



Designation: D8256 – 23

Standard Test Method for Evaluation of Automotive Engine Oils for Inhibition of Deposit Formation in the Sequence VH Spark-Ignition Engine Fueled with Gasoline and Operated Under Low- Temperature, Light-Duty Conditions¹

This standard is issued under the fixed designation D8256; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

Portions of this test method are written for use by laboratories that make use of ASTM Test Monitoring Center (TMC²) services (see [Annex A1](#)).

The TMC provides reference oils, and engineering and statistical services to laboratories that desire to produce test results that are statistically similar to those produced by laboratories previously calibrated by the TMC.

In general, the Test Purchaser decides if a calibrated test stand is to be used. Organizations such as the American Chemistry Council require that a laboratory use the TMC services as part of their test registration process. In addition, the American Petroleum Institute and the Gear Lubricant Review Committee of the Lubricant Review Institute (SAE International) require that a laboratory use the TMC services in seeking qualification of oils against their specifications.

The advantage of using the TMC services to calibrate test stands is that the test laboratory (and hence the Test Purchaser) has an assurance that the test stand was operating at the proper level of test severity. It should also be borne in mind that results obtained in a non-calibrated test stand may not be the same as those obtained in a test stand participating in the ASTM TMC services process.

Laboratories that choose not to use the TMC services may simply disregard these portions.

ASTM International policy is to encourage the development of test procedures based on generic equipment. It is recognized that there are occasions where critical/sole-source equipment has been approved by the technical committee (surveillance panel/task force) and is required by the test procedure. The technical committee that oversees the test procedure is encouraged to clearly identify if the part is considered critical in the test procedure. If a part is deemed to be critical, ASTM encourages alternative suppliers to be given the opportunity for consideration of supplying the critical part/component providing they meet the approval process set forth by the technical committee.

An alternative supplier can start the process by initiating contact with the technical committee (current chairs shown on ASTM TMC website). The supplier should advise on the details of the part that is intended to be supplied. The technical committee will review the request and determine feasibility of an alternative supplier for the requested replacement critical part. In the event that a replacement critical part has been identified and proven equivalent the sole-source supplier footnote shall be removed from the test procedure.

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.B0.01 on Passenger Car Engine Oils.

Current edition approved July 1, 2023. Published July 2023. Originally approved in 2019. Last previous edition approved in 2022 as D8256 – 22a. DOI: 10.1520/D8256-23.

² Until the next revision of this test method, the ASTM Test Monitoring Center will update changes in the test method by means of information letters. Information letters may be obtained from the ASTM Test Monitoring Center, 203 Armstrong Drive, Freeport, PA 16229. Attention: Director. This edition incorporates revisions in all Information Letters through No. 23-1.

1. Scope*

1.1 This test method is commonly referred to as the Sequence VH test, and it has been correlated with the Sequence VG test. The Sequence VG test was previously correlated with vehicles used in stop-and-go service prior to 1996, particularly with regard to sludge and varnish formation.³ It is one of the test methods required to evaluate oils intended to satisfy the API SN, SN Plus performance category.

1.2 The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

1.2.1 *Exception*—Where there is no direct SI equivalent such as screw threads, national pipe threads/diameters, tubing size, or specified single source equipment.

1.3 A table of contents follows:

	Section
Scope	1
Referenced Documents	2
Terminology	3
Summary of Test Method	4
Significance and Use	5
Apparatus (General Description)	6
Apparatus (The Test Engine)	7
Sequence VH Test Engine	7.1
Required New Engine Parts	7.2
Reusable Engine Parts	7.3
Specially Fabricated Engine Parts	7.4
Special Engine Measurement and Assembly Equipment	7.5
Miscellaneous Engine Components—Preparation	7.6
Solvents and Cleaners Required	7.7
Assembling the Test Engine—Preparations	7.8
Assembling the Test Engine—Installations	7.9
Engine Installation on the Test Stand	7.10
Engine Fluids (Supply/Discharge Systems)	8
Intake Air	8.1
Fuel and Fuel System	8.2
Engine Oil and Engine Oil System	8.3
Coolants	8.4
Measurement Instrumentation	9
Temperatures	9.1
Pressures	9.2
Flow Rates	9.3
Fuel Consumption	9.4
Speed and Torque	9.5
Exhaust Gas	9.6
Humidity	9.7
Miscellaneous Laboratory Equipment	10
Test Stand Calibration	11
Test Procedure	12
Pre-Test Procedure	12.1
Engine Operating Procedure	12.2
Periodic Measurements and Functions	12.3
Special Maintenance Procedures	12.4
Diagnostic Data Review	12.5
End of Test Procedure	12.6
Interpretation of Test Results	13
Parts Rating Area—Environment	13.1
Sludge Ratings	13.2
Varnish Ratings	13.3
Clogging	13.4
Sticking	13.5
Used Oil Analyses	13.6
Assessment of Test Validity	14
General	14.1
Used Oil Analyses—Interpretation	14.2
Blowby Flow Rate	14.3

Manifold Absolute Pressure (MAP)	Section 14.4
Fuel Consumption Rate	14.5
Oil Consumption	14.6
Engine Parts Replacement	14.7
Quality Index	14.8
Final Test Report	15
Report Forms	15.1
Precision and Bias	16
Keywords	17
ANNEXES	
ASTM TMC: Organization	Annex A1
ASTM TMC: Calibration Procedures	Annex A2
ASTM TMC: Maintenance Activities	Annex A3
ASTM TMC: Related Information	Annex A4
Safety Precautions	Annex A5
Control and Data Acquisition Requirements	Annex A6
Detailed Specifications and Photographs of Apparatus	Annex A7
Test Engine Part Number, Classification, and Usage Guidelines	Annex A8
External Oil Heat Exchanger Cleaning Technique	Annex A9
Sequence VH Report Forms and Data Dictionary	Annex A10
Dipstick Calibration	Annex A11
Critical Part Supplier List	Annex A12
Operational Data Log—Engine Oil	Annex A13
Rating Worksheets	Annex A14
Fuel Injector Flow Measurements	Annex A15
APPENDICES	
Piston and Ring Measurements Record Forms	Appendix X1
Sources of Materials and Information	Appendix X2

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* Specific hazard statements are given in 7.7, 7.7.1, 7.7.2, 7.7.3, 7.7.4, 7.7.5, A5.3.4, and A5.3.5.5.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:⁴

- D86** Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure
- D235** Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
- D287** Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer/Method)
- D323** Test Method for Vapor Pressure of Petroleum Products (Reid Method)
- D381** Test Method for Gum Content in Fuels by Jet Evaporation
- D445** Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- D525** Test Method for Oxidation Stability of Gasoline (Induction Period Method)

³ Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:D02-1472. Contact ASTM Customer Service at service@astm.org.

⁴ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.