



شرکت عملیات انتقال گاز ایران

شماره تقاضا

منطقه ده عملیات انتقال گاز

۰۳۴۸۷۲۷\_SH

شناسه ملی ۱۰۱۰۱۹۱۸۸۱۳ ، شماره ثبت ۱۴۹۰۲۷ ، کد اقتصادی شماره ۴۱۱۱-۵۷۸۸۱۹۹۴

آدرس: بندر بوشهر - بلوار رئیسعلی دلواری - خیابان شهید عاشوری - روبروی درمانگاه فرهنگیان - کد پستی ۷۵۱۵۸۸۹۱۵۶

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تلفن: ۰۷۷-۳۱۶۶۵۰۸۵/۳۱۶۶۵۱۰۷

کارشناس خرید: شهرام شریفی

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REQUEST FOR QUOTATION

ItemN	MDescription	Qty	Unit
۱	<p>STEAM TURBINE OIL  STEAM TURBINE OIL, ISO GRADE 68  WITH ANTI-OXIDANT, ANTI-RUST, AND  ANTI-FOAM ADDITIVES.  KINEMATIC VIS. AT 40 DEG. C., 64-70 CST.  KINEMATIC VIS. AT100 DEG..C., 8.4-9 CST.  VISCOSITY INDEX 95 MIN.  FLASH POINT DEG.C 220 MIN.  POUR POINT DEG.C -7 MAX.  TOTAL ACID NO. MG.KOH/CM 0.15 MAX.  COPPER CORROSION NO. 1B MAX.  DEMULSIFICATION NO., SEC. 300 MIN.  OXIDATION STABILITY, HRS. 1000 MIN.  WHOLE OF SPEC. ACC. TO IGS-M-CH-043(0), 2008  GENERAL ELECTRIC GEK-32568C, STANDARD DIN 51515, PART 1/2  BS 489: 1999, ALSTOM HTGT 90117, SIEMENS TLV 901304  SUPPLIER: IRANOL HBX 68</p>	۲,۴۹۶	LT
۲	<p>TURBINE OIL, SPECIAL, BEHRAN SP1 32  TURBINE OIL  VISCOSITY AT 40 DEG.C. 32 CST.  VISCOSITY AT 100 DEG.C. 5 CST.  VISCOSITY INDEX: 104  FLASH POINT: 204 DEG.C.  POUR POINT: -30 DEG.C.  DENSITY AT 15 DEG.C. 870 KG/M3  T.A.N. 0.07 MG KOH/G  COPPER CORROSION: 1A (ASTM D-130)  EMULSION CHARACTERISTICS: 5 MIN.  RBOT(ROTARY BOMB OXIDATION TEST,OXIDATION STABILITY):720MIN  FZG GEAR TEST: 8 (DIN-51354)  RUST PREVENTIVE: PASS A,B  AIR RELEASE: 5 MIN.  FOAMING CHARACTERISTICS: SEQUENCE I: 25 MLT  SEQUENCE II: 50 MLT  SEQUENCE III: 25 MLT  MANUFACTURER: "BEHRAN SP-1 32"  NOTE: USED FOR TURBINE "MOTOR SICH" AI-336-2-8</p>	۲,۴۹۶	LT





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قرار دهد

تاکید می گردد با توجه به اینکه طبق زمان تحویل اعلامی فروشنده، پروژه عملیاتی برنامه ریزی می گردد لذا فروشنده محترم ضمن پیش بینی های لازم می بایست تاریخ دقیق تحویل کالا را مشخص و متعهد گردد طی موعده تعیین شده اقلام را تحویل نماید. بدیهی است هیچگونه تاخیر در تحویل کالا پذیرفتنی نیست.

شماره نیاز سامانه ستاد	مهلت ارسال پاسخ
شماره در خواست واحد خرید منطقه ده	ارسال پاسخ از طریق
0348727	

در خصوص استعلام هایی که از طریق سامانه ستاد صورت می پذیرد، ایران کد های انتخابی در سامانه مشابه بوده و شرح دقیق کالای درخواستی طبق آئتم / آئتم های فوق می باشد.

\* مهم: لیست مشخصات و مشخصات فنی هم روشن کامل استفاده در تیرس مطابق کاتالوگ سازنده، در جدول پیوست آورده شده است و تاگرمی گردد بتایج آزمایش روشن مشخصات فنی با هم فاکتورها را مطابق جدول مذکور بایس نماید.

\* روشن ها کوئید سال جاری باشند.

\* برنده استخدام روشن ها را صرفاً از یک Batch کوئید ارسال نماید.

\* روشن ها الزاماً در کدهای فلزی 208 کوئید و هموی حالت چوبی ارسال گردند.

The lubricating oil shall fulfil the requirements stated in the table below.

Requirement	Unit	Limit	Note	Test Method *
Viscosity grade	ISO VG	46		
Viscosity at 40°C	mm <sup>2</sup> /s	41-50		ASTM D 445
Viscosity index □		>90		ASTM D 2270
Density at 15°C	kg/m <sup>3</sup>	<900		ASTM D 1298
Flash point (COP)	°C	>200		ASTM D 92
Pour point	°C	≤-30	a	ASTM D 97
Total Acid No (TAN)	mg KOH/g	<0.3	b	ASTM D 974
Rust prevention		Pass B		ASTM D 665A
Copper corrosion		Degree 2		ASTM D 130
Zinc content □	ppm	0	c	
Emulsion characteristics □	min	<20		ASTM D 1401
Air release to 0.2% □	min	<5		ASTM D 3427
Foaming at 50°C	ml	≤200		ASTM D 892 Mod
Remaining foam after 1 min	ml	≤10		
Oxidation stability TOST	h	>2000		ASTM D 943
Oxidation stability RBOT	min	>450		ASTM D 2272
RBOT-modified	%	>80		ASTM D 2272

\*) Or equivalent ISO or DIN method

□) Original value adjusted due to the requirements for the compressor.

### Notes

- a) The ambient temperature at some sites may be as low as -20°C and Siemens Industrial Turbomachinery AB requires a 10°C margin
- b) The stated value is for the finished product
- c) No oils with metalorganic compounds, e.g. organic zinc compounds, should be used

QSV91G ..... 10 barG [145 psi]  
 Minimum Cranking Speed ..... 120 rpm

## Fuel Recommendations and Specifications

### General Information

Natural gas, or methane, has been used as an engine fuel for many years. It has primarily served as fuel for stationary units powering pumps, compressors, or generators, but is gaining favor as a motor vehicle fuel. Many early engines and applications were **not** highly rated and did **not** require precise control of the fuel adjustments and the fuel.

Modern technology and compliance with various emissions standards now mandate that certified engines be tuned to precise standards and operated on a more restrictive fuel specification for optimum performance and emissions control. Cummins Inc., has prepared a recommendation for natural gas suppliers as a guideline for successful operation. Operators of Cummins natural gas engines **must** refer the following specification to the potential fuel suppliers and request confirmation as to local availability.

Cummins Inc. Natural Gas Recommendations	
Gas Heat Value (MJ/Nm <sub>3</sub> )	30 – 40
Gas Density (Kg/Nm <sub>3</sub> )	0.7 – 0.9
Methane Number (MN)	60*
Methane (CH <sub>4</sub> )	70%
Ethane (C <sub>2</sub> H <sub>6</sub> )	5%
Hydrogen Sulohide (H <sub>2</sub> S)	0.01%
Maximum Gas Temperature (deg C)	50°C [122°F]

Engine Type	Speed (rpm)	Emissions (NOx at 5% O <sub>2</sub> dry)	HT jacket water outlet temperature	Gas	Methane Number
QSV-G 81/91	1500 / 1200	500 & 350 mg/ Nm <sup>3</sup>	95/110°C [203/ 230°F]	Pipeline Natural Gas	60*

**NOTE:** \* 12 to 1 compression ratio for engines using a Methane Number of 70, 11.4 to 1 compression ratio for engine using a Methane Number of 60. No-de-rating allowed.

**NOTE:** If the gas quality supplied falls outside the above specifications, contact your local Cummins Authorized Repair Facility.

Cummins natural gas engines are designed and adjusted to meet performance and emissions specifications with fuel meeting these specifications. The engine may operate on a wide range of fuel properties, but performance and emissions will be affected, and in extreme cases, fuel with characteristics out of these specifications may cause reliability or durability problems. Cummins assumes no responsibility for the use of fuels which do **not** meet this specification. Engine damage caused by fuel **not** meeting this specification is **not** covered under warranty.

Operators should be alert for sudden changes in engine operation, power levels or pre-ignition. Each of these may be a sign of substandard fuel. If you suspect a problem is related to fuel quality, ask your fuel supplier to sample and analyze the fuel, and contact your authorized Cummins service location for assistance.

## Lubricating Oil Recommendations and Specifications

### General Information

The use of quality engine lubricating oils combined with appropriate oil drain and filter change intervals are a critical factor in maintaining engine performance and durability.

Cummins Inc., recommends the use of a high quality SAE 40 heavy duty engine oil for natural gas engines.

The specifications for oils meeting Cummins recommended SAE 40 oil blends are as follows:

Cummins Inc., Oil Recommendations	
Viscosity @ 40C / 100C (cSt)	154 / 14.5
Viscosity Index	92
Gravity API @ 60F	27.0°
Pour Point (Deg F)	0°
Flash Point COC (Deg F)	485°

(Continued)

<b>Cummins Inc., Oil Recommendations</b>	
Neutralization No (TBN — E)	5.2
Calcium (ppm)	1200
Phosphorus (ppm)	270*
Zinc (ppm)	290*
Sulfated Ash (%W)	0.45*

\* additive levels are critical

**△ CAUTION △**

**A sulfated ash limit of 0.45 percent has been placed on all stationary engine lubricating oil recommended for use in Cummins natural gas engines. Higher ash oil can cause valve and/or piston damage and lead to excessive oil consumption and degradation of the catalyst.**

For further details and discussion of engine lubricating oils for Cummins engines, refer to a Cummins Authorized Repair Facility.

### **Oil Drain Intervals**

Special "break-in" engine lubricating oils are **not** recommended for new or rebuilt Cummins engines. Use the same type of oil during the "break-in" as that which is used in normal operation.

Additional information regarding lubricating oil availability throughout the world is available in the E.M.A. Lubricating Oils Data Book for Heavy Duty Automotive and Industrial Engines. The data book can be ordered from the Engine Manufacturers Association, Two North LaSalle Street, Chicago, IL U.S.A. 60602. The telephone number is: (312) 827-8735.

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## **Lubricating Oil Specification for Iran TC50 / IGAT V-project**

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### Summary

Edition 1 of this document was written for the Iran TC50-project. Same requirements have also become of current interest for IGAT V-project. Edition 2 is adjusted to become valid also for IGAT V.

The lubricating oil system for the TC50 / IGAT V-project will provide both the gas turbines and the compressors with lubricating oil. The requirements in Siemens Industrial Turbomachinery AB's lubricating oil specification deviate to some extent from the requirements in the oil specification of Siemens compressor.

Siemens Industrial Turbomachinery AB has therefore decided to write specific lubricating oil requirements for this project in order to meet the more stringent requirements for the compressor.

This report lists the requirements that the oil should fulfil in order to provide proper lubrication for the gas turbine system. The requirements are based Siemens Industrial Turbomachinery AB's Material specification MAT 81 21 09.

This specification is only to be used for the TC50 and IGAT V projects. It must not be used for any other gas turbine project.