



شرکت ملی گاز ایران

مدیریت پژوهش و فناوری

امورتدوین استانداردها

IGS

مشخصات فنی خرید

کیت عایقی فلنج

Flange Insulation Kit

ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری و رئیس شورای استاندارد

باسلام،

به استحضار می‌رساند در جلسه ۱۳۸۱ مورخ ۱۳/۸/۱۳۸۸ هیأت مدیره، نامه شماره گ.۹۲۵۶۵۱۰۰۰۷۹ مورخ ۸۸/۷/۲۱ آن مدیریت در مورد تصویب نهایی استاندارد ها تحت عنوان "کیت عایقی فلنج ها" به شماره استاندارد (017(0) IS-M-EP و "معدلات ساینده و آب بندی مربوط به غلاف های خطوط نولسه" به شماره استاندارد (015(0) IS-M-EP مطرح و مورد تصویب قرار گرفت.

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رئیس هیأت مدیره

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FOREWORD

This standard specification has been technically revised , and up dated , it intended to be mainly used by all divisions of N.I.G.C. and EPC 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 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 IGS users.

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

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1.0. Scope.

This standard specification covers the minimum requirements for the design, materials, manufacturing, inspection and testing, marking and packing of flange insulation kit, intended for electrical isolation of cathodically protected pipelines and to seal the flanges and prevent electrical leakage of the transported gas within the piping system.

2.0. References.

Throughout this standard the following standards and codes are referred to. The applicability of changes in codes and standards that occur after the date of this specification shall be mutually agreed upon by the purchaser and manufacturer.

2.1. Normative references.

- 2.1.1. NACE SP 0286-(2007)** : the electrical isolation of cathodically protected pipelines
- 2.1.2. ANSI B16.21-(2005)** : Nonmetallic flat gaskets for pipelines flanges
- 2.1.3. ANSI B 16.5- (2003)** : Pipe flanges and flanged fitting NPS 1/2 through 24 NPS.
- 2.1.4. ANSI B1647- (2006)** : Large – diameter steel flanges
: :
- 2.1.5. ASTM D 709-(2001)** : Standard specification for laminated thermosetting materials.
- 2.1.6. ASTM B 633-(2007)** : Standard specification for electro-diposited coatings of zinc on iron and steel.
- 2.1.7. ASTM D 229-(2001)** : Standard test methods for rigid sheet and plate materials
- 2.1.8 . ASTM D 1505- (2005)** : Standard test method for density of plastics by the density –
gradient technique
- 2.1.9 . ASTM D 374-(1993)** : Standard test methods for thickness of solid electrical insulation
- 2.1.10. ASTM D149-(2004)** : Standard test method for dielectric breakdown voltage and dielectric strength of solid electrical insulation materials at commercial power frequencies

- 2.1.11. **ASTM D 570 – (1998)** : Standard test method for water absorption of plastics
- 2.1.12. **ASTM D 638-(2003)** : Standard test method for tensile properties of plastics
- 2.1.13. **ASTM D 883-(2007)** : Standard definitions of terms relating to plastics
- 2.115 . **ASTM F844-(2003)** : Standard specification for washers ,steel plain (flat)
Unhardened for general use.
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3.0. Definitions :

-Gasket

A material, which maybe clamped between faces, and acts as a static seal and electrical insulation. Gaskets are cut, formed or molded in to the desired configuration.

-High density polyethylene plastics, (HDPE)

Those linear polyethylene plastics having a standard density of 0.941 g/cm³ or greater.

-Spot facing

All cast and forged flanges and flanged fittings shall have bearing surfaces for bolting which shall be parallel to the flange within 1 deg .

-Fabric – reinforced phenolic laminate core material

It shall consist of a suitable cotton fabric base or filler properly impregnated and bonded with a phenolic thermosetting resin compound or binder.

4.0. Requirements

4.1 Design

4.1.1 Each kit shall include the following components:

- a) Insulating central gasket
- b) Insulating bolt sleeves
- c) Insulating bolt washers
- d) Steel bolt washers

4.1.2 The insulating central gasket, which will be specified by the purchaser, shall be one of the following types:

a) Full face

b) Self centering flat ring

It shall be suitable for installing on raised face serrated finish flanges conforming to: ANSI B16.5 for flange sizes to 24" (inclusive).

ANSI B16.47 for flange sizes 30" and larger .

The gaskets shall have a nominal thickness of 3.2 mm and protrude in to the bore of the pipe by 1.5 mm to prevent electrically conductive bridging over the insulation by debris, etc.

The gaskets dimensions shall be all according to ANSI B 16.21.

4.1.3 Insulating bolt sleeves are normally designed for standard bolting in standard bolt holes and shall be of sufficient length to extend halfway inside the steel washer.

4.1.4 Insulating bolt washers shall be sized internally so that the bolt sleeve will pass through , and the OD shall be sized so that the washer will fit inside the flange spot facing .

4.1.5 Steel washers shall be the same size as the insulating washer.

4.2. Materials :

4.2.1 The central gasket shall be made of a fabric – reinforced phenolic laminate core material coated on both sides with a neoprene sheets to meet the requirements of this specification, which meet ASTM D 709 type II grade CE.

The finished product shall be uniform in texture, finish and specified properties.

Gasket materials shall conform to the requirements for physical properties prescribed in table 1.

Table 1 – Properties of insulating gasket materials

Element	Unit	Requirement	Test method
Thickness (nominal)	MM	3.2	ASTM D 229
Flextural strength (min)	PSI (MPa)	22000(151)	ASTM D 229
Compressive strength (min)	PSI	24000	ASTM D 229
Dielectric strength (min)	KV/mm	20	ASTM D 229
Tensile strength (min)	PSI (MPa)	25000(172)	ASTM D 229
Rockwell hardness (max) scale M	--	90	ASTM D 229
Water absorption (max)	%	1.6	ASTM D 229

4.2.2 Insulating bolt sleeves shall be fabricated from high density polyethylene

Material, to which shall be added only antioxidants, UV stabilizers and pigments necessary for the manufacture of sleeves to the specification and to its end use.

The insulating bolt sleeves shall meet the requirements of table 2.

4.2.3 Insulating bolt washers, shall be fabricated from fabric – reinforced phenolic Material conforming to the requirements of table 3.

4.2.4 Steel washers shall be fabricated from 3.2 mm thickness (nominal) hot rolled Steel washer as per ASTM F844, zinc plated by electrodepositing in accordance with ASTM B 633 class fe/zn5, type II.

4.2.5 The materials shall be free from blisters, wrinkles, air marks or cracks, and reasonably free from other small defects such as scratches, dents, heat marks or other defects affecting serviceability.

Table 2 – Properties of insulating sleeve

Element	Unit	Requirement	Test method
Density (min)	G/cm ³	0.941	ASTM D 1505
Thickness (nominal)	mm	0.8	ASTM D 374
Water absorption (max)	%	0.01	ASTM D 570
Dielectric strength(min.)	KV/mm	16	ASTM D 149

Table 3 – Properties of insulating washer

Characteristic	Unit	Requirement	Test method
Thickness (nominal)	mm	3.2	ASTM D 229
Compressive strength (min)	PSI	26000	ASTM D 229
Water absorption (max)	%	1	ASTM D 229
Dielectric strength (min)	KV/mm	20	ASTM D 229

5.0 Inspection, Test and Certification :

5.1 All tests and inspections shall be made at works prior to shipment. The manufacturer shall be responsible for carrying out all the tests and inspections required by this specification.

5.2 The purchaser or his representative shall have free access to the work to inspect the quality of base and finished materials and to witness the quality control tests.

5.3 The manufacturer / supplier shall provide all means necessary for carrying out their inspection, checking and packing with this specification requirements free of charge.

5.4 The manufacturer / supplier shall furnish or the purchaser or his representative to select of the material representative of each lot of product.

5.5 The manufacturer / supplier shall furnish the purchaser with a certified copy of results of tests made by the manufacturer covering physical and performance characteristics of each lot of product to be supplied under this specification.

Certified test reports and samples furnished by the manufacturer / supplier shall be properly identified with each lot of product.

6.0 Marking :

6.1 Each gasket shall be marked with clearly legible letters on both sides with the manufacturer's name, trade mark, size , pressure rating and material.

6.2 Each kit box shall be marked with the following information:

- Enquiry No
- Shelf life
- Size
- Pressure rating
- Batch No
- Date of manufacture
- Storage condition
- Manufacturer's name

7.0 Packing / Packaging :

All materials shall be packaged in suitable container to ensure safe delivery to their destination.

Individual materials shall be packed in such a manner as to protect the material against physical and mechanical damage and contamination during shipment, handling and storage.

Each kit shall also contain recommended sequence for tightening flange bolts.

8.0 Documentation :

The technical bid shall include the following:

- a)** Original catalogue showing materials, dimensions, technical data and configuration.
- b)** Material specification for the items to be offered.
- c)** Packing specification.
- d)** Installation manual.

9. 0. Data sheet

Manufacturer 's name @ address:		Purchaser/end user :	
Enquiry no.		Project title :	
Gasket type : full face <input type="checkbox"/>	Sleeve type ;	Washers:	
Self-centering flat ring <input type="checkbox"/>	Full length <input type="checkbox"/>	Single set <input type="checkbox"/>	
	Half length <input type="checkbox"/>	Double set <input type="checkbox"/>	
Design elements			
Pressure (PSI /BAR)			
Temperature (C)			
ANSI class rating			
Specific elements			
Quantity			
Flange size			
Flange ID/SCH			
Flange standard			

Notes :

- 1 : This data sheet shall be filled by purchaser/end user and to signed and stamped by manufacturer.
- 2 : the deviation from this standard specification shall be specified by manufacturer