

Technical specification

October 7, 2016

1 Definition

The technical specification concerns lubrication oils intended for lubricating gasoline and diesel IC engines for cars, vans, trucks, tractors and other heavy machinery. The following information outlines the technical requirements, specification and applications of the lubricants. The technical specification does not cover oils intended for two-stroke engines, ship diesel engines and airplane engines.

2 Classification and notation

Motor oils are classified according to their viscosity class and exploitation level.

- The viscosity class is determined and notated according to the SAE J 300, BDS ISO standard, as shown in Table 1.
- The level of wear/degradation is determined according to the API, ACEA and company specifications. These are shown in tables 2-4.
- Our company guarantees that the produced oil batches match the technical specification they were issued with and belong to the classes listed.
- The production of different types of lubricants is achieved by using the appropriate base stocks and synthetic oils, mixed in ratios guaranteed to achieve the required technical class.
- The quality of oil additives is guaranteed by the producer.
- Recycled oils are not used in the production of motor oils.
- The quality requirements shown in tables 4-9 refer to the finished motor oil, complete with all required additives. Quality parameters are determined for each batch produced.
*Note: The "Sulphuric ash" and "Content and elements" parameters are determined for each new batch of additives.

3 Tables and Figures

3.1 Viscosity

Table 1: Viscosity index

Viscosity class according to SAE	Viscosity at low temperatures		Viscosity at high temperatures		
	Stirred	Pumped ¹	At 100 C°		At 150 C°
			max	min	min
10W	7000 at -25 C°	6000 at -30 C°	4.1	-	-
15W	7000 at -20 C°	6000 at -25 C°	5.6	-	-
20W	9500 at -15 C°	6000 at -20 C°	5.6	-	-
20	N/A	N/A	5.6	< 9.3	2.6
30	N/A	N/A	9.3	< 12.5	2.9
40	N/A	N/A	12.5	< 16.3	2.9

3.2 API standard

Table 2: Petrol engines - class "S"

API class	Year introduced	Status
API SC	1964	Removed
API SD	1968	Removed
API SE	1972	Removed
API SF	1980	Removed
API SG	1989	Removed
API SH	1994	Removed
API SJ	1997	Valid
API SL	2001	Valid
API SM	2004	Valid
API SN	2010	Valid

Table 3: Diesel engines - class "C"

API class	Year introduced	Status
API CD	1955	Removed
API CE	1985	Removed
API CF-4	1990	Removed
API CF	1994	Removed
API CG-4	1995	Removed
API CH-4	1998	Valid
API CI-4	2002	Valid
API CJ-4	2006	Valid

3.3 ACEA standard

3.3.1 ACEA European oil Sequences 2010 Gasoline and light duty diesel engines *

Table 4

A1/B1 (HTHS _{3.5}) Ford 913-B	A3/B3 (HTHS _{3.5}) MB 229.1	A3/B4 (HTHS _{3.5}) MB 229.3/5	A5/B5 (HTHS _{3.5}) VW503/506 VW 502 00/50500
Low SAPS	Mid SAPS	Low SAPS	Mid SAPS
C1	C2	C3	C4
A5/B5 (HTHS _{2.9}) Mazda DPF	A5/B5 (HTHS _{2.9}) Toyota DPF Peugeot DPF	A3/B4 (HTHS _{3.5}) MB 229.31/51 VW 505 01 50400/50700	A3/B4 (HTHS _{3.5}) Renault RN 0720

* DPF - Diesel Partikel Filter

SAPS Sulphated Ash Phosphorus - Sulfur

TWS Three Way Catalyst

3.3.2 Motor oils for trucks and construction machines

Table 5

ACEA 2	ACEA 7	Low SAPS ACEA E9	ACEA E4	Low SAPS ACEA E6
API CF-4; CH-4 MB 228.1 MAN 271 VOLVO VDS	API CG-4 ; CJ-4 MB 228.3 MAN 3275 VOLVO VDS-2/3	API CJ-4 MB 228.31 VOLVO VDS-4	extended inter- vals 288.5 MAN 3277 VOLVO VDS-4	extended inter- vals 228.51 MAN 3477

Table 6

	Euro III 2001	EuroIV 2006	EuroV 2009	EuroV 2014
Nitrogen oxides NO_x	5.0	3.5	2.0	0.4
Carbon monoxide CO	2.1	1.5	1.5	1.5
Hydrocarbons C	0.66	0.46	0.46	0.13
Particulate matter PM	0.10	0.03	0.03	0.01

3.4 Requirements for single-grade diesel and petrol motor oils

Table 7: API SD/, S J 300: 30 and 40

Nº	Parameters	10D	16D	Testing method
1.	Kinematic viscosity 100 C° , $mm^2/s40C^\circ$	10.5 to 12.5	14.5 to 16.2	EN ISO 3104
2.	Viscosity index \geq	95	92	EN ISO 2909
3.	Pouring temperature, $C^\circ \leq$	-20	-15	ISO3016
4.	Evaporation according to Noak \leq	9	6	BDC 8088-70
5.*	Sulphuric ash %, \leq	0.56	0.56	EN ISO 3987
6.*	Overall alkalinity, $mgKOH/g, \geq$	4.6	4.6	ASTM D 2896
7.	Flash point, $C^\circ \geq$	230	240	EN ISO 2592

*Note: These values are valid for additive compositions Lubrizol 03.

Table 8: A[O SD/SF, 227.0/1,IL-L 2104 D/46 152 S J 300: '95, 30 and 40

Nº	Parameters	10E2	16E2	Testing method
1.	Kinematic viscosity 100 C° , $mm^2/s40C^{\circ}$	10.5 to 12.5	14.5 to 16.2	EN ISO 3104
2.	Viscosity index \geq	95	92	EN ISO 2909
3.	Pouring temperature, $C^{\circ} \leq$	-20	-15	ISO3016
4.	Evaporation according to Noak \leq	9	6	BDC 8088-70
5.*	Sulphuric ash %, \leq	1.0	1.0	EN ISO 3987
6.*	Overall alkalinity, $mgKOH/g, \geq$	7.7	7.7	ASTM D 2896
7.	Flash point, $C^{\circ} \geq$	230	240	EN ISO 2592

*Note: These values are valid for additive compositions Lubrizol 04.

3.5 Requirements for multi-grade diesel and petrol motor oils

API CE-4, CG-4,C-4,CI-4, ACEA E7 228.3,MAN 3275, VOLVO VDS-2/3,DAF HP3

API CE-4, CG-4,C-4,CI-4, ACEA E7 228.3,MAN 3275, VOLVO VDS-2/3,DAF HP3

4 Methodology for taking samples

5 Testing methodology

6 Packaging and marking

7 Storage and transport

8 Documentation