



Engine Oil, Global Factory Fill and Service Fill for Spark-Ignited Engines

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose/Material Description. This specification describes engine oil with viscosity grades of xW-16, xW-20 and xW-30. Engine Oils approved to this standard are known as dexos® 1 Gen 3.

1.2 Symbols. Not applicable.

1.3 Applicability. Materials meeting this specification are intended to be used as factory-fill or service-fill engine oil for passenger cars and light duty trucks with spark ignited internal combustion engines.

1.4 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

ASTM D92	ASTM D4741	ASTM D7216	DIN 51757
ASTM D97	ASTM D4951	ASTM D7419	DIN EN ISO 2592
ASTM D412	ASTM D5133	ASTM D8114	DIN EN ISO 3104
ASTM D445	ASTM D5293	ASTM D8226	DIN EN ISO 14596
ASTM D471	ASTM D5762	ASTM D8229	DIN ISO 2909
ASTM D664	ASTM D5800	ASTM D8256	ISO 37
ASTM D874	ASTM D6082	ASTM D8291	ISO 3016
ASTM D2240	ASTM D6417	ASTM D8350	ISO 3771
ASTM D2270	ASTM D6443	CEC L-14-93	ISO 15597
ASTM D2622	ASTM D6557	CEC L-40-93	ISO/IEC 17025
ASTM D3228	ASTM D6709	DIN 51363	SAE J300
ASTM D4052	ASTM D6794	DIN 51400	SAE J2643
ASTM D4683	ASTM D6795	DIN 51575	

2.2 GM Standards/Specifications.

GMW3059	GMW17295 (ID)	GMW18359	GMW18364
GMW17043	GMW17299 (ID)		

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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.
 - CG6347 Audit Tolerances.
 - dexos® Approval Committee.
 - dexos® test manual found at <https://dexostrc.org>.
 - European Engine Lubricants Quality Management System (EELQMS).
 - Formulation Submission Package (FSP) forms available at <https://dexostrc.org/bulletin.aspx>.
 - Information Quality https://gmweb.gm.com/quality/oq/QR/IQ_Global/default.aspx. (ID)
- (ID) = This website is limited to internal distribution within General Motors and shall not be distributed outside this company. Contact the GM Lead Engineer for further instructions.

3 Requirements

3.1 Requirements on Test Specimens. Sequence IVB (ASTM D8350), Sequence VH, Sequence VIE (ASTM D8114), Sequence VIF (ASTM D8226) and Sequence VIII (ASTM D6709), Sequence IX (ASTM D8291), Sequence X (ASTM D8229) 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 Coordinating European Council (CEC) Engine Tests. The Shear Stability Test (CEC L-14-93) must be conducted according to the procedures specified in the Additive Technical Committee (ATC) Code of Practice, the Association Technique de l'Industrie Européenne des Lubrifiants (ATIEL) Code of Practice, and the European Engine Lubricants Quality Management System (EELQMS).

3.1.2 All tests must be run in accordance with the requirements listed in the dexos® test registration manual, available at <https://dexostrc.org>.

3.1.3 Laboratories conducting dexos® registered tests and measuring chemical and physical properties of the final formulation must be accredited per ISO/IEC 17025 for the appropriate tests.

3.1.4 It is GM's intent that the product 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 the requirements specified herein including those requirements listed in Appendix A, Table A1 through Table A4 and reference Appendix B, Table B1.

3.2.1 The engine oil supplier seeking approval of a candidate engine oil formulation to this specification must provide a completed Formulation Submission Package (FSP), and an (ACC) Candidate Data Package (CDP), including the ACC summary page for the candidate oil to the Testing Monitoring Center at <https://dexos@submission.org>. The FSP form is available from Testing Monitoring Center (TMC).

3.3 All materials supplied to this standard must comply with GMW3059, Restricted and Reportable Substances. For raw materials, non-dimensional materials (e.g.; fluids, greases) and/or bulk materials that require approval into the GM Materials Approved Source List (GMMASL), an International Material Data System (IMDS) submission must be made by the material supplier as a material Data Sheet (mMDS). After the mMDS is approved by the GM IMDS team, the materials supplier is to provide a "Header only report" to the responsible GM Materials Engineer. Further guidance can be found in the GM-specific instructions on the IMDS website.

3.4 Approval Acceptance Limits. 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 dexos® Approval Committee. The dexos® Approval committee must receive copies of the proficiency testing reports directly from the test program administrator.

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

3.4.1.1 Unless otherwise authorized by the dexos® Approval Committee, the series of tests referred to in 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 Appendix A, Table A2.

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

3.4.3 Licensed dexos® oil formulations are subject to field quality audits. The licensee is responsible for ensuring that all engine and bench test results meet specification (without considering test precision) and for the actual performance of the licensed product sold as factory-fill and/or service-fill oil whether or not interchange and/or read across are used. The licensee is required to develop an action plan to rectify a nonconformance identified during a field quality audit which may include requalifying the formulation for the failed test. GM reserves the right to revoke a license nonconformance.

3.4.4 Reference CG6347 Audit Tolerances External Supplement to GMW18144.

3.5 Initial Source Approval. No shipment shall be made by any supplier until representative initial production samples have been approved by the dexos® Approval Committee or designees as meeting the requirements of this specification.

3.6 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 < 1 month from the date of delivery to the receiving GM facility an oil sample of not < 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.

3.7 Alternative Fuel Approval. Alternate fuel must be approved by GM prior to running any American Petroleum Institute (API) or GM tests.

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.

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.

5.4 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.

5.5 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.

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.

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 through TMC as described in 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.

7 Notes

7.1 Glossary.

ACM: Acrylate 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 or ACM-2.

AEM: Ethylene acrylic material. The AEM referred to in this standard is a particular formulation defined in Verband der Automobilindustrie e. V (VDA) 675301.

FKM: Fluoro rubber having substituent fluoro, perfluoroalkyl or perfluoroalkoxy groups on the polymer chain. The FKM referred to in this standard is a particular formulation defined in SAE J2643.

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

VMQ: 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.

%	Percent
ACC	American Chemistry Council
ACEA	Association des Constructeurs Européens d'Automobiles
ACM	SAE abbreviation for Polyacrylate
AEM	SAE abbreviation for Ethylene Acrylic Copolymer
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
ASTM	ASTM International
ATC	Additive Technical Committee
ATIEL	Association Technique de l'Industrie Européenne des Lubrifiants
CCS	Cold Cranking Simulation
CDP	Candidate Data Package
CEC	Coordinating European Council
CHST	Chain Stretch Test
EELQMS	European Engine Lubricants Quality Management System

EOFT	Engine Oil Filter Test
EOT	End of Test
EOWTT	Engine Oil Water Tolerance Test
FEI	Fuel Economy Improvement
FKM	SAE abbreviation for Fluorocarbon
FSP	Formulation Submission Package
FTIR	Fourier Transform Infrared Spectroscopy
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
GMMASL	GM Materials Approved Source List
GMOD	GM Oxidation and Deposit Test
GMOEE	GM Oil Efficiency Evaluation
GMTC	GM Turbo Coking
GSSLT	Global Subsystem Leadership Team
HNBR	Hydrogenated Nitrile Butadiene Rubber
HTHS	High Temperature High Shear
ICP	Inductively Coupled Plasma
IMDS	International Material Data System
IQ	Information Quality
ISO	International Organization for Standardization
ISP	ISP Salzbergen GmbH and Co. KG - Institut für Schmierstoff Prüfung – German Testing Institute
KOH	Potassium Hydroxide
MSDS	Material Safety Data Sheet
MTM	Mini Traction Machine
µm	micro millimeter
PPAP	Production Part Approval Process
SAE	SAE International
SDS	Safety Data Sheet
SPI	Stochastic Pre-Ignition
SRE	Standard Reference Elastomer
TBN	Total Base Number
TCO	Turbo Coolant Out
TMC	Testing Monitoring Center
VDA	Verband der Automobilindustrie e. V.
VMQ	Vinyl Methyl Silicon
XRF	X-ray Fluorescence Spectroscopy

8 Coding System

8.1 This standard shall be referenced in other documents, drawings, etc., as follows:
Material per GMW18144