د افغانستان سفارت – تهران Embassy of Afghanistan-Tehran سفارت افغانستان – تهران

شماره: ۲٤۳۹
تاریخ: ۱۴۰۴/۰۶/۱۵
ضمایم: ۲۴ ورق

No:
Date:
Encl:

یادداشت

سفارت افغانستان در تهران با اظهار تعارفات خود به وزارت امور خارجه جمهوری اسلامی ایران احتراماً اشعار می‌دارد:

بر اساس حکم شماره ۸۸۵/۶۶۷۵ مورخ ۱۴۰۴/۰۳/۰۵هـ ش رهبری حکومت افغانستان، اداره ملی استاندارد افغانستان (Afghanistan National Standards Authority - ANSA) مجموعه‌ای از معیارهای ویژه برای کیفیت واردات نفت تدوین نموده است که دسته‌بندی‌های آن به شرح ذیل بوده و مشخصات استانداردهای مربوطه در جداول متعدد ضمیمه این یادداشت ارائه شده است:

الف: مشخصات استاندارد بنزین در سه نوع (ای ۹۲ "A92"، ای ۹۵ "A95"، ای ۹۸ "A98") ترتیب گردیده است؛

ب: مشخصات استاندارد گازوئیل در دو نوع (ال ۰۲-۶۲ "L02-62"، گازوئیل کم سلفر " Low Sulfur Diesel Fuel") ترتیب گردیده است؛

ج: مشخصات استاندارد گاز مایع (LPG) در یک نوع ترتیب گردیده است؛

د: مشخصات استاندارد نفت‌خام در یک نوع ترتیب گردیده است؛

ه: مشخصات استاندارد مبلایل (روغن موتورهای گازوئیل و بنزن) برای خودروهای بنزین و گازوئیل در دو نوع ترتیب گردیده است.

لازم به ذکر است که این معیارها به‌منظور تضمین تأمین انرژی با کیفیت و جلوگیری از واردات مواد نفتی بی‌کیفیت وضع گردیده است. مطابق با این معیارها، هرگونه محموله نفتی که مشخصات فنی و حداقل استانداردهای تعیین‌شده را نداشته باشد، از مرزهای کشور مسترد خواهد شد که این امر موجب وارد شدن خسارات مالی و مشکلات برای تاجران و تأمین‌کنندگان (Suppliers) مواد نفتی می‌گردد.

مراتب فوقاً به آن وزارت محترم ارقام یافت، خواهشمند است تا در راستای همکاری‌های مستمر خویش، موضوع فوق الذکر را به مراجع مربوطه جهت اطلاع رسانی به تأمین کنندگان و تاجران مواد نفتی ارجاع نموده، ممنون سازند.

موقع را مغتنم شمرده، احترامات فائقه را تجدید می‌نماید

به: وزارت محترم امور خارجه جمهوری اسلامی ایران

ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF FOREIGN AFFAIRS

Specifications of low sulfur Diesel Fuel (1500 ppm)

No.	TEST PARAMATERS	METHODS	UNITS	LIMITS	RESULT
1	Cetane Number	ASTM D613/D6890		Min 51	
2	Cetane Index	ASTM D976		According to Calculation	
	Distillation	ASTM D86	°C	-	-
3	10%	ASTM D86	°C	180-230	
	50%	ASTM D86	°C	230-280	
	90%	ASTM D86	°C	280-340	
	96%	ASTM D86	°C	360	
4	Kinematic viscosity at 40 °C	ASTM D445	mm^2/s	1.8-6.0	
5	Water content	ASTM D6304	mg/kg	Max 200	
6	Flash point	ASTM D3828/D93/D2709	°C	Min 55	
7	Sulfur content	ASTM D4294/D5453	mg/kg	Max 1500	
8	Mercaptans Sulfur Content	ASTM D3227/GOST17323	%	Max 0.01	
9	Hydrogen sulfide	ASTM D5623/GOST17323	mg/kg	Max 0.5	
10	Copper strip corrosion rating at 50°C	ASTM D130/GOST 32329	-	1a	
11	Content of Dissolved Water, Acids, and Alkalis	ASTM D664/D6304/D 2709	-	non	
12	Gum Content, mg per 100 cm^3 of Fuel	GOST 8489	mg/cm3	Max 40	
13	Acidity, mg KOH per 100 cm^3 of Fuel	ASTM D974/GOST5985	mg/cm3	Max 5	
14	Iodine Number, gr of iodine per 100 gr of fuel	ASTM D5554/GOST 2070	gr/ml	Max 6	
15	Ash Content	ASTM D482/GOST1461	%	Max 0.01	
16	Carbon Residue(10% residue)	ASTM D524/GOST32392	%	Max 0.20	
17	Mechanical Particulate Content	GOST 6370	%	Not Present	
18	Cloud Point	ASTM D2500/D5772/D7689	°C	Max (-7)	
19	Cold Filter Plugging Point (CFPP), °C	ASTM D6371/GOST EN 116	°C	Max (-10)	
20	Density at 15°C	ASTM D1298/D4052	Kg/m3	820-860	

The Cloud Point (CP) and Cold Filter Plugging Point (CFPP) are considered only for the winter season. Taking into account the climatic conditions in Afghanistan, the winter season in this standard is defined from the 15th of Qaws (approximately December 6) to the 15th of Hoot (approximately March 5), and the rest of the year is considered as summer."

Specifications of Diesel Fuel (L0.2-62)

No.	TEST PARAMATERS	METHODS	UNITS	LIMITS	RESULT
1	Cetane Number	ASTM D613/D6890		Min 51	
2	Cetane Index	ASTM D976	-	According to Calculation	
3	Distillation	ASTM D86	°C	-	-
	10%	ASTM D86	°C	180-230	
	50%	ASTM D86	°C	230-280	
	90%	ASTM D86	°C	280-340	
	96%	ASTM D86	°C	Max-360	
4	Kinematics viscosity at 40 °C	ASTM D445	mm^2/s	1.8-6.0	
5	Water content	ASTM D6304	mg/kg	Max 200	
6	Flash point	ASTM D3828/D93/D2709	°C	Min 62	
7	Sulfur content	ASTM D4294/D5453	%	Max 0.2	
8	Mercaptans Sulfur Content	ASTM D3227/ GOST17323	%	Max 0.01	
9	Hydrogen sulfide	ASTM D5623/GOST17323	mg/kg	Max 0.5	
10	Copper strip corrosion rating at 50°C	ASTM D130/GOST 32329	-	Class 3	
11	Content of Dissolved Water, Acids, and Alkalis	ASTM D664/D6304/D 2709	-	-	
12	Gum Content, mg per 100 cm^3 of Fuel	GOST 8489	mg/cm^3	Max 40	
13	Acidity, mg KOH per 100 cm^3 of Fuel	ASTM D974/GOST5985	mg/cm^3	Max 5	
14	Iodine Number, gr of Iodine per 100 gr of fuel	ASTM D5554/GOST 2070	gr/ml	Max 6	
15	Ash Content	ASTM D482/GOST1461	%	0.01	
16	Carbon Residue(10% residue)	ASTM D524/GOST32392	%	Max 0.20	
17	Mechanical Particulate Content	GOST 6370	%	Not Present	
18	Cloud Point	ASTM D2500/D5772/D7689	°C	Max (-7)	
19	Cold Filter Plugging Point (CFPP), °C	ASTM D6371/GOST EN 116	°C	Max (-10)	
20	Density at 15°C	ASTM D1298/D4052	Kg/m^3	820-860	

The Cloud Point (CP) and the maximum Cold Filter Plugging Point (CFPP) are considered only for the winter season. Taking into account the climatic conditions in Afghanistan, the winter season in this standard is defined from the 15th of Qaws (approximately December 6) to the 15th of Hoot (approximately March 5), and the rest of the year is considered as summer."

Specification for Gasoline A92, A95 and A98

Test Parameters	Unit	Test method	Grade			Test Results
			A92	A95	A98	
Color	-	Visual	Visual	Visual	Visual	
Copper Corrosion	-	ASTMD-130	Class 1	Class 1	Class 1	
Density@ 15°C	Kg/m^3	ASTMD-1298	725-780	725-780	725-780	
Distillation	°C	ASTMD-86	-	-	-	
Initial Boiling Point (IBP)	°C	ASTMD-86	Report	Report	Report	
10%	°C	ASTMD-86	Max-65	Max 60	Max 55	
50%	°C	ASTMD-86	Max-110	Max 105	Max 100	
90%	°C	ASTMD-86	Max-180	Max 170	Max 160	
Final Boiling Point (FBP)	°C	ASTMD-86	Max-215	Max 215	Max 215	
Residue	%	ASTMD-86	Max-2	Max 2	Max 2	
Loss (evaporated volume)	%	ASTMD-86	Max-4	Max-4	Max-4	
70 °C	%	ASTMD-86	15-47	15-50	15-50	
100 °C	%	ASTMD-86	40-70	40-70	Max-70	
180 °C	%	ASTMD-86	Min-85	Min-85	Min-85	
Final Boiling Point (FBP)	°C	ASTMD-86	215	215	215	
Residue	%	ASTMD-86	Max-2	Max-2	Max-2	
RON	-	ASTMD-2699/2700	Min - 92	Min - 95	Min - 98	
MON	-	ASTMD-2699/2700	Min - 83	Min - 85	Min - 88	
RVP	KPa	ASTMD-323/GOST 28781	55-90	60-95	80-100	
Sulfur Content	%mass	ASTMD-4294/1266/2622	Max – 0.05	Max – 0.05	Max – 0.05	
Lead content	mg/dcm	ASTMD-3831/GOST 51942	Max- 0.010	-	-	
Gum content	$mg/100cm^3$	ASTMD-381	5.0	5.0	5.0	
Benzene content	%	ASTMD-4053/7576/4420	1.0	1.0	1.0	
Oxidation stability	-	ASTMD-525/GOST 4039	Min-360	Min-360	Min-360	

Crude oil Specifications

Table 1: Classifications of Crude Oil

Class	Name	% mass fraction of Sulfur	Test Method
1	Low sulfur	Up to 0.60	GOST 1437
2	Sulfur (Normal)	0.61-1.80	
3	High Sulfur	1.81-3.50	
4	Highest Sulfur	>3.50	

Table 2: Types of crude oil

Specifications		Crude Oil Parameters										Test Method
		0		1		2		3		4		
		Internal use	Export	Internal use	Export	Internal use	Export	Internal use	Export	Internal use	Export	
Density (Kg/m³)	20 °C	Max - 830.0		830.1-850.0		850.1-870.0		870.1-895.0		Min-895.0		ASTMD-1298/5005/4052 GOST 3900
	15°C	Max – 834.5		834.6-854.4		854.5-874.4		874.5-899.3		Min-899.3		
Fractional Composition												GOST 2177
200 °C		-	30	-	27	-	21	-	-	-	-	
300 °C		-	52	-	47	-	42	-	-	-	-	
350 °C		-	62	-	57	-	53	-	-	-	-	
Mass % of Paraffin		-	6.0	-	6.0	-	6.0	-	-	-	-	GOST 11851

Table 3: Groups of Crude oil

Specifications	Norms of Crude oil (groups)			Test Method
	1	2	3	
% mass fraction of water (Max)	0.5	0.5	0.1	GOST 2477 / ASTM D-4006
Condensed chlorides salts (mg/dm³) Max	100	300	900	GOST 21534 / ASTM D-3230
Mechanical Particulate Content (Max)	0.05			GOST 6370
Saturated vapor pressure (KPa) Max	66.7 (500)	66.7 (500)	66.7 (500)	GOST 1756 / ASTM D-6377
Chlorinated organic contents (ppm)	Report			ASTM D-4929

Table 4: Types of Crude oil

Specifications	Norms of Crude oil (Types)			Test Method
	1	2	3	
% mass fraction of water (Max)	20	50	100	GOST 50802
Total % mass fraction of methyl and ethyl mercaptans	40	60	100	

Table 1 – General Properties of Diesel Engine Oils

No.	Property	Unit	Acceptable Limits[a]	Test Method
1	Kinematic viscosity at 100°C, low shear rate	mm^2/s	As per SAE J300 (Annex A)	ISIRI 340 / ASTM D445
2	Viscosity at 150°C, high shear rate (HTHS)[b]	mPa·s	As per SAE J300 (Annex A)	ASTM D4683 / D5481
3	Apparent low-temp viscosity (CCS)[c]	mPa·s	As per SAE J300 (Annex A)	ISIRI 5512 / ASTM D5293
4	Apparent low-temp viscosity (MRV)[c]	mPa·s	As per SAE J300 (Annex A)	ASTM D4684
5	Viscosity index	-	To be reported	ISIRI 195 / ASTM D2270
6	Shear stability (viscosity at 100°C after testing)	-	Oil must retain its viscosity grade after testing	ISIRI 17764
7	Volatility, max.	Mass percent (%)	Grades 40, 50, 60: 5% Grades 20, 30, 25W-X: 6% Grade 20W-X: 10% Other grades: 15%	ISIRI 3780 / ASTM D5800
8	Flash point, min.	°C	Grades 40, 50, 60: 220°C Other grades: 200°C	ISIRI 198 / ASTM D92
9	Foaming test (foam tendency/stability), max.: – Stage 1: at 24°C – Stage 2: at 93.5°C – Stage 3: at 24°C	mL	 0–10 0–50 0–10	ISIRI 196 / ASTM D892
10	Pour point, max.	°C	Grade 40, 50, 60: -9°C Grade 20, 30, 25W-X: -18°C Grade 15W-X, 20W-X: -24°C Grade 10W-X: -30°C Grade 5W-X: -33°C Grade 0W-X: -39°C	ISIRI 201 / ASTM D97
11	Elements	Mass (%)	As per the specification of the additive used	ISIRI 3281 / ISIRI 9377 / ASTM D4951
12	Total Base Number (TBN)[d]	mg KOH/g	API CC to API CE: min. 5 API CF-4 to CH-4: min. 8 API CH-4 and higher: min. 10	ISIRI 2772 / ASTM D4739
13	Total Acid Number (TAN)	mg KOH/g	To be reported	ISIRI 18030 / ASTM D974

a) For API CK-4 and FA-4, viscosity grades are limited to those in Table 6.
b) HTHS values for API CI-4, CJ-4, CK-4, and FA-4 are given in their respective specification tables (Tables 4, 5, 6).
c) This test is mandatory for multi grade oils.
d) If the TBN value differs in the additive datasheet, that value shall be considered acceptable.

Table 2 – Specific Properties for API CG-4 and API CF-4 Quality Levels

No.	Property	Unit	Acceptable Limits	Test Method
1	Corrosion test at 121°C[a]:			
	– Increase in copper concentration in the oil, Max	mg/kg	20	
	– Increase in lead concentration in the oil, Max	mg/kg	60	ASTM D5968 (CBT)
	– Increase in tin concentration in the oil, Max	mg/kg	To be reported	
	– Copper strip corrosion (per ISIRI 336)	-	Grade 3	
a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.				

Table 3 – Specific Properties for API CH-4 Quality Level

No.	Property	Unit	Acceptable Limits	Test Method
1	Corrosion test at 135°C[a]:			
	– Increase in copper concentration in the oil, Max	mg/kg	20	
	– Increase in lead concentration in the oil, Max	mg/kg	120	ASTM D6594 (HT CBT)
	– Increase in tin concentration in the oil, Max	mg/kg	To be reported	
	– Copper strip corrosion (per ISIRI 336)	-	Grade 3	
a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.				

Table 4 – Specific Properties for API CI-4 Quality Level

No.	Property	Unit	Acceptable Limits	Test Method
1	Viscosity at 150°C, high shear rate (HTHS), min.	mPa·s	3.5	ASTM D4683 / D4741 / D5481
2	Corrosion test at 135°C[a]:			ASTM D6594 (HT CBT)
	– Increase in copper concentration in the oil, Max	mg/kg	20	
	– Increase in lead concentration in the oil, Max	mg/kg	120	
	– Increase in tin concentration in the oil, Max	mg/kg	To be reported	
	– Copper strip corrosion (per ISIRI 336)	-	Grade 3	
3	Elastomer compatibility[a]:			ASTM D7216, D471, D2240, D412
	a. Polyacrylate Rubber (ACM):			
	– Volume change	%	+5, -3	
	– Hardness change	Grade	+8, -5	
	– Tensile strength change	%	+18, -15	
	– Change in Elongation at break	%	+10, -35	

	b. Hydrogenated Nitrile Rubber (HNBR):			
	– Volume change	%	+5, -3	
	– Hardness change	Grade	+7, -5	
	– Tensile strength change	%	+10, -TMC1006	
	– Change in Elongation at break	%	+10, -TMC1006	
	c. Silicone Rubber (VMQ):			
	– Volume change	%	+TMC1006, -3	
	– Hardness change	Grade	+5, -TMC1006	
	– Tensile strength change	%	+10, -45	
	– Change in Elongation at break	%	+20, -30	
	d. Fluorocarbon Rubber (FKM):			
	– Volume change	%	+5, -2	
	– Hardness change	Grade	+7, -5	
	– Tensile strength change	%	+10, -TMC1006	
	– Change in Elongation at break	%	+10, -TMC1006	
a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.				

Table 5 – Specific Properties for API CJ-4 Quality Level

No.	Property	Unit	Acceptable Limits		Test Method
1	Sulfated ash, max.	Mass %	1.0		ISIRI 194 / ASTM D874
2	Phosphorus, max.	Mass %	0.12		ISIRI 9377 / ASTM D4951
3	Sulfur, max.	Mass %	0.4		ISIRI 9377 / ASTM D4951
4	Viscosity at 150°C, high shear rate (HTHS), min.	mPa·s	3.5		ASTM D4683 / D4741 / D5481
5	Shear stability – Minimum viscosity after 90 cycles	mm^2/s	SAE xW-40 12.5	SAE xW-30 9.3	ASTM D7109
6	Corrosion test at 135°C: – Increase in copper concentration in the oil, Max – Increase in lead concentration in the oil, Max – Copper strip corrosion (per ISIRI 336)	mg/kg	20 120 3		ASTM D6594 (HT CBT)
7	Elastomer compatibility[a]: **a. Polyacrylate Rubber (ACM):** – Volume change – Hardness change	 % Grade	 +5, -3 +8, -5		ASTM D7216, D471 D2240, D412

	– Tensile strength change	%	+18, -15	
	– Change in Elongation at break	%	+10, -35	
	b. Hydrogenated Nitrile Rubber (HNBR):			
	– Volume change	%	+5, -3	
	– Hardness change	Grade	+7, -5	
	– Tensile strength change	%	+10, -TMC1006	
	– Change in Elongation at break	%	+10, -TMC1006	
	c. Silicone Rubber (VMQ):			
	– Volume change	%	+TMC1006, -3	
	– Hardness change	Grade	+5, -TMC1006	
	– Tensile strength change	%	+10, -45	
	– Change in Elongation at break	%	+20, -30	
	d. Fluorocarbon Rubber (FKM):			
	– Volume change	%	+5, -2	
	– Hardness change	Grade	+7, -5	
	– Tensile strength change	%	+10, -TMC1006	
	– Change in Elongation at break	%	+10, -TMC1006	
	E. polymer (VAMAC G):			
	– Volume change	%	+TMC1006, -3	
	– Hardness change	Grade	+5, -TMC1006	
	– Tensile strength change	%	+10, TMC1006	
	– Change in Elongation at break	%	+10, -TMC1006	
a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.				

Table 6 – Specific Properties for API CK-4 and API FA-4 Quality Levels

No.	Property	Unit	Acceptable Limits			Test Method
			API CK-4		API FA-4	
			xW-30	xW-40	xW-30	
1	Sulfated ash, max.	Mass %	1.0			ISIRI 194 / ASTM D874
2	Phosphorus, max.	Mass %	0.12			ISIRI 9377 / ASTM D4951
3	Sulfur, max.	Mass %	0.4			ISIRI 9377 / ASTM D4951

4	Viscosity at 150°C, high shear rate (HTHS), min.	mPa·s	2.9-3.2	(per Annex table A-1)		Min 3.5	ASTM D4683 / D4741 / D5481
5	Shear stability – Minimum viscosity after 90 cycles:	mm²/s	9.3	0W-40 12.8	xW-40 12.5	9.3	ASTM D7109
6	Corrosion test at 135°C: – Increase in copper concentration in the oil, Max – Increase in lead concentration in the oil, Max – Copper strip corrosion (per ISIRI 336)	mg/kg	20 120 3				ASTM D6594 (HT CBT)
7	Elastomer compatibility[a]: **a. Polyacrylate Rubber (ACM):** – Volume change – Hardness change – Tensile strength change – Change in Elongation at break **b. Hydrogenated Nitrile Rubber (HNBR):** – Volume change – Hardness change – Tensile strength change – Change in Elongation at break **c. Silicone Rubber (VMQ):** – Volume change – Hardness change – Tensile strength change – Change in Elongation at break **d. Fluorocarbon Rubber (FKM):** – Volume change – Hardness change – Tensile strength change – Change in Elongation at break **E. polymer (VAMAC G):** – Volume change – Hardness change – Tensile strength change – Change in Elongation at break	 % Grade % % % Grade % % % Grade % % % Grade % % % Grade % %	 +5, -3 +8, -5 +18, -15 +10, -35 +5, -3 +7, -5 +10, -TMC1006 +10, -TMC1006 +TMC1006, -3 +5, -TMC1006 +10, -45 +20, -30 +5, -2 +7, -5 +10, -TMC1006 +10, -TMC1006 +TMC1006, -3 +5, -TMC1006 +10, TMC1006 +10, -TMC1006				ASTM D7216, D471, D2240, D412

a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.

Annex A

The viscosity of engine lubricating oils shall comply with SAE J300:2015.

Table A-1: SAE Viscosity Grades for Engine Oils (SAE J300 2015)

SAE Viscosity Grade	Apparent Viscosity at Low Temperature[c] (mPa·s)		Viscosity at 100°C at Low Shear Rate[b] (mm^2/s)[c]		Viscosity at 150°C at high shear rate (HTHS)[e] (mPa·s) Min
SAE Viscosity Grade	Related to engine start-up[a] (Maximum)	Related to oil pumpability[d]	Minimum	Maximum	High-Shear Viscosity at 150°C (e), Minimum
0W	6200 at -35°C	60000 at -40°C	3.8	-	-
5W	6600 at -30°C	60000 at -35°C	3.8	-	-
10W	7000 at -25°C	60000 at -30°C	4.1	-	-
15W	7000 at -20°C	60000 at -25°C	5.6	-	-
20W	9500 at -15°C	60000 at -20°C	5.6	-	-
25W	13000 at -10°C	60000 at -15°C	9.3	-	-
8	-	-	4.0	<6.1	1.7
12	-	-	5.0	<7.1	2.0
16	-	-	6.1	<8.2	2.3
20	-	-	6.9	<9.3	2.6
30	-		9.3	<12.5	2.9
40	-		12.5	<16.3	3.5 (grades 0W-40, 5W-40, 10W-40)
40	-		12.5	<16.3	3.7 (grades 15W-40, 20W-40, 25W-40, and 40)
50	-		16.3	<21.9	3.7
60	-		21.9	<26.1	3.7

[a] ISIRI 5512/ASTM D5293
[b] ISIRI 340/ASTM D445
[c] 1 mPa.s=1 cP; 1 mm^2/s=1cSt
[d] ASTM D4684 (MRV)
[e] ASTM D4683, ASTM D4741 or ASTM D5481 (HTHS)

Annex B
(Informative)
API classification

Table B-1: API Classification for Base Oils

Table B-1: API Classification for Base Oils

Group	Viscosity index	Saturates content (mass %)	Sulfur (mass %)	Other
I	≥80, <120	<90	and/or >0.03	-
II	≥80, <120	≥90	and ≤0.03	-
III	≥120	≥90	and ≤0.03	-
IV	-	-	-	PAO[a]
V	-	-	-	All other base oils not included in Groups I-IV

(a) Poly alpha olefins

Annex C
(Informative)
Performance Tests (Engine Tests)

Table C-1 – Performance (Engine) Tests for Various Quality Levels of Four-Cylinder Diesel Engine Oils Based on API Classification

Engine Test									Quality level
ASTM D8047 (COAT)	ASTM D5966 (RFWT)	ASTM D8048 (VOLVO T13)	ASTM D7468 (Cummins ISM)	ASTM D7484 (Cummins ISB)	ASTM D7422 (Mack T12)	ASTM D7156 (Mack T11)	ASTM D 6750 Caterpillar 1N	ASTM D7549 (caterpillar C13)	CK4، FA4
ASTM D 6894 (EOAT)	ASTM D 5966 (RFWT)	ASTM D 6984 (Sequence IIIF)	ASTM D 7468 (Cummins ISM)	ASTM D 7484 (Cummins ISB)	ASTM D 7422 (Mack T12)	ASTM D 7156 (Mack T11)	ASTM D 6750 (caterpillar 1N)	ASTM D 7549 (caterpillar C13)	CJ-4
	ASTM D 6894 (EOAT)	ASTM D 5966 (RFWT)	ASTM D 6984 (Sequence IIIF)	ASTM D 6975 (Cummins M11- EGR)	ASTM D 5967 (Mack T8)	ASTM D 6987 (Mack T10)	ASTM D 6750 (caterpillar 1K)	ASTM D 6923 (caterpillar 1R)	CI-4
	ASTM D 6894 (EOAT)	ASTM D 5966 (RFWT)	ASTM D 6984	ASTM D 6838 (Cummins M11)	ASTM D 5967	ASTM D 6483	ASTM D 6750	ASTM D 6681	CH-4
				ASTM D 5966 (RFWT)	ASTM D 5533 (Sequence IIIE)	ASTM D 5967 (Mack T8)	ASTM D 6750 (caterpillar 1N)	ASTM D 5119 (CRC L-38)	CG-4

Continuation of Table C-1 – Performance (Engine) Tests for Various Quality Levels of Four-Cylinder Diesel Engine Oils Based on API Classification

Engine Test									Quality level
					ASTM RR: D02: 1220 (Mack T7)	ASTM RR: D02: 1219 (Mack T6)	ASTM D 6750 (caterpillar 1K)	ASTM D 5119 (CRC L-38)	CF-4*
				ASTM D5290 (Cummins NTC-400)	ASTM RR: D02: 1220 (Mack T7)	ASTM RR: D02: 1219 (Mack T6)	ASTM STP 509 (Caterpillar 1G2)	ASTM D 5119 (CRC L-38)	CE
							ASTM STP 509 (Caterpillar 1G2)	ASTM D 5119 (CRC L-38)	CD
						(LTD)	ASTM STP 315H (Caterpillar 1H2)	ASTM D 5119 (CRC L-38)	CC

Table 1 – General Properties of Gasoline Engine Oils

No.	Property	Unit	Acceptable Limits[a]	Test Method
1	Kinematic viscosity at 100°C, low shear rate	mm^2/s	As per SAE J300 (Annex A)	ISIRI 340 / ASTM D445
2	Viscosity at 150°C, high shear rate (HTHS)	mPa·s	As per SAE J300 (Annex A)	ASTM D4683 / D5481 / D4741
3	Apparent low-temp viscosity (CCS)[a]	mPa·s	As per SAE J300 (Annex A)	ISIRI 5512 / ASTM D5293
4	Apparent low-temp viscosity (MRV)[a]	mPa·s	As per SAE J300 (Annex A)	ASTM D4684
5	Viscosity Index	-	Report	ISIRI 195 / ASTM D2270
6	Shear stability (Viscosity at 100°C after test)	-	Oil must remain within viscosity grade	ISIRI 17764 / ISIRI 3780 / ASTM D5800
7	Volatility, max.	Mass percent (%)	Grades 40, 50, 60: 5% Grades 20, 30, 25W-X: 6% Grade 20W-X: 10% Other grades: 15%	ISIRI 3780 / ASTM D5800
8	Flash point, min	°C	SAE grades 40, 50, 60 → 220 Others → 200	ISIRI 198 / ASTM D92
9	Foaming test (foam tendency/stability), max.: – Stage 1: at 24°C – Stage 2: at 93.5°C – Stage 3: at 24°C	mL	 0–10 0–50 0–10	ISIRI 196 / ASTM D892
10	Pour point, max.	°C	Grade 40, 50, 60: -9°C Grade 20, 30, 25W-X: -18°C Grade 15W-X, 20W-X: -24°C Grade 10W-X: -30°C Grade 5W-X: -33°C Grade 0W-X: -39°C	ISIRI 201 / ASTM D97
11	Elements	Mass (%)	As per the specification of the additive used	ISIRI 3281 / ISIRI 9377 / ASTM D4951
12	Total Base Number (TBN)[b]	mg KOH/g	API SJ & above: min 6 API SC to SJ: min 4	ISIRI 2772 / ASTM D4739
13	Total Acid Number (TAN)	mg KOH/g	Report	ISIRI 18030 / ASTM D974

a) This test is mandatory for multi grade oils.
d) If the TBN value differs in the additive datasheet, that value shall be considered acceptable.

Table 2 – Special Properties for API SH Quality Level

No.	Property	Unit	Acceptable Limits		Test Method
			SAE 15W-40	SAE 5W-30 SAE 10W-30	
1	Filterability[a] (EOFT test), max	% flow reduction	50	-	ASTM D6795
2	Homogeneity & Compatibility[a]	-	Must Pass		ASTM D6922
3	Rust Prevention[a] (BRT), min	-	100		ASTM D6557
4	Phosphorus	Mss %	Min 0.06	Max 0.12	ASTM D5185 / ISIRI 9377
a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.					

Table 3 – Special Properties for API SJ and API SL Quality Levels

No.	Property	Unit	Acceptable Limits				Test Method
			API SNJ		API SL		
			SAE 0W-20 SAE 5W-20 SAE 5W-30 SAE 10W-30	Other grades	SAE 0W-20 SAE 5W-20 SAE 0W-30 SAE 5W-30 SAE 10W-30	Other grades	
1	Foaming Test at 150°C, 1 min, max (Stage IV)	mL	200 - 50		100 - 0		ISIRI 9378
2	Filterability[a] (EOFT test), max	% flow reduction	50		50		ASTM D6795
	Filterability[a] (EOWTT test), max 0.6% water 1.0% water 2.0% water 3.0% water	% flow reduction	 Report Report Report Report		 50 50 50 50		ASTM D6794
3	Oxidation[a]: TEOST 33 Test, max TEOST MHT-4 TEST, max	mg	 60 -		 - 45		ASTM D6335 ASTM D7097
4	Homogeneity & Compatibility[a]	-	Pass		Pass		ASTM D6922
5	Gelation Index[a], max	-	12	-	12	-	ASTM D5133
6	Rust Prevention[a] (BRT), min	-	100		100		ASTM D6557
7	Phosphorus	Mass %	0.06–0.1	Min 0.06	0.06–0.1	Min 0.06	ISIRI 9377/ASTM D5185
a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.							

Table 4 – Special Properties for API SM Quality Level

No.	Property	Unit	Acceptable Limits		Test Method
			SAE 0W-20 SAE 5W-20 SAE 0W-30 SAE 5W-30 SAE 10W-30	Other grades	
1	Foaming Test at 150°C, 1 min, max (Stage IV)	mL	100 - 0		ISIRI 9378
2	Filterability[a] (EOFT test), max	% flow reduction	50		ASTM D6795
	Filterability[a] (EOWTT test), max 0.6% water 1.0% water 2.0% water 3.0% water	% flow reduction	 50 50 50 50		ASTM D6794
3	Oxidation[a]: TEOST MHT Test, max	mg	35	45	ASTM D6335 ASTM D7097
4	Homogeneity & Compatibility[a]	-	Pass		ASTM D6922
5	Gelation Index[a], max	-	12	-	ASTM D5133
6	Rust Prevention[a] (BRT), min	-	100		ASTM D6557
7	Phosphorus	Mass %	0.06–0.08	Min 0.06	ISIRI 9377/ASTM D5185

a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.

Table 5 – Special Properties for API SN Quality Level

No.	Property	Unit	Acceptable Limits			Test Method
			SAE 0W-16 SAE 5W-16 SAE 0W-20 SAE 5W-20 SAE 0W-30 SAE 5W-30 SAE 10W-30	Other grades	API SN (RC[a])	
1	Foaming Test at 150°C, 1 min, max (Stage IV)	mL	100 - 0			ISIRI 9378
2	Filterability[a] (EOFT test), max	% flow reduction	50			ASTM D6795
	Filterability[a] (EOWTT test), max 0.6% water 1.0% water 2.0% water 3.0% water	% flow reduction	50 50 50 50			ASTM D6794
3	Oxidation[a]: TEOST 33C Test, max TEOST MHT Test, max	mg	- 35	- 45	SAE 0W-20 - 35	Other grades 30 35	ASTM D6335 ASTM D7097
4	Homogeneity & Compatibility[a]	-	Pass			ASTM D6922
5	Gelation Index[a], max	-	12	-	12	ASTM D5133
6	Rust Prevention[a] (BRT), min	-	100			ASTM D6557
7	Sulfur, max: Grades: 0W-16, 0W-20, 0W-30, 5W-16, 5W-20, 5W-30	Mass %	0.5	-	0.5	ISIRI 9377 / ISIRI 8402
	10W-30 grades		0.6	-	0.6	
	Other grades		-	-	0.6	
8	Phosphorus	Mass %	0.06–0.08	Min 0.06	0.06–0.08	ISIRI 9377/ASTM D5185
9	Elastomer compatibility[b]: **a. Polyacrylate Rubber (ACM-1):** – Volume change – Hardness change – Tensile strength change	 % Grade %	- 9, -5 10, -10 40, -40			ASTM D7216 ASTM D471 ASTM D2240 ASTM D412

	c. Silicone Rubber (VMQ-1):			
	– Volume change	%	40, -5	ASTM D471
	– Hardness change	Grade	10, -30	ASTM D2240
	– Tensile strength change	%	5, -50	ASTM D412
	d. Fluorocarbon Rubber (FKM):			
	– Volume change	%	3, -2	ASTM D471
	– Hardness change	Grade	6, -6	ASTM D2240
	– Tensile strength change	%	10, -65	ASTM D412
	E. AEM-1:			ASTM D471
	– Volume change	%	30, -5	ASTM D2240
	– Hardness change	Grade	10, -20	ASTM D412
	– Tensile strength change	%	30, 30	

a) Resource conserving

a) This test depends on the availability of accredited laboratories equipped and authorized by the National Standards Authority.

Annex A

The viscosity of engine lubricating oils shall comply with SAE J300:2015.

Table A-1: SAE Viscosity Grades for Engine Oils (SAE J300 2015)

SAE Viscosity Grade	Apparent Viscosity at Low Temperature[c] (mPa·s)		Viscosity at 100°C at Low Shear Rate[b] (mm²/s)[c]		Viscosity at 150°C at high shear rate (HTHS)[e] (mPa·s) Min
SAE Viscosity Grade	Related to engine start-up[a] (Maximum)	Related to oil pumpability[d]	Minimum	Maximum	High-Shear Viscosity at 150°C (e), Minimum
0W	6200 at -35°C	60000 at -40°C	3.8	-	-
5W	6600 at -30°C	60000 at -35°C	3.8	-	-
10W	7000 at -25°C	60000 at -30°C	4.1	-	-
15W	7000 at -20°C	60000 at -25°C	5.6	-	-
20W	9500 at -15°C	60000 at -20°C	5.6	-	-
25W	13000 at -10°C	60000 at -15°C	9.3	-	-
8	-	-	4.0	<6.1	1.7
12	-	-	5.0	<7.1	2.0
16	-	-	6.1	<8.2	2.3
20	-	-	6.9	<9.3	2.6
30	-		9.3	<12.5	2.9
40	-		12.5	<16.3	3.5 (grades 0W-40, 5W-40, 10W-40)
40	-		12.5	<16.3	3.7 (grades 15W-40, 20W-40, 25W-40, and 40)
50	-		16.3	<21.9	3.7
60	-		21.9	<26.1	3.7

[a] ISIRI 5512/ASTM D5293
[b] ISIRI 340/ASTM D445
[c] 1 mPa.s=1 cP; 1 mm²/s=1cSt
[d] ASTM D4684 (MRV)
[e] ASTM D4683, ASTM D4741 or ASTM D5481 (HTHS)

Annex B
(Informative)
API classification

Table B-1: API Classification for Base Oils

Group	Viscosity index	Saturates content (mass %)	Sulfur (mass %)		Other
I	≥80, <120	<90	and/or	>0.03	-
II	≥80, <120	≥90	and	≤ 0.03	-
III	≥120	≥90	and	≤ 0.03	-
IV	-	-	-	-	PAO[a]
V	-	-	-	-	All other base oils not included in Groups I-IV

(a) Poly alpha olefins

Annex C
(Informative)
Performance Tests (Engine Tests)

The performance (engine) tests related to various quality levels of diesel engine oils based on API classification are as follows:

Table C-1 – Performance (Engine) Tests for Various Quality Levels of Four-Cylinder Gasoline Engine Oils Based on API Classification

Engine test						Quality level
	ASTM D 6709 (Sequence VIII)	ASTM D 6593 (Sequence VG)	ASTM D 7589 (Sequence VID)	ASTM D 6891 (Sequence IVA)	ASTM D 7320 (Sequence IIIG)	SN[a]
	ASTM D 6709 (Sequence VIII)	ASTM D 6593 (Sequence VG)	ASTM D 6891 (Sequence IVA)	(Sequence III GA)	ASTM D 7320 (Sequence IIIG)	SM
		ASTM D 6709 (Sequence VIII)	ASTM D 6593 (Sequence VG)	ASTM D 6891 (Sequence IVA)	ASTM D 6984 (Sequence IIIF)	SL
		ASTM D 5302 (Sequence VE)	ASTM D 5533 (Sequence IIIE)	ASTM D 5844 (Sequence IID)	ASTM D 5119 (CRC L-38)	SJ
		ASTM D 5302 (Sequence VE)	ASTM D 5533 (Sequence IIIE)	ASTM D 5844 (Sequence IID)	ASTM D 5119 (CRC L-38)	SH
	ASTM STP 504A (Caterpillar 1H2)	ASTM D 5302 (Sequence VE)	ASTM D 5533 (Sequence IIIE)	ASTM D 5844 (Sequence IID)	ASTM D 5119 (CRC L-38)	SG
		ASTM STP 315H (Sequence VD)	ASTM STP 315H (Sequence IIID)	ASTM D 5844 (Sequence IID)	ASTM D 5119 (CRC L-38)	SF
		ASTM STP 315F (Sequence VC(	ASTM STP 315F (Sequence IIIC(	ASTM STP 315D (Sequence IIB)	ASTM D 5119 (CRC L-38)	SE
PTM 346 (Caterpillar 1H)	ASTM STP 315C (Sequence VB(	ASTM STP 315C (Sequence IV(	ASTM STP 315D (Sequence IIIB(	ASTM STP 315D (Sequence IIB)	ASTM D 5119 (CRC L-38)	SD
(Caterpillar L-1)	ASTM STP 315B (sequence v)	ASTM STP 315C (Sequence IV)	ASTM STP 315B (Sequence IIIA)	ASTM STP 315B (Sequence IIA)	ASTM D 5119 (CRC L-38)	SC

a) The Sequence VI engine series is used for testing the RC (Resource Conserving) property.

TABLE 1 Detailed Requirements for Liquefied Petroleum Gases (LPG)

Specifications	Product Type				Test methods
	Commercial Propane	Commercial Butane	Commercial PB Mixtures	Special-Duty Propane[A]	ASTM Test Methods (see Section 2)
Vapor pressure at 37.8 °C (100 °F), kPa (psig) max[B]	1435 (208)	483 (70)	C	1435 (208)	D1267[D] or D2598 or D6897
Heavier hydrocarbon contaminants:[E] Butane and heavier,[F] % by volume, max	2.5	...	...	2.5	D2163
Pentane and heavier,[G] % by volume, max	...	2.0	2.0	...	D2163
Propylene content, % by volume, max	...	...	...	5.0	D2163
Residual matter One of the following requirements shall be met: (1) Residue on evaporation of 100 mL, mL, max, and	0.05	0.05	0.05	0.05	D2158[I]
Oil stain observation	Pass[H]	Pass[H]	Pass[H]	Pass[H]	D2158[I]
or (2) Residue by gas chromatography, mg/kg, max	350	350	350	350	D7756
Density at 15 °C or relative density at 15.6 °C/15.6 °C (60 °F/60 °F)	J	J	J	...	D1657 or D2598
Corrosion, copper, strip, max	No. 1	No. 1	No. 1	No. 1	D1838[K]
Sulfur, mg/kg (ppm by mass), max	185[L]	140[L]	140[L]	123[L]	D6667
Hydrogen sulfide	pass	pass	pass	pass	D2420
Moisture content	pass	...	...	pass	D2713
Free water content	...	None[M]	None[M]	...	...

A) Equivalent to Propane HD-5 of GPA Standard 2140.
B) Note that the total pressure of a batch of LPG can be higher than the vapor pressure determined by Practice D2598 if there are any inert gases (such as nitrogen or carbon dioxide) present in the LPG. Test Method D2598 is a calculation method of the vapor pressure of all hydrocarbons identified in a batch of LPG by Test Method D2163, but this gas chromatographic method does not detect the presence of inert gases, if present, in a batch of LPG.
C) The permissible vapor pressures of products classified as PB mixtures shall not exceed 208 psig (1435 kPa) and additionally shall not exceed the pressure calculated in psig from the following relationship between the observed vapor pressure at 100 °F (37.8 °C) and the observed relative density at either 60 °F or 15.6 °C

Vapor pressure, psig, max

$= 1167 - 1880\ (relative\ density\ at\ 60°F/60°F)$

$= 1167 - 1880\ (relative\ density\ at\ 15.6°C/15.6°C)$

A specific mixture shall be designated by the vapor pressure at 100 °F in pounds per square inch gauge. To comply with the designation, the vapor pressure of the mixture shall be within +0 psi to −10 psi of the vapor pressure specified.

D) In case of dispute about the vapor pressure of a product, the value actually determined by Test Method D1267 shall prevail over the value calculated by Practice D2598 or measured by Test Method D6897.

E) See X1.2.2.3.

F) "Butane and heavier" includes all hydrocarbons (including olefins) with 4 or more carbon atoms.

G) "Pentane and heavier" includes all hydrocarbons (including olefins) with 5 or more carbon atoms.

H) An acceptable product shall not yield a persistent oil ring when 0.3 mL of solvent residue mixture is added to a filter paper, in 0.1 mL increments and examined in daylight after 2 min as described in Test Method D2158.

I) In case of dispute, Test Method D2158 shall be the referee test method

J) Although not a specific requirement, the density or relative density can be needed for other purposes and should be reported. Additionally, the relative density of PB mixture is needed to establish the permissible maximum vapor pressure (see Footnote *B*)

K) This method may not accurately determine the presence of reactive materials (for example, H_2S, S^o) in liquefied petroleum gas if the product contains corrosion inhibitors or other chemicals which diminish the reaction with the copper strip.

L) The total sulfur limits in these specifications *do include* sulfur compounds used for stenching purposes.

M) The presence or absence of water may be determined by visual inspection of the samples on which the density or relative density is determined.

The proportions of propane and butane during different seasons of the year shall be as follows:

Hydrocarbons	Spring – summer	Autumn – winter
Propane	30%	70%
Butane	70%	30%

Note: The latest changes in the proportions of propane and butane during different seasons of the year are as follows:

Hydrocarbons	Spring – summer	Autumn – winter
Propane	40-30	60-70
Butane	60-70	30-40

Considering the data received from the esteemed Meteorological Department and the variations in temperature across different months and seasons, the following schedule is proposed for the use of imported fuel gases during winter and summer:

- **Winter gas usage period:** From 10th Aqrab (November 1) to 10th Hamal (March 30)
- **Summer gas usage period:** From 11th Hamal (March 31) to 9th Aqrab (October 31)