



شرکت ملی گاز ایران

مدیریت پژوهش و فناوری

امورتدوین استانداردها

IGS

Iranian Gas Standards

مشخصات فنی خرید

روغن کمپرسورها

Air Compressor Oil

ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری و رئیس شورای استاندارد

باسلام،

به استحضار می‌رساند در جلسه ۱۴۴۶ مورخ ۱۳۸۹/۱۲/۲۲ هیأت مدیره، نامه شماره ک.د/۰۰۰/۱۷۱۴۱۲ مورخ ۸۹/۱۲/۱۴ آن مدیریت در مورد تصویب نهایی استانداردهای تدوین شده تحت عناوین ذیل مطرح و مورد تصویب قرار گرفت.

- ۱- دستورالعمل تخلیه هوا و تزریق گاز در خطوط لوله
کاز بخش اول: خطوط انتقال گاز شیرین
IGS-C-PL-013-1(0)
- ۲- دستورالعمل اجرای شیرهای مدفون دسته بلند برای
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IGS-C-PL-032(0)
- ۳- مشخصات فنی خرید روغن کمپرسور هوا
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این مصوبه در حکم مصوبه مجمع عمومی شرکتهای تابعه محسوب و برای کلیه شرکتهای تابعه لازم الاجراء می باشد.

ناصر آبگون
دبیر هیأت مدیره

رونوشت: مدیرعامل محترم شرکت ملی گاز ایران و قائم مقام رئیس هیأت مدیره

- معاون محترم مدیرعامل
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- رئیس محترم امور حقوقی
- رئیس محترم امور مناجام

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- "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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1. SCOPE

This standard specification covers the minimum requirements for lubricating oils used in air compressors lubricating system for reciprocating and screw types . Oils shall be refined petroleum oils , formulated to provide rust protection and oxidation stability and may contain selective additives as needed to control foam , wear , demulsibility and as required to comply with the requirements of this standard specification .

Note 1 : The choice of oil and its viscosity grade should comply with the air compressor manufacturer's recommendations .

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 (2011) 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 92 (2005) "Test Method for Flash and Fire Points by Cleveland Open Cup Tester"

ASTM D 97 (2002) "Test Method for Pour Point of Petroleum Products"

ASTM D 130 (2004) "Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test"

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

ASTM D 664 (2006) "Test Method for Acid Number of Petroleum Products by Potentiometric Titration"

ASTM D 665A (2006) "Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water"

ASTM D 874 (2006) "Test Method for Sulfated Ash from Lubricating Oils and Additives"

ASTM D 892 (2006) "Test Method for Foaming Characteristics of Lubricating Oils"

ASTM D 1298 (1999) "Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method"

ASTM D 1401 (2002) "Test Method for Water Separability of Petroleum Oils and Synthetic Fluids"

ASTM D 2270 (2004) "Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100 °C"

ASTM D 2272 (2002) "Test Method for Oxidation Stability of Steam Turbine Oils by Rotating Bomb"

ASTM D 2422 (2002) "Classification of Industrial Fluid Lubricants by Viscosity System"

ASTM D 2783 (2003) "Test Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Four Ball Method)"

ASTM D 3427 (2006) "Test Method for Air Release Properties of Petroleum Oils"

ASTM D 4057 (2000) "Practice for Manual Sampling of Petroleum and Petroleum Products"

ASTM D 6304 (2007) "Test Method for Determination of Water in Petroleum Products , Lubricating Oils , and Additives by Coulometric Karl Fischer Titration"

DIN 51352 Part 2 (1985) "Testing of Lubricants , Determination of Ageing Characteristics of Lubricating Oils , Conradson Carbon Residue After Ageing by Passing Air Through the Lubricating Oil in the Presence"

DIN 51551 (1993) "Determination of Conradson Carbon Residue of Lubricants and Liquid Fuels"

ISO 3448 (1993) "Industrial Liquid Lubricants – ISO Viscosity Classification"

ISO 4406 (1999) "Hydraulic Fluid Power–Fluids – Method for Coding the Level of Contamination by Solid Particles"

3. REQUIREMENTS

3.1 Characteristics

Oils shall be in accordance with the requirements given in Table 1 for reciprocating and screw oil free type air compressors and Table 2 for screw oil injected type air compressors when tested according to the specified test methods .

3.2 Sampling

The sampling shall be carried out in accordance with ASTM D 4057 .

3.3 Interchangeability

Interchangeability of type of used oil with another type of oil shall be approved with the air compressor manufacturer .

3.4. Compatibility

The feasibility of mixing unused oils of different type , with oil in service shall not be allowable unless when compatibility of these oils approved with the air compressor manufacturer or a recognized laboratory .

Note : Compatibility tests may be needed to determine the feasibility of mixing unused oils of different type and origin , with oil in service . The main characteristics of the mixture should not be less favourable than those of the worst individual oil . Reference to the oil supplier is recommended if any doubts concerning compatibility arise .

4. INSPECTION

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

4.2 The supplier 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 .

4.3 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 .

4.4 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 witness any inspections and tests in accordance with this standard specification .

4.5 Purchaser's inspector reserves the right to have access to the products at any time during manufacturing .

4.6 The supplier shall provide all facilities necessary for carrying out all inspections and tests as required by this standard specification .

4.7 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 .

4.8 If a sample rejected in any inspection or test , re-sample shall be carried out , in case of any rejection in new samples all products represented by such sampling shall be rejected .

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

5. DOCUMENTATION

The manufacturer/supplier shall provide original technical catalogues , technical specification , Material Safety Data Sheet (MSDS) and application procedure recommendation and guidelines .

The manufacturer/supplier shall provide ISO 9001 : 2008 "Certification" for "Design , Manufacturing and Quality control" issued by an internationally recognized body .

Petroleum-based oils can have both immediate and long-term adverse effects on environment and can be dangerous or even deadly to wildlife .

The manufacturer/supplier shall provide standard methods regarding to disposal of used/unused residue air compressor oil and containers which polluted by these substances .

Presented disposal methods should comply with national and local legislations and standards regarding to protection of environment .

6. PACKING

6.1 The oil shall be suitably packed in approved containers in accordance with the requirement of the contractor or order .

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

7. MARKING

7.1 Marking of Containers

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

Name and trade mark of the supplier

Product designation (type and trade name)

IGS No.

Net weight

Handling

Storage condition

Date of manufacture

Date of expiry

Order No.

Batch No.

Manufacturer/supplier 's address

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

7.2 Instruction

The supplier shall provide complete sets of instruction for use and replacement of oil in service and refilling with an unused oil .

8. STORAGE LIFE

The oil shall meet the requirement of clause 3 after storage for 24 months from date of delivery, in a tightly covered container at temperature between -10 to +35 °C .

Table 1 – Characteristics for Reciprocating and Screw Oil Free Air Compressors

Item	Property	Unit	ISO_Viscosity Grade ¹⁾		Test Method	
			46	68		
1	1) Physical : Kinematic viscosity at 40 °C min max	cSt(mm ² /s) cSt(mm ² /s)	41.4 50.6	61.2 74.8	ASTM D 445 or ASTM D 7042	
2		Viscosity index , min	---	95	95	ASTM D 2270
3		Flash point , min	°C	205	220	ASTM D 92
4		Pour point , max ²⁾	°C	-9	-9	ASTM D 97
5		Density at 15 °C , max	kg/m ³	875	880	ASTM D 1298
6		Sulfated ash , max	mass %	0.05	0.05	ASTM D 874
7	2) Chemical : Total acid number , max	mg KOH/g	0.1	0.1	ASTM D 664	
8	3) Performance : Water separability at 54 °C , max	minutes	30	30	ASTM D 1401	
9		Rust preventing characteristics	---	Pass	Pass	ASTM D 665A
10		Copper corrosion , 3 h at 100 °C ³⁾ , max	---	1a	1a	ASTM D 130
11		Oxidation stability , to 175 kPa drop , min	minute	200	200	ASTM D 2272
12		Water content ³⁾ , max	%	0.1	0.1	ASTM D 6304 ⁴⁾
13		Conradson carbon residue after ageing by passing air through the lubricating oil in the presence of Fe ₂ O ₃ ³⁾ , max	mass %	2.5	3	DIN 51352 Part 2
14		Distillation residue remaining after distilling 80% (V/V) of the lubricating oil as specified in DIN 51352 , Conradson carbon residue ³⁾ , max	mass %	0.3	0.3	DIN 51551
15		Cleanliness level	---	17/14	17/14	ISO 4406

Notes :

1) Mentioned viscosity system is according to ISO 3448 and/or ASTM D 2422 .

2) The limitation of pour point should be decreased to low ambient temperature in site condition with 10 °C margin .

3) For this test , a certificate should be submitted from an independent laboratory . Each certificate is valid for maximum two years .

4) IP 438 and IP 385 are recommended as guidance .

Table 2 – Characteristics for Screw Oil Injected Air Compressors

Item		Property	Unit	ISO_Viscosity Grade ¹⁾		Test Method
				46	68	
1	1) Physical :	Kinematic viscosity at 40 °C min max	cSt(mm ² /s) cSt(mm ² /s)	41.4 50.6	61.2 74.8	ASTM D 445 or ASTM D 7042
2		Viscosity index , min	---	100	100	ASTM D 2270
3		Flash point , min	°C	220	230	ASTM D 92
4		Pour point , max	°C	-30	-30	ASTM D 97
5		Density at 15 °C , max	kg/m ³	875	880	ASTM D 1298
6		Sulfated ash , max	mass %	0.05	0.05	ASTM D 874
7	2) Chemical :	Total acid number , max	mg KOH/g	0.1	0.1	ASTM D 664
8	3) Performance :	Water separability at 54 °C , max	minutes	15	15	ASTM D 1401
9		Foam characteristics : tendency/stability , sequence I , max	ml	50/0	50/0	ASTM D 892
10		Air release , 50 °C , max	minutes	10	10	ASTM D 3427
11		Rust preventing characteristics	---	Pass	Pass	ASTM D 665A
12		Copper corrosion , 3 h at 100 °C ²⁾ , max	---	1a	1a	ASTM D 130
13		Oxidation stability , to 175 kPa drop , min	minute	200	200	ASTM D 2272
14		Water content ²⁾ , max	%	0.1	0.1	ASTM D 6304 ³⁾
15		Conradson carbon residue after ageing by passing air through the lubricating oil in the presence of Fe ₂ O ₃ ²⁾ , max	mass %	2.5	3	DIN 51352 Part 2
16		Distillation residue remaining after distilling 80% (V/V) of the lubricating oil as specified in DIN 51352 , Conradson carbon residue ²⁾ , max	mass %	0.3	0.3	DIN 51551
17		Four ball test welding point , min	kgf	350	350	ASTM D 2783
18		Cleanliness level	---	17/14	17/14	ISO 4406

Notes :

1) Mentioned viscosity system is according to ISO 3448 and/or ASTM D 2422 .

2) For this test , a certificate should be submitted from an independent laboratory . Each certificate is valid for maximum two years .

3) IP 438 and IP 385 are recommended as guidance .