword

This specification was prepared under Joint Industry Programme 33 (JIP33) "Standardization of Equipment Specifications for Procurement" organized by the International Oil & Gas Producers Association (IOGP) with the support from the World Economic Forum (WEF). Companies from the IOGP membership participated in developing this specification to leverage and improve industry level standardization globally in the oil and gas sector. The work has developed a minimized set of supplementary requirements for procurement, with life cycle cost in mind, resulting in a common and jointly agreed specification, building on recognized industry and international standards.

Recent trends in oil and gas projects have demonstrated substantial budget and schedule overruns. The Oil and Gas Community within the World Economic Forum (WEF) has implemented a Capital Project Complexity (CPC) initiative which seeks to drive a structural reduction in upstream project costs with a focus on industry-wide, non-competitive collaboration and standardization. The CPC vision is to standardize specifications for global procurement for equipment and packages. JIP33 provides the oil and gas sector with the opportunity to move from internally to externally focused standardization initiatives and provide step change benefits in the sector's capital projects performance.

This specification has been developed in consultation with a broad user and supplier base to realize benefits from standardization and achieve significant project and schedule cost reductions.

The JIP33 work groups performed their activities in accordance with IOGP's Competition Law Guidelines (November 2020).

This fourth edition cancels and replaces the third edition published in January 2019. Due to technical writing requirements leading to extensive changes, this fourth edition should be treated as a new document.

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Introduction

The purpose of this quality requirements specification (QRS) is to specify quality management requirements and the proposed extent of purchaser intervention activities for the procurement of ball valves in accordance with IOGP S-562 for application in the petroleum and natural gas industries.

Purchaser intervention activities are identified through the selection of one of four conformity assessment system (CAS) levels based on a risk and criticality assessment. The applicable CAS level is specified by the purchaser in the procurement data sheet (PDS) or purchase order.

The IOGP S-562 specification documents follow a common structure (as shown below) comprising a specification, also known as a technical requirements specification (TRS), a PDS, an information requirements specification (IRS) and this QRS. These four specification documents, together with the purchase order, define the overall technical specification for procurement.



JIP33 Specification for Procurement Documents Quality Requirements Specification (QRS)

This QRS is to be applied in conjunction with the specification, the PDS and the IRS, referred to in this document as IOGP S-562, IOGP S-562D and IOGP S-562L respectively. Further information on the purpose of these documents and the order of precedence for their use is provided in the introduction of the specification.

1 Scope

This QRS specifies quality management requirements for the supply of ball valves to IOGP S-562 including:

- a) manufacturer quality management system (QMS) requirements;
- b) purchaser conformity assessment (surveillance and inspection) activities;
- c) traceability requirements.

2 Normative references

For the purpose of this document, the documents referenced in IOGP S-562 and those listed below, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Specification Q1, *Quality Management System Requirements for Organizations Providing Products for the Petroleum and Natural Gas Industry*

API Specification 6D, *Specification for Valves*

EN 10204, *Metallic products - Types of inspection documents*

IOGP S-562, *Supplementary Specification to API Specification 6D for Ball Valves*

ISO 9000:2015, *Quality management systems — Fundamentals and vocabulary*

ISO 9001:2015, *Quality management systems — Requirements*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 29001, *Petroleum, petrochemical and natural gas industries — Sector-specific quality management systems — Requirements for product and service supply organizations*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purpose of this document, the terms and definitions given in IOGP S-562 and ISO 9000:2015 (normative to ISO 9001:2015) and the following shall apply.

3.1.1

conformity assessment

demonstration that specified requirements are fulfilled

Note 1 to entry: "Conformity assessment" is also referred to as "assessment".

Note 2 to entry: Conformity assessment includes review, inspection, verification and validation activities.

Note 3 to entry: Conformity assessment activities may be undertaken at manufacturer/sub-supplier premises, virtually by video link, desktop sharing, etc. or by review of information.

3.1.2

conformity assessment system

CAS

system that provides different levels of purchaser interventions to assess and verify manufacturer conformance to specified requirements

Note 1 to entry: CAS level A applies to the highest risk and associated extent of verification. CAS level D is the lowest.

3.1.3

hold point

H

<conformity assessment> point in the chain of activities beyond which an activity shall not proceed without the approval of the purchaser or purchaser's representative

3.1.4

witness point

W

<conformity assessment> point in the chain of activities at which the manufacturer shall notify the purchaser or purchaser's representative before proceeding

Note 1 to entry: The operation or process may proceed without witness if the purchaser does not attend after the agreed notice period.

3.1.5

surveillance

S

<conformity assessment> observation, monitoring or review, by the purchaser or purchaser's representative, of an activity, operation, process, product or associated information

3.1.6

review

R

<conformity assessment> review of the manufacturer's records, procedures and supporting information to verify and/or validate conformance to requirements

3.2 Abbreviated terms

CAS	conformity assessment system
EDS	element data sheet
FAT	factory acceptance test
IRS	information requirements specification
ITP	inspection and test plan
MDS	material data sheet
NDE	non-destructive examination
PDS	procurement data sheet
QMS	quality management system
QRS	quality requirements specification
SWL	safe working limit

TRS technical requirements specification

4 Quality requirements

4.1 Quality management system (QMS)

The manufacturer shall operate and maintain a quality management system (QMS) that conforms with ISO 9001, ISO 29001, API Specification Q1 or an equivalent QMS standard.

4.2 Conformity assessment system (CAS)

4.2.1

The CAS provides different levels of assessment of manufacturer control activities. The CAS level is defined by the purchaser using a risk-based approach and included in the purchase order / contract. The defined CAS level may be adjusted by the purchaser during manufacture based on the manufacturer's performance and re-assessment of risk.

NOTE For industrial proven solutions, CAS level D is specified unless risk assessment indicates that a more stringent CAS level is required.

4.2.2

Quality plans and inspection and test plans shall include provision for purchaser intervention activities based on the CAS level selected in the PDS or purchase order. See Table A.1.

4.2.3

The manufacturer's performance in meeting the requirements may be routinely assessed during execution of the scope and, where appropriate, corrective action requested, and conformity assessment activities may be increased or decreased consistent with criticality and risk.

4.2.4

If any subcontracted or scope of supply occurs outside of the primary manufacturer location, it shall include interventions within the primary inspection and test plan (ITP) or secondary ITP. It is discouraged to use "hold" (H) within Table A.1, section 3 and recommended to use "surveillance" (S).

5 Certification and traceability

Where material certification and traceability requirements are not specified in API Specification 6D or IOGP S-562, they shall be maintained in accordance with Table B.1.

6 Evidence — conformance records

Documents and information shall be provided for in accordance with IOGP S-562L.

Annex A (normative)

Purchaser conformity assessment requirements

Table A.1 defines four CAS levels or levels of purchaser assessment.

Table A.1 — Purchaser conformity assessment requirements

Purchaser assessment activities		CAS			
		A	B	C	D
1	Operational planning and control activities				
1.1	Attend pre-inspection/pre-production meeting (IOGP S-562, 14.1)	H	H	S	-
2	Design and development activities				
2.1	No applicable activities	-	-	-	-
3	Externally provided products and services (outsourced)				
3.1	Verify external supply scope, if applicable (IOGP S-562, 6.1.1, 6.2, 6.3)	S	S	-	-
4	Production and service provision				
4.1	Inspection and test activities as per IOGP S-562				
4.1.1	Material traceability and certification (IOGP S-562, 6.1.1, 7.11.2, I.2)	W	R	R	R
4.1.2	Visual and dimensional check of pressure-containing and pressure-controlling parts according to machining drawings (IOGP S-562, 4.4.1, 5.12, 9.4.4)	W	W	S	-
4.2	Component manufacture				
4.2.1	Manufacturing welding repair (IOGP S-562, 7.11.2)	W	S	S	-
4.2.2	Non-metallic materials (IOGP S-562, 5.15.1, 6.2, K.22, L.6)	S	S	-	-
4.2.3	Non-destructive examination (NDE) process (IOGP S-562, 9.7, Table 19, Table I.1)	W	S	S	-
4.2.4	Welding controls including production and NDE (IOGP S-562, 5.6.1.1, 7.12, 7.4, Table I.1)	W	S	S	-
4.2.5	Overlays and hard-facing (IOGP S-562, 7.5.2, Table I.1)	W	S	S	-
4.2.6	Painting (IOGP S-562, 11 para 1, 11 para 1a, 11 para 2, 11 para 3)	W	S	S	-
4.3	Assembly				
4.3.1	Verify assembly including bolting torque and sequence, threaded fittings, critical sealing elements, gearbox and safe working limit (SWL) of the lifting points (IOGP S-562, 5.1.4, 5.15.2, 5.20, 5.6.1.2, 5.9, 9.6, Table 12)	W	W	S	-
4.3.2	Gearbox lubrication inspection (IOGP S-562, 5.4.5.5)	W	S	S	R

Table A.1 (continued)

	Purchaser assessment activities	CAS			
		A	B	C	D
4.4	Final tests, including factory acceptance test (FAT)				
4.4.1	FAT (IOGP S-562, 10.1.1, 10.1.2, 10.1.3, 10.3.1, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.4.1, 10.4.3.1, 10.4.3.2, 10.4.4, 10.6, 5.4.5.1, 5.4.5.5, 5.6.2, 5.8, I.4, I.6.1, I.6.3.1, I.6.3.2, I.8.1, I.8.2.1, I.8.3.1, I.9.1, K.16, K.29, L.5, Table 20, Table 22)	H	W	W	-
5	Final inspection				
5.1	Final inspection, including visual, weight, legible markings, dimensional, painting, preservation, nameplates and labeling (IOGP S-562, 10.4.1, 11 para 2, 12.1, 12.2, 12.3, 12.4, 13.1, 13.2, 13.3, 5.12, 5.16, 5.2.3.1.4, 5.4.2.3, 5.4.3.1, 5.6.1.2, 5.9, G.2, K.8, L.35, L35 para 2, Table 11, Table 12, Table 13, Table 13 footnote i, Table 13 Item No. 13)	H	W	W	-
5.2	Verify shipping documentation (IOGP S-562, 13.2, 13.3, 14.2.1)	H	W	S	-
5.3	Release equipment for shipment (IOGP S-562, 14.2.1)	H	H	H	H
Key - No intervention performed H Hold point W Witness point R Review S Surveillance					

Annex B (normative)

Certification and traceability requirements

Table B.1 provides the certification and traceability requirements for the equipment and component parts.

Table B.1 — Certification and traceability requirements

Item		Certificate type ^a	Traceability level ^b	Additional requirements
Valves excluding QSL4/4G	Metallic pressure-containing parts or metallic pressure-controlling parts	3.1	Level I	
	Pressure-boundary bolts	3.1	Level II	Per batch
	Metallic non-pressure-containing parts	2.2	Level II	
	Nonmetallic pressure-containing parts or nonmetallic pressure-controlling parts	3.1	Level II	Per batch
	Nonmetallic non-pressure-containing parts	2.1	Level III	
	Valve gearboxes	3.1	Level II	
Valves QSL4/4G only	Metallic pressure-containing parts or metallic pressure-controlling parts	3.2	Level I	
	Pressure-boundary bolts	3.2	Level I	Per batch
	Metallic non-pressure-containing parts	2.2	Level III	
	Nonmetallic pressure-containing parts or nonmetallic pressure-controlling parts	3.1	Level II	Per batch
	Nonmetallic parts	2.1	Level III	
	Valve gearboxes	3.1	Level II	
Welded components including	Casting weld repairs	3.1	Level I	Weld maps to be retained to provide traceability of each weld to applicable WPS, welder, consumable batch and NDE reports
	Pup piece welds	3.1	Level I	Weld maps to be retained to provide traceability of each weld to applicable WPS, welder, consumable batch and NDE reports
	Lifting point welds	3.1	Level I	Weld maps to be retained to provide traceability of each weld to applicable WPS, welder, consumable batch and NDE reports
Lifting points	As per IOGP S-562, 5.9	2.1	Level II	

Table B.1 (continued)

Item	Certificate type ^a	Traceability level ^b	Additional requirements
^a Inspection certificates shall be provided in accordance with ISO 10474 or EN 10204.			
^b Traceability levels are defined in the following table.			
Level	Traceability	Definition	
Level I	Full traceability	Material is uniquely identified and its history tracked from manufacture through stockists (where applicable) to the manufacturer and to the actual position on the equipment with the specific location defined on a material placement record (the traceability to a specific location only applies to skids / packaged equipment, not to bulks).	
Level II	Type traceability	The manufacturer maintains a system to identify material throughout manufacture, with traceability to a material certificate.	
Level III	Compliance traceability	The manufacturer maintains a system of traceability that enables a declaration of compliance to be issued by the manufacturer.	



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