



High Performance Hydraulic Fluid

1 Scope

1.1 Material Description. Fluid shall be free from water, sediment, acid, particulates, or other substances detrimental to proper function and performance of the system in which it is used.

1.2 Symbols. Not applicable.

1.3 Applicability. This specification details the requirements of a fluid intended primarily for use for lubrication and hydraulic actuation purposes over an extended temperature range.

1.4 Remarks. This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this specification to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

2 References

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

2.1 External Standards/Specifications.

ASTM D92	ASTM D1193	ASTM D4739	ASTM D7043
ASTM D97	ASTM D1298	ASTM D5185	CEC L-45-99
ASTM D130	ASTM D1418	ASTM D5293	CEC L-48-A-00
ASTM D412	ASTM D2240	ASTM D5800	CEC L-084-02
ASTM D445	ASTM D2270	ASTM D6304	FED-STD-791
ASTM D471	ASTM D2983	ASTM D6594	ISO 37
ASTM D664	ASTM D4289	ASTM D6922	SAE J2643
ASTM D892	ASTM D4629		

2.2 GM Standards/Specifications.

GMW3059

2.3 Additional References.

- TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

3.1 Requirements. Fluids qualified under this specification shall conform to the test methods in Appendix B and requirements as listed in Appendix A, Table A1.

3.2 Additional Requirements.

3.2.1 The requirements given in this specification are minimum or maximum acceptance limits for valid tests. No adjustments for test precision are to be applied as test variability was taken into account in the determination of the requirements.

3.2.2 The General Motors Automatic Transmission Fluid (ATF) and Gear Oil Committee reserves the right to require any additional tests that may be deemed necessary to ensure satisfactory performance of fluids submitted for qualification as High Performance Hydraulic Fluid.

3.3 Materials Compatibility. All materials must meet print specification compatibility tests with fluid. Tests must be conducted by certified laboratory.

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. In addition, product MSDS/SDS submissions must be in compliance with specific country General Motors TMC003 Material Safety Data Sheet/Safety Data Sheet guidance documents where available.

5.6 All materials supplied to this standard must comply with the requirements of GMW3059, **Restricted and Reportable Substances for Parts.**

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.

7 Notes

7.1 Glossary. Not applicable.

7.2 Acronyms, Abbreviations, and Symbols.

ARDL	Akron Rubber Development Laboratory Inc.
ATF	Automatic Transmission Fluid
Ca	Calcium
CCS	Cold Cranking Simulator Viscosity
cP	CentiPoise
cSt	CentiStoke
DKA	Deutscher Koordinierungsausschuss im CEC
EOT	End of Test

GHS	Globally Harmonized System of Classification and Labeling of Chemicals
GSSLT	Global Subsystem Leadership Team
KOH	Potassium Hydroxide
KRL	Kugel Rollen Lager
MSDS	Material Safety Data Sheet
P	Phosphorus
ppm	parts per million
S	Sulfur
SDS	Safety Data Sheet
SRE	Standard Reference Elastomers
Si	Silicone
UHP	Ultra High Purity
Zn	Zinc

8 Coding System

This standard shall be referenced in other documents, drawings, etc., as follows:
Material per GMW16613

9 Release and Revisions

This standard was originated in May 2011. It was first approved by the GM ATF and Gear Oil Committee in September 2011. It was first published in October 2011.

Issue	Publication Date	Description (Organization)
1	OCT 2011	Initial publication.
2	FEB 2012	Update to Table A1. (Fuels, Fluids and Lubricants GSSLT)
3	APR 2014	Replace seal test with the GM Aerated Seal Test. (Fuels, Fluids and Lubricants Global Subsystem Leadership Team)