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مشخصات فنی خرید

دی اتانول آمین برای استفاده در سیستم شیرین سازی گاز طبیعی

Diethanolamine for Use in Gas Sweetening System



دفتر مدیر عامل



شرکت ملی گاز ایران



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ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری و رئیس شورای استاندارد

باسلام،

به استحضار می‌رساند در جلسه ۱۴۲۳ مورخ ۱۳۸۹/۷/۲۵ هیأت مدیره، نامه شماره ک/۹۴۵۳۶/۰۰۰/۹۵ مورخ ۸۹/۷/۱۷ آن مدیریت در مورد استانداردها با مشخصات ذیل که توسط کمیته های تخصصی تدوین و بازرنگری استاندارد تهیه و در شورای استاندارد به تصویب رسیده است، مطرح و تأیید گردید.

IGS-M-CH-023(1)	مشخصات استاندارد ماده دی اتانول آمین برای استفاده در سیستم شیرین سازی گاز طبیعی
IGS-M-CH-046-1(0)	روغن هیدرولیک - نوع HM یا HLP
IGS-M-CH-046-2(0)	روغن هیدرولیک - نوع HV یا HVLP
IGS-O-SF-06(0)	اقدامات و ملاحظات بهداشتی، ایمنی و زیست محیطی (HSE) برای ماده بودارکننده گاز طبیعی (odorant)
IGS-C-TP-23(0)	پوشش اپوکسی درون لوله های خطوط انتقال گاز طبیعی

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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 div.
- 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 diethanolamine (DEA) for absorbing H₂S and CO₂ in natural sour gas treating plant . This standard specification specifies purity , properties , test methods and packaging of DEA .

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 (2007) "Standard Test Methods for Flash Point by Pensky – Martens Closed Cup Tester"

ASTM D 445 (2006) "Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)"

ASTM D 891 (2004) "Standard Test Methods for Specific Gravity , Apparent , of Liquid Industrial Chemicals"

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

ASTM D 1078 (2005) "Standard Test Method for Distillation Range of Volatile Organic Liquids"

ASTM D 1177 (2007) "Standard Test Method for Freezing Point of Aqueous Engine Coolants"

ASTM D 1209 (2005) "Standard Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)"

ASTM D 1218 (2002) "Standard Test Method for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids"

ASTM D 1364 (2002) "Standard Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method)"

ASTM D 2073 (1998) "Standard Test Methods for Total , Primary , Secondary , and Tertiary Amine Values of Fatty Amines , Amidoamines , and Diamines by Referee Potentiometric Method"

ASTM D 2074 (2007) "Standard Test Methods for Total , Primary , Secondary , and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method"

ASTM D 2766 (2005) "Standard Test Method for Specific Heat of Liquids and Solids"

ASTM D 2080 (1998) "Standard Test Method for Average Molecular Weight of Fatty Quaternary Ammonium Chlorides"

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

Diethanolamine (DEA)

Diethanolamine is an organic chemical compound which is both a secondary amine and a dialcohol with molecular formula $\text{CH}_2\text{OH}-\text{CH}_2-\text{NH}-\text{CH}_2-\text{CH}_2\text{OH}$.

4. REQUIREMENTS

4.1 Purity

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

Table 1 – Purity

Item	Content (%wt)	Value	Value	Test Method
1	DEA , min	98.5	85	ASTM D 2073 or ASTM D 2074
2	*MEA , max	0.6	0.6	ASTM D 2073
3	**TEA , max	0.8	0.8	ASTM D 2074
4	Water , max	0.15	15	ASTM D 1364
5	Iron	nil	nil	by Ion Chromatography (see clause 5.1)
6	Chloride	nil	nil	ASTM D 2080
7	Sulfate	nil	nil	by Ion Chromatography (see clause 5.2)

*MEA : Monoethanolamine

**TEA : Triethanolamine

4.2 Properties

The physical properties of diethanolamine shall be in accordance with Table 2 when tested in accordance with specified test methods .

Table 2 – Physical Properties

Item	Characteristic	Unit	Value (98.5%)	Value (85%)	Test Method
1	Color , max	Pt/Co	15	25	ASTM D 1209
2	Specific Gravity at 20 °C , min	---	1.096	1.090	ASTM D 891
3	Viscosity at 30 °C , min	cP	320.0	108	ASTM D 445
4	Boiling point at 760 mmHg , min	°C	210	127	ASTM D 1078
5	Freezing point , min	°C	28	0	ASTM D 1177 or ASTM D 1015
6	Flash point , min	°C	162	149	ASTM D 93
7	Solubility in water at 20 °C	%	100	100	BS 6829 sec. 1.6
8	Specific heat at 30 °C , min	cal/g. °C	0.62	0.65	ASTM D 2766
9	Refractive Index at 25 °C , min	---	1.473	1.456	ASTM D 1218

5. TESTS

5.1 Determination of Iron

The value of iron shall be determined by ion-chromatographic analysis by using eluent on a Prontosil 120-5-C18-AQ column with 5 µm particle size and 124 × 4 mm dimensions .

The iron react with EDTA and be determined by using UV detector .

The specification of eluent shall be as follows :

0.5 mmol/l Nitric Acid / 2.5 mmol/l TBAOH / 7.5 mmol/l TBAHSO₄ ;
85% Methanol in ultra pure water ;

Rinsing of MSM ;
50 mmol/l MgSO_4 in ultra pure water .

Note : Any ion-chromatographic method giving equivalent , or better , component separation and detection may be used . In case of dispute , the above – mentioned method shall be used.

5.2 Determination of Sulfate

The value of sulfate shall be determined by ion-chromatographic analysis by using eluent on a Metrosep A sup 5-250 Polyvinyl with four groups of Ammonium column with 5 μm particle size and 75 \times 4 mm dimensions .

The specification of eluent shall be as follows :

1.0 mmol/l NaHCO_3 / 3.2 mmol/l Na_2CO_3

Note : Any ion-chromatographic method giving equivalent , or better , component separation and detection may be used . In case of dispute , the above – mentioned method shall be used.

6. DOCUMENTATION

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

- ISO 9001: 2008 certification for quality control of offered DEA for treatment of natural sour gas issued by an internationally recognized body .
- Approval test reports , original technical catalogues , manufacturing product data sheet and application procedure recommendation and guidelines .
- Material Safety Data Sheet (MSDS) .

7. INSPECTION

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 material 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 .

The manufacturer shall provide all means necessary for carrying out all inspections and tests as required by this standard specification .

The manufacturer shall set up and maintain such quality assurance and inspection systems to ensure that the material comply in all respects with the requirements of this standard specification .

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 .

Tests and qualification records shall be available for review by the purchaser .

Inspection or tests carried out by the purchaser's inspector , in no way relieves the supplier of his responsibilities and liabilities under the requirements of this standard specification .

8. MARKING

8.1 Marking of Containers

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

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.)

8.2 Precautionary Marking

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

9. PACKAGING

9.1 The diethanolamine (DEA) shall be suitably packed in approved containers in accordance with the requirement of the contractor or order .

Note : Empty space on containers must be free of oxygen and filled by inert gas (Nitrogen) , otherwise storage life is maximum 6 months (see clause 10) .

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

10. STORAGE LIFE

The diethanolamine (DEA) shall meet all requirements of this standard specification at least 24 months from date of delivery .

ANNEX A
"Data Sheet for DEA"

Manufacturer's name and address	
Product designation	

Table A – 1. Purity

ITEM	CONTENT (%wt)	VALUE	TEST METHOD	REMARK
1	DEA			
2	MEA			
3	TEA			
4	Water			
5	Iron			
6	Chloride			
7	Sulfate			

TABLE A – 2. Physical and Chemical Properties

ITEM	CHARACTERISTIC	UNIT	VALUE	TEST METHOD	REMARK
1	Color				
2	Specific Gravity at 20 °C				
3	Viscosity at 30 °C				
4	Boiling point at 760 mmHg				
5	Freezing point				
6	Flash point				
7	Solubility in water at 20 °C				
8	Specific heat at 30 °C				
9	Refractive Index at 25 °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)

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AUTHORIZED SIGNATURE :

COMPANY'S STAMP :