



شرکت ملی گاز ایران

مدیریت پژوهش و فناوری

امور تدوین استانداردها

IGS

Iranian Gas Standards

مشخصات فنی خرید

گریس آب بندی برای شیرهای سماوری و توپکی

Sealant for Ball and Plug Valves Used in Natural Gas System



شرکت ملی گاز ایران

دفتر مدیر عامل

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FOREWORD

This standard specification is intended to be mainly used by NIGC and contractors 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 Div. 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 users .

This standard must not be modified or altered by the end users within NIGC and her contractors . Any deviation from normative references and/or well known manufacturers specifications must be reported to standardization division .

Any comments from concerned parties on NIGC distributed IGS are welcome to technical standards committees and will receive serious attention and consideration should a revision to standards is recommended .

GENERAL DEFINITIONS :

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

1- "**STANDARDIZATION DIV.**" has been organized to deal with all aspects of industrial standards in NIGC . Therefore , all queries for clarification or amendments are requested to be directed to the mentioned division .

2- "**COMPANY**" : refers to National Iranian Gas Company .

3- "**SUPLIER**" : refers to a firm who will supply the service , equipment or material to IGS specification 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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1. SCOPE

1.1 This standard specification covers the NIGC requirements for sealant which is used for sealing and/or lubricating of ball and plug valves concerning in natural gas distribution and transmission system, compressor station, that works at warm and cold climates.

Note : The operational temperature range in NIGC gas refineries is between -70 °C to 200 °C and in its gas transmission lines is within -40 °C to 90 °C.

1.2 The sealant may be furnished in the following types:

Type I : Bulk

Type II : Stick

2. NORMATIVE REFERENCES

Throughout this standard specification the following standards are referred to the editions of these standards that are in effect at the time of issue of this standard specification (2010) shall, to the extent specified herein, form part of this standard specification. The applicability of changes in standards that occur after the date of this standard specification shall be mutually agreed upon by the purchaser and the supplier.

ASTM D 1403 (2007) "Standard Test Method for Cone Penetration of Lubricating Grease Using One-Quarter and One-Half Scale Cone Equipment"

ASTM D 217 (2002) "Standard Test Method for Cone Penetration of Lubricating Grease"

ASTM D 2265 (2006) "Standard Test Method for Dropping Point of Lubricating Grease Over Wide Temperature Range"

ASTM D 566 (2002) "Standard Test Method for Dropping Point of Lubricating Grease"

ASTM D 4048 (2002) "Standard Test Method for Detection of Copper Corrosion from Lubricating Grease"

ASTM D 1264 (2008) "Standard Test Method for Determining the Water Washout Characteristics of Lubricating Greases"

ASTM D 1742 (2006) "Standard Test Method for Oil Separation from Lubricating Grease During Storage"

ASTM D 972 (2008) "Standard Test Method for Evaporation Loss of Lubricating Greases and Oils"

MIL G 6032 D (1988) "Plug Valve, Gasoline and Oil Resistant. NATO Code : G . 363 : 2002 : Grease, Plug Valve, Hydrocarbon Resistant"

Defence Standard 91-6 "Grease, Plug Valve, Hydrocarbon Resistant" , NATO Code G-363 , Joint Service Designation XG-235, August 2002"

3. REQUIREMENTS

3.1 Materials

The sealant shall be a mixture consisting of animal, vegetable or synthetic oil, or a combination thereof, and a suitable viscosifier and or gelling agent (such as organoclay or organophilic clay). The sealant shall contain no solid fillers such as graphite, mica, sulfur, clay, asbestos or chalk.

The sealant when examined visually shall appear homogeneous, free of lumps, crust and separated oil.

Note : Synthetic base oil of sealants must be approved by FT-IR spectroscopy.

3.2 Physical Properties

Physical properties of the sealant shall be in accordance with table 1 (for warm climate) and table 2 (for cold climate), when tested in accordance with specified test methods.

3.3 Performance Test

The sealant performance shall be approved with cycling test. This type test shall be carried out in accordance with Appendix 1 IGS-M-PL-002(2) Part 1: 2002 by an recognized authorized certifying body and manufacturer shall submit this cycling test certificate.

Note : Appendix 1 IGS-M-PL-002 Part 1 : 2002 is submitted in Appendix F this standard specification.

As long as the properties and manufacture of sealant have not been changed, the issued certificate is valid.

The selected test valve shall meet all requirements of IGS-M-PL-002 (0) Part 1.

The test procedure shall be as Appendix 1 above mentioned IGS and required number of cycle shall be 3000.

The size of selected test valve shall be in accordance with clause 2 of IGS-M-PL-002 (0) Part 1.

At the end of the test, valve shall be tested as per IGS standard and no leaking is allowed.

3.4 Corrosivity Test

Corrosivity of the sealant shall be approved by one of the following tests:

- 1- RIPI. TEST METHOD (APPENDIX E)
- 2- DEF STAN 91-6/4 (APPENDIX C)

TABLE 1 – Sealant Specifications for Ball and Plug Valves Used in Natural Gas Network pipeline (Warm Climate)

(Warm Climate)

Item	Property	Value				Unit	Test Method	Type of Test				
		Bulk		Stick								
1	Appearance	Homogeneous and free from impurities.				---	Visual examination	Routine				
2	Consistency (equivalent NLGI grade)	3	4	5	6	NLGI Grade	---	---				
3	Cone Penetration at 25 °C					0.1 mm	ASTM D 217 or ASTM D 1403	Routine				
	Unworked, min								220	170	130	80
	Worked, max								260	200	160	115
4	Dropping Point, min	220		260		°C	ASTM D 566 or ASTM D 2265	Routine				
5	Copper Corrosion at 100 °C, 24 hrs					---	ASTM D 4048	Routine				
	Condition of copper strip								No pitting, etching or dark brown, green, black or grey staining (classification 1a maximum) .			
	Condition of sample								No change in texture and no green, grey or black coloration. Slight discoloration is permissible.			
6	Water Washout Characteristics at 79 °C, 2 hrs. max	4		4		mass%	ASTM D 1264	Type				
7	Oil Separation at 100 °C, in 30 hrs, max	3		2		mass%	ASTM D 1742	Type				
8	Evaporation Loss at 100°C, after 22 hrs, max	1		1		mass%	ASTM D 972	Type				
9	The Resistance of Grease to Fuel*	30		25		mass%	DEF STAN 91-6/4 ANNEX A	Routine				
	Solubility, max											
	Deterioration of the sample at 23 ± 2°C					---						
	After 7 ± 0.5 hrs immersion in test fluid								No swelling, blistering, cracking, loss of adhesion or other deterioration.			
After 24 hrs air drying	No swelling, blistering, cracking, loss of adhesion or other deterioration.											
10	The Resistance of Grease to Water at 23 ± 2 °C for 168 ± 2 hrs					---	DEF STAN 91-6/4 ANNEX B	Routine				
	Disintegration of the sample								No disintegration of the sample.			
	Appearance of the water	No more than slight turbidity of the liquids.										

11	The Resistance of Grease to Aqueous Alcohol** at 23 ± 2 °C for 168 ± 2 hrs		---	DEF STAN 91-6/4 ANNEX B	Routine
	Disintegration of the sample	No disintegration of the sample.			
	Appearance of the aqueous alcohol	No more than slight turbidity of the liquids.			
12	Film Stability and Corrosivity of Steel Test Panels at Elevated Temperatures at 100 ± 1 °C for 168 ± 2 hrs		---	DEF STAN 91-6/4 ANNEX C	Routine
	Changes observed in the sample	No hardening, cracking or separation of the sample .Slight discoloration is permissible.			
	Corrosion observed in the steel test panels	No corrosion or resinous deposit on the steel panel.			
13	Storage Stability	No separation of oil, formation of granular particles or any non homogeneity in the container.	---	Note 1	Routine
14	Grease Stability and Corrosivity of Steel, Aluminum, Grey Cast Iron and Brass*** at 60 °C, 40 bar, for 168 hrs		---	RIPI Method	Type
	Changes observed in the sample	No hardening, cracking or separation of the sample .Slight discoloration is permissible.			
	Corrosion observed in the strips test panels	No corrosion or resinous deposit on the strips panels.			

● Test fluid, of the following composition by volume at 20 ± 5 °C:

- I. 60% 2,2,4 . Trimethylpentane, laboratory reagent grade.
- II. 25% Toluene, laboratory reagent grade.
- III. 15% Xylene , laboratory reagent grade.

●● Aqueous alcohol; a 50/50 v/v mixture of distilled water and industrial methylated spirits, to BS 3591, grade 68.

●●● See "APPENDIX E" , E.3 Apparatus.

Note 1: A 0.5 kg (one. pound) can of sealant, with the lid tightly sealed on, shall be stored for 120 days at 54 ± 5 °C.

Note 2: For type test, a certificate shall be submitted from an independent laboratory. Each certificate is credible for maximum two years.

Note 3: The independent laboratory shall be approved by NIGC.

Note 4: The routine test shall be carried out respectively
If the result of each of these tests is failed the following tests are canceled and the sealant is rejected.