



شرکت ملی گاز ایران

مدیریت پژوهش و فناوری

امور تدوین استانداردها

IGS

مشخصات فنی خرید

آلومینای فعال بعنوان جاذب در کاربردهای نم زدائی

Activated Alumin as adsorbent for dehydration applications



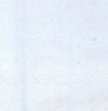
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شرکت ملی گاز ایران

دفتر مدیر عامل



ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری

باسلام،

به استحضار می‌رساند در جلسه ۱۷۰۳ مورخ ۱۳۹۵/۷/۲۵ هیأت مدیره، نامه شماره گ.۹۸۵۴۸/۰۰۰/۹ مورخ ۹۵/۰۷/۱۹ مدیر پژوهش و فناوری در مورد تصویب نهایی استانداردهای زیر مطرح و با عنایت به اخذ تاییدیه شورای استاندارد مورد تصویب قرار گرفت.

این مصوبه برای کلیه شرکت‌های فرعی لازم الاجرا می‌باشد.

۱. استاندارد تحت عنوان "دستورالعمل ارزیابی آزمایشگاهی ضد کف‌های سیلیکونی مورد استفاده در واحدهای شیرین سازی گاز طبیعی" به شماره استاندارد (IGS-M-CH-059(0))
۲. استاندارد تحت عنوان "مشخصات فنی خرید اتصال سه راهی انشعاب گرم" به شماره استاندارد (IGS-M-PL-033(1)).
۳. استاندارد تحت عنوان "مشخصات فنی خرید تجهیزات ارسال و دریافت پیگ" به شماره استاندارد (IGS-M-PL-028(1)).
۴. استاندارد تحت عنوان "مشخصات فنی خرید آلومینای فعال بعنوان جاذب در کاربردهای نم زدایی" به شماره استاندارد (IGS-M-CH-020(1)).

ناصر آنگون

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FOREWORD

This standard is intended to be mainly used by NIGC and contractors, and has been prepared based on interpretation of recognized standards, technical documents, knowledge, backgrounds and experiences in natural gas industry 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 employees and contractors. This standard must not be modified or altered by NIGC employees or its contractors. Any deviation from normative references and / or well-known manufacturer's specifications must be reported to Standardization division. The technical standard committee welcomes comments and feedbacks about this standard, and may revise this document accordingly based on the received feedbacks.

GENERAL DEFINITIONS:

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

- 1- "STANDARDIZATION DIV." is organized to deal with all aspects of industry standards in NIGC. Therefore, all enquiries for clarification or amendments are requested to be directed to mentioned division.
- 2- "COMPANY": refers to National Iranian Gas Company (NIGC).
- 3- "SUPPLIER": refers to a firm who will supply the service, equipment or material to NIGC 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 of Activated Alumina for use as a protection layer for natural gas dehydration application and desiccant for instrument air.

This standard specification specifies physical and chemical properties, test methods, inspection and packaging of Activated Alumina.

2. REFERENCES

ASTM D 4058 (2011) "Standard Test Method for Attrition and Abrasion of Catalysts and Catalyst Carriers"

ASTM D 4179 (2011) "Standard Test Method for Single Pellet Crush Strength of Formed Catalysts and Catalyst Carriers"

ASTM D 3663 (2003) "Standard Test Method for Surface Area of Catalysts and Catalyst Carriers"

ASTM D 4164 (1999) "Standard Test Method for Mechanically Tapped Packing Density of Formed Catalyst and Catalyst Carriers"

ASTM D 6761 (2002) "Standard Test Method for Determination of the Total Pore Volume of Catalysts and Catalyst Carriers"

ASTM E 104-02 (2007) "Standard Practice for Maintaining Constant Relative Humidity by Means of Aqueous Solutions"

ASTM E 725 (2001) "Standard Test Method for Sampling Granular Carriers and Granular Pesticides"

ISO 9277 (2003) "Determination of the specific surface area of solids by gas adsorption using the BET method"

ISO 15901-2 (2007) " Pore size distribution and porosity of solid materials by mercury porosimetry and gas adsorption ? Part 2: Analysis of mesopores and macropores by gas adsorption "

UOP 954 (2011) "Standard Test Method for Determining the Loss on Ignition (LOI) for Fresh, Regenerated, Used, and Spent Catalysts, Catalyst Supports, and Adsorbents"

3. DEFINITIONS

Activated alumina (Alumina, Al_2O_3) is an aluminum oxide bead, also called/used as desiccant, activated alumina drier, adsorbent, catalyst carrier, de-fluorination, etc. Activated alumina has high porous structure, high surface area-to-mass ratio and pole-

molecular absorbent property, as well as great properties like high selectivity, high rate of absorbent, high resistant to thermal stock etc.

Activated alumina has a wide variety of applications, including compressed air and gas drying.

4. REQUIREMENTS

4.1 Characteristics

Activated Alumina shall be in accordance with the requirements given in Table 1 when tested according to the specified test methods.

4.2 Sampling

The sampling shall be carried out in accordance with ASTM E 725.

5. INSPECTION

The supplier and/or manufacturer set up and maintain such quality and inspection system to ensure the products comply with all aspects of the requirements of this standard specification.

The supplier and/or manufacturer shall be responsible for carrying out all the tests and quality assurances required by this standard specification and shall maintain complete records of all such tests and qualifications. Such records shall be available for review by the purchaser or its nominated inspector. These documents and test results shall be traceable with regard to the batch number. The supplier and/or manufacturer 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 purchaser or its nominated inspector reserves the right to inspect a part or whole of the products during manufacturing and prior to packing and could be witnessed by any inspections and tests in accordance with this standard specification.

Purchaser's inspector reserves the right to have access to the products at any time during manufacturing. The supplier and/or manufacturer shall provide all facilities necessary for carrying out all inspections and tests as required by this standard specification.

Random sampling proportional to the quantity of each batch and frequency of inspections and tests as required by this standard specification shall be at the discretion of the inspector. If a sample rejected in any inspection or test, re-sample shall be carried out, in the case of any rejection in new samples all products represented by such sampling shall be rejected. Inspection or tests that carried out by the purchaser's inspector, in no way relieves the supplier and/or manufacturer of his responsibilities and liabilities under the conditions, terms and inspection of this standard specification.

6. PACKAGING

6.1 The Activated Alumina shall be suitably packed in airtight bags/ new steel drums and palletized in accordance with N.I.G.C packing and marking instructions.

6.2 The Activated Alumina shall be suitably packed in approved containers in accordance with N.I.G.C packing and marking instructions.

The containers shall be Big Bags or new steel drums with inner PE liner in accordance with the requirement of the purchase order.

6.3 The Containers/Pallets shall be protected against all damages or defects which may occur during handling.

7. MARKING

7.1 Marking of Containers/Pallets

Each Container/Pallet shall be legibly marked at least with the following information:

Product designation (type and trade name)

IGS No.

Net weight

Handling

Storage Condition

Date of Manufacture

Date of Expiry

Order No.

Batch No.

Supplier and/or manufacturer's name and address

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

7.2 Instructions for Use

The supplier and/or manufacturer shall provide complete sets of instructions for use and replacement of Activated Alumina in service and refilling with an unused material.

8. STORAGE LIFE

The Activated Alumina shall meet the requirements of this standard specification after storage for 24 months from date of delivery at supplier and/or manufacturer's mentioned storage condition.

Table 1- Physical and Chemical Specification of Activated Alumina

Item	Property		Unit	Requirement	Test method
1	Composition	Al ₂ O ₃	Wt%	Min: 93	XRF
		Na ₂ O		MAX: 0.5	XRF
		Fe ₂ O ₃		MAX: 0.04	XRF
		SiO ₂		MAX: 0.02	XRF
2	Specific Surface Area (BET)		m ² /g	Min: 300	ISO 9277 or ASTM D 3663
3	Bulk Density Packed		Kg/m ³	700 - 800	ASTM D 4164
4	Static Water Adsorption (at %60 relative humidity)		Wt%	Min:19	ASTM E 104
5	Crush Strength	2-5 mm	Kgf	Min:15	ASTM D 4179
		4-8 mm		Min: 35	
6	Total Pore Volume		cm ³ /gr	Min: 0.40	ISO 15901-2 or ASTM D 6761
7	Abrasion/ Attrition Loss		Wt%	Max: 1	ASTM D 4058
8	Loss On Ignition		%	Max: 7	UOP 954