



شرکت ملی گاز ایران

مدیریت پژوهش و فناوری

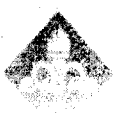
امور تدوین استانداردها

IGS

مشخصات فنی خرید

روغن موتور مولدهای برق گازسوز اضطراری

Emergency power generators gas engine oil



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دفتر مدیر عامل



ابلاغ مصوبه هیات مدیره

مدیر محترم پژوهش و فناوری

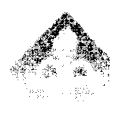
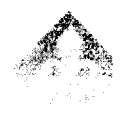
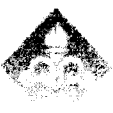
باسلام،

به استحضار می‌رساند در جلسه ۱۶۸۷ مورخ ۱۳۹۵/۳/۲۰ هیات مدیره، نامه شماره گ. ۲۹۱۸۳/۰۰۰/۹۰ مورخ ۹۵/۳/۲۴ مدیر پژوهش و فناوری در مورد تصویب نهایی استاندارد تحت عنوان "مشخصات فنی خرید روغن موتور مولدهای برق گازسوز اضطراری" به شماره استاندارد (0) IGS-M-CH-057 مطرح و مورد تصویب قرار گرفت این مصوبه در حکم مصوبه مجمع عمومی شرکت‌های تابعه محسوب و برای کلیه شرکت‌های تابعه لازم الاجرا می‌باشد.

ناصر آبگون
دبیر هیات مدیره

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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.

Website: <http://igs.nigc.ir>

E-mail: igs@nigc.ir

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1. SCOPE

This standard specification covers the minimum requirements for lubricating oils used in stationary gas engines lubricating system in two grades of different viscosity ranges. Oils shall be refined petroleum oils, formulated by additives consisting of oxidation inhibitors, detergents and dispersants, anti-wear, anti-corrosion and anti-foaming agents, that provides oxidation stability, nitration resistance and thermal stability.

Note 1: Oil viscosity grade should comply with the engine manufacturer and its 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 (2014) 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.

2.1 Normative References

ASTM D 92 (2012) "Test Method for Flash and Fire Points by Cleveland Open Cup Tester"

ASTM D 97 (2012) "Test Method for Pour Point of Petroleum Products"

ASTM D 130 (2012) "Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test"

ASTM D 445 (2012) "Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)"

ASTM D 664 (2011) "Test Method for Acid Number of Petroleum Products by Potentiometric Titration"

ASTM D 665 (2012) "Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water"

ASTM D 874 (2013) "Test Method for Sulfated Ash from Lubricating Oils and Additives"

ASTM D 892 (2013) "Test Method for Foaming Characteristics of Lubricating Oils"

ASTM D 2270 (2010)"Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100 °C"

ASTM D 2273 (2012) "Test Method for Trace Sediment in Lubricating Oils"

ASTM D 2422 (2013)"Classification of Industrial Fluid Lubricants by Viscosity System"

ASTM D 2896 (2011) "Standard Test Method for Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration E(01-mar-2002) IP Designation"

ASTM D 4052 (2011) "Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter"

ASTM D 4057 (2012) "Practice for Manual Sampling of Petroleum and Petroleum Products"

ASTM D 5800 (2000) "Standard Test Method for Evaporation Loss of Lubricating Oils by the Noak Method"

ASTM D 6278 (2012) "Standard Test Method for Shear Stability of Polymer Containing Fluids Using a European Diesel Injector Apparatus"

ASTM D 6595 (2011) "Standard Test Method for Determination of Wear Metals and Contaminants in Used Lubricating Oils or Used Hydraulic Fluids by Rotating Disc Electrode Atomic Emission spectrometry"

2.2 Informative References

ISIRI 11378 (1387) "روغن موتور برای موتور های دیزلی در سطح کیفیت معادل با API CF"

ISIRI 1342 (1387) " روغن موتور برای موتور های دیزلی در سطح کیفیت CD"

ASTM D4485-06 (2006) "Standard Specification for Performance of Engine Oils"

مشخصات ارائه شده توسط سازندگان داخلی و خارجی روغن موتورهای گاز سوز

کاتالوگ سازندگان مولدهای برق گاز سوز

3. DEFINITIONS

3.1 Characteristics

In four-cycle engines that clean dry natural gas is burned as the fuel, ash-containing additives should be used in the formulation to control valve and valve seat wear. The residue from burning the ash containing additives (mainly detergents) during combustion produces a solid lubricant to help protection of the valve and seat surfaces. Depending on such factors as metallurgy and operating conditions, it varies the amount of ash in the oil and its residue produces during combustion has been found to be effective at controlling wear in different engines. However, using oils with too high ash level can have negative consequences on engine performance.

3.2 Low ash oils: oils with sulfated ash levels between 0.1 and 0.50 wt%. These contain ashless dispersants and can contain small amounts of metallo-organic oxidation inhibitors along with antiwear additives.

3.3 Medium ash oils: oils with sulfated ash levels between 0.51 and 1.4wt%. These oils contain metallo-organic detergents in combination with other inhibitors.

3.4 TBN: An indication of detergent level in gas Engine oil.

3.5 Sulfated ash content: It is the method to determine The amount of metallo-organic detergent required in gas engine oil, that depending on engine manufacturer, engine design, fuel quality, and operating conditions.

Oils shall be in accordance with the requirements given in Table 1 or 2 when tested according to the specified test methods.

Note1: Oil ash type should comply with the engine Manufacturer and its recommendations.

4. REQUIREMENTS

4.1 Sampling

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

4.2 Interchangeability

Interchangeability of type of used oil with another type of oil shall be approved with the gas engine manufacturer or oil supplier

4.3 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 gas engine manufacturer, recognized laboratory or gas engine oil supplier.

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 favorable than those of the worst individual oil. Reference to the oil supplier is recommended if any doubts exist.

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. INSPECTION

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

6.2 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.

6.3 The supplier shall furnish for 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 .

6.4 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.

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

6.6 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.

6.7 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.

6.8 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 .

7. PACKING

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

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

8. MARKING

8.1 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

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

8.2 Instruction

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

9. STORAGE LIFE

The oil shall meet the requirement of clause 3 after storage for 12 months from date of delivery, in a tightly covered container at temperature between -10 to +45 °C.

Table 1.(Low Ash Engine Oil)

Item	Property	Unit	Limits		Test Method
1	SAE Viscosity Grade	-	30	40	SAE J300
2	Appearance	-	Clear and Homogen		Visual
3	Kinematic Viscosity at 100°C min max	cSt	9.3 <12.5	12.5 <16.3	ASTM D 445
4	Kinematic Viscosity at 40°C	cSt	To be Reported		ASTM D 445
5	Viscosity Index, min	-	90	90	ASTM D 2270
6	Shear Stability, Kinematic Viscosity at 100°C Viscosity loss		Remain at its viscosity grade		ASTM D 6278
7	Flash Point, min	°C	230	245	ASTM D 92
8	Pour Point, max	°C	-12	-12	ASTM D 97
9	Density at 15 °C	kg/m ³	To be Reported		ASTM D 4052
10	Sulphated Ash, max	mass%	0.5	0.5	ASTM D 874
11	Total Base Number, min	mg KOH/g	5	5	ASTM D 2896
12	Total Acid Number	mg KOH/g	To be Reported		ASTM D 664
13	Zinc Content	ppm	300	300	ASTM D 6595
14	Phosphorus Content, max	ppm	300	300	ASTM D 6595
15	Water & Sediments, max	vol%	0.05	0.05	ASTM D 2273
16	Foaming Characteristics (Tendency/Stability), max Seq. I,II,III	ml/ml	10/0 20/0 10/0	10/0 20/0 10/0	ASTM D 892
17	Evaporation Loss at 250°C after 1 hr(Noak), max	mass%	6	4	ASTM D 5800
18	Copper Strip Corrosion, 3hr at 100°C, max	-	1a	1a	ASTM D 130
19	Rust Prevention, 24 hr	-	Pass	Pass	ASTM D 665A

Table 2.(Medium Ash Oil)

Item	Property	Unit	Limits		Test Method
1	SAE Viscosity Grade	-	30	40	SAE J300
2	Appearance	-	Clear and Homogeny		Visual
3	Kinematic Viscosity at 100°C min max	cSt	9.3 <12.5	12.5 <16.3	ASTM D 445
4	Kinematic Viscosity at 40°C	cSt	To be Reported		ASTM D 445
5	Viscosity Index, min	-	90	90	ASTM D 2270
6	Shear Stability, Kinematic Viscosity at 100°C Viscosity loss		Remain at its viscosity grade		ASTM D 6278
7	Flash Point, min	°C	230	245	ASTM D 92
8	Pour Point, max	°C	-12	-12	ASTM D 97
9	Density at 15 °C	kg/m ³	To be Reported		ASTM D 4052
10	Sulphated Ash, max	mass%	1	1	ASTM D 874
11	Total Base Number, min	mg KOH/g	7	7	ASTM D 2896
12	Total Acid Number	mg KOH/g	To be Reported		ASTM D 664
13	Zinc Content	ppm	To be Reported		ASTM D 6595
14	Phosphorus Content	ppm	To be Reported		ASTM D 6595
15	Water & Sediments, max	vol%	0.05	0.05	ASTM D 2273
16	Foaming Characteristics (Tendency/Stability),max Seq. I,II,III	ml/ml	10/0 20/0 10/0	10/0 20/0 10/0	ASTM D 892
17	Evaporation Loss at 250°C after 1 hr(Noak), max	mass%	6	4	ASTM D 5800
18	Copper Strip Corrosion, 3hr at 100°C, max	-	1a	1a	ASTM D 130
19	Rust Prevention, 24 hr	-	Pass	Pass	ASTM D 665A