IGS-M-PL-002-1(6)	Apr. 2021
Approved	مصوب

شرکت ملی گاز ایران
مدیریت پژوهش و فنآوری
امورتدوین استانداردها

IGS

مشخصات فنی خرید

شیرهای سماوری جوشی / فلنجی – بخش اول ، ۲ تا ۲۴ اینچ ، کلاسهای ۱۵۰ ، ۳۰۰ و ۶۰۰

Welded / Flanged Plug Valves - Part 1 , 2 to 24 Inches , Classes 150,300 and 600

Fax : (9821)-8487-5032
http://igs.nigc.ir

دفترمدیرعامل

شرکت ملی گازایران

تاریخ : ۱۴۰۰/۰۴/۰۶
شماره : گ۰/دب/۰۰۰/۲۰۰-۲۰۲۸۳

ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری

باسلام،

به استحضار می‌رساند در جلسه ۱۹۲۵ مورخ ۱۴۰۰/۰۳/۰۹ هیات مدیره، نامه شماره گ۹/۰۰۰/۲۳۲۱۰ مورخ ۱۴۰۰/۰۲/۲۸ مدیر پژوهش و فناوری درمورد تصویب نهایی مقررات فنی شرکت ملی گاز ایران به شرح زیر مطرح و مورد تصویب قرار گرفت.

۱-مشخصات فنی خرید شیرهای سماوری جوشی/ فلنجی- بخش اول: ۲ تا ۲۴ اینچ، کلاس های ۱۵۰، ۳۰۰ و ۶۰۰ IGS-M-PL-002-1(6)

۲-دستور العمل ارزیابی کیفیت جوش الکتروفیوژن با انجام آزمون به دو روش خمکاری نوار جوش و لهیدگی IGS-C-DN-003(1)

۳-دستور العمل ایمنی جوشکاری و برشکاری IGS-O-SF-009(0)

۴-دستور العمل سیستم پوششی اپوکسی پودری داخلی برای خطوط لوله گاز طبیعی شیرین IGS-C-TP-026-2(0)

این مصوبه در حکم مصوبه مجمع عمومی شرکت‌های تابعه محسوب و برای کلیه شرکت‌های تابعه لازم الاجرا می‌باشد .

الهام ملکی
دبیر هیات مدیره

رونوشت : مدیرعامل محترم شرکت ملی گاز ایران و رئیس هیات مدیره
اعضای محترم هیات مدیره
رئیس دفتر محترم مدیرعامل
رئیس محترم امور حقوقی
رئیس محترم حسابرسی داخلی
رئیس محترم امور مجامع

Foreword

This standard is intended to be mainly used by NIGC and contractors, and has been prepared based on interpretation of recognized standards, technical documents, knowledge, backgrounds and experiences in natural gas industry at national and international levels.

Iranian Gas Standards (IGS) are prepared, reviewed and amended by technical standard committees within NIGC Standardization division and submitted to the NIGC's "STANDARDS COUNCIL" for approval.

IGS Standards are subject to revision, amendment or withdrawal, if required. Thus the latest edition of IGS shall be checked/inquired by NIGC employees and contractors.

This standard must not be modified or altered by NIGC employees or its contractors. Any deviation from normative references and / or well-known manufacturer's specifications must be reported to Standardization division.

The technical standard committee welcomes comments and feedbacks about this standard, and may revise this document accordingly based on the received feedbacks.

General Definitions

Throughout this standard the following definitions, where applicable, should be followed:

1- "STANDARDIZATION DIV" is organized to deal with all aspects of industry standards in NIGC. Therefore, all enquiries for clarification or amendments are requested to be directed to mentioned division.

2- "COMPANY": refers to National Iranian Gas Company (NIGC).

3- "SUPPLIER": refers to a firm who will supply the service, equipment or material to NIGC whether as the prime producer or manufacturer or a trading firm.

4- "SHALL ": is used where a provision is mandatory.

5- "SHOULD": is used where a provision is advised only.

6- "MAY": is used where a provision is completely discretionary.

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Contents

1. Scope

1.1. General

(Sub.)

This standard covers the minimum requirements for flanged/welding ends lubricated carbon steel taper plug valves, NPS 2 through 24, ASME class rating 150,300 and 600, service temperature range from -29 ºC to +60 ºC, meeting the requirements of ASME B 31.8 suitable for non-sour natural gas transmission and distribution system. Design, manufacturing, materials, dimensions, tolerances, inspection, testing and marking shall be according to API 6D, 24th edition: 2014 except as supplemented or amended by this specification**.**

Note: This specification supersedes IGS-M-PL-002-1 (5) "Plug Valves Sizes 2" to 24" part (1).

1.1. 1. Guidance for use of this specification:

(Add)

The amendments/ supplements to API Spec. 6D. 24th edition: 2014 given in this specification are directly equivalent sections or clauses in API 6D. All other paragraphs which are not amended by this supplementary shall remain valid as written. The following annotations, as specified hereunder, have been used at the beginning of each paragraph to indicate the type of change made to that paragraph of API 6D.

Sub. (Substitution) "The paragraph in API Spec. 6D shall be deleted and replaced by the new paragraph in this supplementary ".

Del. (Deletion) "The paragraph in API Spec. 6D shall be deleted without any replacement".

Add. (Addition) "The new paragraph with the new number shall be added to the relevant section of API Spec. 6D".

Mod. (Modification) "Part of the clause or paragraph in API Spec. 6D shall be modified and/or the new description and/or statement shall be added to that clause or paragraph as given in this supplementary.

2. Reference Codes and Standards

(Add.)

Throughout this standard specification the standards and codes which mentioned in API 6D: 2014 and the following standard are referred to. The applicability of changes in standards and codes that occur after the date of this standard that referred shall be mutually agreed upon by the purchaser and supplier and / or manufacturer.

2.1.API 6 D: 2014, " Specification for pipeline and piping valves".

2.2.API 599: 2013," Metal Plug Valves-Flanged, Threaded and Welding Ends".

2.3. ASME B36.10: 2004," Welded and Seamless Wrought Steel pipe".

2.4. ASTM A 105:2014, Standard specification for carbon steel forgings ".

2.5. ASTM A 106:2011, " Standard specification for Seamless carbon steel pipe for High-Temperature service".

2.6. ASTM A 193: 2016, "Standard specification for alloy steel and stainless steel bolting materials for high temperature service".

2.7. ASTM A194:2015, "Standard specification for carbon and alloy steel nuts for bolts for high pressure of high temp. Service or both".

2.8. ASTM A216:2016," Standard specification for carbon steel casting, suitable for fusion welding, for high temperature service".

2.9. ASTM B650:95(2013)," Standard specification for electrodeposited engineering chromium coatings on ferrous substrates".

2.10. ASTM B733:2015," **Standard** specification for autocatalytic (electro less) Nickel-Phosphorus coatings on metal ".

2.11. ASTM D217:2010," **Standard** specification for Cone Penetration of Lubricating Grease"

2.12.ISO 724:1993," ISO general-purpose metric screw Threads-Basic dimensions"

2.13.ISO 5211:2001,"Part-turn Actuator Attachments".

2.14.ISO 9001:2015," Quality management System-Requirements".

2.15.ISO 17020:2012"Conformity Assessment-Requirements for the operation of various types of bodies performing inspection"

2.16.ISO TS 29001 :2007,"Petroleum, Petrochemical and Natural Gas Industries-Sector Specific Requirements-Requirements for Product and Service Supply Organization".

2.17. EN 10204: 2004,"Metallic Products-Type of Inspection Documents".

2.18.ISO 10497:2010,"Testing of Valves-Fire type –testing requirements".

2.19.ISO 10474: 2013,"Steel and Steel Products-Inspection Documents".

2.20.MSS SP-6:2012," Standard Finishes for Contact Face of Pipe, Flanges and Connecting-End Flanges of Valves and Fittings".

2.21.IGS-M-IN-304(1): 2017," Gas over Oil Actuator".

2.22.IGS-M-PL-009(0):2005," **Hand** wheel Operated Gear Box for Ball, Plug and Butterfly Valve".

2.23 IGS-M-PL-035(0):2014" Spiral Wound Gasket (Class Rating 150,300,600)

3. Terms, Definitions, Acronyms, Abbreviations, Symbols and Units

3.1. Terms and Definitions

(Sub.)

For the purposes of this standard specification the definitions mentioned in API 6D and the following definitions apply:

3.1.18. Maximum pressure differential (MPD)

(Mod.)

Maximum differential between the upstream and downstream pressure across the obturator base on valve's class rating.

Anti-Seize Thread Lubricant

(Add.)

A highly refined lubricant use during assembly to prevent galling, corrosion and seizing/gripping of threads due to weathering or chemicals**.**

Approval Agency

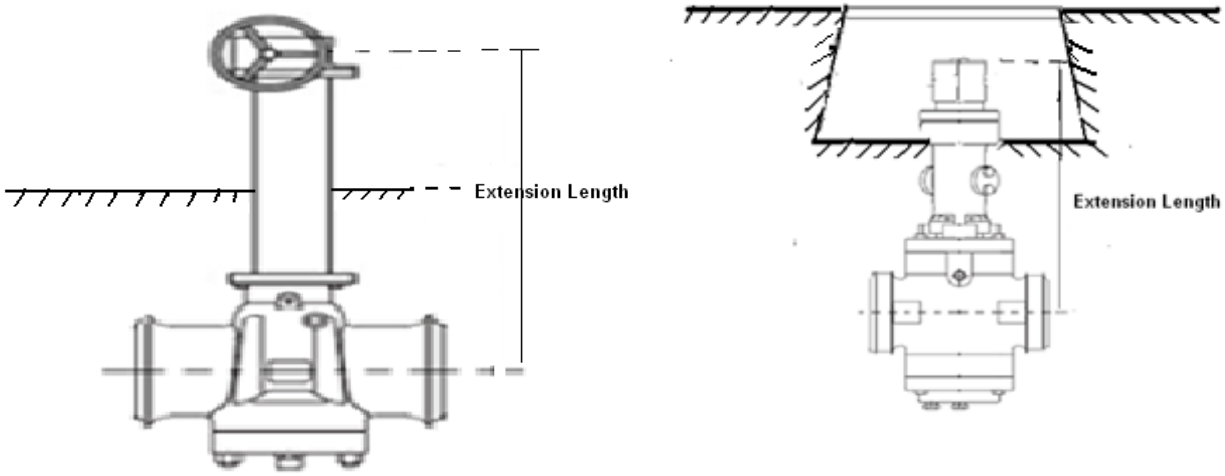
(Add.)

Authorized certifying body which approved by technical inspection division.
Subsidiaries of National Iranian Gas Company in order to identify these companies should refer to the URL (http://inspect.nigc.ir) for list of qualified companies in this field of use.

Carbon equivalent
(Add.)
The carbon equivalent (CE) calculated in accordance with Equation:

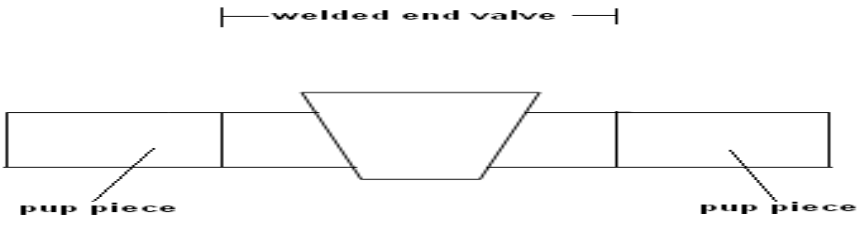
$$(CE_{IIW} = C + \frac{Mn}{6} + \frac{(Cr + Mo + V)}{5} + \frac{(Ni + Cu)}{15})$$

Stem Extension Length
(Add.)
The distance from belowground valve centerline to hand wheel centerline/ operating level.



Pup pieces'/ Transition piece
(Add.)

A piece of pipe welded to end of valve allow for transition between the valve body (material, grade and thickness) and the adjacent pipe (material, grade and thickness) to which the valve is intended to be connected. These pieces will be ordered with the necessary extra length by purchaser. The thickness and material grade of the pup pieces and welding process shall be met the criteria of ASME B31.8.



Regular Pattern

(Add.)

The plug port area of these valves is at least 60% of the end port area. The transition from the end ports to the bore is smooth, and entails no sudden alterations in shape or section which might cause excessive changes in velocity or direction of the fluid flowing in the pipeline.

Short Pattern

(Add.)

The plug port area of these valves is at least 40% of the end port area. Face to face/end to end length of these valves is shorter than the regular pattern near gate valves.

Venturi Pattern

(Sub.)

The plug port area of these valves is at least 40% of the end port area. These valves have a smooth transition from end to the bore and typically used in services where rate flow is not critical.

Type test

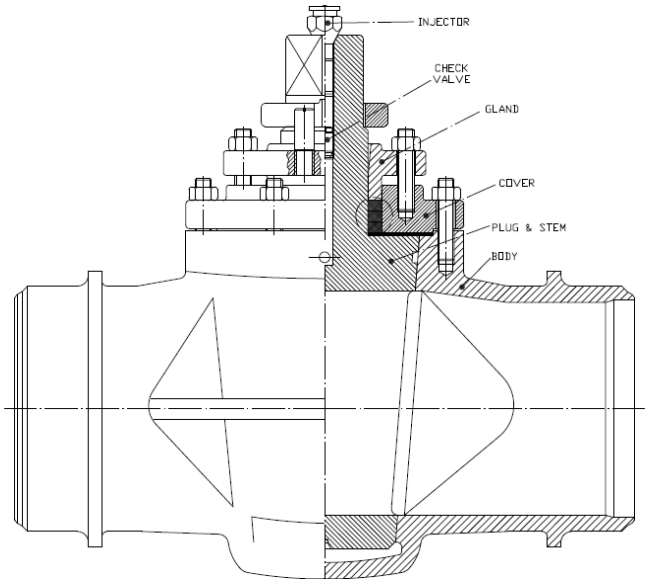
(Add.)

Testing performed on typical samples to prove that material, design, manufacturing etc are complying with the specification's requirements. Type test certificate is valid until the materials, designation and production methods remain unchanged.

Standard Plug Valve

(Add.)

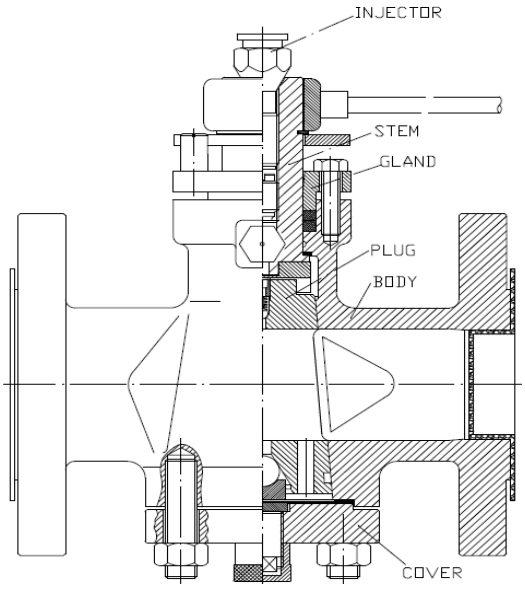
The standard type plug valve used in natural gas services is a lubricated taper plug valve in which the plug is mounted in the body from upward.



Pressure balanced Plug Valve

(Add.)

The Pressure balanced plug valve used in natural gas services is a lubricated taper plug valve in which the plug is mounted in inverted position and divorced from the stem. Pressure is balance by two holes in the plug which connects the plug port with lower and upper cavities.



4. Valve Types and Configurations

4.1. Valve Types

4.1.2. Plug valves

(Sub.)

Plug Valves shall be lubricated taper plug valve which have a solid conical obturator with bore that rotates about an axis perpendicular to the direction of flow.

5. Design

5.1. Design Standards and Calculations

(Sub)

Design shall be in full conformance to the requirements of ASME B16.34. Unless otherwise specified in purchaser order, all plug valves shall be inverted / pressure balance type. However standard type is permitted for valves with NPS ≤ 6, class 150.For each valve the plug shall be individually lapped in its valve body to achieve a tight seal. The documents shall be reviewed by purchaser. Material group No 1.1 listed in table 1 of ASME B16.34 shall be provided with valve body minimum wall thickness in accordance with Table 3A. Additional metal thickness or reinforcement may be needed to assure adequate strength and rigidity.

5.4. Face –to-face and End-to-end Dimensions

(Add.)

Face-to-face / end-to-end dimensions and tolerances of valves shall be in accordance with API 6D**,** Table C.2.

5.5. Valve operation

(Sub.)

Unless otherwise specified in purchase order, valve operation method shall be as below Table.

Methods of plug valve operation			
NPS	Pressure Class Rating		
	150	300	600
2,3	W	W	W
4	W	W	W/G
6	W	W/G	G
8,10, 12	G	G	G
16	--	G/A	G/A
20,24	--	G/A	G/A
W: WRENCH G: GEAR BOX A: ACTUATOR /: or			

Gear boxes shall be in accordance with IGS-M- PL-009 (latest edition) and supplied by the valve manufacturer when specified**.** Actuating mechanism (hydraulic, pneumatic or electric) and manufacturer of the actuator shall have approved by purchaser in advance. Gas over Oil Actuator shall be as latest edition of IGS-M-IN-304**.** Valve operating test shall be done with the recommended actuator /gear box at maximum pressure differential (MPD). The serial number of the valve tested with the actuator /gear box shall be marked on each other. Manufacturer shall provide the following data to purchaser:

- Break to close (BTC) torque, running to close (RTC) torque and end to close (ETC) torque
- Break to open (BTO) torque, running to open (RTO) torque and end to open (ETO) torque
- Maximum allowable stem thrust or torque (MAST).
- Output to input ratio and number of turns to open/close of gear box

5.6. Pigging
(Sub.)
These types of plug valves are not pig able.

5.7. Valve Ends
5.7.1. Flanged Ends
(Add.)
End flanges shall be integrated with the body furnished with raised face (RF) and serrated finish (SF) as per MSS SP-6.

5.7.2. Welding Ends

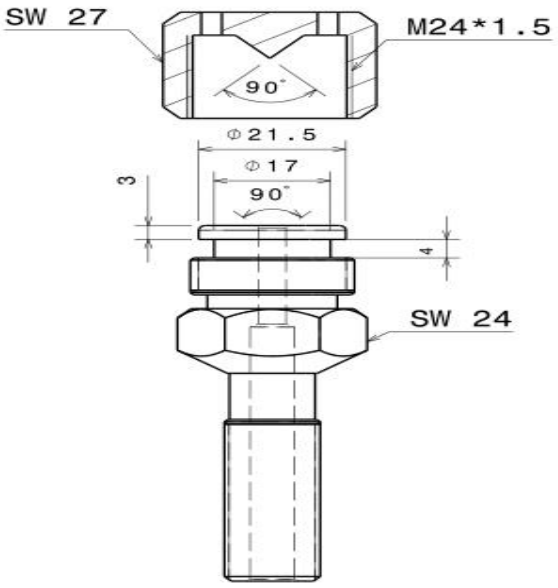
(Add.)

The purchaser shall specify the mating pipe for welding ends valve. End preparation shall be in accordance with ASME B31.8 or ASME B 16.25.

5.10. Injection Points

(Add.)

All valves shall be equipped with injection facility for plug and stem. The grease injection fitting shall be as below figures equipped with a secondary check valve to prevent escape of sealant meanwhile maintenance/ replacement.

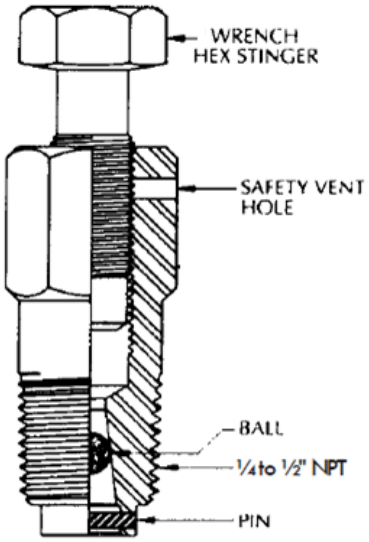


Details of injection fitting

The injection line shall be connected from body side or center of stem's axis as below Table

	CLASS 150 & CLASS 300		CLASS 600	
	SEAT INJ. LINE	STEM INJ. LINE	SEAT INJ. LINE	STEM INJ. LINE
SIZE 4 in AND SMALLER	C. O. S	S. O. B	C. O. S	S. O. B
SIZE 6 IN	C. O. S	S. O. B	S. O. B	S. O. B
SIZE 8 in AND UPPER	S. O. B	S. O. B	S. O. B	S. O. B
S. O. B. : SIDE OF BODY		C. O. S. : CENTER OF STEM AXIS		

All above ground valves shall be equipped with packing injector for stem as below figure.



Details of packing injector

Note: All parts of grease Injection fittings and packing injectors shall be stainless steel

Table 2 - Pipe Size for Sealant lines and packing injector

(Sub.)

Thread Size for body connection		
Type	**Connection Thread of injection fittings (1)**	**Connection Thread of packing injectors(2)**
II	M14×1.5	3/8-18 NPT
III	M18×1.5	1/2-14 NPT
(1) As per ISO 724 **(2)As per ASME B 1.20.1**		

5.11. Sealant Lines

(Add.)

For valves with stem extension, the injection lines shall be extended to operating level. The injection line shall be one piece, sch80 seamless carbon steel pipe as per ASME B36.10 and ASTM A106.

5.13. Hand wheel and Wrenches-Levers

(Sub.)

- Wrenches for valves shall consist of a head that fits on the stem and is designed to take an extended handle. The head shall be Parallel Square as below table dimensions:

- The head design shall allow permanent attachment of the extended section if specified by the purchaser.

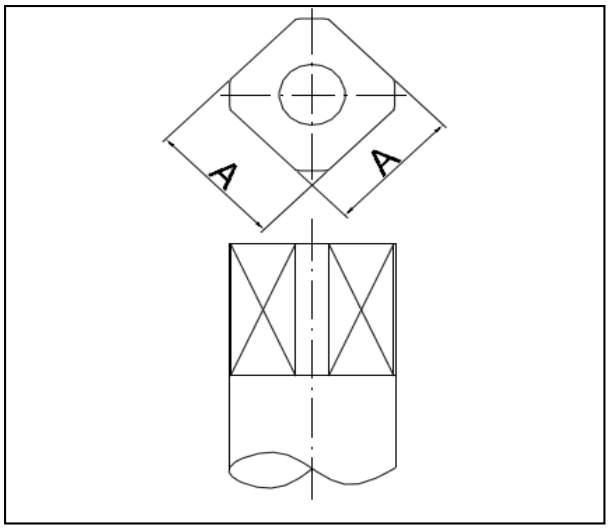
- The maximum force required at the wrench to apply the breakaway torque under Maximum pressure differential (MPD) shall not exceed 80 lbf (360 N).

- Wrenches (integral/loose)shall not be longer than twice the face-to-face or end-to-end dimension.

-Hand wheel diameter(s) shall not exceed the 800mm.The maximum torque required at the hand wheel shall not exceed 80 N-m.

- Direction of closing shall be clockwise.

Valve Size & Class	Head Size (A) mm
NPS 2, Class 150& 300 NPS 3, Class150 & 300 NPS 4 ,Class150	33×33
NPS 2 Class 600 NPS 3 Class 600 NPS 4 Class 600 NPS 6 Class 150& 300	50×50



5.14. Locking Provision

(Sub.)

If specified in purchase order, valve shall be equipped with locking devices in fully open and/or fully closed position.

5.16. Position Indicator

(Sub.)

All valves shall be furnished with position stops and position indicator. The closing direction for hand wheel or wrench shall be clockwise. Valve shall be furnished with embossed position indicator showing open position in the direction of flow and close position perpendicular to it. The "SHUT/CLOSE" and "OPEN" terms (in English) shall be easy visible and permanently legible.

5.18. Actuator, Operators, and Stem Extensions

5.18.1. General

(Sub.)

For gear /actuator operated valves, driving interface flange adapter shall be in accordance with ISO 5211. The top flange shall be integrated or welded to thebody.

For valves specified with stem extension, the distance of valve center line from operating level shall be as specified by purchaser.

5.18.5. Protection of Extended Stems and Shafts in Belowground Services.

(Sub.)

For valves with stem extension, all lubricant/ sealant lines shall be extended to operating level. The detachable extended stem and its components shall be protected by a fully enclosed extension casing. The enclosure shall be water-proof. The stem extension length, design, drawings, materials, and connection details shall be approved by purchaser.

Note: The stem extension should be complying with the last version of IGS-C- PL-032 by mutually agreement between manufacturer and purchaser.

5.19. Lifting

(Sub.)

Lifting lugs shall be provided for valves with NPS > 6. Design of these lugs shall be include of additional weight of actuator / gear box as far as possible.

5.21. Stem Retention/ Anti Blow out Stem

(Add.)

Stem shall be of the Anti-Blow-out type. Pressure balance plug valves with NPS > 6 shall equipped with at least two separate independent stem seals system. The stem sealing system shall be supported by fire resistance back-up seal / packing.

5.22. Fire Safe Type –testing

(Sub.)

Fire test shall be performed in accordance with API 6FA or ISO 10497. The certificate shall be submitted by an approval agency. The fire test certificate evaluated only for the proposed range of products which made by the manufacturer and satisfactory tested as per API 6D at the time of issue.

5.24. Life Cycle Type –testing

(Add.)

Durability of plug surface coating and leak tightness shall be approved by satisfactory pass of performance cycling test mentioned in APPENDIX III.

The related certificate shall be submitted by an approval agency.

5.25. Pup/Transition pieces

(Add.)

For valves with pup/transition pieces (if required), the pup's length and valve mating pipe shall be specified by purchaser. These pieces shall be supplied and welded by the valve manufacturer under its responsibility. Welding process shall be carried out in open position according to criteria of ASME B31.8. Longitudinal weld seams of the pup /transition piece shall be located in the top quadrant staggered from each other.

$t_v \leq 1.5t_p$

6.Material

6.1. Material Specification

(Sub.)

Body and plug shall be carbon steel casting at least ASTM A216 grade WCB/WCC or forging carbon steel at least ASTM A105.

6.4. Forged Parts

(Sub.)

For standard type valves, the plug and stem may be one piece, same material.

For pressure balance valves, stem material shall be forged carbon steel at least ASTM A105 or alloy steel at least AISI 4140 with minimum 50 µm electro less nickel plating as per ASTM B 733.

6.7. Bolting

(Sub.)

Bolts & Nuts shall be in accordance with ASTM A193 Grade B7 & ASTM A194 Grade 2H.

The threading of the bolting shall be in accordance with the "COARSE" series, class 2B, of ASME standard B 1.1. However, bolting to ISO standards, including metric threading, is allowed as an alternate.

Note 1: The assembling shall be incorporate with Anti-seize thread lubricant.

Note 2: It is recommended for buried pressure balance valves with stem extension, the cover attached to the body with bolt and nut system.

6.11. Surface Treatments

(Add.)

Plug surface shall have special treatment such as minimum 50 µm electro less nickel plated as per ASTM B733 (hardness of 800 HV) plus minimum 25µm PTFE top layer.

Note: Other plug surface treatment is accepted provided approved by purchaser and satisfactory pass the Cycle Test as per Appendix I.

6.12. Seal Material

(Add.)

Hydrocarbon resistance seal materials such as hydrogenated nitrile butadiene rubber (HNBR), fluoro carbon rubber(Viton), poly tetra fluoro ethylene(PTFE) etc.

6.13. Gaskets

(Add.)

Preferably, spiral wound gasket suitable for pressure /temperature rating of the valve as per **IGS-M-PL-035(0)**.

Note: Compressed Asbestos Fiber (CAF) gaskets are not acceptable.

7. Welding

(Add.)

Welding procedure (including weld repair/ repair of weld) and welding operator qualifications and acceptance criteria shall be performed in accordance with ASME BPVC Section VIII & IX and ASME B16.34.

7.5. Repair

(Add.)

Weld repair of forged parts is not permitted.

Weld repair on castings shall not be permitted on:

a) Plug or seal surfaces.

b) Castings that have leaked on hydrostatic test.

c) which the depth of any cavity prepared for repair welding exceed 20 % of the wall thickness or 25 mm whichever is smaller.

d) Any weld repair area greater than 250 mm2 for every millimeter of wall thickness provided that exceed 6500 mm2.

7.6. Repair of weld

(Mod.)

Repair of welds shall be made in accordance with ASME BPVC, Section VIII, Division1.

8. Quality Control

(Sub.)

8. Quality Control

8.6. Visual Inspection of Castings

(Sub.)

All casting surfaces shall be visually inspected in accordance with MSS-SP-55 with the following acceptance criteria:

-Type I: none acceptable
-Type II to XII: a and b only

Minor defects shall be removed by grinding provided there is a smooth transition between the grounded area and the original contour and the minimum wall thickness requirements are not affected.

8.6.1. VT of Forgings

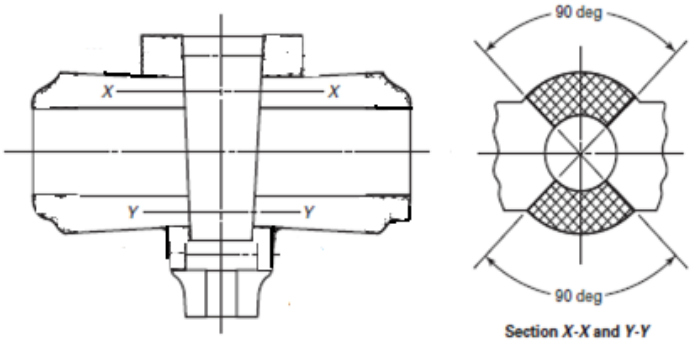
(Add.)

All forging surfaces shall be visually inspected. Examination and acceptance shall be in accordance with ASME BPVC Section VIII, Division 1, UF-45 and UF-46.

8.8. RT on Critical Areas of Casted Body

(Add.)

20% of each heat number of casted body, at least one sample of each class and size, shall be 100% spot radio graphed on critical areas which mentioned in below figure. Examination and Acceptance shall be in accordance with ASME B16.34, Appendix I.



Critical areas of body

8.9. MT/ PT on 100% of Exterior Surface and Machined Surface Areas

(Add.)

All exterior surfaces and machined surface areas shall be 100% magnetic particle examined. Examination shall be carried out in accordance with ASME Section V, Article7. Acceptance shall be in accordance with ASME Section VIII, Division 1, and Appendix 6. If agreed, instead of MT, casting surface area can be PT examined according to ASME Section V; Article 6. Acceptance shall be in accordance with ASME Section VIII, Division 1, and Appendix 7.

8.10. VT of Welding

(Add.)

All welds shall be visually inspected in accordance with ASME Section Article 9. Defects such as cracks, pinholes, surface porosity, exposed slag shall be removed by mechanical means and re-welded as per ASME Section VIII, Division1 including any PWHT and NDE requirements.

8.11. RT of welding ends

(Add.)

20% of each heat number of welding end valves (forged/cast body), at least one sample of each class and size, shall be 100% radio graphed on ends for a minimum length of 50mm or 1.5 times the mating pipe wall thickness, whichever is larger. Examination shall be carried out in accordance with ASME, Section V; Article2.Acceptance shall be in accordance with ASME, Section VIII, Division 1, and Appendix 7.

8.12. RT of Transition piece welds

(Add.)

If transition pieces are to be welded, the transition piece's connection butt welds shall be %100 radio graphic tested. Examination shall be carried out in accordance with ASME

BPVC Section V, Article2.Acceptance shall be in accordance with ASME BPVC Secton VIII, Division 1, UW-51 for linear indications and ASME BPVC Section VIII, Division, Appendix 4 for rounded indications

Note: If the transition pieces are not seamless pipe, the longitudinal seam weld shall be at the 12 o'clock position and 100% radiographic tested.

9. Pressure testing

9.2. Stem Backseat Test

is not required.

9.3. Hydrostatic Shell Test

(Add.)

Each valve shall be hydrostatically shell tested as per 9.3 of API 6D with 1.5 times of the valve's pressure rating. No visible or any other evidence of leakage is permitted.

If the pressure rating of pipe pups is insufficient for hydrostatic-shell test pressure, then the pups shall be welded to the valve following the valve-shell test and the valve and pups tested with the operation pressure again.

9.4. Hydrostatic Seat Test

9.4.1 The test valve shall be fabricated with light valve sealant (with NLGI 2 according to ASTM D217). In case of fail, injection of heavier sealant for sealing and leak tightness to pass the test is not permitted.

9.4.3 Acceptance Criteria

(Sub.)

Each valve shall be hydrostatically seat tested on each side/ seat as per 9.4 of API 6D with 1.1 times of the valve's pressure rating. No visible or any other evidence of leakage is permitted.

9.4.4.6 Alternative Seat Test

(Del.)

9.4.4.7 Low-pressure Gas Seat Test

(Add.)

Each valve shall be gas seat tested on each side/seat as per H.3.3, Type II of Annex H of API 6D. No leakage is permitted during the test duration.

Note: In case of fail, injection of sealant for sealing and leak tightening to pass the test is not permitted.

10. Coating / Painting

(Sub.)

Coating/painting shall be externally carried out at final stage after all tests and examinations. Before painting/ coating, valve shall be completely drained of test fluid and thoroughly dried. Purchaser shall specify surface preparation and coating / painting specifications which compatible with the pipe service condition and its coating system.

Flange face and actuator mounting flange sealing surfaces and exposed stems shall not be coated.

Welding end valves shall have the entire surface coated/painted except for ends cut back (A) as per following Table:

***A* - welding ends cut back length**	
Valve size (NPS)	**Uncoated bevel end (mm)**
2≤NPS≤ 6	25
8≤NPS≤12	50
16≤NPS≤24	100

11. Marking

(Add.)

The nameplate minimum letter size shall be 3mm or larger.

12. Preparations for Shipment

(Add.)

Only those valves which have been inspected and certified by Purchaser's inspector (Client inspector/ relevant third party inspector) shall be shipped. Before shipment, valves shall be drained. Valves shall be suitably packed in open position in wooden box or crates individually or collectively to protect the valves against all damages or defects which may occur during transit and extended tropical open air storage. Both ends of welding end valve shall be closed with slip-on recessed end cap. Flange end valves shall be fitted with plywood covers. All machined surfaces shall be coated with a removable rust preventative material. Care shall be taken to prevent damage to the valve/ stem extension coating which may occur during transit. If required, the purchase number shall be specified on valve and the relevant gear box/actuator. The packing procedure shall be submitted by manufacturer and approved by purchaser.

13. Documentation

13.3. Technical Evaluation Document

(Add.)

Vendor shall supply documentation including all correspondence, literature, drawings and data as per ISO documentation prepared in English. The attached valve data sheet in Appendix I should be filled for each item by purchaser and the attached data sheet in Appendix II shall be completed for each item by manufacturer.

Required documents:

-Original technical catalogue and manual.
- Up dated API 6 D monogram.
- Fire Safe Test certificate.
- Life Cycle Test Certificate.
- Operating Torque.
- Sectional drawings and bill of materials.
- Sub vendor part –list.
- Quality control plan (QCP).
-Weight of valve and operator.
- Related data sheet (Appendix II).

- Operation maintenance manual.
- List of recommended spare parts.
- Packing procedure.

15. Quality Assurance Provision

(Add.)

Manufacturer shall establish quality assurance and quality control system with all applicable procedures in accordance with ISO 9001/ 29001. The certificates shall comply with ISO 17020 type A or B as per request.

Appendix I
Method of Life Cycle Test

1. Introduction

Performance test by Life Cycling method shall be carried out in accordance with this Appendix by an independent and authorized certifying body as Type Test.
In this method two valves shall be chosen. One for checking the integrity of plug surface coating, regardless of type, after 10,000 cycles and the other one for checking the leaking of valve after 3,000 cycles.
Prior to Life Cycling Test, all required tests mentioned in this IGS shall be satisfactory carried out to make sure the selected valves meet all the requirements of this specification. This method shall be performed at maximum design pressure.

2. Checking the integrity of plug external coating

2.1. Test procedure

The first selected valve shall be cycled for 10,000 times. Testing shall be carried out in ambient condition within 20 to 30 o C. Valve shall be opened and closed in one minute. Every 2000 cycles (open & close) the valve may be re-lubricated.

2.2. Acceptance

After 10,000 cycles, test valve shall be disassembled and the plug surface shall be visually examined. No critical scratch or crack on the surface of the plug and no more than 50 % of plug anti-friction coating de-scaled or worn is permitted.

3. Checking the leaking phenomena after cycle test

3.1. Test procedure

The other selected valve shall be cycled for 3,000 times. Testing shall be carried out in ambient condition within 20 to 30 o C. Every minute the valve shall be opened and closed one time. After each 500 cycle and before re-lubricating the test valve shall undergo seat test in accordance with API 6D with satisfactory results (no leakage). No adjustment or injection of sealant grease is permitted

3.2. Acceptance

At the end of 3,000 cycles, the test valve shall be seat tested with satisfactory results (no leakage).

4. Qualification of other sizes and classes

In lieu of testing each size and pressure rating of a given valve design, other valves of the same basic design, metallic and non-metallic materials and plug coating as the test valve may be qualified, subject to the following limitations:

4.1. One test valve may be used to qualify all valves in accordance with limitation of following tables:

Test valve	**Size (NPS)**	4	6	8	10	12
Other Valve Qualified	**Size Range (NPS)**	2 - 8	6-12	8-16	10-20	12-24

Qualification of Other Pressure rating Valves			
Rating of Test valve(Class)	150	300	600
Other Valve Rating Qualified(Class)	150	150 & 300	150 & 300 & 600

Appendix II

Plug Valve Data Sheet

Manufacturer:	Enquiry No:		Tender/Job NO:	
General specification:	Rev:			
Customer Name:	Date:			
Item: from:	Quantity:		Size	Class
GENERAL				
Valve Model:	Weight:			
Design, Dimension and Testing Standard /Code:				
Fire safe Standard: Fire safe Certificate: □Yes □No	API Monogram □Yes □No	Life Cycle Test Certificate: □Yes □No		
Anti-blow out sys.: □Yes □No	Locking Device: □Yes □No			
Operating Temp.:				
VALVE SPECIFICATION				
Drawing Number:				
Port Type: □ Rectangular □ Round	□Pressure balance □Standard			
Pattern: □ Short □ Regular □ Venturi				
Percentage of Port Area:	End Connection:			
Stem Extension:□Yes □No Length(mm):				
SEAL INJECTION SEAT: □YES □NO STEM: □YES □NO				
CONNECTION PAPE MAT. & WT				
Installation: □Above ground □Under ground				
□ Pup piece : Thickness: Material: length				
Operation: □Wrench □Gear Box□ □Actuator□				
Position of wrench /hand –wheel: horizontal□ vertical□				
Break Away Torque:				
End to End/ Face to Face Dimension:				
Material	Stem & Stem Treatment:			
	O-Rings:			
	Plug & Plug Treatment:			
	Cover/ Body			
	Bolt s& Nuts			
	Packing			
	Gaskets			
Coating/ Painting:				
Deviation from IGS-M-PL-002-1:				

Notes:

1- This Data Sheet should be completed for each item by manufacturer.

2- Any deviation from this specification shall clearly specified by manufacturer.

3- This Data Sheet shall be signed and stamped by manufacturer, authorized employee for purchaser approval.