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مشخصات فنی خرید

دی اتیلن گلیکول برای نم زدایی از گاز طبیعی

Diethylene Glycol (DEG) for Dehydration of Natural Gas



شرکت ملی گاز ایران

دفتر مدیرعامل

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- ۱- دستورالعمل جوشکاری و آزمون غیر مخرب استحکام و عدم نشتی سه راهی انشعاب پلی اتیلن IGS-C-DN-04(0)
- ۲- مشخصات استاندارد مساده دی اتیلن کلاکول برای تم زبانی از گاز طبیعی IGS-M-CH-022(1)
- ۳- مشخصات فنی خرید گریس آب بندی برای شیرهای سمانوری و توپکی IGS-M-CH-037(0)

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FOREWORD

This standard is intended to be mainly used by NIGC and contractors and has been prepared on interpretation 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 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 mentioned division .
- 2- "COMPANY" : refers to national Iranian gas company .
- 3- "SUPPLIER" : 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

This standard specification covers the minimum requirements for diethylene glycol (DEG) for dehydration in natural gas treating plant . This standard specification provides purity , properties and test methods .

2. 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 93 (2002) "Standard Test Methods for Flash – Point by Pensky – Martens Closed Cup Tester"

ASTM D 445 (2001) "Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)"

ASTM D 482 (2002) "Standard Test Method for Ash from Petroleum Products"

ASTM D 1015 (2005) "Standard Test Method for Freezing Points of High-Purity Hydrocarbons"

ASTM D 1078 (2001) "Standard Test Method for Distillation Range of Volatile Organic Liquids"

ASTM D 1209 (2000) "Standard Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)"

ASTM D 1613 (2006) "Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint , Varnish , Lacquer , and Related Products"

ASTM D 1747 (1999) "Standard Test Method for Refractive Index of Viscous Materials"

ASTM D 2766 (2000) "Standard Test Method for Specific Heat of Liquids and Solids"

ASTM D 4052 (2002) "Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter"

ASTM E 202 (2000) "Standard Test Method for Analysis of Ethylene Glycols and Propylene Glycols"

ASTM E 203 (2008) "Standard Test Method Water Using Volumetric Karl Fischer Titration"

ASTM E 300 (2000) "Practice for Sampling Industrial Chemicals"

ASTM E 394 (2000) "Standard Test Method for Iron in Trace Quantities Using the 1,10-Phenanthroline Method"

BS 6829 Sec. 1.6 (1995) "Analysis of Surface Active Agents (Raw Materials) Part 1: General Methods Section 1.6 : Method for Determination of Solubility in Water"

3. DEFINITION

Diethylene Glycol (DEG)

Diethylene glycol (DEG) is an organic compound described by the structural formula $\text{HO-CH}_2\text{-CH}_2\text{-O-CH}_2\text{-CH}_2\text{-OH}$. It is a clear, hygroscopic, odorless liquid. It is miscible with water and polar organic solvents such as alcohols and ethers.

4. REQUIREMENTS

4.1 Purity

The composition of diethylene glycol shall be in accordance with Table 1 when tested in accordance with specified test methods.

4.2 Sampling

The sampling shall be carried out in accordance with ASTM E 300.

4.3 Properties

The physical properties of diethylene glycol (DEG) shall be in accordance with Table 2 when tested in accordance with specified test methods.

Table 1 – Purity

Item	Content	Unit	Value	Test Method
1	DEG ,min	wt %	99.0	ASTM E 202
2	*MEG , max	wt %	0.5	ASTM E 202
3	**TEG , max	wt %	0.5	ASTM E 202
4	Water , max	wt %	0.2	ASTM E 203
5	Acidity as acetic acid , max	wt %	0.005	ASTM D 1613
6	Ash , max	wt %	0.005	ASTM D 482
7	Iron , max	ppm	1.0	ASTM E 394

*MEG : Monoethylene glycol

**TEG : Triethylene glycol

Table 2 – Physical Properties

Item	Characteristic	Unit	Value	Test Method	Type of Test
1	Apparent specific gravity at 20 °C , min	---	1.1170	ASTM D 4052	Routine
2	Color , max	---	15	ASTM D 1209	Routine
3	Boiling point , 760 mm Hg , min	°C	240	ASTM D 1078	Routine
4	Viscosity at 20 °C , min	cP	35.7	ASTM D 445	Routine
5	*Flash point , min	°C	140	ASTM D 93	Type
6	*Solubility in water at 20 °C	% by wt	100	BS 6829 sec. 1.6	Type
7	*Refractive index at 20 °C , min	---	1.447	ASTM D 1747	Type
8	Freezing point , min	°C	-8	ASTM D 1015	Routine
9	Specific heat at 20 °C , max	cal/gr °C	0.50	ASTM D 2766	Type

***Note :** For type test , a certificate shall be submitted from an independent laboratory .

5. DOCUMENTATION

The manufacturer/supplier shall provide sufficient information and shall supply , the technical information as a minimum requirement as follows :

- ISO 9001: 2008 for quality control of offered DEG for dehydration of natural gas issued by an internationally recognized body .
- Approval test report , original technical catalogues , manufacturing product data sheet and application procedure recommendation and guidelines .
- Material Safety Data Sheet (MSDS) .
- Filled , signed and stamped data sheets stating in Annex A .

6. INSPECTION

The supplier shall be responsible for carrying out all the tests required by this standard specification , using his own or other reliable facilities , and he shall maintain complete records of all such tests and qualifications . Such records shall be available for review by the purchaser . The supplier shall furnish to the purchaser a certificate of quality stating that each batch has been sampled , tested , and qualified in accordance with this standard specification and has been found to meet the requirements specified.

The supplier shall afford the purchaser's inspector all reasonable facilities required for inspection of each batch of production in accordance with this standard specification . Such inspection in no way relieves the supplier of his responsibilities under the term of this standard specification .

The purchaser reserves the right to perform any inspections set forth in this standard specification where such inspections are deemed necessary to assure that supplies and services conform to the prescribed requirements .

The purchaser's inspector reserve the right to have access to the materials subject to inspection for the purpose of witnessing selection of the samples , preparation of the test samples and performance of the test(s) . For such tests , the inspector reserves the right to indicate the sample(s) from which the quantities will be taken in accordance with the provisions of this standard specification .

7. MARKING

7.1 Marking of Containers

Each container shall be legibly marked with at least following information :

Manufacturer Name and Address

Composition

MESC No.

Handling Guidelines

Safety precautions

Storage Symbols

Date of Manufacture

Date of expiry

Batch No.

Net weight

Gross weight

HMIS (including Health , Fire , Reactivity , Personal Protection , Specified Hazard , etc.)

7.2 Precautionary Marking

All individual containers shall be marked with precautionary symbols and/or phrases .

8. PACKAGING

8.1 The diethylene glycol (DEG) shall be suitably packed in approved containers in accordance with the requirement of the contractor or order .

8.2 The containers shall be protected against all damages or defects which may occur during handling .

9. STORAGE LIFE

The diethylene glycol (DEG) shall meet all requirements of this standard specification at least 24 months from date of delivery .

ANNEX A
"Data Sheets for DEG"

Manufacturer's name and address	
Product designation	

Table A – 1. Purity

ITEM	CONTENT (%wt)	VALUE	TEST METHOD	REMARK
1	DEG			
2	MEG			
3	TEG			
4	Water			
5	Acidity as acetic acid			
6	Ash			
7	Iron			

TABLE A – 2. Physical and Chemical Properties

ITEM	CHARACTERISTIC	UNIT	VALUE	TEST METHOD	REMARK
1	Apparent specific gravity at 20 °C				
2	Color				
3	Boiling point , 760 mm Hg				
4	Viscosity at 20 °C				
5	Flash point				
6	Solubility in water at 20 °C				
7	Refractive index at 20 °C				
8	Freezing point				
9	Specific heat at 20 °C				

Notes:

1. This data sheet shall be filled , signed , and stamped by manufacturer/supplier .
2. Any deviation from this standard specification shall clearly be specified by manufacturer/supplier .

DEVIATION(S)

AUTHORIZED SIGNATURE

COMPANY'S STAMP :