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An American National Standard



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Standard Test Method for Research and Motor Method Octane Ratings Using On-Line Analyzers¹

This standard is issued under the fixed designation D 2885; 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.

1. Scope

1.1 This test method covers the calibration and use of automatic analyzers for determining the antiknock quality of motor gasolines. Octane numbers from analyzers operated in accordance with this test method are equivalent to ASTM research or motor method octane numbers.²

1.2 In this test method, inch-pound units are the preferred system of measurement.

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 2699 Test Method for Research Octane Number of Spark-Ignition Engine Fuel³

D 2700 Test Method for Motor Octane Number of Spark-Ignition Engine Fuel³

D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products⁴

E 178 Practice for Dealing With Outlying Observations⁵

3. Terminology

3.1 Definitions:

3.1.1 *octane number, n* —for spark-ignition engine fuel, any one of several numerical indicators of resistance to knock obtained by comparison with reference fuels in standardized engine or vehicle tests.

3.1.1.1 *Discussion*—In the context of this test method, octane number is understood to mean the numerical indicator of knock obtained by comparison with primary reference fuels in a standardized CFR engine operating under conditions specified in either the Research, Test Method D 2699, or Motor, Test Method D 2700, standards.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *analyzer lag or response time*—the time required for a knock testing unit/analyzer system to evaluate sample fuel quality and produce a Δ O.N. output signal. It includes measurements of both fuels for one complete comparison cycle.

3.2.2 *check fuels (A and B)*—a pair of spark-ignition engine fuels or process unit materials used for system qualification, typical of the products to be measured in terms of commercial grade or process unit characteristics. Each fuel shall be round-robin octane number (O.N.) calibrated using primary reference fuels, multiple engines, and so forth, to establish the expected difference O.N. for the fuel pair.

3.2.3 *delta O.N. (Δ O.N.)*—the octane difference between two fuels as tested by the procedures of this test method.

3.2.4 *expected difference O.N.*—the octane difference between two check fuels of a pair, based on the average results of round-robin calibrations, and expressed as a positive Δ O.N. value.

3.2.5 *octane span or calibration*—the octane number scaling or adjustment of the knock testing unit variable used to measure relative octane quality. This can be in terms of either compression ratio digital counter units or knock intensity units per octane number.

3.2.6 *overall system response time*—the time required from a process, pipe line, or in-line blender change until that change can be displayed as a Δ O.N. value. It includes the time for the slowest reacting process variable, the sampling system time, and the knock testing/analyzer response time.

¹ This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.01 on Combustion Characteristics.

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² “Research method” refers to ASTM Test Method D 2699, Test Method for Knock Characteristics of Motor Fuels by the Research Method. “Motor method” refers to ASTM Test Method D 2700, Test Method for Knock Characteristics of Motor and Aviation Fuels by the Motor Method. Test Methods D 2699 and D 2700 can be found in this volume.

³ *Annual Book of ASTM Standards*, Vol 05.05.

⁴ *Annual Book of ASTM Standards*, Vol 05.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.