



## DEPARTMENT OF TRANSPORTATION

### MATERIALS TRANSPORTATION BUREAU

WASHINGTON, D.C. 20590

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#### Title 46—Shipping

#### CHAPTER I—U.S. COAST GUARD, DEPARTMENT OF TRANSPORTATION

[Docket No. HM-133; Amdt. to 146]

#### PART 146—TRANSPORTATION OR STORAGE OF EXPLOSIVES OR OTHER DANGEROUS ARTICLES OR SUBSTANCES, AND COMBUSTIBLE LIQUIDS ON BOARD VESSELS

##### Definitions for Flammable and Combustible Liquids

The purpose of these amendments to the dangerous cargo regulations in 46 CFR Part 146 is to:

1. Specify a new definition for the class of materials identified as "Flammable liquid";
2. Specify a new definition for the class of materials identified as "Combustible liquid";
3. Set forth requirements for the materials that are covered by the new definitions; and
4. Provide exemptions for certain materials covered by the new definitions.

In 49 CFR, amendments 172-23, 173-78, 174-19, 177-29, and 173-78A under Docket No. HM-102 published on January 4, 1974 (39 FR 2768), May 22, 1975 (40 FR 22263), and June 12, 1975 (40 FR 22264), the Hazardous Materials Regulations Board (the Board) adopted a new definition for flammable liquids, created and defined a new class of materials identified as "Combustible liquid," modified the definition for pyrophoric liquids within the flammable liquid class, and set forth the requirements for materials that are covered by the new definitions.

The provisions adopted under Docket No. HM-102 were not made applicable to the transportation of flammable and combustible liquids aboard vessels because of limitation of statutory authority of the Coast Guard imposed under 46 U.S.C. 170(6).

On January 3, 1975, The Hazardous Materials Transportation Act (Title I, Pub. L. 93-633) was signed into law. Section 113(f) of the Act amended 46 U.S.C. 170(6) to give the Secretary of Transportation authority to establish the defining flash point criteria for flammable and combustible liquids. With the necessary statutory authority available, the Bureau considered it appropriate to make the provisions adopted under HM-102 applicable to the carriage of flammable and combustible liquids aboard vessels.

Rather than publishing extensive changes to 46 CFR 146 to accomplish this, the Materials Transportation Bureau (MTB), on September 8, 1975 (40 FR 41537) published a proposal to modify existing proposals under consideration in Docket No. HM-112; Notice 73-9 (39 FR 1211) (January 24, 1974) so that the terms flammable, combustible, and pyrophoric liquid will have the same meaning in regulations for transportation aboard

vessels, as they have for transportation by air, rail or highway. HM-112 will have the effect of consolidating the Department's Hazardous Materials Regulations (including those for water made in 46 CFR 146) in Title 49 of the Code of Federal Regulations.

This choice was made on the assumption that HM-112 would be finalized before the provisions under HM-102 became effective on January 1, 1976. If this had occurred, changes to 46 CFR Part 146 would have been unnecessary because the effect of the consolidation under HM-112 would have been to make the amendments to 49 CFR resulting from HM-102 applicable to the water mode.

Because mandatory compliance by the rail, highway and air modes with HM-102 amendments to Title 49 is required on January 1, 1976, and because the Bureau does not foresee the consolidation under HM-112 being finalized by January 1, 1976, as expected, the Bureau now considers it necessary to amend 46 CFR Part 146 to incorporate the amendments made to 49 CFR under HM-102.

Under Docket HM-112; Notice No. 73-9A (40 FR 41537), the public has had the opportunity to present its views on the substance of the amendments being made herein. In addition to written comments accepted until October 8, 1975, the Bureau held a public hearing on Notice 73-9A in Washington, D.C. on October 1, 1975. The Bureau considers further public procedure unnecessary.

The four comments received on Notice 73-9A supported the proposal. One commenter stated that regulations dealing with the carriage of flammable and combustible liquids aboard vessels should take into account the effect of such regulations in relation to the IMCO Dangerous Code. Section 173.404(b) of 49 CFR presently provides the necessary flexibility with respect to the use of labels required for purposes of import or export shipments.

In consideration of the foregoing, 46 CFR Part 146 is amended as follows:

1. § 146.03-14 is revised to read as follows:

##### § 146.03-14 Flash point.

(a) "Flash point" means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid and shall be determined as follows:

(1) For a homogeneous, single-phase, liquid having a viscosity less than 45 S.U.S. at 100° F. (37.8° C.) that does not form a surface film while under test, one of the following test procedures shall be used:

(i) Standard Method of Test for Flash Point by Tag Closed Tester, (ASTM D56-70);

(ii) Standard Method of Test for Flash Point of Aviation Turbine Fuels by Setafash Closed Tester, (ASTM D3243-73), or

(iii) Standard methods of Test for Flash Point of Liquids by Setafash Closed Tester, (ASTM D3278-73).

(2) For a liquid other than one meeting all of the criteria of paragraph (a) (1) of this section, one of the following test procedures shall be used:

(i) Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, (ASTM D93-71);

(ii) Standard Method of Test for Flash Point of Aviation Turbine Fuels by Setafash Closed Tester, (ASTM D3243-73); or

(iii) Standard Methods of Test for Flash Point of Liquids by Setafash Closed Tester, (ASTM D3278-73).

(3) For a liquid that is a mixture of compounds that have different volatility and flash points, its flash point shall be determined as specified in paragraph (a) (1) or (a) (2) of this section, on the material in the form in which it is to be shipped. If it is determined by this test that the flash point is higher than 20° F. (-6.66° C.) a second test shall be made on a sample of the liquid evaporated from an open beaker (or similar container), under ambient pressure and temperature (20 to 25° C.) conditions, to 90 percent of its original volume or for a period of four hours, whichever comes first. The lower flash point of the two tests shall be the flash point of the material.

(4) For flash point determinations by Setafash closed tester, the glass syringe specified need not be used as the method of measurement of the test sample if a minimum quantity of two milliliters is assured in the test cup.

2. § 146.03-28a is added to read as follows:

##### § 146.03-28a Pyrophoric liquid.

"Pyrophoric liquid" means any liquid that ignites spontaneously in dry or moist air at or below 130° F. (54.5° C.)

3. § 146.03-34a is added to read as follows:

##### § 146.03-34a S.U.S.

"S.U.S." means Saybolt Universal Seconds as determined by the Standard Method of Test for Saybolt Viscosity (ASTM D88-56) and may be determined by use of the S.U.S. conversion tables specified in ASTM Method D2161-66 following determination of viscosity in accordance with the procedures specified in the Standard Method of Test for Viscosity of Transparent and Opaque Liquids (ASTM D445-65).

4. § 146.03-36a is added to read as follows:

##### § 146.03-36a Viscous liquids.

(a) Flammable liquids are described as viscous flammable liquids based on the viscosity as determined by one of the following methods:

(1) The viscosity of the liquids must be determined in a Stormer viscosimeter

with an actuating weight of 400 grams and with the liquid maintained at a temperature of 28° C. The cylinder of the viscosimeter must be immersed in the liquid.

(2) For transparent liquids the sample may be tested in a vertical glass tube, one inch inside diameter by approximately thirteen inches long, having two marks ten inches apart engraved thereon, the lower mark being two inches above the bottom of the tube. The liquid to be tested shall be poured into the tube until its surface rises one-half inch above the upper mark and must be maintained at a temperature of 28° C. during the test. A polished steel ball one-fourth inch in diameter shall be supported one-half inch above the surface of the liquid at the center of the tube and dropped therein.

(3) When the speed of the cylinder in the test under paragraph (a) (1) of this

section does not exceed ten revolutions per thirteen seconds, or the time required in the test under paragraph (a) (2) of this section for the steel ball to fall the vertical distance between the two lines upon the glass tube is not less than four seconds, the material is described as "Viscous."

§ 146.04-5 [Amended]

5. In § 146.04-5, the List of explosives and other dangerous articles and combustible liquids is amended by placing an asterisk (\*) preceding the following articles: Butyl ether, Chlorobenzol, Dichloropentane, Dinitrotoluene, liquid, Ethyl benzene, Ethyl butyrate, Ethylene glycol diethyl ether, Formaldehyde, Hexaldehyde, Mesityl oxide, Paraldehyde, Stoddard solvent, Styrene, and Turpentine; the following articles are added to the List in their proper alphabetical sequence:

Article	Classed as—	Label required †
*Butyl ether (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Chlorobenzol (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Dichloropentane (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Dinitrotoluene, liquid (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Ethyl benzene (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Ethyl butyrate (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Ethylene glycol diethyl ether (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Formaldehyde (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Hexaldehyde (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Mesityl oxide (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Paraldehyde (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Stoddard solvent (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Styrene (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.
*Turpentine (see: Flammable liquid, n.o.s.)	Flam. L.	Flam. L.

† Unless otherwise exempt by the provisions of the detailed regulations.

6. § 146.21-1 paragraph (a) is revised to read as follows:

§ 146.21-1 Definition of flammable liquids.

(a) A flammable liquid is defined as any liquid having a flash point below 100° F. (37.8° C.), that does not meet one of the definitions specified in § 146.24-1.

(1) For the purposes of the regulations in this subchapter, any mixture having one component or more with a flash point 100° F. (37.8° C.) or higher that makes up at least 99 percent of the total volume of the mixture, is not considered to be a flammable liquid.

(2) For the purposes of this subchapter, a distilled spirit of 140 proof or lower is considered to have a flash point no lower than 73° F.

NOTE: A flammable liquid with a flash point of 73° F. or higher in packaging having a capacity of 110 gallons or less, packaged prior to January 1, 1976, may be shipped and transported without being

subject to any of the requirements of this subchapter applicable to flammable liquids until January 1, 1977.

7. § 146.21-60 is revised to read as follows:

§ 146.21-60 Potable spirits.

Alcoholic beverages (wine and distilled spirits as defined in 27 CFR 4.10 and 5.11) in containers having a rated capacity of one gallon or less are not subject to the requirements of this subchapter.

8. § 146.21-65 paragraphs (a) and (b) are revised to read as follows:

§ 146.21-65 Limited quantity shipments.

(a) Flammable liquids, except those enumerated in paragraph (c) of this section, are exempt from specification packaging, marking other than name of contents, and labeling requirements, unless otherwise provided, when packed and offered for shipment in accordance with paragraphs (a) (1), (2), (3), and (4) of this section.

(1) In metal containers not over one capacity each, packed in strong containers.

In containers having a capacity not over one pint or sixteen ounces by weight each, packed in strong outside containers.

(3) In inside containers having a rated capacity of one gallon or less when packed in strong outside containers. The provisions of this partial exemption apply only if the flash point of the material is 73°F. or higher and the flash point or an indication that the flash point is 73°F. or higher is marked on the outside of the package.

(4) Such limited quantity shipments may be accepted on board vessels, subject to the regulations in this Part, provided the bill of lading or other shipping paper correctly describes the article and the required marking on the outside container is in accordance with the true name in the commodity list. Stowage shall be "On deck under cover" or "Tween decks" in a compartment not subject to artificial heat.

(b) A flammable liquid having a flash point of 73°F. or higher is not subject to the specification packaging requirements of this subchapter when in a packaging having a capacity of 110 gallons or less. The provisions of this paragraph apply only if the flash point of the material or an indication that the flash point is 73°F. or higher is marked on the outside package.

§ 146.21-70, 146.21-75, 146.21-77, and 146.21-79 [Removed]

9. In § 146.21, the following subsections are revoked: 146.21-70, 146.21-75, 146.21-77, and 146.21-79.

§ 146.21-100 [Amended]

10. § 146.21-100 Table D—Classification: Flammable liquids is revised as follows:

a. By striking the words "at or below 80°F." in column one in the parenthetical expression "(When possessing a flash point at or below 80°F.)" wherever they appear and inserting in place thereof the words "less than 100°F."

b. By revising the heading of column two to read "Characteristic properties", cautions, markings required" and by

adding the following footnote to each corresponding code page:

"The flash points provided are approximations and are given "F. T.O.C."

c. By revising paragraph (a) in columns 5 and 6 and paragraphs (b) and (f) in columns 4 and 7 for the article Flammable liquids, n.o.s., by striking the words "20°F. to 80°F." and inserting in place thereof "20°F. to less than 100°F."

11. § 146.26-1 is revised to read as follows:

§ 146.26-1 Definition of combustible liquids.

(a) A combustible liquid is defined as any liquid having a flash point at or above 100°F. (37.8°C), and below 200°F. (93.3°C), which does not meet the definition of any other classification specified in this subchapter.

(b) For the purposes of the regulations in this subchapter any mixture having one component or more with a flash point at 200° F. (93.3° C.) or higher, that makes up at least 99 percent of the total volume of the mixture, is not considered to be a combustible liquid.

(c) For the purposes of this subchapter, an aqueous solution containing 24 percent or less alcohol by volume is considered to have a flash point no less than 100° F. (37.8° C.) if the remainder of the solution does not meet the definition of a hazardous material as defined in this subchapter.

(d) 200° F. (93.3° C.) is a limitation of the application of the regulations in this subchapter and should not be construed as indicating that liquids with higher flash points will not burn. Markings such as "NONFLAMMABLE" or "NONCOMBUSTIBLE" should not be used for materials that have a flash point of 200° F. (93.3° C.) or higher.

§ 146.20-30 [Removed]

12. § 146.26-30 is revoked.

13. § 146.26-33 is added to read as follows:

§ 146.26-33 Exempt shipments.

The requirements of this subchapter do not apply to combustible liquids in packagings having capacities of 110 gallons or less.

§ 146.26-100 [Amended]

14. § 146.26-100 Table J—Classifica-

tion: Combustible liquids is revised as follows:

A. By striking in column 1 the parenthetical expression "(When possessing a flashpoint at or below 150° F. and above 80° F.)" wherever they appear and inserting in place thereof "When possessing a flash point below 200° F. and at or above 100° F.)"

B. By revising the heading of column two to read "Characteristic Properties, cautions, markings required" and by adding the following footnote to each corresponding code page:

"The flash points provided are approximations and are given in "F. T.O.C."

C. By revising the entries in column 5 (Passenger vessel) for each article to read as follows:

Stowage:

"On deck in open."

"Portable tanks in compliance with DOT regulations."

"Marine Portable tanks."

D. By revising the entries in column 6 (Ferry vessel, passenger or vehicle) for each article to read as follows:

Ferry stowage (AA) \* \* \*

"Portable tanks in compliance with DOT regulations."

"Marine Portable tanks."

"Tank trucks in compliance with DOT regulations."

E. By revising the entries in column 7 (R.R. car ferry, passenger or vehicle) for each article to read as follows:

Ferry stowage (BB).

"Portable tanks in compliance with DOT regulations."

"Marine Portable tanks."

"Tank trucks in compliance with DOT regulations."

"Tank cars in compliance with DOT regulations."

(46 U.S.C. 170(7), 391a, 49 CFR 1.53 (f)).

Effective date: March 31, 1976. However, immediate compliance with the regulations as amended herein is authorized immediately.

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Bureau.

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