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CAN/CGSB-3.27-2012

Supersedes CAN/CGSB-3.27-2005

Naphtha Fuel

ICS 75.160.20

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NATIONAL STANDARD OF CANADA **CAN/CGSB-3.27-2012**

Supersedes CAN/CGSB-3.27-2005

NAPHTHA FUEL

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE.

Prepared by the
Canadian General Standards Board CGSB

Approved by the
Standards Council of Canada

Published November 2012 by the
Canadian General Standards Board
Gatineau, Canada K1A 1G6

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Acknowledgment is made for the translation of this National Standard of Canada by the Translation Bureau of Public Works and Government Services Canada.

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NAPHTHA FUEL

1. SCOPE

1.1 This standard applies to one type of naphtha fuel suitable for use in catalytic-type heaters and in naphtha pressure-appliances such as stoves, lanterns, heating units and blowtorches.

1.1.1 The specified limiting values in this standard are present to allow the use of this naphtha fuel in catalytic heaters. The use of other types of fuel in catalytic heaters such as fuels with a higher boiling point range, higher vapour pressure or higher sulphur concentration could result in poor or hazardous performance.

1.2 The testing and evaluation of a product against this standard may require the use of materials and/or equipment that could be hazardous. This document does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any applicable regulatory requirements prior to its use.

2. REFERENCED PUBLICATIONS

2.1 The following publications are referenced in this standard:

2.1.1 Canadian General Standards Board (CGSB)

CAN/CGSB-3.0 — Methods of Testing Petroleum and Associated Products:

No. 14.3 — Standard Test Method for the Identification of Hydrocarbon Components in Automotive Gasoline Using Gas Chromatography

No. 28.8 —Visual Haze Rating of Distillate Fuel Oils.

2.1.2 ASTM International

Annual Book of ASTM Standards (Appendix A).

2.2 A dated reference in this standard is to the issue specified. An undated reference in this standard is to the latest issue, unless otherwise specified by the authority applying this standard. The sources are given in the Notes section.

3. DEFINITIONS

The following definition applies in this standard:

3.1 **Naphtha fuel** — A light distillate fuel generally composed of C5 to C12 hydrocarbons and naturally occurring, petroleum-derived non-hydrocarbons that typically boils below 127°C.

4. GENERAL REQUIREMENTS

4.1 The naphtha fuel shall be visually clear and free from undissolved water, sediment, and suspended matter under the temperature and conditions of custody transfer. It is recommended that the fuel not be dyed.

4.2 The naphtha fuel shall be a stable, homogeneous liquid free from foreign matter likely to clog filters or nozzles, or damage equipment.

4.3 The naphtha fuel shall not contain any metal–containing additives such as anti-knock compounds or combustion enhancers.

4.4 If the naphtha fuel contains additives, the supplier shall provide the purchaser with a record of the type and concentration (par. 7.1.a).

5. DETAILED REQUIREMENTS

5.1 The naphtha fuel shall comply with the specified limiting values. The specified limiting values shall not be changed. This precludes any allowances for the test method precision and for adding or subtracting digits.

5.1.1 To determine conformance with the specified limiting values, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specified limiting value, in accordance with the rounding-off method of ASTM E29. There are three exceptions (par. 5.9 a., b. and c.).

5.1.2 Where test values differ between two parties, a resolution shall be in accordance with ASTM D3244 in order to determine conformance with the specified limiting values, with the criticality of the limits set at $P = 0.5$.

5.1.3 Test methods other than those referenced in this standard may be used only if they have been validated in accordance with ASTM D3764 or D6708. These are referred to as validated test methods.

5.1.4 Validated test methods shall correlate with methods referenced in the standard. Differences in precision, sensitivity and bias between methods referenced in the standard and the validated methods shall be noted when using results from validated methods.

5.1.5 Validated test methods shall only be used within the bounds of the data covered in their validation.

5.1.6 In the event of a dispute, the procedures given in par. 5.1.1 and 5.1.2 shall be used. If parties in a dispute cannot agree on an analytical method to resolve the dispute, the method listed in the standard shall be used. Where more than one method is listed for a given detailed requirement, the referee method shall be used.

		Specified Limiting Values			
	Property	**Min.**	**Max.**	**Test Method**	
				ASTM	**CGSB**
5.2	Appearance at 20-25°C	—	1	—	CAN/CGSB-3.0 No. 28.8
5.3	Colour, Saybolt	+25	—	D156[1] D6045	—
5.4	Aromatics, % by volume	—	10	—	CAN/CGSB-3.0 No. 14.3
5.5	Benzene, % by volume	—	0.1	—	CAN/CGSB-3.0 No. 14.3
5.6	Olefins, one of the following:				
	a. Olefins, % by volume or	—	2	—	CAN/CGSB-3.0 No. 14.3[1]
	b. Bromine number	—	5	D1159	—

[1] *Referee method(s) to be used in the event of a dispute.*

	Property	Specified Limiting Values		Test Method	
		Min.	Max.	ASTM	CGSB
5.7	Residue acidity	Neutral		D1093	—
5.8	Sulphur, mg/kg	—	5	D5453[1] D3120 D6920 D7039	—
5.9	Distillation[2]			D86	—
	a. Initial boiling point, °C	38	71		
	b. 50% recovered, °C	66	93		
	c. Final boiling point, °C	93	127		
	d. Recovery, % by volume	97	—		
	e. Residue, % by volume	—	1.0		
5.10	Vapour pressure, kPa	—	55.0	D5191[1] D5190 D6378	—
5.11	Oxidative stability, induction period, min	480	—	D525	—
5.12	Copper strip corrosion, 3 h at a minimum temperature of 50°C	—	No. 1	D130	—
5.13	Solvent washed gum content, mg/100 mL	—	1.0	D381	—

6. INSPECTION

6.1 Sampling

6.1.1 Sampling equipment and procedures shall be designed and used to obtain representative samples of the product. Sampling lines, hoses, etc., should be flushed prior to taking a sample. Sampling containers shall be appropriate for preserving the integrity of the sample for the detailed requirement being determined. Procedures shall be in accordance with ASTM D4057, D4177, D5842 or D5854.

6.1.2 Sample volume shall be consistent with the requirements of the testing laboratory and/or the authority having jurisdiction. Unless otherwise specified (par. 7.1.b.), a sample of at least 3 L shall be taken.

7. NOTES

7.1 **Options —** The following options may be specified in the application of this standard:

a. Additive types and concentrations, if present (par. 4.4).

b. Sample size, if other than specified (par. 6.1.2).

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[2] *The ASTM Test Method D86 utilizes either manual or automated equipment. In the event of a dispute, the automated test method shall be the referee method. Users are cautioned to develop their own supporting data to establish correlation with the referee method.*

7.2 **Sources of Referenced Publications**

The following addresses were valid at the date of publication.

7.2.1 The publications referred to in par. 2.1.1 may be obtained from the Canadian General Standards Board, Sales Centre, Gatineau, Canada K1A 1G6. Telephone 819-956-0425 or 1-800-665-2472. Fax 819-956-5740. E-mail at ncr.CGSB-ONGC@tpsgc-pwgsc.gc.ca. Web site www.tpsgc-pwgsc.gc.ca/ongc-cgsb.

7.2.2 The publications referred to in par. 2.1.2 may be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, U.S.A., Web site www.astm.org, or from IHS Canada, 1 Antares Drive, Suite 200, Ottawa, Ontario K2E 8C4, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251. E-mail gic@ihscanada.ca, Web site www.ihs.com.

APPENDIX A

(This appendix forms a mandatory part of the standard.)

REFERENCED ASTM PUBLICATIONS (par. 2.1.2)

Annual Book of ASTM Standards

D86	Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure
D130	Standard Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test
D156	Standard Test Method for Saybolt Color of Petroleum Products (Saybolt Chromometer Method)
D381	Standard Test Method for Gum Content in Fuels by Jet Evaporation
D525	Standard Test Method for Oxidation Stability of Gasoline (Induction Period Method)
D1093	Standard Test Method for Acidity of Hydrocarbon Liquids and Their Distillation Residues
D1159	Standard Test Method for Bromine Numbers of Petroleum Distillates and Commercial Aliphatic Olefins by Electrometric Titration
D3120	Standard Test Method for Trace Quantities of Sulfur in Light Liquid Petroleum Hydrocarbons by Oxidative Microcoulometry
D3244	Standard Practice for Utilization of Test Data to Determine Conformance with Specifications
D3764	Standard Practice for Validation of the Performance of Process Stream Analyzer Systems
D4057	Standard Practice for Manual Sampling of Petroleum and Petroleum Products
D4177	Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
D5190	Standard Test Method for Vapor Pressure of Petroleum Products (Automatic Method)
D5191	Standard Test Method for Vapor Pressure of Petroleum Products (Mini Method)
D5453	Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Motor Fuels and Oils by Ultraviolet Fluorescence
D5842	Standard Practice for Sampling and Handling of Fuels for Volatility Measurement
D5854	Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products
D6045	Standard Test Method for Color of Petroleum Products by the Automatic Tristimulus Method
D6378	Standard Test Method for Determination of Vapor Pressure (VPx) of Petroleum Products, Hydrocarbons, and Hydrocarbon-Oxygenate Mixtures (Triple Expansion Method)
D6708	Standard Practice for Statistical Assessment and Improvement of Expected Agreement Between Two Test Methods that Purport to Measure the Same Property of a Material
D6920	Standard Test Method for Total Sulfur in Naphthas, Distillates, Reformulated Gasolines, Diesels, Biodiesels, and Motor Fuels by Oxidative Combustion and Electrochemical Detection
D7039	Standard Test Method for Sulfur in Gasoline and Diesel Fuel by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry
E29	Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.