Chrysler Group LLC
Material Standard
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LUBRICANT – ENGINE OIL, LOW SULFUR, PHOSPHORUS AND ASH

1.0 GENERAL***

This engine oil defined by this standard must also meet the requirements of the ACEA C3 European Oil Sequence for The Service Fill of Gasoline and Diesel Engines.

1.1 Purpose

This standard presents the requirements of an engine oil containing additives suitable for the lubrication of Gasoline and Diesel powered vehicles. In addition the base oil and additive components combined will not be detrimental to the durability of exhaust system Catalyst and Diesel Particulate Filters (DPF).

1.2 Coverage of this Standard

This engine oil is intended for use in Diesel Engines for Engineering Test and Certification Vehicles equipped with a DPF after-treatment system. The engine oil is also intended for use as the initial fill, top-off and service of Diesel Engines used in vehicles equipped with a DPF system.

The Chrysler Group LLC Organic Materials Engineering, Lubricants Group will make all determinations as successful formulation development and test completion in regards to all of the requirements outlined in this standard.

In addition to the testing detailed on this standard, MS-11106 lubricant should be thoroughly vehicle tested. Prior to use in any specific powertrain component, the responsible design engineer should specify all necessary vehicle/field testing. Vehicle testing as to durability, emissions protection and fuel economy is highly recommended.

Materials engineering should be consulted prior to use of this material as other fluids may provide more acceptable cost and performance characteristics.

2.0 MATERIAL CHARACTERISTICS***

This lubricant shall meet the requirements of the latest version of ACEA C3 European Oil Sequence for the Service Fill of Gasoline and Diesel Engines in addition to those characteristics specified in the following sections. This engine oil must all meet Mercedes Benz 229.51 engine oil standard. This engine oil shall be free from suspended matter, water, and other foreign material.

3.0 PHYSICAL, CHEMICAL AND PERFORMANCE REQUIREMENTS OF THE MATERIAL

TABLE 1: PHYSICAL AND CHEMICAL REQUIREMENTS			
TEST METHOD	CHARACTERISTIC	REQUIREMENT	QA
ASTM D445	Kinematic Viscosity @ 100C	9.3 - <12.5 cSt	C
ASTM D5293	Low Temperature Cranking Viscosity	6600 cP @ -30C	I
ASTM D4684	Low Temperature Pumping Viscosity	60000 cP @ -35C	I
ASTM D97	Pour Point	-36 C Max.	I
ASTM D4683	High Shear Rate Viscosity	3.5 cP Min.	P
ASTM D6335	High Temperature Deposits	30 mg Max.	I
ASTM D7097	Medium High Temperature Deposits	25 mg Max.	I
ASTM D892	Foam Tendencies	Sequence I 0/0 ml Max. Sequence II 50/0 ml Max. Sequence III 0/0 ml Max.	I
ASTM D6082	Foam Tendencies	Sequence IV 100 ml Max.	P
ASTM D874	Sulfated Ash	0.8 % Max.	P
ASTM D2896	Total Base Number	6.0 mgKOH/g Min.	I
ASTM D5185	Sulfur Content	0.2 % Max.	I
ASTM D5185	Phosphorus Content	0.08 % Max.	C
DIN ISO 15597	Chlorine Content	0.005 % Max.	I
ASTM D5800	Evaporative Loss	10 % Max.	I

TABLE 2: ENGINE TEST REQUIREMENTS			
TEST METHOD	CHARACTERISTIC	REQUIREMENT	QA
M 271	MB DL Sludge	MB 229.51	I
M 271	MB DL Wear , 250 Hrs.	MB 229.51	I
M 111 (CEC L-54-T-96)	Fuel Economy Versus RL 191	MB 229.51	I
OM 611 DE22LA	MB DL, 300 Hrs. Engine Wear, Deposits & Sludge	MB 229.51	I
OM 602A (CEC L-51-A-98)	Engine Wear, Deposits & Sludge	MB 229.51	I
VW TDI (CECL-78-T-99)	Piston Cleanliness	Pass	I
VW PV 1449	Viscosity Increase Total Base Number Depletion Piston Deposits	Pass	I

All engine testing requirements in this section must be conducted under the protocol specified in the Engine Lubricants Quality Management System (EELQMS). This system which is described in the ATIEL Code of Practice, addresses product development testing and product performance documentation, and involves the registration of all candidate and reference oil testing and defines the compliance process.

4.0 QUALITY

Refer to CS-9801 for general quality requirements.

Lubricants supplied under this standard shall not deviate from the properties of the original sample by more than the amount indicated below:

TABLE 3: PRODUCT CONSISTENCY REQUIREMENTS			
TEST METHOD	CHARACTERISTIC	DEVIATION	QA
ASTM D1298 or D4052	Density	+/- 0.7%	C
ICP or Equivalent	Elemental Analysis	-10% - +15%	C
ASTM D2896	Total Base Number	+/- 0.5 mg KOH/g	C
Infrared Spectroscopy	The infrared spectrogram shall correspond to the spectrogram of the material originally approved.		C

Tests designated "C" are control tests for quality assurance purposes and must be run on each production batch. Tests designated "P" are performance tests and should be run on a regular basis, but not every batch, basis (minimum four times per year). Tests designated "I" are for initial engineering qualification purposes only. The supplier may substitute internal test methods after initial approval if a direct correlation to the specific test method specified is established to the satisfaction of Organic Materials Engineering.

5.0 DEFINITIONS/ABBREVIATIONS/ACRONYMS

ACEA	The European Automobile Manufacturers Association, previously known as The Association des Constructews Euro peens d'Industrie.
ASTM	ASTM International, previously known as The American Society For Testing And Materials.
ATIEL	Association Technique de l' Industrie Europeenne des Lubrifiants.
EELQMS	Engine Lubricants Quality Management System.
CEC	Coordinating Engineering Council
DIN	Petroleum Test Methods or Deutsches Institut fur Normung
DPF	Diesel Particulate Filter
TEOST	Thermal Engine Oil Oxidation Stability Test

6.0 GENERAL INFORMATION

Three asterisks "***" after the section/paragraph header denotes single or multiple technical changes to the section/paragraph. Specific technical changes within a section, subsection, table, or figure may be highlighted in yellow.

Certain important information relative to this standard has been included in separate standards. To assure the processes submitted meet all of Chrysler requirements, it is mandatory that the requirements in the following standards be met.

CS-9800 - Application of this standard, the subscription service, and approved sources
CS-9003 - Regulated substances and recyclability

Within Engineering Standards, the Regulatory (Government-mandated) requirements are designated by <S> and <E> which correspond to Safety and Emission Shields respectively. When applicable, the Chrysler mandated requirements are designated by <D> which correspond to the Diamond symbol and by <A> for Appearance related objectives, respectively.

For specific information on this document, please refer to the contact person shown in the "Publication Information" Section of this document. For general information on obtaining Engineering Standards and Laboratory Procedures, see CS-9800 or contact the Engineering Standards Department at engstds@chrysler.com.

7.0 REFERENCES

Chrysler Standards	ASTM Standards	ASTM Standards	SAE Standards	Federal Standards
CS-9003	ASTM D97	ASTM D5293		
CS-9800	ASTM D445	ASTM D5800		
CS-9801	ASTM D874	ASTM D6082		
	ASTM D892	ASTM D6335		
	ASTM D1298	ASTM D7097		
	ASTM D2896			
	ASTM D4052			
	ASTM D4683			
	ASTM D4684			
	ASTM D5185			
Quality and Reliability Documents				
Other Documents				
DIN ISO 15597- Available at http://www.din.de/cmd?level=tpl-home&languageid=en				
M 111 M 271 OM 611 DE22LA OM 602A VW TDI VW PV 1449 - Available at www.acea.be/				

8.0 ENGINEERING APPROVED SOURCE LIST

TABLE 4: ENGINEERING APPROVED SOURCE LIST Materials covered by this standard shall only be purchased from the source(s) listed in this table.		
SUPPLIER	SUPPLIER CODE	ADDITIONAL INFORMATION
ExxonMobil	47096K	RN5326AAC
Petronas	64458	1157
Shell	90117	XSA 7382 AL
Valvoline	94016	Synpower MST / OS 212236 Synpower MST / OS 222112

9.0 PUBLICATION INFORMATION

[redacted]

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- Removed references to ACEA A3/B4 from document

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