Second Revision No. 1-NFPA 385-2021 [Global Comment]

[See attached file 385_SR-1 for global changes regarding nomenclature on flammable and combustible liquids. There is also an attachment explaining the changes for staff use.]

Supplemental Information

File Name	Description	Approved
NFPA_30_FR-401_Final_Revision._Rev.docx	Details the change in NFPA 30 that are applied to NFPA 385 in the Second Revision. This document is for staff use only.	
385_SR-1_Global.docx	For staff use.	
385_SR-1_Global_for_ballot.docx	For ballot	

Submitter Information Verification

Committee:

Submittal Date: Fri Apr 09 12:40:59 EDT 2021

Committee Statement

Committee Statement: The changes are made to correspond to the NFPA 30 nomenclature changes that are being implemented in NFPA codes and standards. The change from using the term "flammable and combustible liquid" to "ignitible (flammable and combustible) liquid," provides clarity for the fire and explosion hazards created by liquids that burn and eliminates the confusion created by different definitions used by transportation codes.

Response Message: SR-1-NFPA 385-2021

Chapter 1 Administration

1.1 Scope.

1.1.1*

This standard shall apply to tank vehicles used for the transportation of asphalt and for the transportation of normally stable ignitible (flammable and combustible) liquids with flash points below 200°F (93°C).

A.1.1.1

Normally stable materials are those having the relative capacity to resist changes in their chemical composition that would produce violent reactions or detonations despite exposure to air, water, or heat, including the normal range of conditions encountered in handling, storage, or transportation. Unstable (reactive) ignitible (flammable and combustible) liquids are liquids that, in the pure state or as commercially produced or transported, will vigorously polymerize, decompose, condense, or become self-reactive under conditions of shock, pressure, or temperature.

1.1.3

The provisions of this standard shall not preclude the use of additional safeguards for tank vehicles used for the transportation of ignitible (flammable and combustible) liquids having characteristics that introduce additional factors such as high rates of expansion, instability, corrosiveness, and toxicity.

1.1.6

A tank vehicle transporting an ignitible (flammable or combustible) liquid in interstate service shall be considered to be in compliance with this standard while it is in interstate service if it meets the requirements of the U.S. Department of Transportation in 49 CFR 171–179, "Hazardous Materials Regulations."

1.2 Purpose.

The purpose of this standard shall be to provide for safe transportation of ignitible (flammable and combustible) liquids in tank vehicles.

Chapter 3 Definitions

3.3.3 Cargo Tank.
For the purposes of this standard, any tank having a liquid capacity in excess of 110 gal (415 L) used for carrying ignitible (flammable and combustible) liquids or asphalt and mounted permanently or otherwise upon a tank vehicle. The term *cargo tank* does not apply to any container used solely for the purpose of supplying fuel for the propulsion of the tank vehicle upon which it is mounted.

A.3.3.7 Flash Point.

…..
Certain solutions of liquids in water exhibit a flash point using the standard closed-cup test procedures but will not burn and might even extinguish a fire. To assist in identifying such solutions, the following standard is helpful: ASTM D4206, *Standard Test Method for Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus Tester (Open Cup)*. Liquid mixtures that do not sustain combustion for a specified time at a specified temperature are considered to be noncombustible. This test provides additional data for determining proper storage and handling of such mixtures. In a confined space, such mixtures might still create an ignitible vapor–air mixture, depending on the amount of Class I liquid [flash point < 100°F (37.8°C)] flammable liquid in the mixture and the quantity of the spill.

3.3.9.3* Ignitible Liquid.
Any liquid or liquid mixture that has a measurable closed-cup flash point. [**30**, 2021]

A.3.3.9.3 Ignitible Liquid.
Unless otherwise specified, the term liquid means an ignitible liquid.

The term *ignitible liquid* refers to any liquid that has a measurable closed-cup flash point. Class I liquids [FP < 100°F (37.8°C)], Class II and Class III liquids [FP ≥ 100°F (37.8°C)], and inflammable liquids are all ignitible liquids. [**30**, 2021]

3.3.10 Tank.

3.3.10.1 Full-Trailer Tank.
Any vehicle with or without auxiliary motive power, equipped with a cargo tank mounted thereon or built as an integral part thereof, used for the transportation of ignitible (flammable and combustible) liquids or asphalt, and so constructed that practically all of its weight and load rests on its own wheels.

3.3.10.2 Semi-Trailer Tank.
Any vehicle, with or without auxiliary motive power, equipped with a cargo tank mounted thereon or built as an integral part thereof, used for the transportation of ignitible (flammable and combustible) liquid or asphalt, and so constructed that, when drawn by a tractor by means of a fifth wheel connection, some part of its load and weight rests upon the towing vehicle.

3.3.11 Tank Truck.
Any single self-propelled motor vehicle equipped with a cargo tank mounted thereon and used for the transportation of ignitible (flammable and combustible) liquids or asphalt.

Chapter 4 Classification of Ignitible (Flammable and Combustible) Liquids

4.1 Scope.

4.1.1
This chapter shall establish a uniform system of defining and classifying ignitible (flammable and combustible) liquids for the purpose of proper application of this standard.

Chapter 5 Tank Vehicle Design

5.1.6*
Cargo tanks used for transporting ignitible (flammable or combustible) liquids at temperatures at or above their boiling points shall be constructed in accordance with Section 5.2.

A.5.1.6
Possible temperature rise during transfer as well as the loading temperature and altitude should be considered when determining if the ignitible (flammable or combustible) liquid will be transported at or above its boiling point. Where an accurate boiling point is unavailable for the material in question or for mixtures that do not have a constant boiling point, the 20 percent point of a distillation performed in accordance with ASTM D86, *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure*, can be used as the boiling point of the liquid.

5.1.7
Cargo tanks used for transporting ignitible (flammable or combustible) liquids at temperatures below their boiling points shall be constructed in accordance with the provisions of Section 5.3.

5.1.8*
The material used in the construction of the cargo tanks shall be compatible with the chemical characteristics of the ignitible (flammable or combustible) liquid to be transported.

A.5.1.8
In case of doubt, the supplier or producer of the ignitible (flammable or combustible) liquid or another competent authority should be consulted as to the suitability of the material of construction to be used.

5.2 Cargo Tanks, Piping, and Connections Designed for Transporting Ignitible (Flammable or Combustible) Liquids at Temperatures at or Above Their Boiling Points.
Cargo tanks, piping, and connections designed for transporting ignitible (flammable or combustible) liquids at or above their boiling points shall be constructed in accordance with the U.S. Department of Transportation's regulations in 49CFR 178, "Specifications for Packagings," and in accordance with Chapter 9 of NFPA 58.

5.3 Cargo Tanks, Piping, and Connections Designed for Transfer of Ignitible (Flammable or Combustible) Liquids at Temperatures Below Their Boiling Points.

5.4 Emergency-Discharge Control.

5.4.1 Liquids Having Viscosities Less Than 45 Standard Units Saybolt (SUS).

5.4.1.1*
Each outlet of a cargo tank or compartment used for transportation of Class I liquid [flash point < 100°F (37.8°C)] and trucks constructed hereafter for transportation of Class II and Class IIIA liquids [100°F (37.8°C) ≤ flash point < 200°F (93°C)], having a viscosity less than 45 SUS at 100°F (37.8°C), shall be equipped with a self-closing shutoff valve designed, installed, and operated so as to ensure against the accidental escape of contents.

5.6 Separation to Prevent Intermixing.
Tank vehicles designed to transport Class I liquid [flash point < 100°F (37.8°C)] in one or more compartments and Class II or Class III [flash point ≥ 100°F (37.8°C)] liquid in other compartment or compartments or to transport chemically noncompatible liquids shall be provided with double bulkheads and shall be equipped with separate piping, pumps, meters, and hoses for such classes of product.

Chapter 7 Marking on Tank Vehicles

7.1 General.

7.1.1
Every tank vehicle used for the transportation of any ignitible (flammable or combustible) liquids, regardless of the quantity being transported or whether loaded or empty, shall be conspicuously and legibly marked in accordance with the requirements of the U.S. Department of Transportation regulations in 49 CFR 171–179, "Hazardous Materials Regulations."

Chapter 8 Auxiliary Equipment

8.1 Auxiliary Internal Combustion Engines.

8.1.1
Internal combustion engines, other than those providing propulsive power, installed or carried on a tank vehicle transporting Class I liquids [flash point < 100°F (37.8°C)] for the purpose of providing power for the operation of pumps or other devices, shall meet the requirements of 8.1.2 through 8.1.9.

8.2 Auxiliary Electric Generators and Motors.

8.2.1
Electrical equipment installed or carried on a tank vehicle transporting Class I liquids [flash point < 100°F (37.8°C)] for the operation of pumps or other devices used for the handling of product, and operating product handling accessories shall meet the requirements of 8.2.2 through 8.2.6.

Chapter 9 Operation of Tank Vehicles

9.1 General Operating Conditions.

9.1.6
Ignitible~~Flammable~~ (flammable and combustible) liquids that are loaded at or above their boiling points or that might reach their boiling point temperatures during transit shall be loaded only into cargo tanks constructed in accordance with Section 5.2.

9.1.7*
Ignitible~~Flammable~~ (flammable and combustible) liquids shall be loaded only into cargo tanks whose material of construction is compatible with the chemical characteristics of the liquid to be transported. The ignitible (flammable or combustible) liquid being loaded shall also be chemically compatible with the liquid hauled on the previous load unless the cargo tank has been cleaned.

A.9.1.7
In case of doubt, the supplier or producer of the ignitible (flammable or combustible) liquid or other competent authority should be consulted.

9.1.8
Class II or Class III liquids [flash point ≥ 100°F (37.8°C)] shall not be loaded into a compartment adjacent to Class I liquids [flash point < 100°F (37.8°C)] unless double bulkheads are provided.

9.1.10*
To prevent a hazard from a change in the flash points of liquids, no cargo tank, or any compartment thereof, that has been utilized for Class I liquid [flash point < 100°F (37.8°C)] shall be loaded with Class II or Class III liquid [flash point ≥ 100°F (37.8°C)] until such tank or compartment and all piping, pumps, meters, and hose connected thereto have been completely drained.

A.9.1.10
To reduce the danger of static ignition when changing from Class I [flash point < 100°F (37.8°C)] to Class II or Class III [flash point ≥ 100°F (37.8°C)] (switch loading), other precautions might be necessary. *(See Annex B for further information.)*

9.1.10.1
A tank, compartment, piping, pump, meter, or hose that does not drain completely shall be flushed at the loading point with a quantity of Class II or Class III liquid [flash point ≥ 100°F (37.8°C)] equal to twice the capacity of piping, pump, meter, and hose, to clear any residue of Class I liquid from the system.

9.2.3
During transfer of Class I liquids [flash point < 100°F (37.8°C)], motors of tank vehicles or motors of auxiliary or portable pumps shall be shut down during the making and breaking of hose connections.

9.2.3.1
Where loading or unloading is done without requiring the use of the motor of the tank vehicle, the motor shall be shut down throughout the transfer operations of Class I liquids [flash point < 100°F (37.8°C)].

9.2.4
Where portable pumps are used for transferring Class I liquids [flash point < 100°F (37.8°C)], the portable pumps shall comply with the applicable provisions of Section 8.1 or Section 8.2.

9.2.5
No cargo tank or compartment thereof used for the transportation of any ignitible (flammable or combustible) liquid or asphalt shall be loaded liquid full. Sufficient space (outage) shall be provided in every case to prevent leakage from such tank or compartment by expansion of the contents due to rise in temperature in transit and in no case less than 1 percent.

9.2.6
Delivery of Class I liquids [flash point < 100°F (37.8°C)] to underground tanks of more than 1000 gal (3800 L) capacity shall be made by means of tight connections between the hose and the fill pipe.

9.2.12.2
Bonding shall not be required for tank vehicles used exclusively for transporting Class II or Class III liquids [flash point ≥ 100°F (37.8°C)] when loaded at locations where no Class I liquids [flash point < 100°F (37.8°C)] are handled.

9.2.13
No external bond-wire connection or bond-wire integral with a hose shall be required for the unloading of ignitible (flammable and combustible) liquids into underground tanks nor when a tank vehicle is loaded or unloaded through tight connections such as to an aboveground tank or through bottom connections.

9.2.15
No ignitible (flammable or combustible) liquid shall be transferred to or from any tank vehicle until the parking brake and wheel chocks have been set to prevent motion of the vehicle.

Annex B Precautions Against Ignition by Static Electricity

B.4 Examples.
The following are examples of proper bonding and grounding technique:

(2) No such precaution (bond wire) is required under circumstances where it is ensured that there can be no ignitible mixture present. An example of such a situation is where tank vehicles are used exclusively for transporting Class II and Class III liquids [flash point ≥ 100°F (37.8°C)] *(see 9.2.12.2)*. Because Class II and Class III liquids [flash point ≥ 100°F

(37.8°C)] do not produce ignitible mixtures at ordinary temperatures, there would be nothing to ignite in the tanks transporting such liquids. The word *exclusively* is important. There are many tank vehicles operated by fuel oil dealers that, by the nature of the operation, fall into this category. The exception "where no Class I liquids are handled" is included both to guard against inadvertent filling with a Class I liquid [flash point < 100°F (37.8°C)] and to recognize the desirability of having uniform bonding practices at a terminal handling Class I [flash point < 100°F (37.8°C)] as well as Class II or Class III liquids [flash point ≥ 100°F (37.8°C)].

B.5 Switch Loading.

The term *switch loading (see A.9.1.10)* has come into use to describe a situation that warrants special consideration.

When a tank is emptied of a cargo of Class I liquid [flash point < 100°F (37.8°C)], there is left a mixture of vapor and air, which can be, and often is, within the flammable range. When such a tank is refilled with a Class I liquid, any charge that reaches the tank shell is bled off by the required bond wire *(see 9.2.12)*. Also, there is no flammable mixture at the surface of the rising oil level because the Class I liquid produces at its surface a mixture too rich to be ignitible. This is the situation that commonly exists in tank vehicles in gasoline service. If, as occasionally happens, a static charge does accumulate on the surface sufficient to produce a spark, it occurs in a too rich, nonignitible atmosphere and thus causes no harm. A very different situation arises if the liquid is *switch loaded*, that is, a Class II or Class III liquid [flash point ≥ 100°F (37.8°C)] is loaded into a tank vehicle that previously contained a Class I liquid [flash point < 100°F (37.8°C)]. Class II or Class III liquids [flash point ≥ 100°F (37.8°C)] are not necessarily more potent charge generators than the Class I liquid previously loaded, but the atmosphere in contact with the rising oil surface is not enriched to bring it out of the flammable range. If circumstances are such that a spark occurs either across the oil surface or from the oil surface to some other object, it is in a mixture that can be within the flammable range and an explosion can result.

Second Revision No. 2-NFPA 385-2021 [Section No. 2.2]

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2018 edition.

~~NFPA 30, *Flammable and Combustible Liquids Code,* 2021 edition.~~

NFPA 58, *Liquefied Petroleum Gas Code,* 2020 edition.

NFPA 70®, *National Electrical Code®,* 2020 edition.

NFPA 407, *Standard for Aircraft Fuel Servicing,* 2022 edition.

Submitter Information Verification

Committee: TRA-AAA
Submittal Date: Mon Apr 26 14:57:10 EDT 2021

Committee Statement

Committee Statement: NFPA 30 is no longer referenced in the standard. It is only extracted.
Response Message: SR-2-NFPA 385-2021