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Research and Technology Management

امور تدوین استانداردها

Standardization Division

IGS

Iranian Gas Standards

Specification for :

مشخصات فنی :

**CHEMICAL FOAM INHIBITOR (ANTIFOAM) for Use
in Amine Gas Sweetening System**

مواد ضد کف برای سیستم شیرین سازی گاز

APPROVED

FOREWORD

This standard 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 ammended by technical standard committees within NIGC Standardization Div. and submitted to the **NIGC's "STANDARDS COUNCIL"** for approval .

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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 div.

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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پیشگفتار

- ۱- این استاندارد/دستورالعمل بمنظور استفاده اختصاصی در شرکت ملی گاز ایران و شرکتهای فرعی وابسته تهیه شده است.
- ۲- شرکت ملی گاز ایران در مورد نیازهای عمومی از استانداردهای وزارت نفت (IPS) و در مورد نیازهای اختصاصی از استانداردهای اختصاصی خود (IGS) استفاده می نماید.
- ۳- استانداردهای شرکت ملی گاز ایران (IGS) توسط کمیته های تخصصی استاندارد متشکل از کارشناسان بخش های مختلف و یا مشاور تهیه می شود و توسط شورای استاندارد (منتخب هیئت مدیره شرکت ملی گاز ایران) به تصویب میرسند.
- ۴- در تنظیم متن استانداردهای (IGS) از کلیه منابع شناخته شده استاندارد، اطلاعات فنی - تخصصی مربوط به صنایع گاز دنیا، مشخصات فنی تولیدات سازندگان معتبر جهانی و نیز از نتیجه تحقیقات و تجربیات کارشناسان و متخصصان داخلی بر حسب مورد استفاده می شود. همچنین بمنظور استفاده هر چه بیشتر از تولیدات داخلی قابلیت های سازندگان داخلی نیز مورد توجه قرار میگیرد.
- ۵- استانداردها از طریق پایگاه اینترنتی شرکت * و یالوح فشرده (CD) در اختیار واحدها و کاربران قرار می گیرد .
- ۶- استانداردها بطور متوسط هر ۵ سال یکبار و یادر صورت ضرورت زودتر، مورد بازنگری و بروزرسانی قرار میگیرند. بنابراین کاربران باید همیشه آخرین نگارش را مورد استفاده قرار دهند.
- ۷- هرگونه نظر و یا پیشنهاد اصلاح در مورد استانداردها مورد استقبال و بررسی قرار خواهد گرفت و در صورت تأیید، استاندارد مربوطه نیز مورد تجدیدنظر قرار خواهد گرفت .

تعاریف عمومی

در متن استانداردهای (IGS) از تعاریف و اصطلاحات زیر استفاده میشود.

- ۱- "شرکت" (COMPANY): منظور از شرکت "شرکت ملی گاز ایران" و یا شرکتهای فرعی وابسته میباشد.
- ۲- "فروشنده" (SUPPLIER/VENDOR): به فرد یا موسسه ای اطلاق میگردد که تعهدی رانسبت به شرکت تقبل نموده است.
- ۳- "خریدار" (PURCHASER): منظور از خریدار "شرکت ملی گاز ایران" و یا شرکتهای فرعی وابسته میباشد.
- ۴- "SHALL": در مواردی بکاربرده میشود که انجام خواسته مورد نظر اجباری است
- ۵- "SHOULD": در مواردی بکاربرده میشود که انجام خواسته مورد نظر ترجیحی و درعین حال اختیاری است
- ۶- "MAY": در مواردی بکاربرده میشود که انجام کار به شکل مورد بحث نیز قابل قبول میباشد

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ANTIFOAM FOR USE IN AMINE GAS SWEETENING SYSTEM

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1. SCOPE	

THIS STANDARD GIVES THE PROCEDURE FOR PURCHASING CHEMICAL FOAM INHIBITOR (ANTIFOAM) TO BE USED IN NATURAL GAS SWEETENING SYSTEM USING AMINE AS ADSORPTION MEDIA .

2. REFERENCES

THROUGHOUT THIS STANDARD THE FOLLOWING STANDARDS ARE REFERRED TO . THE EDITIONS OF THESE STANDARDS THAT ARE IN EFFECTED AT THE TIME OF ISSUES OF THIS STANDARD (1999) SHALL , TO THE EXTENT SPECIFIED HEREIN , FORM PART OF THIS STANDARD . THE APPLICABILITY OF CHANGES IN STANDARDS THAT OCCUR AFTER THE DATE OF THIS STANDARD SHALL BE MUTUALLY AGREED UPON BY THE PURCHASER AND SUPPLIER .

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

D 1881 – 86 “ STANDARD TEST METHOD FOR FOAMING TENDENCIES OF ENGINE COOLANTS IN GLASSWARE “

US MILITARY STANDARDS

MIL – STD – 105 “ SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY ATTRIBUTES “

3. FOAM MEDIA DATA

THE TYPE OF AMINE AND ITS CONTAMINANTS ARE MENTIONED AS PER APPENDIX (DATA SHEET) .

4. SYSTEM DESIGN

THE SUPPLIER SHALL SUBMIT AN ANTIFOAM TO BE ABLE TO DEPRESS FOAMING IN AMINE SYSTEM AS SPECIFIED IN APPENDIX (DATA SHEET) . IT SHALL NOT COUSE ANY SIDE EFFECT SUCH AS CORROSION , EROSION , PRECIPITATION , ETC TO THE SYSTEM .

THE SUPPLIER SHALL GIVE FULL DETAILS OF THE PROPOSED ANTIFOAM INCLUDING TYPES , CHEMICAL BASE AND IT'S CHARACTERISTICS . THE PROPOSED ANTIFOAM SHALL ALSO MEET THE FOLLOWING REQUIREMENTS :

4.1 DEFINITIONS

APPROVED PRODUCTS : THE APPROVED PRODUCTS ARE THOSE PRODUCTS WHOSE APPROVAL TEST SAMPLES (SEE 5.1) HAVE BEEN LABORATORY TESTED AND HAVE PASSED THE APPROVAL TEST SPECIFIED HEREIN (SEE 5) AND HAVE BEEN LISTED ON OR APPROVED FOR BEING LISTED AS APPROVED SAMPLES .

APPROVED SUPPLIERS : THE SUPPLIERS OF APPROVED PRODUCTS WILL BE KNOWN AS APPROVED SUPPLIERS .

ACCEPTED PRODUCTS : THE ACCEPTED PRODUCTS ARE THOSE PRODUCTS WHICH HAVE PASSED THE APPROVAL TEST AS WELL AS ACCEPTANCE OPERATIONAL TEST (SEE 4.5) .

QUALIFIED PRODUCTS : THE QUALIFIED PRODUCTS MEAN THE ACCEPTED PRODUCTS PROPOSED WITH RESPECT TO THIS STANDARD WHICH MEET ALL REQUIREMENTS OF THIS STANDARD .

QUALIFIED SUPPLIER (S) : THE SUPPLIER OF QUALIFIED PRODUCTS WILL BE KNOWN AS THE QUALIFIED SUPPLIER (S) .

FINAL SUPPLIER : THE SUCCESSFUL BIDDER IS KNOWN AS THE FINAL SUPPLIER .

4.2 FORMULATION CHANGES

THE PRESENTED MATERIAL (S) FOR SUPPLY SHALL BE ACCEPTED ONLY FOR THE FORMULATION FOR WHICH APPROVAL AND ACCEPTANCE OPERATIONAL TESTS ARE MADE . ANY CHANGE (S) IN FORMULATION , SHALL COUSE FOR DESIGNATING THE MATERIAL AS A NEW MATERIAL WHICH SHALL NOT BE CONSIDERED ACCEPTED . THE SUPPLIER MAY SUBMIT THE MODIFIED MATERIAL FOR ACCEPTANCE UNDER THIS STANDARD , USING A NEW SUPPLIER'S DESIGNATION .

4.3 APPLICABILITY

ANTIFOAM SHALL BE EASILY APPLICABLE WHEN USED FOR LOADING INTO THE SYSTEM WITHOUT ANY VIGOROUS OR IMPRACTICAL EFFORT .

4.4 ECONOMICAL ASPECTS

THE PROPOSED ANTIFOAM SHALL MEET THE REQUIREMENTS OF CLAUSE 4.1 AT THE LOWEST COST PER YEAR (SEE DATA SHEET) . THE COST EVALUATION WILL BE MADE BY THE PURCHASER (

TECHNICAL DEPARTMENT OF ENDUSER IN THIS CASE) , WITH REFERENCE TO THE PERFORMANCE OF THE PRODUCT(S) (SEE 4.1) , INCLUDING COST OF PRODUCT(S) PER YEAR AND OTHER COSTS SUCH AS FORWARDING SHIPMENT, STORAGE , OPERATION AND SO ON .

4.5 ACCEPTANCE OPERATIONAL TEST

A 30 – DAY CONTINUOUS OPERATIONAL TEST WILL BE PERFORMED ON APPROVED PRODUCTS (SEE 8) . THE PRODUCT SHALL PASS THE OPERATIONAL TEST TO BE TAKEN AS AN ACCEPTED PRODUCT .

5. APPROVAL TEST

APPROVAL TEST IS THE LABORATORY TEST PERFORMED ON THE SAMPLES SUBMITTED FOR APPROVAL . THE APPROVAL TEST OF THE ANTIFOAM WILL BE MADE IN ACCORDANCE WITH ASTM TEST METHOD D 1881 – 86 USING ACTUAL AMINE SOLUTION AS SPECIFIED IN APPENDIX (DATA SHEET) . AMINE SOLUTION TAKEN FROM THE NOMINATED GAS SWEETENING PLANT . THE ANTIFOAM CONCENTRATION IN TEST SOLUTION SHALL BE IN ACCORDANCE WITH THE SUPPLIER RECOMMENDATION .

5.1 APPROVAL TEST SAMPLE

5.1.1 APPROVAL TEST SAMPLE SHALL CONSIST OF SUFFICIENT AMOUNT OF MATERIAL PROPOSED AS AN ANTIFOAM FURNISHED UNDER THIS STANDARD . SAMPLE SHALL BE FORWARDED TO THE PURCHASER . SAMPLE SHALL BE PLAINLY IDENTIFIED BY SECURELY ATTACHED DURABLE TAGS OR LABELS MARKED WITH FOLLOWING INFORMATION :

SAMPLE FOR QUALIFICATION TEST (OR APPROVAL TEST)

BRAND NAME

NAME OF PRODUCTION PLANT (PLANT WHERE ANTIFORAM IS MASS PRODUCED)

MATERIAL DESIGNATION (PRODUCT REF/CODE)

DATE OF PRODUCTION

5.1.2 THE SUPPLIER SHALL ALSO PROVIDE THE OPERATIONAL INFORMATION WITH EACH SAMPLE AS FOLLOWS :

DESCRIPTION AND FUNCTION (S)
ANALYTICAL CONTROL
OPERATIONAL INSTRUCTION
DOSAGE IN “ LIT / DAY “ WITH REFERENCE TO THIS
STANDAARD (SEE DATA SHEET)
HANDLING
STORAGING
SHELFLIFE
OTHERS

5.1.3 THE SUPPLIER SHALL SPECIFY PHYSICAL PROPERTIES FOR THE MATERIAL (S) COVERING THE FOLLOWINGS :

FORM
PH
COLOR
ODOUR
POUR POINT
FLASH POINT
VISCOSITY AT 20°C
SPECIFIC GRAVITY
DENSITY AT 20°C
SOLUBILITY IN WATER AT 20°C
OTHERS

6. PRODUCTION TESTS

PRODUCTION TESTS ARE THE ONES NORMALLY PERFORMED BY THE PRODUCER ON SAMPLES TAKEN FROM PRODUCTION RUN DURING THE PRODUCTION OF ANTIFOAM ACCORDING TO ITS OWN QUALITY STANDARD . THE SUPPLIER SHALL PROVIDE THE PRODUCTION TESTS REPORTS TO THE MENTIOND STANDARD .

7. QUALITY ASSURANCE

THE SUPPLIER SHALL PROVIDE A QUALITY ASSURANCE CERTIFICATE TO ENSURE THAT THE ANTIFOAM PROPOSED COMPLIES WITH THIS STANDARD .

8. ACCEPTANCE OPERATIONAL SAMPLES

THE APPROVED SUPPLIER WHOSE PROPOSED PRODUCTS MEET SUBCLAUSE 5 WILL BE REQUESTED TO SUPPLY SUFFICIENT AMOUNT OF APPROVED PRODUCT(S) FOR A CONTINUOUS 30 DAY ACCEPTANCE OPERATIONAL TEST .

9. STORAGE LIFE AND PACKAGING

9.1 STORAGE LIFE

THE ANTIFOAM SHALL MEET ALL REQUIREMENTS OF THIS STANDARD AT LEAST 24 MONTHS FROM DATE OF DELIVERY .

9.2 PACKAGING

THE MATERIAL (S) SHALL BE SUITABLY PACKAGED IN 210 LITRE NEW STEEL DRUMS AND PROTECTED AGAINST ALL DAMAGES WHICH MAY OCCUR DURING HANDLING AND SEAWORTHY SHIPMENT .

9.3 COMPATIBILITY OF THE CONTAINER WITH ANTIFOAM

THE CONTAINER MATERIAL SHALL BE COMPATIBLE WITH ANTIFOAM TO THE EXTENT THAT IT SHALL NOT CAUSE DELAMINATION , SWELLING , EMBRITTEMENT , DISSOLUTION , OR OTHER DETERIORATION SUCH AS TO CAUSING THE DEGRADATION OF THE CONTAINER MATERIAL .

10. INSPECTION AND QUALITY ASSURANCE (QA)

10.1 THE SUPPLIER SHALL BE RESPONSIBLE FOR CARRYING OUT ALL THE TESTS AND QA'S REQUIRED BY THIS STANDARD (SEE 5.1.3) , 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 LOT HAS BEEN SAMPLED , TESTED , AND QUALIFIED IN ACCORDANCE WITH THIS STANDARD AND HAS BEEN FOUND TO MEET THE REQUIREMENTS SPECIFIED .

10.2 AN INSPECTION LOT SHALL CONSIST OF A BATCH (OR BATCHES) OF PRODUCTION PROCESSED FROM THE SAME MATERIAL COMPONENTS , AND OFFERED FOR INSPECTION AT ONE TIME .

10.3 THE SUPPLIER SHALL AFFORD THE PURCHASER'S INSPCTOR ALL REASONABLE FACILITIES REQUIRED FOR INSPECTION OF EACH BATCH OF PRODUCTION IN ACCORDANCE WITH THIS STANDARD . SUCH INSPECTION IN NO WAY RELIEVES THE SUPPLIER OF HIS RESPONSIBILITIES UNDER THE TERM OF THIS STANDARD .

10.4 THE PURCHASER RESERVES THE RIGHT TO PERFORM ANY INSPECTIONS SET FORTH IN THIS STANDARD WHERE SUCH INSPCETIONS ARE DEEMED NECESSARY TO ASSURE THAT SUPPLIES AND SERVICES CONFORM TO THE PRESCRIBED REQUIREMENTS .

10.5 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 .

10.6 SAMPLING FOR VISUAL INSPECTION

THE RANDOM SAMPLE (S) OF FILLED CONTAINERS SHALL BE SELECTED FROM EACH INSPECTION LOT BY PURCHASER'S INSPECTOR IN ACCORDANCE WITH STANDARD MIL – STD – 105 AT INSPECTION LEVEL I AND (AQL) 2.5 PERCENT DEFECTIVE TO VERIFY CONFORMANCE TO ALL REQUIREMENTS OF THIS STANDARD REGARDING FILL , CLOSURE AND MARKING .

11. MARKING

11.1 MARKING OF CONTAINERS

EACH CONTAINER SHALL BE LEGIBLY MARKED AT LEAST WITH FOLLOWING INFORMATION :

SUPPLIER'S NAME AND ADDRESS

PURCHASER'S NAME AND ADDRESS

STANDARDS SPECIFICATION : (IGS-MS-CH-031-1999)

MESC NO.

HANDLING GUIDELINES

STORAGING SYMBOLS

DATE OF MANUFACTURE

BATCH NO.

11.2 INSTRUCTION

SUPPLIER SHALL PROVIDE COMPLETE SETS OF INSTRUCTIONS FOR USE COVERING DOSAGE , LOCATION OF FEEDING , TYPE OF INJECTION SYSTEM AND ANALYTICAL CONTROL THOROUGHLY .

11.3 PRECAUTIONARY MARKING

ALL INDIVIDUAL CONTAINERS SHALL BE MARKED WITH PRECAUTIONARY SYMBOLS OR PHRASES .

**“ APPENDIX “
(DATA SHEET)
“ FOAM MEDIA DATA “**

1. SOURCE OF SOUR GAS

- GAS RESERVOIR
- ASSOCIATED GAS

2. TYPE OF PRETREATMENT

- SEPARATOR
- FILTER
- N.G.L

3. COMPOSITION OF INLET GAS TO CONTACTOR TOWER

3.1 MAIN COMPONENTS

COMPONENT	UNIT	AMOUNT
METHANE		
ETHANE		
PROPANE		
BUTANES		
PENTANES AND HEAVIER		
CARBON DIOXIDE		
NITROGEN		
HYDROGEN SULFIDE		
MERCAPTAN SULFUR		
TOTAL SULFUR		
WATER VAPOR		
OTHERS :		

- 3.2 MAIN IMPURITIES LIKE OIL , DUST , AEROSOLS , UNSATURATED HYDROCARBON , SOLID CONTENT , CORROSION PRODUCT , INHIBITOR (S) AS PRETREATMENT (SPECIFY AMOUNT OF THESE SUBSTANCES IF POSSIBLE) :

4. CONTACTOR SPECIFICATION

- TYPE OF CONTACTOR :
 - PACKED BED :
 - TYPE OF PACKING :
 - VOLUME OF PACKING :
 - TRAY TOWER :
 - TYPE :
 - NUMBER :
- MAXIMUM CAPACITY :
 - GAS FLOW :
 - LIQUID FLOW :
- DIAMETER :

- HEIGHT :
- MINIMUM TEMPERATURE OF TOWER :
- MAXIMUM TEMPERATURE OF TOWER :
- PRESSURE :
- DIFFERENTIAL PRESSURE IN TOWER (ΔP) :

5. AMINE SOLUTION

- TYPE :
 - DEA
 - MEA
 - OTHER TO BE SPECIFY :
 - CONCENTRATION :
 - DILUTING SOLUTION :

6. REGENERATION SYSTEM OF AMINE

- 6.1
- TYPE OF FILTERATION :
 - PERCENT OF FILTERATION :

6.2 REGENERATOR SPECIFICATION

- TYPE OF TRAY :
- NUMBER OF TRAY :
- MAXIMUM CAPACITY :
 - AMINE FLOW :
 - STEAM FLOW :
- DIAMETER :
- HEIGHT :
- MINIMUM TEMPERATURE :
- MAXIMUM TEMPERATURE :
- PRESSURE :

7. P.F.D OF SYSTEM (TO BE ATTACHED)

8. PRESENT TREATMENT (TYPE (BASE) OF ANTIFOAM AND OTHER INHIBITOR (S)) :

9. EXISTING PROBLEM :

10. SYSTEM MATERIALS :

- FERROUS
- NON – FERROUS
- MIXED
- OTHERS TO BE DESCRIBED :