NOTICE: This standard has either been superseded and replaced by a new version or withdrawn.
Contact ASTM International (www.astm.org) for the latest information

Designation: D 2639 – 04$^{\epsilon 1}$

Standard Test Method for Plastic Properties of Coal by the Constant-Torque Gieseler Plastometer[1]

This standard is issued under the fixed designation D 2639; 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.

ϵ[1] NOTE—Editorial changes were made throughout in January 2005.

1. Scope

1.1 This test method covers a relative measure of the plastic behavior of coal when heated under prescribed conditions. This test method may be used to obtain semiquantitative values of the plastic properties of coals and blends used in carbonization and in other situations where determination of plastic behavior of coals is of practical importance.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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:* [2]

D 2013 Practice of Preparing Coal Samples for Analysis

D 2234 Practice for Collection of a Gross Sample of Coal

3. Terminology

3.1 *Definitions:*

3.1.1 *dial division per minute, n*—as used in this test method, a measure of stirrer rotation rate. There are 100 dial divisions for each full 360° rotation of the stirrer. Stirrer rotation rate is total dial divisions turned by the stirrer in a one minute time period.

3.1.2 *initial softening temperature, n*—as used in this test method, the temperature at which the stirrer rotation rate first reaches 1.0 dial divisions per minute.

3.1.3 *maximum fluidity, n*—as used in this test method, the measured maximum stirrer rotation rate, in dial divisions per minute.

3.1.4 *maximum fluidity temperature, n*—as used in this test method, the temperature at which stirrer rotation rate reaches a maximum value.

3.1.5 *plastic range, n*—difference between the solidification temperature and the initial softening temperatures.

3.1.6 *solidification temperature, n*—as used in this test method, the temperature at which the the first zero ddpm is reached after the last stirrer rotation.

4. Summary of Test Method

4.1 The plastometer measures the plastic properties of coals by the use of a constantly applied torque on a stirrer placed in a crucible into which the coal is charged. The crucible is immersed in a bath and the temperature increased uniformly. The rates of movement of the stirrer are recorded in relation to increase in temperature.

5. Significance and Use

5.1 Reliable values of the plastic properties of coals are used to predict or explain the behavior of a coal or blends during carbonization or in other processes such as gasification, liquefaction, and combustion.

6. Apparatus

6.1 *Gieseler Plastometer*—The apparatus shall consist of the following:

6.1.1 *Retort*—A steel retort consisting of four parts as shown in Fig. 1.

6.1.2 *Retort Crucible*, cylindrical, 21.4 ± 0.08 mm (0.844 ± 0.003 in.) in inside diameter and 35.0 mm (1.38 in.) in depth, with exterior threads for joining the crucible to the crucible cover. The crucible shall have a 2.38- ± 0.02-mm

[1] This test method is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.15 on Metallurgical Properties of Coal and Coke.

Current edition approved Nov. 1, 2004. Published November 2004. Originally approved in 1967. Last previous edition approved in 1998 as D 2639–98$^{\epsilon 1}$.

[2] 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.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.

Documents
Document Sharing Hub

Full document details: ASTM D2639-04e1

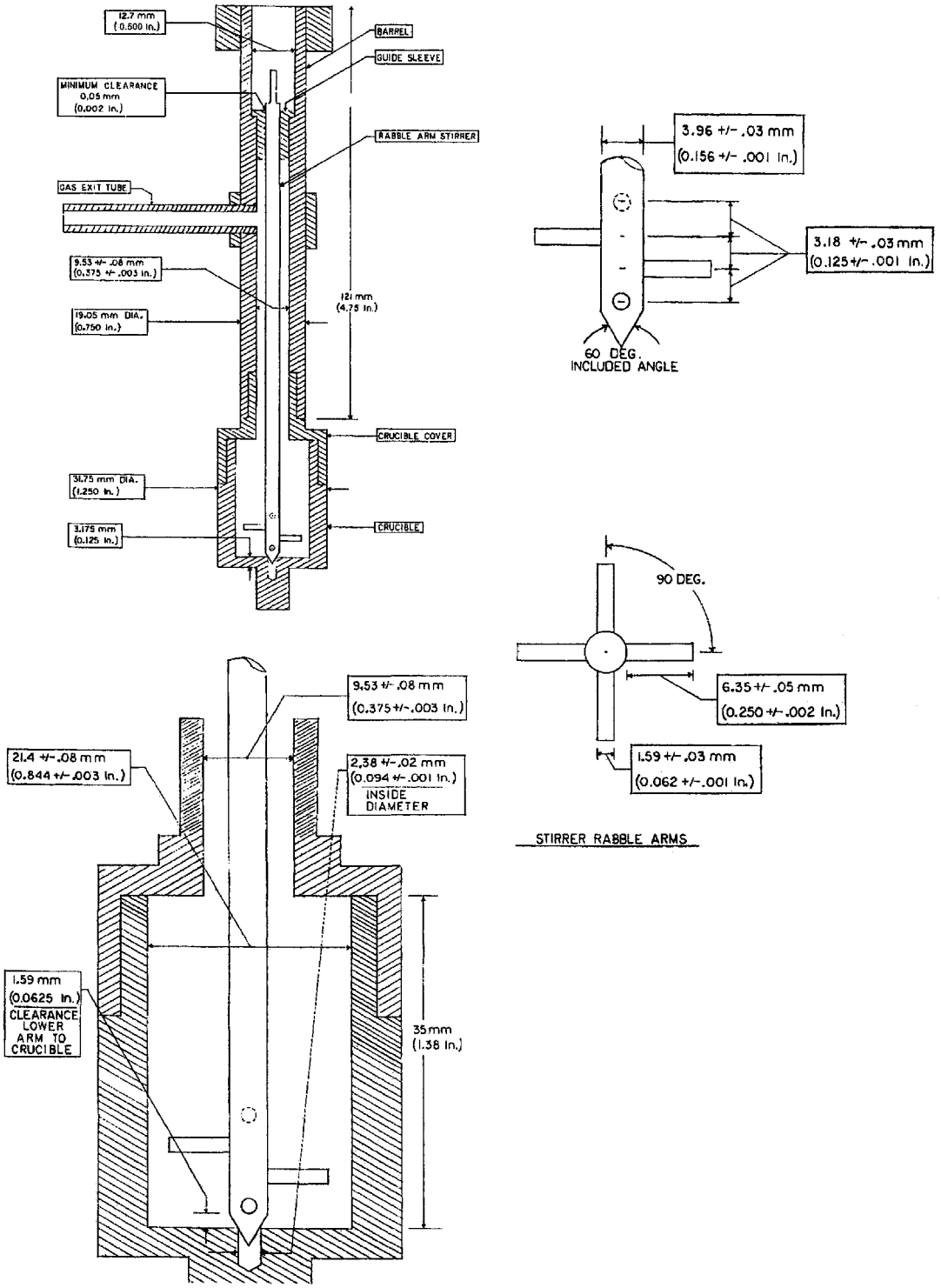

FIG. 1 Retort Assembly

FIG. 1 Retort Assembly

Documents
Document Sharing Hub
Full document details: ASTM D2639-04e1