

Kinematic viscosity (extrapolated) v (at near-zero shear rate) mm <sup>2</sup> /s at 23 °C (73.4 °F)	Flow-time t in seconds	Jet diameter in mm	Flash point c.c.
20 < v ≤ 80 .....	20 < t ≤ 60 .....	4	above 17 °C (62.6 °F).
80 < v ≤ 135 .....	60 < t ≤ 100 .....	4	above 10 °C (50 °F).
135 < v ≤ 220 .....	20 < t ≤ 32 .....	6	above 5 °C (41 °F).
220 < v ≤ 300 .....	32 < t ≤ 44 .....	6	above –1 °C (31.2 °F).
300 < v ≤ 700 .....	44 < t ≤ 100 .....	6	above –5 °C (23 °F).
700 < v .....	100 < t .....	6	No limit.

(2) The methods by which the tests referred to in paragraph (b)(1) of this section shall be performed are as follows:

(i) *Viscosity test.* The flow time in seconds is determined at 23 °C (73.4 °F) using the ISO standard cup with a 4 mm (0.16 inch) jet as set forth in ISO 2431 (IBR, see § 171.7 of this subchapter). Where the flow time exceeds 100 seconds, a further test is carried out using the ISO standard cup with a 6 mm (0.24 inch) jet.

(ii) *Solvent Separation Test.* This test is carried out at 23 °C (73 °F) using a 100.0 mL (3 ounces) measuring cylinder of the stoppered type of approximately 25.0 cm (9.8 inches) total height and of a uniform internal diameter of approximately 30 mm (1.2 inches) over the calibrated section. The sample should be stirred to obtain a uniform consistency, and poured in up to the 100 mL (3 ounces) mark. The stopper should be inserted and the cylinder left standing undisturbed for 24 hours. After 24 hours, the height of the upper separated layer should be measured and the percentage of this layer as compared with the total height of the sample calculated.

[Amdt. 173–224, 55 FR 52634, Dec. 21, 1990]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 173.121, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at [www.govinfo.gov](http://www.govinfo.gov).

**§ 173.124 Class 4, Divisions 4.1, 4.2 and 4.3—Definitions.**

(a) *Division 4.1 (Flammable Solid).* For the purposes of this subchapter, *flammable solid* (Division 4.1) means any of the following four types of materials:

(1) Desensitized explosives that—

(i) When dry are Explosives of Class 1 other than those of compatibility

group A, which are wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties; and

(ii) Are specifically authorized by name either in the Hazardous Materials Table in § 172.101 of this subchapter or have been assigned a shipping name and hazard class by the Associate Administrator under the provisions of—

(A) A special permit issued under subchapter A of this chapter; or

(B) An approval issued under § 173.56(i).

(2)(i) Self-reactive materials that are thermally unstable and can undergo an exothermic decomposition even without participation of oxygen (air). A material is excluded from this definition if any of the following applies:

(A) The material meets the definition of an explosive as prescribed in subpart C of this part, in which case it must be classed as an explosive;

(B) The material is forbidden from being offered for transportation according to § 172.101 of this subchapter or § 173.21;

(C) The material meets the definition of an oxidizer or organic peroxide as prescribed in this subpart, in which case it must be so classed;

(D) The material meets one of the following conditions:

(1) Its heat of decomposition is less than 300 J/g; or

(2) Its self-accelerating decomposition temperature (SADT) is greater than 75 °C (167 °F) for a 50 kg package; or

(3) It is an oxidizing substance in Division 5.1 containing less than 5.0% combustible organic substances; or

(E) The Associate Administrator has determined that the material does not present a hazard which is associated with a Division 4.1 material.

(ii) *Generic types.* Division 4.1 self-reactive materials are assigned to a generic system consisting of seven types. A self-reactive substance identified by technical name in the Self-Reactive Materials Table in §173.224 is assigned to a generic type in accordance with that table. Self-reactive materials not identified in the Self-Reactive Materials Table in §173.224 are assigned to generic types under the procedures of paragraph (a)(2)(iii) of this section.

(A) *Type A.* Self-reactive material type A is a self-reactive material which, as packaged for transportation, can detonate or deflagrate rapidly. Transportation of type A self-reactive material is forbidden.

(B) *Type B.* Self-reactive material type B is a self-reactive material which, as packaged for transportation, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in a package.

(C) *Type C.* Self-reactive material type C is a self-reactive material which, as packaged for transportation, neither detonates nor deflagrates rapidly and cannot undergo a thermal explosion.

(D) *Type D.* Self-reactive material type D is a self-reactive material which—

(1) Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement;

(2) Does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or

(3) Does not detonate or deflagrate at all and shows a medium effect when heated under confinement.

(E) *Type E.* Self-reactive material type E is a self-reactive material which, in laboratory testing, neither detonates nor deflagrates at all and shows only a low or no effect when heated under confinement.

(F) *Type F.* Self-reactive material type F is a self-reactive material which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power.

(G) *Type G.* Self-reactive material type G is a self-reactive material

which, in laboratory testing, does not detonate in the cavitated state, will not deflagrate at all, shows no effect when heated under confinement, nor shows any explosive power. A type G self-reactive material is not subject to the requirements of this subchapter for self-reactive material of Division 4.1 provided that it is thermally stable (self-accelerating decomposition temperature is 50 °C (122 °F) or higher for a 50 kg (110 pounds) package). A self-reactive material meeting all characteristics of type G except thermal stability is classed as a type F self-reactive, temperature control material.

(iii) *Procedures for assigning a self-reactive material to a generic type.* A self-reactive material must be assigned to a generic type based on—

(A) Its physical state (*i.e.* liquid or solid), in accordance with the definition of liquid and solid in §171.8 of this subchapter;

(B) A determination as to its control temperature and emergency temperature, if any, under the provisions of §173.21(f);

(C) Performance of the self-reactive material under the test procedures specified in the UN Manual of Tests and Criteria (IBR, see §171.7 of this subchapter) and the provisions of paragraph (a)(2)(iii) of this section; and

(D) Except for a self-reactive material which is identified by technical name in the Self-Reactive Materials Table in §173.224(b) or a self-reactive material which may be shipped as a sample under the provisions of §173.224, the self-reactive material is approved in writing by the Associate Administrator. The person requesting approval shall submit to the Associate Administrator the tentative shipping description and generic type and—

(1) All relevant data concerning physical state, temperature controls, and tests results; or

(2) An approval issued for the self-reactive material by the competent authority of a foreign government.

(iv) *Tests.* The generic type for a self-reactive material must be determined using the testing protocol from Figure 20.1 (a) and (b) (Flow Chart Scheme for Self-Reactive Substances and Organic Peroxides) from the UN Manual of

Tests and Criteria (IBR, see §171.7 of this subchapter).

(3) Readily combustible solids are materials that—

(i) Are solids which may cause a fire through friction, such as matches;

(ii) Show a burning rate faster than 2.2 mm (0.087 inches) per second when tested in accordance with the UN Manual of Tests and Criteria (IBR, see §171.7 of this subchapter); or

(iii) Any metal powders that can be ignited and react over the whole length of a sample in 10 minutes or less, when tested in accordance with the UN Manual of Tests and Criteria.

(4) Polymerizing materials are materials which, without stabilization, are liable to undergo an exothermic reaction resulting in the formation of larger molecules or resulting in the formation of polymers under conditions normally encountered in transport. Such materials are considered to be polymerizing substances of Division 4.1 when:

(i) Their self-accelerating polymerization temperature (SAPT) is 75 °C (167 °F) or less under the conditions (with or without chemical stabilization) as offered for transport in the packaging, IBC or portable tank in which the material or mixture is to be transported. An appropriate IBC or portable tank for a polymerizing material must be determined using the heating under confinement testing protocol from boxes 7, 8, 9, and 13 of Figure 20.1 (a) and (b) (Flow Chart Scheme for Self-Reactive Substances and Organic Peroxides) from the UN Manual of Tests and Criteria (IBR, see §171.7 of this subchapter) by successfully passing the UN Test Series E at the “None” or “Low” level, or by an equivalent test method with the approval of the Associate Administrator;

(ii) They exhibit a heat of reaction of more than 300 J/g; and

(iii) Do not meet the definition of hazard classes 1–8 (including combustible liquids).

(iv) The provisions concerning polymerizing substances in paragraph (a)(4) will be effective until January 2, 2023.

(b) *Division 4.2 (Spontaneously Combustible Material)*. For the purposes of this subchapter, *spontaneously combustible material* (Division 4.2) means—

(1) *A pyrophoric material*. A pyrophoric material is a liquid or solid that, even in small quantities and without an external ignition source, can ignite within five (5) minutes after coming in contact with air when tested according to UN Manual of Tests and Criteria.

(2) *Self-heating material*. A self-heating material is a material that through a process where the gradual reaction of that substance with oxygen (in air) generates heat. If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance will rise which, after an induction time, may lead to self-ignition and combustion. A material of this type which exhibits spontaneous ignition or if the temperature of the sample exceeds 200 °C (392 °F) during the 24-hour test period when tested in accordance with UN Manual of Tests and Criteria (IBR; see §171.7 of this subchapter), is classed as a Division 4.2 material.

(c) *Division 4.3 (Dangerous when wet material)*. For the purposes of this chapter, *dangerous when wet material* (Division 4.3) means a material that, by contact with water, is liable to become spontaneously flammable or to give off flammable or toxic gas at a rate greater than 1 L per kilogram of the material, per hour, when tested in accordance with UN Manual of Tests and Criteria.

[82 FR 15879, Mar. 30, 2017, as amended at 85 FR 27880, May 11, 2020]

#### § 173.125 Class 4—Assignment of packing group.

(a) The packing group of a Class 4 material is assigned in column (5) of the §172.101 Table. When the §172.101 Table provides more than one packing group for a hazardous material, the packing group shall be determined on the basis of test results following test methods given in the UN Manual of Tests and Criteria (IBR, see §171.7 of this subchapter) and by applying the appropriate criteria given in this section.

(b) Packing group criteria for readily combustible materials of Division 4.1 are as follows:

(1) Powdered, granular or pasty materials must be classified in Division 4.1 when the time of burning of one or