



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 261-2021

**Determination of flash point - Pensky-Martens closed cup
method**

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardizing Documents.

This Document replaced GB/T 261-2008 Determination of Flash Point - Pensky-Martens Closed Cup Method. Compared with GB/T 261-2008, the major technical changes of this Document are as follows besides the structural adjustments and editorial modifications:

a) Change the scope from "applicable to samples with a flash point higher than 40°C" to "applicable to samples with a flash point within the range of 40°C to 370°C" (see Clause

1 of this Edition; Clause 1 of the 2008 Edition);

b) Add Step A to the scope to indicate that it is applicable to biodiesel blended fuel samples (see Clause 1 of this Edition);

- c) Add Step C to apply to BD100 biodiesel samples, including the scope, sampling, test conditions, test steps and precision, etc. (see Clauses 1, 8, 10 and 13 of this Edition);
- d) Change and add the relevant contents of some instruments; including the requirements for the built-in pressure gauge, barometer, temperature measuring device, explosion-proof oven, and instrument installation location of automatic instruments (see Clause 6 of this Edition; Clause 6 of the 2008 Edition);
- e) Refine and supplement the sampling and sample handling contents (see Clause 8 of this Edition; Clause 8 of the 2008 Edition);
- f) Expand the atmospheric pressure range for accurate correction of flash point in the flash point correction formula (see Clause 11 of this Edition; Clause 11 of the 2008 Edition);
- g) Add The tolerance values of calibration standard substances to Table B.1 of Appendix B (see Appendix B of this Edition);
- h) In order to cooperate with the use of automatic temperature measuring devices, delete Appendix D Thermometer Adapter in GB/T 261-2008; and add relevant content of electronic temperature measuring equipment (see D.1 in Appendix D of this Edition).

This Document used redrafting method to modify and adopt ISO 2719:2016 Determination of

Flash Point - Pensky-Martens Closed Cup Method.

Compared with ISO 2719:2016, this Document made partial adjustment in structure; Appendix

A list the comparison table of clauses between this Document and ISO 2719:2016.

The major technical differences and causes between this Document and ISO 2719:2016 are as

follows:

Determination of Flash Point - Pensky-Martens Closed Cup
Method

Warning: People who use this Document shall have practical working experience in regular laboratory. The use of this Document may involve certain dangerous materials, equipment, and operations. This Document does not point out all possible safety issues.

Users are responsible for taking appropriate safety and health measures and ensuring that the conditions stipulated by relevant national laws and regulations are met.

1 Scope

This Document specifies the method for determining the flash point of flammable liquids, liquids with suspended particles, liquids that tend to form films on the surface under test conditions, and other liquids using a Pensky-Martens closed cup flash point tester.

NOTE 1: Although this Document can be used for kerosene with a flash point above 40°C, the flash point

of kerosene is generally determined in accordance with GB/T 21789. The flash point of unused

lubricating oils is usually determined in accordance with GB/T 3536.

NOTE 2: This Document can be used for jet fuels with a flash point below 40°C, but the precision has not been verified.

Warning: Since some mixtures do not obtain the flash point defined in this Document, but obtain a significantly increased flash (not the effect of halo) and a change in the flash from blue to yellow-brown, continued heating can cause the vapor around the test cup to burn.

This Document is applicable to samples with a flash point range of 40°C ~ 370°C. This Document includes three test steps: Step-A, Step-B and Step-C. Step-A is applicable to distillate

fuels (including diesel, biodiesel blends, heating oil and turbine fuel), unused lubricating oils,

paints and varnishes and other homogeneous liquids not included in Step-B and Step-C. Step-

B is applicable to residual fuel oil, diluted asphalt, used lubricating oil, liquids with suspended

particles, liquids that tend to form films on the surface under the test conditions or liquids whose

viscosity is not suitable for heating under the stirring speed and heating conditions specified in

Step-A. Step-C is applicable to the determination of BD100 biodiesel samples. This

Document

does not apply to water-based paints and water-based varnishes.

NOTE 3: When monitoring the lubricating oil system, in order to compare the flash points of unused

lubricating oil and used lubricating oil, Step-A can also be used to determine the flash point of used

lubricating oil, but this precision is only applicable to Step-B.

C.3.3 Ignitor

The diameter of the tip opening of the ignition tube flame jet device is about 0.7mm~0.8mm (see Figure C.4). The tip is stainless steel, or other suitable metal material. The ignitor is equipped with a mechanical operator. When the slide plate is in the "open" position, the tip is

lowered so that the center of the flame nozzle opening hole is located between the upper and

lower surface planes of the test cup cover and passes through a point on the center radius of the

maximum opening A (see Figure C.3).

The bead at the tip is made of suitable material, about 4mm, which is equivalent to the flame

size, and is assembled in a prominent position on the test cup cover.

C.3.4 Automatic ignition device

For automatic ignition of the flame, the diameter of the ignitor tip opening is about 0.7mm~0.8mm.

C.3.5 Stirring device

It is mounted in the center of the test cup cover (as shown in Figure C.4), with two double-bladed metal paddles. The lower paddle surface is about 38mm away from the test cup cover;

the two blades are 8mm wide and inclined at 45°. The upper paddle surface is about 19 mm from the test cup cover; the two blades are 8 mm wide and inclined at 45°. The two sets of paddles are fixed on the rotating shaft of the stirrer. When viewed from the bottom of the stirrer,