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APPROVED مصوب

شرکت ملی گازایران

مدیریت پژوهش وفناوری

امورتدوین استانداردها

IGS

Iranian Gas Standards

مشخصات فنی خرید

شیرهای سماوری جوشی وفلنجی اندازه ۲ تا ۲۴ اینچ

PLUG VALVES size 2" to 24" part(1)

.

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دفتر مدیرعامل

شرکت ملی گازایران

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ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری

باسلام،

به استحضار می رساند در جلسه ۱۳٤۰ مورخ ۱۲/ ۸/ ۱۳۸۷ هیأت مدیره، نامه شماره گ۹/۹۵۷۱٦/۰۰۰ مورخ ۸۷/۷/۳۰ آن مدیریت درمورد تصویب نهایی استانداردها تحت عناوین "روغن ترانسفورمرهای برق" به شماره IGS-M-CH-044-1(0) ، " بررسی دوره ای کیفیت روغن ترانسفورمرهای برق" به شماره IGS-C-CH-044-2(0) و"روش تست کارآیی برای شیرهای سماوری اندازه ۲ تا ۲٤ اینچ" به شماره IGS-M-PL-002(1), Part 1, APPENDIX ارجاعی از سرپرست شرکت مطرح و تصویب شد.

ناصر آبگون
دبیر هیأت مدیره

رونوشت : سرپرست محترم شرکت ملی گاز ایران و قائم مقام رئیس هیأت مدیره
: اعضای محترم هیأت مدیره/ رئیس محترم امور حسابرسی داخلی / رئیس محترم امور حقوقی

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ADDENDUM : The following paragraph of IGS-M-PL-02 ,part 1,1387 ,(sub-clause 3.13) ,has been replaced by attached table.**"Valve external surface shall be painting or coating as per manufacture's standard"**

ABOVE GROUND PLUG VALVE	
Primer coat	Epoxy polyamide ,in accordance with SSPC 22 ,with a min. thickness of(DFT) of 70µm .
Intermediate coat	Epoxy polyamide ,in accordance with SSPC 22 , with a min. thickness of 140µm.
Top coat	Two-component aliphatic polyurethane , in accordance With MIL-C-83286 B ,or equivalent ,with min. thickness (DFT) of 70µm. Colour : white (RAL 9016)
BURIED PLUG VALVE	
First option	
Two-component liquid epoxy Coating in Accordance with EN 10289	1.Service temperature : -20° C to +60° C. 2.Thickness : class B (min. DFT 800µm). 3.Cutback at the ends : (100±10)mm.
Second option	
Two-component Polyurethane Coating in Accordance with EN 10290	1.Service temperature : -20° C to +60° C. 2.Thickness : class A(min. DFT 800µm). 3.Cutback at the ends : (100±10)mm.

Normative references.

1.SSPC-paint 22 : Epoxy polyamide paints (Primer ,Intermediate , Top coat).

(Editorial changes Sept.2000)

2.MIL-C-83286 B : Urethane , Aliphatic Isocyanate For Aerospace applications.

3.BS EN 10289 (200 2) : Steel tubes and fittings for onshore and offshore pipelines-External liquid applied epoxy and epoxy-modified coatings.

4.BS EN 10290 , 2002 : Steel tubes and fittings for offshore and offshore pipelines-External liquid applied polyurethane and polyurethane modified coatings.

FOREWORD

This standard cancels and replaces PLD 102, which has been technically revised, it intended to be mainly used by all divisions of N.I.G.C., and has been prepared on interpretation of recognized standards, technical documents, knowledge, backgrounds and experiences in gas industries at national and international levels.

Iranian Gas Standards (IGS) are prepared, reviewed and amended by technical standard committees within NIGC standardization division of research & technology management and submitted to "the Standards council of NIGC" for approval.

Iranian Gas Standards (IGS) are subjected to revision , amendment or withdrawal , if required , thus the latest edition of IGS shall be checked / inquired by NIGC users .

Any comments from concerned parties or individuals in IGS'S are welcomed.

TABLE OF CONTENT

1.0. SCOPE

1.1 This standard covers the minimum requirements for carbon steel lubricated taper plug valves in normal size of 2-24 inch for class rating of 150,300 and 600.

1.2 This standard covers valve for sweet natural gas concerning distribution, transmission systems and compressor station services. The valve shall be suitable for design temperature range from -29^{0}C to 60^{0}C , for sour gas clause 3.11 (current standard) shall be followed.

1.3 Any points not covered by this standard shall be in accordance with API 6 D, and ANSI /ASME B.16.34 (latest edition).

2.0. NORMETIVE REFERENCES :

- API 6 D:	**Petroleum and natural gas industries–pipeline transportation systems – pipeline valves**
- API 6 FA:	**Specification for fire test for valves**
- ANSI/ASME B16.34:	**Valves – flanged threaded, and welding end**
- ASME SEC.VIII:	**Boiler & pressure vessel code**
- ASTM A 105:	**Standard specification for carbon steel forgings for pipelin application**
- ASTM A216:	**Standard specification for carbon steel casting, suitable for fusion welding, for high temp. Service**
- ANSI B. 16.5:	**Pipe flanged and flanged fittings NPS ½ through NPS 24**
- ASTM A 193:	**Standard specification for alloy steel and stainless steel bolting materials for high temp . Service**
- ASTM A194:	**Standard specification for carbon and alloy steel nuts for bolts for high pressure of high temp .Service or both**
- MSS-SP-55:	**Quality standard for steel castings for valves, flanges , fitting,**

and other piping components, visual method for evaluation of surface integrity

3.0. DESIGN

3.1. Valves from 2 to 24 inch shall be in accordance with API 6 D and ANSI/ASME B 16.34

3.2. Flanged ends valves shall be furnished with raised face and serriated finish , flanges shall be integral with the body.

3.3. Unless otherwise specified, all lubricated taper plug valves must be of the inverted plug "The pressure balance type"

3.4. When specified standard type (non-pressure balanced) are permitted only for class 150 , up to 8 inch inclusive.

3.5. The port area shall be rectangular and meet the following :

- **Regular pattern : Minimum 60 percent of valve end area .**
- **Short pattern : Minimum 40 percent of valve end area .**
- **Venturi pattern : Minimum 40 percent of valve end area .**

3.6. Face to face and end to end dimensions shall be in accordance with API 6D latest edition

3.7. Valves shall be fire safe in accordance with one of the following standards:

- **API 6 FA**
- **B.S.6755 part2**

3.8. Valves shall be designed to be able to accommodate a device for locking the plug assembly in both open and closed position.

3.9. Valve shall be furnished with a position indicator , showing open position in the direction of flow and close position perpendicular to direction of flow , the on/off marking shall be in English, easily visible and permanently legible.

3.10. System sealing shall be designed for easy replacement while the valves is in the open position, all valves stem seals shall be designed in order to utilizing at least two separate independent stem seals wherein one seal is replaceable without gas flow interruption or alternatively shall be equipped with a facility for injection of secondary sealant

3.11. In the case of sour gas, all parts, material, welds, and heat effected zones of welds exposed to line fluids shall meet the hardness, carbon equivalent valve. (CEV) and heat treatment requirements as specified in ISO 15156 part 1, 2, 3 additional requirements should be specified by end user.

3.12. Design, Manufacturing. Dimension, testing and marking shall be all in accordance with API 6D and ANSI /ASME B 16.34 latest edition.

3.13. Valve external surface painting or coating as per manufacturer's standard, but details shall submitted.

3.14. Performance test and certificate shall be according to appendix 1, visual examination, radiography and magnetic particle testing shall be according to appendix 2.

4.0. MATERIAL :

Body, Bonnet, Cover ,ends:	**Cast carbon steel at least according to ASTM A216 Grade WCB/WCC or BS 1504 - 161 GRADE 430/480 or forged carbon steel at least to ASTM a 105 or BS 1503 GRADE 221/550**
Plug:	**Cast carbon steel at least according to ASTM A 216, Grade WCB/WCC or BS 1504 – 161 GRADE 430/480, or forged carbon steel to ASTM a 105 or BS 1503, grade 221/550**
	Plug surface shall have special treatment, electroless

	nickel plated with minimum 25µ thickness as per ASTM B656 or hard chromium plated with minimum 25µ thickness as per ASTM B 650, with or without special type of PTFE as top layer, for ease of operation and tightness. **Top layer thickness shall be specified by manufacturer.**
Stem:	**Forged carbon steel at least to ASTM A105 or BS 1503, Grade 221/550 or alloy steel bar at least according to AISI 4140 with hard chromium or electroless nickel plating or special type of PTFE .**
Non-metallic parts:	**Shall be made of suitable elastomer/ Plastomer materials (such as PTFE, viton according to ASTM D2004, HK 710 or ASTM D-145) .**

5.0. DOCUMENTATION :

5.1. Required documents at the stage for technical evaluation:

- **Up dated API 6 D monogram .**
- **Sectional drawing , with part- list materials.**
- **Original technical catalogue.**
- **Related data sheet.**
- **List of recommended spare parts.**
- **Packing procedure.**

5.2. Required documents at stage of ordering:

- **Four set of manufacturing drawing including list of material & technical information.**
- **Operation maintenance manual.**

METHOD OF OPERATION

Table 1

SIZE (in)	METHOD OF OPERATION		
	CLASS RATING 150	CLASS RATING 300	CLASS RATING 600
2	WRENCH (1,2)	WRENCH (1,2)	WRENCH (1,2,3)
4	WRENCH	WRENCH	WRENCH
6	WRENCH	WRENCH	GEAR
8	GEAR	GEAR	GEAR
10	GEAR	GEAR	GEAR
12	GEAR	GEAR	GEAR
16	-----	GEAR	GEAR
20	------	GEAR/ACTUATOR	GEAR/ACTUATOR
24	-------	GEAR/ACTUATOR	GEAR/ACTUATOR

Notes:

1- Plug pattern

(1) : Short

(2) : Venturi

(3) : Regular

2- Gear box Specification shall be according to IGS-MS PL-009(0):2005 .

3- Stem extension & matching pipe shall be specified by client .

4-The length of the wrench shall be such that a force not exceeding 350N to be required to operate the valve from either its open or close position under the maximum differential pressure.

DATA SHEET

MANUFACTURER	**ENQUIRY NO:**
REQUIRED SPECIFICATION:	

GENERAL

ITEM NO ☐	**QUANTITY** ☐	
STANDARD TYPE ☐	**PRESSURE BLANCE TYPE** ☐	
SIZE ☐	**CLASS** ☐	
PORT AREA (RECTANGULAR) PERCENTAGE	☐	
STEM EXTENSION	**IF REQUIRED LENGTH :** ☐	**NOT REQUIRED**
SERVICE TEMPERATURE	**MIN : (^{0}C)** ☐	**MAX: (^{0}C)** ☐

END CONNECTION

FLANGED ENDS	**R.F. YES☐ NO☐**	**S.F. YES☐ NO☐**	
	SIZE: ☐	**PRESSURE CLASS:** ☐	
	ANSI B16.5	**YES☐**	**NO☐**
WELDING ENDS	**END PREPARATION**	**ASME B.31.8**	**YES☐ NO☐**

VALVE SPECIFICATION

MODEL		
ANTI -BLOW OUT STEM	**YES☐ NO☐**	
FIRE SAFE DESIGN	**YES☐ NO☐**	
FIRE SAFE RELEVANT STANDARD		
OPERATING TEMP RANGE -29^{O}C TO 60^{O}C	**YES☐ NO☐**	
ANTI STATIC DEVICE	**YES☐ NO☐**	
APPLICABLE TO SOUR GAS	**YES☐ NO☐**	
SEALANT INJECTION	**STEM: YES☐ NO☐**	**PLUG: YES☐ NO☐**

OPERATION	**WRENCH**	**GEAR**	**ACTUATOR**
	☐	☐	☐
LOCKING DEVICE	**YES** ☐	**NO** ☐	
OVERALL DIMENSION	**END TO END (mm)** ☐	**FACE TO RACE (mm)** ☐	
WEIGHT(kg)			

REQUIRED DOCUMMENTATION

THE MANUFACTURER SHALL SUBMIT THE FOLLOWING DOCUMENTATION BELOW FOLLOWING ORDERING		
NON - DESTRUCTIVE EXAMINATION (NDE) RECORD	**YES**	**NO**
NACE HARDNESS CERTIFICATION		
NDT PROCEDURES		
FIRE TEST CERTIFICATE		
TYPE APPROVAL BY A RECOGNIZED CERTIFICATION BODY AGENCY		
VALVE EXTERNAL SURFACE PAITING OR COATING		
QUALITY PLAN		
CYCLING TEST CERTIFICATE FROM INDEPENDENT & RECOGNIZED CERTIFYING BODY		

APPENDIX 1

PERFORMANCE TEST BY CYCLING METHOD :

Manufacturer shall submit the cycling test certificate from an independent & certifying body.

- **Required Number of cycle must be at least 10,000. times for valves from 2 to 24 in**
- **inch ,concerning checking the integrity of plug external coating.**
- **Required number of cycle must be at least 3,000. times for valves from 2 to 24**
- **Inch ,concerning checking the leak performance after cycle test.**
- **TEST PROCETURES SHALL BE AS FOLLOWS :**

Introduction :

Performance test (type test) , shall be carried out in accordance with this Annex by an authorized certifying body, as long as the design, manufacturing method and material have not been changed, the issued certificate is valid.

1- Selection of sizes for type testing :

2-1. for valves from 2 to 24 in. , class 150,300,600, qualification of the range shall be as follows :

Half of the largest produced size in each class rating.

2-2. If the cycle test has been carried out on a valve with higher class rating, the other lower class rating at the same size range of same manufacturer is acceptable.

2-3. Two samples shall be chosen, one for checking the integrity of plug external coating (regardless of type of coating after 10,000 cycles , and one for checking the leaking of the valve, after 3000 cycles.

2-4. The selected samples must meet all the requirements of IGS –M-PL-002(2), Part 1.

2-5. Tthe chosen test valves port area shall be as per this IGS standard.

2-6. Selection of test samples shall be done by manufacturer.

3.Checking the integrity of plug external coating :

3-1. Prior to cycling test, all the requited tests as per IGS-M-PL-002 (1), shall be carried out to make sure, the selected test valve meets all the requirements of IGS standard.

3-2.Tthe selected valve shall be cycled for 10,000 times.

3-3.Tthe plug shall be cycled in body taper seat in original condition .

3-4.During the cycle test, after every 2000 cycles, the plug surface shall be examined to verify the integrity of anti- friction coating of the plug.

3-5.**Acceptance criteria:**

After 10,000 cycles, the plug surface shall be visually examined, which not more than 50% of plug anti- friction coating may de-scaled or worn.

3.6. **Testing procedure for checking the integrity of plug external coating:**

3-6-1. Every minute valve shall be opened & closed one time.

3-6-2.Tthe cycling speed shall be specified by certifying body.

3-6-3.If cycle test is carried out at manufacturer's works, all machinery, instruments & programming of cycle test shall be evaluated approved & recorded by certifying body.

3-6-4. The authorized certifying body must make sure the selected sample by the manufacturer is produced in his own facility.

3-6-5. The sample shall be tested in ambient condition and within 20-30 ^{0}C temp.

4.Checking the leaking phenomena after cycle test :

4-1. Prior to cycling test , all required tests as per IGS-M-PL-002(1) before external coating of the valve body , shall be carried out & make sure , the selected valve for cycling test meets all requirements or IGS standard .

4-2. the selected valve shall be cycled for 3000 times.

4-3. At the end of the test, valve shall be tested as per IGS standard & no leaking is allowed.

4-4.Testing procedure:

4-4-1. Every minute valve shall be opened & closed one time.

4-4-2. In every 100 cycles (opened & closed) valve shall be re-lubricated.

4-4-3. Make sure , there is not any leak at end of every 100 cycles , before re- lubricating the valve under test , the seat test (as per API 6 **D**) shall be carried out , no adjustment is permitted till end of 3000 cycles.

4-4-4.The cycling speed shall be specified by certifying body.

4-4-5. If cycle test is caring out at manufacturer's works, all machinery, instruments & programming of cycle test shall be evaluated, approved & recorded by certifying body.

4.4.6. The authorized certifying body must make sure the selected sample by the manufacturer is produced in his own facility.

4-4.7.Tthe sample shall be tested in ambient condition & within 20-30^{0}C temp.

5. The attached data sheet shall be filled, signed & stamped by authorized certifying body & the manufacturer.

Date sheet

Performance test (cycle test)

<table>
<tr><td>Manufacturer's name and address</td><td colspan="5"></td></tr>
<tr><td>Certifying body's name and address</td><td colspan="5"></td></tr>
<tr><td rowspan="5">Test result details of samples as per API6D/IGS. and this annex.</td><td rowspan="2">Sample 1 (integrity test)</td><td>Class</td><td>Size (in)</td><td>Port area</td><td>Fig no</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="5"></td></tr>
<tr><td rowspan="2">Sample 2 (leak test)</td><td>Class</td><td>Size (in)</td><td>Port area</td><td>Fig no</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>Overall comments of certifying body as per this appendix and API6D/IGS</td><td colspan="5"></td></tr>
<tr><td rowspan="2">Manufacturer.s authorized person</td><td>Name</td><td>Signature</td><td>Stamp</td><td colspan="2">Date</td></tr>
<tr><td></td><td></td><td></td><td colspan="2"></td></tr>
<tr><td>Certifying body,s authorized person</td><td></td><td></td><td></td><td colspan="2"></td></tr>
</table>

APPENDIX 2
VISUAL , RADIOGRAPHY AND MAGNETIC PARTICLE EXAMINATION

VISUAL EXAMINATION:	**Surface defect of casted body shall be checked in accordance with MSS-SP-55**
RADIOGRAPHY:	**20% of each individual order of casted body valve ends shall be 100 percent radiographed for a length of 50 mm or twice of end thickness , which ever is larger, in accordance with ASTM E-94 and no defect permitted.**
MAGNETIC PARTICLE TESTING:	**All interior and exterior surface of cast steel body shall be 100 percent magnetic particle tested in accordance with ASME SECTION V and interpreted in accordance with ASME section V11 DIV . 1**