WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW16077

Engine Oil, Global Factory-Fill, Diesel Engine, SAE 0W-40

1 Scope

1.1 Material Description. This specification describes factory-fill engine oil for passenger cars and light-duty trucks with diesel-fueled engines. The material is SAE 0W-40, global GM engine oil.

1.2 Symbols. Not applicable.

1.3 Applicability. Materials meeting this specification are intended to be used as factory-fill engine oil for passenger cars and light-duty trucks with diesel-fueled engines.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D412	ASTM D5762	CEC L-54-T-96	EN ISO 14596
ASTM D445	ASTM D5800/A	CEC L-78-T-99	ISO 37
ASTM D471	ASTM D6082	CEC L-88-T-02	ISO 48 Method M
ASTM D664	ASTM D6443	CEC L-093	ISO 1817
ASTM D874	ASTM D6557	CEC L-099	ISO 3016
ASTM D892	ASTM D6593	DIN 51 363-2	ISO 7619-1
ASTM D2240	ASTM D6709	DIN 51 363-3	ISO 15597
ASTM D2622	ASTM D7216	DIN 51 400-10	LBCH02-28
ASTM D2896	ASTM D7320	DIN 51 452	SAE J300
ASTM D3228	CEC L-14-A-93	DIN 51 453	SAE J2643
ASTM D4052	CEC L-36-A-90	DIN 51 575	SAE 0W-40
ASTM D4684	CEC L-38-A-94	DIN 51 757 Part 4	SAE 15W-40
ASTM D4739	CEC L-39-T-96	DIN ISO 2909	VDA 675301
ASTM D4741	CEC L-40-A-93	DIN ISO 3104	
ASTM D4951	CEC L-51-A-98	DIN ISO 3771	
ASTM D5293	CEC L-53-T-95	EN ISO 2592	

2.2 GM Standards/Specifications.

GMW3059	GMW14270	GMW16073

2.3 Additional References.

- Additive Technical Committee (ATC) Code of Practice.
- American Chemistry Council (ACC) Petroleum Additives Product Approval Code of Practice
- Association Technique de l'Industrie Européenne des Lubrifiants (ATIEL) Code of Practice.
- European Engine Lubricants Quality Management System (EELQMS).
- Formulation Submission Package (FSP) forms available at gmdexos.com.
- GMPTE-T DUR019 – Diesel Release Test.

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- GMPTE-T DUR020 – OP1.
- GMPTE-T DUR021 – Valve Train Wear.
- GMPTE-T MEC024 – Aeration.
- Safety and Industrial Hygiene (S&IH) Technical Standard (TS), S&IH TS 3.4-160-02 (available at www.gmsupplypower.covisint.com)

3 Requirements

3.1 Test Requirements. The Sequence IIIG (ASTM D7320), Sequence IIIGA (ASTM D7320 Appendix X1), Sequence VG (ASTM D6593), and Sequence VIII (ASTM D6709) engine tests, and the Ball Rust Test (ASTM D6557), must be conducted according to the procedures specified in the American Chemistry Council (ACC) Petroleum Additives Product Approval Code of Practice.

3.1.1 The Peugeot TU5JP-L4 (CEC L-88-T-02), MB M111 Black Sludge (CEC L-53-T-95) and/or M271 sludge test (see Appendix A, Table A2, Note 3), Peugeot TU3M (CEC L-38-A-94), MB M111 Fuel Economy (CEC L-54-T-96), DV4TD (CEC L-093), OM646LA (CEC L-099) and/or OM602A (CEC L-51-A-98) (see Appendix A, Table A3, Note 1 and Note 2), and VW DI (CEC L-78-T-99) engine tests, and the Shear Stability Test (CEC L-14-A-93), must be conducted according to the procedures specified in the Additive Technical Committee (ATC) Code of Practice, the Association Technique de l'Industrie Europeenne des Lubrifiants (ATIEL) Code of Practice, and the European Engine Lubricants Quality Management System (EELQMS).

3.1.2 The Sequence IIIG (ASTM D7320), IIIGA (ASTM D7320 Appendix X1), OP1 (GMPTE-T DUR020), Valve-train Wear (GMPTE-T DUR021), Aeration (GMPTE-T MEC024), and Diesel-Engine Oil Release (GMPTE-T DUR019) engine tests, and all tests listed in Appendix A, Table A1 and Table A2 of this specification, must be run on the final candidate oil formulation unless otherwise authorized by the dexos® Approval Committee.

3.1.3 It is GM's intent that the product actually supplied under this specification, i.e., the final formulation, will have passed all of the requirements defined herein. In the event that GM does not agree with the suitability of any viscosity-grade read across, base oil interchange, minor modification, or other change to the candidate oil formulation, GM reserves the right to require additional testing**.**

3.2 Data Requirements. The engine oil supplier seeking approval of a candidate engine oil formulation to this specification must fulfill all of the requirements specified herein including those requirements listed in Appendix A, Table A1 of this specification**.**

3.2.1 The engine oil supplier seeking approval of a candidate engine oil formulation to this specification must provide a complete Formulation Submission Package (FSP) for the candidate oil to the dexos® Approval Committee. FSP forms may be obtained from the Center for Quality Assurance, at gmdexos.com.

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. All shipments of material or parts under contract or purchase order manufactured to this specification shall be equivalent in every respect to the initial samples approved by Engineering. There shall be no changes in either formulation or manufacturing processes permitted without prior notification and approval by Engineering. Lack of notification by the supplier constitutes grounds for rejection of any shipment. While samples may be taken from incoming shipments and checked for conformance to this specification, the supplier shall accept the responsibility for incoming shipments meeting this specification without dependence upon purchaser's inspection.

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The series of tests used to approve each batch of product along with acceptance limits will be agreed upon by the purchaser and seller. The laboratory providing the certificate of analysis must also participate in a proficiency testing program (round robin) that is approved by the Fuels, Fluids, and Lubricants Global Subsystem Leadership Team (GSSLT) or designate. The Fuels, Fluids, and Lubricants GSSLT or designate must receive copies of the proficiency testing reports directly from the test program administrator.

5.3.1 The Engineering approval required for 5.3 must come from the dexos® Approval Committee.

5.3.2 Unless otherwise authorized by the dexos® Approval Committee, the "series of tests" referred to in Section 5.3 must include, but is not limited to kinematic viscosity at 100 °C, total base number (TBN), specific gravity at 15 °C, foam tendency at 94 °C, Fourier Transform Infrared Spectroscopy (FTIR) spectra, and concentrations of zinc, calcium, magnesium, and phosphorus using methods defined in Table A1.

5.3.3 The proficiency testing report referred to in Section 5.3 must be supplied to the dexos® Approval Committee only upon request of the dexos® Approval Committee**.**

5.4 Initial Source Approval. No shipment shall be made by any supplier until representative initial production samples have been approved by the Fuels, Fluids, and Lubricants Global Subsystem Leadership Team or designees meeting the requirements of this specification.

5.4.1 The "designee" referred to in Section 5.4 is the dexos® Approval Committee.

5.5 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements. In addition, product MSDS/SDS submissions must be in compliance with specific country General Motors S&IH TS 3.4-160-02 where available.

5.6 All materials supplied to this standard must comply with the requirements of the International Material Data System (IMDS) and GMW3059, **Restricted and Reportable Substances.**

5.7 Cleanliness. The engine oil supplied under contract or purchase order to this specification must be filtered by the supplier down to at least 25 µm nominal prior to filling the carrier's tank (truck or railcar) for shipment to the receiving GM facility. The supplier must implement procedures to substantiate the cleanliness of the carrier it contracts with to deliver the engine oil supplied under contract or purchase order to this specification. These procedures must be made available to GM for inspection upon request. After filling the carrier's tank (truck or railcar) for shipment of the engine oil to be supplied under contract or purchase order to this specification, the supplier must collect and retain for a period of not less than one (1) month from the date of delivery to the receiving GM facility an oil sample of not less than 250 mL taken directly from the carrier's tank. This sample must be made available to GM for inspection upon request. Beyond the requirements herein, the engine oil supplied under contract or purchase order to this specification must be clean and free from contamination and/or debris.

6 Approved Sources

Materials supplied to this specification must be approved by General Motors.

The appropriate GM Materials Engineering department(s) must confirm material as meeting the requirements of this specification. Any test data sheets of material submitted to General Motors for such confirmation (e.g., during Production Part Approval Process (PPAP)) under this material specification must list all properties and must apply corresponding test methods of this material specification.

Engineering qualifications of an approved source are required for this standard. Only sources listed in the GM Materials File (i.e., GM SupplyPower) under this standard number have been qualified by engineering as meeting the requirements of this standard. To access this list, reference GMW14270 for latest location.

For other GM locations, the responsible engineering group should be contacted to obtain the approved source in that individual country.

6.1 Requests for candidate oil approval to this specification must be submitted to the dexos® Approval Committee**.** Contact information for approval requests may be found in section 3.2.1 of this specification.

6.2 Oil marketers may not claim to meet this specification in whole or in part without prior dexos® Approval Committee approval.

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7 Notes

7.1 Glossary.

ACM: A Copolymer of ethyl acrylate (or other acrylates) and a small amount of a monomer which facilitates vulcanization. The ACM referred to in this standard is a particular formulation defined in SAE J2643 as ACM-1.

AEM: An ethylene acrylic material. The AEM referred to in this standard is a particular formulation defined in VDA 675301.

FPM: A fluoro rubber having substituent fluoro, perfluoroalkyl or perfluoroalkoxy groups on the polymer chain. The FPM referred to in this standard is a particular formulation defined in CEC L-39-T-96 as RE1.

HNBR: A hydrogenated acrylonitrile-butadiene rubber. The HNBR referred to in this standard is a particular formulation defined in SAE J2643 as HNBR-1.

NBR: An acrylonitrile-butadiene rubber. The NBR referred to in this standard is a particular formulation defined in CEC L-39-T-96 as RE4.

VMQ: A silicone rubber having both methyl and vinyl substituent groups on the polymer chain. The VMQ referred to in this standard is a particular formulation defined in SAE J2643 as VMQ-1.

7.2 Acronyms, Abbreviations, and Symbols.

ACC	American Chemistry Council
ACEA	Association des Constructeurs Européens d'Automobiles
ACM	Polyacrylate Rubber
AEM	Ethylene Acrylate Rubber
ATC	Additive Technical Committee
ATIEL	Association Technique de l'Industrie Européenne des Lubrifiants
EELQMS	European Engine Lubricant Quality Management System
FCA	Fiat Chrysler Automobiles
FPM	Fluorocarbon Rubber
FSP	Formulation Submission Package
FTIR	Fourier Transform Infrared Spectroscopy
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
GMPT	GM Powertrain
GSSLT	Global Subsystem Leadership Team
HNBR	Hydrogenated Nitrile Butadiene Rubber
ICP	Inductively Coupled Plasma
IMDS	International Material Data System
IRHD	International Rubber Hardness Degrees
MSDS	Material Safety Data Sheet
NBR	Nitrile Butadiene Rubber
PPAP	Production Part Approval Process
S&IH	Safety and Industrial Hygiene
SDS	Safety Data Sheet
TBN	Total Base Number
TS	Technical Standard
VMQ	Silicon Rubber
XRF	X-ray Fluorescence Spectroscopy

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