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## National Standard of Canada

# Heating fuel oil

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## **Heating fuel oil**

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# Heating fuel oil

## 1 Scope

This standard applies to three types of middle distillate fuel oils that are suitable for use in liquid-fuel-burning equipment without preheating (Types 0, 1 and 2), and three types of fuel oils that contain residual fuel components and require preheating (Types 4, 5 and 6).

The heating fuel oils covered by this standard are intended for use in oil burning equipment to generate heat for domestic and industrial purposes.

Types 0, 1 and 2 fuel oils are primarily for use in domestic oil burning appliances. They may also be used for some industrial purposes.

- a) Type 0 fuel oil is intended for use in fuel domestic oil burning appliances that have outside storage and where ambient temperatures as low as  $-48^{\circ}\text{C}$  could be encountered.
- b) Type 1 fuel oil is intended primarily for use in sleeve-type and wick-feed burners, and in most vaporizing pot-type burner applications. It is also intended for atomizing burners in which Type 2 fuel oil cannot be used satisfactorily. During periods of lower ambient temperature, Type 1 fuel oil may be used in place of Type 2 to minimize waxing problems.
- c) Type 2 fuel oil is a heavier distillate than Type 1 and is intended for use in most atomizing-type burner applications. This type of fuel oil is used in most domestic oil burning appliances and in some medium capacity commercial and industrial burners. Type 2 may contain up to 5% biodiesel.

Types 4, 5 and 6 fuel oils are primarily for use as industrial fuels: suitable for use in the pulp and paper industry, metallurgical operations, heat or power generation, etc.

- a) Type 4 is an industrial fuel oil intended primarily for burner installations equipped with limited preheating facilities or with no preheating.
- b) Type 5 is a residual fuel oil for burner installations equipped with limited preheating facilities that require a fuel oil of lower viscosity than Type 6.
- c) Type 6 is a high-viscosity residual fuel oil for use in burners equipped with preheating facilities to handle such fuels.

See Annex B for regulations that apply to heating fuel oil.

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 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this National Standard of Canada. The referenced documents may be obtained from the sources noted below.

NOTE The addresses provided below were valid at the date of publication of this standard.

An undated reference is to the latest edition or revision of the reference or document in question, unless otherwise specified by the authority applying this standard. A dated reference is to the specified revision or edition of the reference or document in question.

## 2.1 Canadian General Standards Board (CGSB)

CAN/CGSB-3.0 — *Methods of testing petroleum and associated products:*

No. 28.8 — *Visual haze rating of liquid fuels*

CAN/CGSB-3.524 — *Biodiesel (B100) for blending in middle distillate fuels.*

### 2.2.1 Source

The above 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 [ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca](mailto:ncr.cgsb-ongc@tpsgc-pwgsc.gc.ca). Web site [www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html](http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html).

## 2.2 ASTM International

*Annual Book of ASTM Standards* (see Annex A).

### 2.2.1 Source

The above may be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, U.S.A., telephone 610-832-9585, fax 610-832-9555, Web site [www.astm.org](http://www.astm.org), or from IHS Markit, 200-1331 MacLeod Trail SE, Calgary, Alberta T2G 0K3, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, Web site [www.global.ihs.com](http://www.global.ihs.com).

## 3 Terms and definitions

For the purposes of this National Standard of Canada, the following terms and definitions apply.

### 3.1

#### **biodiesel**

blendstock for middle distillate fuels comprised of mono-alkyl esters of long chain fatty acids derived from renewable sources. In its neat form, biodiesel is commonly designated as B100 (see 6.18).

### 3.2

#### **operability temperature**

lowest temperature at which the fuel oil is designed to provide satisfactory performance under the conditions of storage and use (see 6.20, 6.21 and 9.3).

## 4 Classification

4.1 Heating fuel oils shall be supplied in the following types, as specified (see 8.1):

### 4.1.1 Types

Type 0    Type 4

Type 1    Type 5

Type 2    Type 6



## 5 General requirements

**5.1** The heating fuel oils shall be hydrocarbons (unless otherwise allowed, see 5.4 and 6.17) that may contain additives designed to improve their properties or performance, such as, low-temperature flow properties and electrical conductivity.

**5.2** The heating fuel oils shall be a stable homogeneous liquid, free of foreign matter that is likely to clog filters or nozzles, or to damage equipment.

**5.3** In Types 0, 1 and 2 fuel oils, there shall be no intentional addition of used lubricating oils, used solvents, triglycerides (such as raw vegetable oils, animal fats, fish oils or used cooking oils), or other fluids which are not normal components of the fuel. Types 4, 5 and 6 fuel oils may contain used lubricating oils or other fluids provided that the fuel oil is used in specifically designed equipment and the relevant authority approves their use.

**5.4** The heating fuel oils shall remain undyed except when it is required for taxation purposes by provincial or territorial regulation.

## 6 Detailed requirements

### 6.1 Specified limiting values

**6.1.1** The heating fuel oil 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 adding or subtracting digits.

**6.1.2** For purposes of determining 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 two exceptions (see 6.3 and 6.17/6.23).

**6.1.3** 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  $P = 0.5$ .

**6.1.4** Zeroes trailing the last nonzero digit for numbers represented with a decimal point are significant digits, in accordance with ASTM E29.

### 6.2 Test methods

**6.2.1** 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.

**6.2.2** 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.

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

**6.2.4** In the event of a dispute, the procedures given in 6.1 shall be used.

**6.2.5** If parties in a dispute cannot agree on an analytical method to resolve the dispute, the referee method listed in the standard shall be used.

		Specified limiting values							
Property	Limit	Types of fuel oil						Test method	
		0	1	2	4	5	6	ASTM	
6.3	Flash point, °C (see 6.23)	Min.	40.0	40.0	40.0	54.0	54.0	60.0	D93 <sup>a</sup> , D3828 <sup>e</sup> or D7094
6.4	Kinematic viscosity, at 40°C, mm <sup>2</sup> /s (cSt) <sup>c</sup> (see 6.25)	Min.	1.20	1.30	1.70 <sup>b</sup>	5.5	—	—	D445 <sup>a</sup> or D7042
		Max.	2.00	2.50	3.60	24.0	—	—	
6.5	Kinematic viscosity <sup>d</sup> , at 50°C, mm <sup>2</sup> /s (cSt) <sup>c</sup>	Min.	—	—	—	—	15	100.	D445
		Max.	—	—	—	—	100.	650.	
6.6	Distillation (see 6.24)								D86 <sup>a</sup> , D2887 <sup>f</sup> or D7345
	a) 10% recovered, °C	Max.	—	215	—	—	—	—	
	b) 90% recovered, °C	Max.	—	300.	360.	—	—	—	
	c) end point, °C	Max.	300.	—	—	—	—	—	
6.7	Water and sediment, % by volume (see 6.22)	Max.	0.02	0.02	0.02	—	—	—	D1796 <sup>a</sup> (modified) or D2709
			—	—	—	0.50	1.00	1.00	D95 <sup>a</sup> and D473
6.8	Sulphur, % by mass (see 6.19 and 8.2)	Max.	0.30	0.30	0.50	—	—	—	D1266, D1552, D2622, D4294, D5453 <sup>a</sup> or D7039
6.9	Copper strip corrosion, 3 h at minimum test temperature of 50°C (see 9.5)	Max.	No. 1	No. 1	No. 1	—	—	—	D130
6.10	Carbon residue on 10% bottoms, % by mass	Max.	0.1	0.1	0.3	—	—	—	D524 or D4530 <sup>a</sup>
6.11	Ash, % by mass	Max.	0.010	0.010	0.010	0.10	0.10	0.20	D482

		Specified limiting values							
Property	Limit	Types of fuel oil						Test method	
		0	1	2	4	5	6	ASTM	
6.12	Electrical conductivity, at point, time, and temperature of delivery to purchaser, pS/m (see 9.6)	Min.	25	25	25	—	—	—	D2624
6.13	Density, at 15°C, kg/L	Max.	0.840	0.850	0.900	—	—	—	D1298 or D4052 <sup>a</sup>
6.14	Total sediment, % by mass	Max.	—	—	—	0.10	0.15	0.20	D4870
6.15	Pour point, °C (see 6.20, 8.1 and 9.3)	Max.	-48	Report	Report	—	—	—	D97 or D5949 <sup>a</sup>
			—	—	—	Report	—	—	D97
6.16	Cloud point, °C (see 6.21 and 8.1)	Max.	-48	Report	Report	—	—	—	D2500 and D5773 <sup>a</sup>
6.17	Biodiesel, % by volume (see 6.18)	Min.	—	—	—	—	—	—	D7371
		Max.	0	0	5	—	—	—	
<sup>a</sup> The referee method to be used in the event of a dispute.									
<sup>b</sup> If the fuel is designed for an operability temperature of -10°C or colder, then the minimum viscosity shall be 1.50 cSt. If the fuel is designed for an operability temperature of -20°C or colder, then the minimum viscosity shall be 1.30 cSt.									
<sup>c</sup> The SI unit for kinematic viscosity is the square metre per second. The preferred multiple for fluids in this viscosity range is the square millimetre per second, which is equivalent to a centiStokes (i.e. 1 mm <sup>2</sup> /s = 1 cSt).									
<sup>d</sup> Approximate viscosity equivalents at 100°C are as follows: Temperature:    50°C   100°C Viscosity (cSt):    15     5 100    15 150    20 650    50									
<sup>e</sup> The results obtained by ASTM D3828 can be more than 2°C lower than those obtained by ASTM D93, the referee method.									
<sup>f</sup> D2887 may not be appropriate for Type 2 fuel oil containing biodiesel as the correlation to D86 may not apply.									

## 6.18 Biodiesel

The biodiesel component shall comply with CAN/CGSB-3.524.

Metered (measured) volumes may be used to report the concentration of the biodiesel used to prepare a blend. Alternatively, the fuel oil may be tested in accordance with ASTM D7371 to determine the biodiesel concentration.

## **6.19 Sulphur**

Sulphur content is established by government regulations in effect where the fuel oil is to be used, or by contractual agreement (see 6.8 and 8.2). In the event of a dispute, the referee test method for Types 0, 1 and 2, shall be ASTM D5453.

## **6.20 Pour point**

Pour point, except for Type 0, may be specified as required for the conditions of storage or use or as agreed by contract (see 6.15 and 8.1). Pour-depressed and flow-improved fuel oil that is designed to provide satisfactory performance under the conditions of storage and use may also be used. The fuel oil shall be tested in accordance with ASTM D97 or D5949. In the event of a dispute, ASTM D5949 shall be the referee test method for Types 0, 1 and 2.

## **6.21 Cloud point**

Cloud point for Types 1 and 2, may be specified as required by the conditions of storage or use or as agreed by contract (see 6.16 and 8.1). The fuel oil shall be tested in accordance with ASTM D2500 or D5773. In the event of a dispute, ASTM D5773 shall be the referee test method for Types 0, 1, and 2.

## **6.22 Water and sediment**

Testing for Types 0, 1 and 2 shall be conducted in accordance with ASTM D1796 (modified) or D2709. The test in ASTM D1796 shall be modified by substituting the centrifuge tube specified in ASTM D2273 for that in ASTM D1796. For Types 4, 5 and 6, water shall be determined by distillation (ASTM D95), and sediment by extraction (ASTM D473).

## **6.23 Flash point**

The test values determined in accordance with ASTM D93, D3828 or D7094 shall be reported to the nearest 0.5°C (see 6.3 and table footnote e).

## **6.24 Distillation**

Testing shall be in accordance with ASTM D86, D2887 or D7345. When testing in accordance with ASTM D2887, use the method in the appendix to convert the results to estimates of ASTM D86. Only bias-corrected values from ASTM D7345 may be used as an alternate to ASTM D86. In the event of a dispute, the automated method of ASTM D86 shall be the referee test method.

## **6.25 Kinematic viscosity**

Only bias-corrected values from ASTM D7042 may be used as an alternate to ASTM D445 for Types 0, 1, 2 and 4.

# **7 Inspection**

## **7.1 Sampling**

**7.1.1** Sampling equipment and procedures shall be designed and used to obtain representative samples of a product. Sampling lines, hoses, etc. should be adequately flushed prior to taking a sample. Samples should be stored in a cool, dark place. Procedures shall be in accordance with ASTM D4057, D4177 or D5854.

**7.1.2** Sample volume should be consistent with the requirement of the testing laboratory or the authority having jurisdiction or both. Unless otherwise specified (see 8.2), or if the amount required is not known, a sample of at least 3 L shall be collected.

## 8 Options

**8.1** The following options shall be specified in the application of this standard:

- a) Type of fuel (see 4.1)
- b) Pour point or cloud point except for Type 0 (see 6.15 and 6.16).

**8.2** The following options may be specified if the requirements are more stringent than those stipulated in this standard:

- a) Sulphur (see 6.8)
- b) Sample size (see 7.1.2).

## 9 Precautions

### 9.1 Wick-type kerosene heaters

Fuel oils meeting the requirements of this standard are not satisfactory for use in wick-type kerosene burning space heaters. When in doubt, consult the equipment operating instructions or the manufacturer of the appliance.

### 9.2 Blending and storage

Blending biodiesel into Type 2 heating fuel oil should be done to ensure that the finished fuel blend is homogeneous. This will help to ensure that precipitation does not occur in the finished fuel due to lower temperatures, increased moisture or other effects.

NOTE Recommended practices for storage and blending may be found in the National Renewable Energy Laboratory (NREL) Biodiesel Handling and Use Guide, 4<sup>th</sup> edition, January 2009 (or as updated from time to time) <http://www.nrel.gov/docs/fy09osti/43672.pdf>.

### 9.3 Pour point

The pour point of the finished fuel blend should be suitable as required for the conditions of storage or use or as agreed by contract. The addition of biodiesel can degrade the low temperature properties of the conventional heating fuel oil component of the blend. The effectiveness of some fuel additives can be affected when biodiesel is blended into the fuel.

### 9.4 Storage stability

Furnace burner manufacturers have concerns with the stability of blends of biodiesel and middle distillate fuel. Poor oxidative stability of biodiesel blends can result in sediment formation and lacquering of furnace burner injection equipment. The addition of biodiesel in Type 2 heating fuel oil can degrade the storage stability of the finished fuel blend and long term storage (greater than 6 months) is not recommended. The impact of specific storage conditions has not been completely determined. The oxidation stability requirement of the B100 component is specified in CAN/CGSB-3.524. Additionally, the storage stability of the finished fuel blend can be evaluated using ASTM D7462. Blended fuels having less than 1.6 mg/100 mL total insolubles by D7462 should provide adequate storage stability.

### 9.5 Water and copper

Water in storage tanks and copper in the fuel supply system can increase the rate of fuel degradation in long term storage. Heating oil storage tanks should be clean and free of water. Incorporating metal deactivator additives into the fuel can help to mitigate the effects of copper contamination.

## 9.6 Conductivity depletion

Due to the normal depletion of fuel oil conductivity during commingling, storage and distribution, or at low temperatures, the fuel oil should be sufficiently treated with conductivity-improver additive to ensure that the electrical conductivity requirement in 6.12 is met. The temperature at the point of use and the method of distribution could require a substantially higher conductivity level than 25 pS/m at the point of additive treatment. For more information, refer to ASTM D2624 and D4865.

## 9.7 Fuel colour

Although this standard does not have a colour requirement, colour can be a useful indicator of fuel quality or contamination for heating fuel oil Types 0, 1 and 2. Normally fuel colour ranges from water white (colourless) to an amber or light brownish colour depending on crude oil type or refinery processes. Fuel in long term storage can darken owing to oxidation of trace components, but this will not affect its performance. If the darkening is accompanied by the formation of sediment, however, the fuel could be rendered not acceptable for use. Fuels having unusual shades of colour should be investigated to determine fitness for use.

## 9.8 Manufacturing processes

Contamination from manufacturing processes or treatments can be carried over in trace quantities into the fuel and cause unexpected problems. Moreover, these contaminants might not be detected by the requirements listed in this standard. It is recommended that adequate quality assurance procedures be put in place to ensure that manufacturing processes capable of such contamination are identified and controlled. Sodium, calcium, chlorides, sulphates, clay, sand, acids, caustics, soaps, and amine process additives are examples of possible contaminations or potential precipitates.

## 9.9 Visual haze

The solubility of water in fuel is a function of temperature. When fuel is exposed to low ambient temperatures, water can separate causing a haze or cloudy appearance in heating fuel oil Types 0, 1 and 2. It has been a common industry practice to predict the solubility of water in fuel by performing the visual haze test at 4°C for fuel destined for winter use, and at 15°C for fuel intended for summer use. Experience has indicated that fuel passing these requirements has been acceptable in the appropriate season. For further information on the visual haze test, refer to CAN/CGSB-3.0 No. 28.8.

## 9.10 Mercaptan sulphur

The plugging of domestic heating oil burner fuel screen filters or nozzles can be caused by the formation of copper mercaptide gels. Limiting the amount of mercaptan sulphur in heating fuel oil Types 0, 1 and 2 can reduce this problem. Eliminating the use of copper and copper alloys in heating fuel systems as well as the use of metal deactivator additives can also mitigate this problem.

## 9.11 Low temperature solubility

Several types of biodiesel contaminants have relatively low solubility in middle distillate fuel and can precipitate from fuel blends, sometimes irreversibly. This includes sterol glucosides and some saturated monoglycerides. Exposure to cold temperatures over time can accelerate this precipitation and the formation of larger agglomerates. These contaminants can settle in the bottom of storage tanks and clog filters. A combination of processing controls and quality assurance procedures should be applied to the production, storage and handling of biodiesel to ensure that material with a tendency to precipitate is not present in concentrations sufficient to clog fuel filters. Care shall also be taken when formulating and blending with heating fuel oil to ensure precipitation does not occur in the finished fuel due to lower temperatures, increased moisture or other effects.

### 9.12 Hydrogen sulphide

Hydrogen sulphide ( $\text{H}_2\text{S}$ ) is often found in the vapour phase above 4, 5 and 6 fuel oils and occasionally in more limited concentration in the vapour phase above Type 0, 1 and 2 fuel oils.  $\text{H}_2\text{S}$  is toxic at low concentrations in air. Additives are available that can react with  $\text{H}_2\text{S}$  in the liquid phase and reduce the concentration of  $\text{H}_2\text{S}$  both in the fuel and in the vapour phase. Some sulphur compounds present in Types 4, 5 and 6 can, over time, react to form additional  $\text{H}_2\text{S}$  and this should be considered in determining the additive treat rate.

### 9.13 Fuel flammability

A number of properties shall be considered in assessing the overall flammability hazard of a fuel. Flash point is the minimum fuel temperature at which a mixture of air and fuel vapour can form and be ignited by a spark or flame under specified laboratory conditions. However, the flash point is only an indication of the potential flammability risk of a fuel. Oxygen concentration in the atmosphere is an additional factor affecting flammability. Investigation of fuel-related fires in marine vessel engine rooms and underground mining applications has shown that these fires are generally initiated through direct contact of a fuel spray or spill with hot surfaces having a temperature exceeding the auto-ignition temperature of the fuel. The flash point of the fuel has little bearing on the probability of such fires occurring. Similarly, fires in fuel tanks are typically initiated as a result of hot work (e.g., welding) on the exterior surface of the tank causing fuel adhering to the interior tank wall surface to evaporate and spontaneously ignite after having exceeded its auto-ignition temperature.

## Annex A

*(normative)*

### Referenced ASTM International publications (see 2.2)

#### Annual Book of ASTM Standards

D86	Standard Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure
D93	Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
D95	Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
D97	Standard Test Method for Pour Point of Petroleum Products
D130	Standard Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test
D445	Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
D473	Standard Test Method for Sediment in Crude Oils and Fuel Oils by the Extraction Method
D482	Standard Test Method for Ash from Petroleum Products
D524	Standard Test Method for Ramsbottom Carbon Residue of Petroleum Products
D1266	Standard Test Method for Sulfur in Petroleum Products (Lamp Method)
D1298	Standard Test Method for Density, Relative Density or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
D1552	Standard Test Method for Sulfur in Petroleum Products by High Temperature Combustion and IR Detection
D1796	Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)
D2273	Standard Test Method for Trace Sediment in Lubricating Oils
D2500	Standard Test Method for Cloud Point of Petroleum Products
D2622	Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry
D2624	Standard Test Methods for Electrical Conductivity of Aviation and Distillate Fuels
D2709	Standard Test Method for Water and Sediment in Middle Distillate Fuels by Centrifuge
D2887	Standard Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography
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
D3828	Standard Test Methods for Flash Point by Small Scale Closed Cup Tester



- D4052 Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter
- D4057 Standard Practice for Manual Sampling of Petroleum and Petroleum Products
- D4177 Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
- D4294 Standard Test Method for Sulfur in Petroleum and Petroleum Products by Energy Dispersive X-ray Fluorescence Spectrometry
- D4530 Standard Test Method for Determination of Carbon Residue (Micro Method)
- D4865 Standard Guide for Generation and Dissipation of Static Electricity in Petroleum Fuel Systems
- D4870 Standard Test Method for Determination of Total Sediment in Residual Fuels
- D5453 Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, and Engine Oil by Ultraviolet Fluorescence
- D5773 Standard Test Method for Cloud Point of Petroleum Products (Constant Cooling Rate Method)
- D5854 Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products
- D5949 Standard Test Method for Pour Point of Petroleum Products (Automatic Pressure Pulsing 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
- D7039 Standard Test Method for Sulfur in Gasoline, Diesel Fuel, Jet Fuel, Kerosine, Biodiesel, Biodiesel Blends, and Gasoline-Ethanol Blends by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry
- D7042 Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinetic Viscosity)
- D7094 Standard Test Method for Flash Point by Modified Continuously Closed Cup (MCCCFP) Tester
- D7345 Standard Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure (Micro Distillation Method)
- D7371 Standard Test Method for Determination of Biodiesel (Fatty Acid Methyl Esters) Content in Diesel Fuel Oil Using Mid Infrared Spectroscopy (FTIR-ATR-PLS Method)
- D7462 Standard Test Method for Oxidation Stability of Biodiesel (B100) and Blends of Biodiesel with Middle Distillate Petroleum Fuel (Accelerated Method)
- E29 Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.

## **Annex B** (informative)

### **Federal, provincial and other regulations applicable to heating oil<sup>1,2</sup>**

#### **B.1 Federal regulations**

##### **B1.1 Canadian Environmental Protection Act**

The following federal regulations have been enacted under the *Canadian Environmental Protection Act: 1999*<sup>3</sup>.

###### **B.1.1.1 Fuels Information Regulations, No. 1** (C.R.C. c. 407 amended by SOR/DORS/ 2000-104)

These regulations require producers and importers to submit information on sulphur and additive contents (other than lead) of liquid fuels.

###### **B.1.1.2 Contaminated Fuel Regulations** (SOR/DORS/91-486)

These regulations prohibit the importation of fuels that have been contaminated with hazardous wastes.

###### **B.1.1.3 Renewable Fuels Regulations** (SOR/DORS/2010-189)

These regulations define the renewable fuel content requirements for gasoline, diesel and heating oil.

##### **B.1.2** The following federal regulations also apply to fuels meeting this standard:

###### **B.1.2.1 Transportation of Dangerous Goods Regulations** (SOR/DORS/2001-286)

These regulations, enacted under the *Transportation of Dangerous Goods Act, 1992*, give detailed packaging, labelling and documentation requirements for transporting fuels in Canada.

#### **B.2 Provincial regulations**

##### **B.2.1 Ontario**

###### **B.2.1.1 General requirements**

The general requirements are controlled under the *Technical Standards and Safety Act, 2000*, S.O. 2000, c. 16, approved by Order in Council, March 5, 2001. Under this Act, the *Liquid Fuels Handling Code*, August 2001, was published by the Technical Standards and Safety Authority. The Code lists product standards (in Appendix B where CAN/CGSB-3.2 is referenced), which include a 120-day period for any new standards or amendments to take effect.

<sup>1</sup> The regulations listed are subject to revision by the relevant authority. The user should consult the relevant authority to confirm the current regulations. The information provided about the regulations is for information only. In case of conflict, the text of the regulation takes precedence.

<sup>2</sup> The requirements in provinces other than those listed above will be added as information becomes available in future revisions and amendments to this standard.

<sup>3</sup> The Acts and Regulations may be obtained from Government of Canada Publications, Ottawa, Canada. Telephone 1-800-635-7943 or 613-941-5995. Fax 1-800-565-7757 or 613-954-5779. Web site [publications.gc.ca/helpAndInfo/cntcts-e.htm](http://publications.gc.ca/helpAndInfo/cntcts-e.htm). Provincial Acts may be obtained from their relevant authority, however if a Web site becomes inoperative, the Canadian Legal Information Institute Web site at [www.canlii.com](http://www.canlii.com) may also be useful.

## B.2.2 Quebec

### B.2.2.1 General requirements

The general requirements are controlled under the latest version of the *Loi sur les produits pétroliers*, R. L. R. Q., c. P-30.01, *Règlement sur les produits pétroliers*, D.581-2015, G.O. 28, 2147 or *Petroleum Products Act*, R.S.Q., c. P-30.01, *Petroleum Products Regulation*, Q.C. 581-2015, G.O. 28,1375<sup>4</sup>. This regulation lists Quebec quality requirements for aviation gasolines, aviation turbine fuels, automotive gasolines, gasolines containing denatured fuel ethanol for use in automotive spark ignition fuels, diesel fuels, diesel fuels containing biodiesel (B100) for blending in middle distillate fuels, fuel oil types 0, 1 and 2, and fuel oil types 4, 5 and 6. Amendments and editions published apply only 90 days after the last day of the month that the French text of the amendments or editions was published. The Direction générale des hydrocarbures et des biocombustibles of the ministère de l'Énergie et des Ressources naturelles is responsible for the application and revision of this regulation. Web site [www.mrn.gouv.qc.ca/english/energy/index.jsp](http://www.mrn.gouv.qc.ca/english/energy/index.jsp).

### B2.2.2 Clean Air Regulation (CQLR c Q-2, r 4.1)

This regulation references CAN/CGSB-3.2-2007 *Heating Fuel Oil* published in July 2007 by the Canadian General Standards Board, a dated reference.

## B.2.3 Manitoba

### B.2.3.1 Gas and Oil Burner Regulation (Man. Reg. 104/87 as amended by Man. Reg. 129/2013)

This Regulation states:

“No person shall sell or deliver fuel oil for use within the province in a fuel oil burner used for heating purposes unless the fuel oil meets the requirements for the supply of fuel oil set forth in CAN/CSA B139-M91 entitled *Installation Code for Oil-Burning Equipment*, as amended from time to time.” The current version of the “*Installation Code for Oil-Burning Equipment*” is CAN/CSA B139-09. In this document, it specifically refers to the 2007 edition of CAN/CGSB-3.2.

## B.2.4 British Columbia

### B.2.4.1 Renewable and Low Carbon Fuel Requirements Regulation (B.C. Reg. 394/2008 as amended by B.C. reg. 320/2009 and B.C. reg. 379/2010)

These regulations define the requirements for renewable fuels in British Columbia. The regulation is available online at [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/394\\_2008](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/394_2008).

## B.2.5 Newfoundland and Labrador

### B.2.5.1 Heating oil Storage Tank System Regulations (NL Reg. 60/03 Amended by 103/03, 40/07, 17/09, 108/09, 90/10, 114/10, 71/11, 112/11)T

These regulations apply to all systems with a capacity of 2500 litres or less that are or were connected to a heating appliance and are or were being used for the storage of heating oil and the delivery of heating oil to a connected heating appliance.

The regulation references CAN/CGSB-3.2-99, a dated reference.

<sup>4</sup> Available from Les Publications du Québec. Telephone 1-800-463-2100 or 418-643-5150. Fax 1-800-561-3479 or 418-643-6177. Also available on-line at [www2.publicationsduquebec.gouv.qc.ca/home.php](http://www2.publicationsduquebec.gouv.qc.ca/home.php).

## **B.3 Municipal regulations**

### **B3.1 Montréal**

**B3.3.1** By-Law 90, Montréal Urban Community 1987 (as amended in 1996, 1998, 2000 and 2001) limits sulphur in light fuel oil (Types 0, 1, 2 and 4) to a maximum of 0.4% by mass, and in heavy fuel oil (Types 5 and 6) to a maximum of 1.25 to 1.4% by mass depending upon location of use. <http://ville.montreal.qc.ca/sel/sypre-consultation/afficherpdf?idDoc=7566&typeDoc=1>