



Designation: D 5853 – 95 (Reapproved 2000)<sup>ε1</sup>

An American National Standard



Designation: 441/99

## Standard Test Method for Pour Point of Crude Oils<sup>1</sup>

This standard is issued under the fixed designation D 5853; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

<sup>ε1</sup> NOTE—Warning notes were placed in the text editorially in December 2000.

### 1. Scope

1.1 This test method covers two procedures for the determination of the pour point temperatures of crude oils down to  $-36^{\circ}\text{C}$ . One method provides a measure of the maximum (upper) pour point temperature (Procedure A) and is described in 9.1; the other method provides a measure of the minimum (lower) pour point temperature (Procedure B) and is described in 9.2.

1.2 The use of this test method is limited to use for crude oils. Pour point temperatures of other petroleum products can be determined by Test Method D 97.

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.* For specific hazard statements, see Section 7.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

- D 97 Test Method for Pour Point of Petroleum Products<sup>2</sup>
- D 130 Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test<sup>2</sup>
- D 323 Test Method for Vapor Pressure of Petroleum Products (Reid Method)<sup>2</sup>
- D 4057 Practice for Manual Sampling of Petroleum and Petroleum Products<sup>3</sup>
- D 4177 Practice for Automatic Sampling of Petroleum and Petroleum Products<sup>3</sup>
- E 1 Specification for ASTM Thermometers<sup>4</sup>
- E 77 Test Method for Inspection and Verification of Thermometers<sup>4</sup>

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.07 on Flow Properties.

Current edition approved Oct. 10, 1995. Published December 1995.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 05.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 05.02.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 14.03.

### 3. Terminology

#### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *pour point, n*—the lowest temperature at which movement of the test specimen is observed under the conditions of the test.

3.1.2 *maximum (upper) pour point, n*—the pour point obtained after the test specimen has been subjected to a prescribed treatment designed to enhance gelation of wax crystals and solidification of the test specimen.

3.1.3 *minimum (lower) pour point, n*—the pour point obtained after the test specimen has been subjected to a prescribed treatment designed to delay gelation of wax crystals and solidification of the test specimen.

### 4. Summary of Test Method

4.1 After preliminary heating, the test specimen is cooled at a specified rate and examined at intervals of  $3^{\circ}\text{C}$  for flow characteristics. The lowest temperature at which movement of the test specimen is observed is recorded as the pour point.

### 5. Significance and Use

5.1 The pour point of a crude oil is an index of the lowest temperature of handleability for certain applications.

5.2 This is the only pour point method specifically designed for crude oils.

5.3 The maximum and minimum pour point temperatures provide a temperature window where a crude oil, depending on its thermal history, might appear in the liquid as well as the solid state.

5.4 The test method can be used to supplement other measurements of cold flow behavior. It is especially useful for the screening of the effect of wax interaction modifiers on the flow behavior of crude oils.

### 6. Apparatus

#### 6.1 Pour Point Test Apparatus Assembly (see Fig. 1):

6.1.1 *Test Jar*, cylindrical, of clear glass, flat bottomed, outside diameter 33.2 to 34.8 mm, and height 115 to 125 mm. The inside diameter of the jar can range from 30.0 to 32.4 mm,



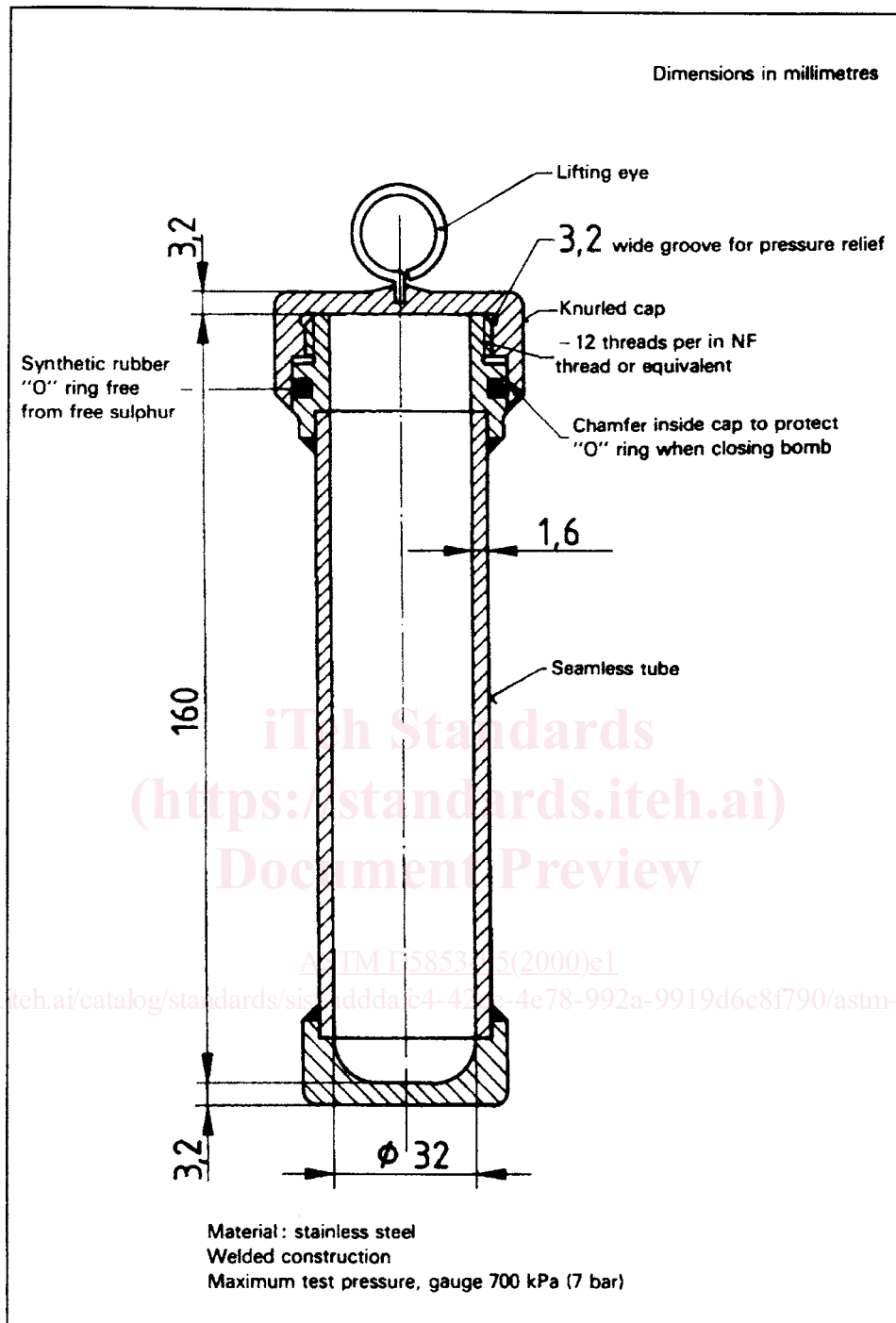


FIG. 2 Pressure Vessel

can be monitored and controlled to the designated temperature ( $\pm 1^\circ\text{C}$  (9.1.4; 9.2.4)).

6.3 *Pressure Vessel*,<sup>5</sup> constructed of stainless steel according to the dimensions given in Fig. 2, and capable of withstanding a test pressure of 700 kPa. Alternative designs for the pressure vessel cap and synthetic rubber gasket may be used provided

that the internal dimensions of the pressure vessel are the same as those shown in Fig. 2.

6.4 *Timing Device*, capable of measuring up to 30 s with a resolution of at least 0.1 s and an accuracy of  $\pm 0.2$  s or better.

## 7. Reagents and Materials

7.1 The following solvents of technical grade are appropriate for low-temperature bath media.

7.1.1 *Acetone*, (**Warning**—Extremely flammable.)

7.1.2 *Alcohol, Ethanol*, (**Warning**—Flammable.)

<sup>5</sup> This pressure vessel is identical to the pressure vessel described in Test Method D 130.