

**NFPA 400-Proposed 2016 Edition**

*Hazardous Materials Code*

**TIA Log No.:** 1174

**Reference:** Table 5.2.1.1.3 and 5.2.1.2 through 5.2.1.10.1, and Annex J

**Comment Closing Date:** February 20, 2015

**Submitter:** Robert James, UL LLC

Note: To read the Substantiation now, [please click here](#).

1. Revise Tables 5.2.1.1.3 and 5.2.1.2 through 5.2.1.10.1 to read as follows:

**Table 5.2.1.1.3 Maximum Allowable Quantity (MAQ) of Hazardous Materials per Control Area**

Material	Class	High Hazard Protection Level	Storage			Use — Closed Systems			Use — Open Systems	
			Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)
<b>Physical Hazard Materials</b>										
Ammonium nitrate	See Chapter 11	See Chapter 11	See Chapter 11	See Chapter 11	See Chapter 11	See Chapter 11	See Chapter 11	See Chapter 11	See Chapter 11	See Chapter 11
	II	3	N/A	120 <sup>c,d</sup>	N/A	N/A	See note	N/A	N/A	See note
Combustible liquid	III-A	3	N/A	330 <sup>c,d</sup>	N/A	N/A	See note	N/A	N/A	See note
	III-B	N/A	N/A	13,200 <sup>c,m</sup>	N/A	N/A	See note	N/A	N/A	See note
Combustible metals	See note	See note	See note	See note	See note	See note	See note	See note	See note	See note
Cryogenic fluid	Flammable	2	N/A	45 <sup>j,k</sup>	N/A	N/A	45 <sup>j,k</sup>	N/A	N/A	45 <sup>j,k</sup>
	[55: Table 6.3.1.1] Oxidizing	3	N/A	45 <sup>c,d</sup>	N/A	N/A	45 <sup>c,d</sup>	N/A	N/A	45 <sup>c,d</sup>
	Inert	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A	NL
Explosives	See note	See note	See note	See note	See note	See note	See note	See note	See note	See note
Flammable gas <sup>l</sup>	Gaseous	2	N/A	N/A	1000 <sup>c,d</sup>	N/A	N/A	1000 <sup>c,d</sup>	N/A	N/A
	[55: Table 6.3.1.1] Liquefied	2	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A

Material	Class	High Hazard Protection Level	Storage			Use — Closed Systems			Use — Open Systems	
			Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)
	Liquefied Petroleum (LP)	2	NA	NA	(300) <sup>o,p,q</sup>	NA	NA	(300) <sup>o,p,q</sup>	NA	NA
Flammable liquid	I-A	3	N/A	30 <sup>c,d</sup>	N/A	N/A	See note	N/A	N/A	See note
	IB and IC	3	N/A	120 <sup>c,d</sup>	N/A	N/A	See note	N/A	N/A	See note
	Combination (IA, IB, IC)	3	N/A	120 <sup>c,d,n</sup>	N/A	N/A	See note	N/A	N/A	See note
Flammable solid	N/A	3	125 <sup>c,d</sup>	N/A	N/A	125 <sup>c,d</sup>	N/A	N/A	25 <sup>c,d</sup>	N/A
Inert Gas	Gaseous	N/A	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A
	Liquefied	N/A	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A
Organic peroxide	UD	1	1 <sup>c,i</sup>	(1) <sup>c,i</sup>	N/A	1/4 <sup>i</sup>	(1/4) <sup>i</sup>	N/A	1/4 <sup>i</sup>	(1/4) <sup>i</sup>
	I	1	5 <sup>c,d</sup>	(5) <sup>c,d</sup>	N/A	1 <sup>c,d</sup>	(1) <sup>c,d</sup>	N/A	1 <sup>c,d</sup>	(1) <sup>c,d</sup>
	II	2	50 <sup>c,d</sup>	(50) <sup>c,d</sup>	N/A	50 <sup>d</sup>	(50) <sup>d</sup>	N/A	10 <sup>c,d</sup>	(10) <sup>c,d</sup>
	III	3	125 <sup>c,d</sup>	(125) <sup>c,d</sup>	N/A	125 <sup>d</sup>	(125) <sup>d</sup>	N/A	25 <sup>c,d</sup>	(25) <sup>c,d</sup>
	IV	N/A	NL	NL	N/A	NL	NL	N/A	NL	NL
	V	N/A	NL	NL	N/A	NL	NL	N/A	NL	NL
Oxidizer	4	1	1 <sup>c,i</sup>	(1) <sup>c,i</sup>	N/A	1/4 <sup>i</sup>	(1/4) <sup>i</sup>	N/A	1/4 <sup>i</sup>	(1/4) <sup>i</sup>
	3 <sup>f</sup>	2 or 3	10 <sup>c,d</sup>	(10) <sup>c,d</sup>	N/A	2 <sup>d</sup>	(2) <sup>d</sup>	N/A	2 <sup>d</sup>	(2) <sup>d</sup>
	2	3	250 <sup>c,d</sup>	(250) <sup>c,d</sup>	N/A	250 <sup>d</sup>	(250) <sup>d</sup>	N/A	50 <sup>d</sup>	(50) <sup>d</sup>
	1	N/A	4000 <sup>c,e</sup>	(4000) <sup>c,e</sup>	N/A	4000 <sup>e</sup>	(4000) <sup>e</sup>	N/A	1000 <sup>e</sup>	(1000) <sup>e</sup>
Oxidizing gas [55: Table 6.3.1.1]	Gaseous	3	N/A	N/A	1500 <sup>c,d</sup>	N/A	N/A	1500 <sup>c,d</sup>	N/A	N/A
	Liquefied	3	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A
Pyrophoric	N/A	2	4 <sup>c,i</sup>	(4) <sup>c,i</sup>	N/A	1 <sup>i</sup>	(1) <sup>j</sup>	N/A	NP	NP

Material	Class	High Hazard Protection Level	Storage			Use — Closed Systems			Use — Open Systems	
			Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)
Pyrophoric Gas [55: Table 6.3.1.1]	Gaseous	2	N/A	N/A	50 <sup>c,i</sup>	N/A	N/A	50 <sup>c,i</sup>	N/A	N/A
	Liquefied	2	N/A	N/A	(4) <sup>c,i</sup>	N/A	N/A	(4) <sup>c,i</sup>	N/A	N/A
Unstable Reactive	4	1	1 <sup>c,i</sup>	(1) <sup>c,i</sup>	N/A	1/4 <sup>i</sup>	(1/4) <sup>j</sup>	N/A	1/4 <sup>i</sup>	(1/4) <sup>j</sup>
	3	1 or 2	5 <sup>c,d</sup>	(5) <sup>c,d</sup>	N/A	1 <sup>d</sup>	(1) <sup>d</sup>	N/A	1 <sup>d</sup>	(1) <sup>d</sup>
	2	2	50 <sup>c,d</sup>	(50) <sup>c,d</sup>	N/A	50 <sup>d</sup>	(50) <sup>d</sup>	N/A	10 <sup>d</sup>	(10) <sup>d</sup>
	1	NA	NL	NL	N/A	NL	NL	NL/N/A	NL	NL
Unstable (reactive) Gas [55: Table 6.3.1.1]	Gaseous									
	34 or 43 detonable	1	N/A	N/A	10 <sup>c,i</sup>	N/A	N/A	10 <sup>c,i</sup>	N/A	N/A
	3 non-detonable	2	N/A	N/A	50 <sup>c,d</sup>	N/A	N/A	50 <sup>c,d</sup>	N/A	N/A
	2	3	N/A	N/A	750 <sup>c,d</sup>	N/A	N/A	750 <sup>c,d</sup>	N/A	N/A
	1	N/A	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A
Unstable (reactive) Gas [55: Table 6.3.1.1]	Liquefied									
	4 or 3 detonable	1	N/A	N/A	(1) <sup>c,i</sup>	N/A	N/A	(1) <sup>c,i</sup>	N/A	N/A
	3 non-detonable	2	N/A	N/A	(2) <sup>c,d</sup>	N/A	N/A	(2) <sup>c,d</sup>	N/A	N/A
	2	3	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A
	1	N/A	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A
Water-reactive	3	2	5 <sup>c,d</sup>	(5) <sup>c,d</sup>	N/A	5 <sup>d</sup>	(5) <sup>d</sup>	N/A	1 <sup>d</sup>	(1) <sup>d</sup>
	2	3	50 <sup>c,d</sup>	(50) <sup>c,d</sup>	N/A	50 <sup>d</sup>	(50) <sup>d</sup>	N/A	10 <sup>d</sup>	(10) <sup>d</sup>
	1	N/A	NL	NL	N/A	NL	NL	N/A	NL	NL

Material	Class	High Hazard Protection Level	Storage			Use — Closed Systems			Use — Open Systems	
			Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)	Gas <sup>b</sup> scf (lb)	Solid Pounds	Liquid Gallons (lb)
<b>Health Hazard Materials</b>										
Corrosive	N/A	4	5000 <sup>c,d</sup>	500 <sup>c,d</sup>	N/A	5000 <sup>d</sup>	500 <sup>d</sup>	N/A	1000 <sup>d</sup>	100 <sup>d</sup>
Corrosive Gas [55: Table 6.3.1.1]	Gaseous	4	N/A	N/A	810 <sup>c,d,g</sup>	N/A	N/A	810 <sup>c,d,g</sup>	N/A	N/A
	Liquefied	4	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A
Highly toxic	N/A	4	10 <sup>c,d</sup>	(10) <sup>c,d</sup>	N/A	(10) <sup>d</sup>	(10) <sup>d</sup>	N/A	3 <sup>d</sup>	(3) <sup>d</sup>
Highly toxic gas [55: Table 6.3.1.1]	Gaseous	4	N/A	N/A	20 <sup>d,g</sup>	N/A	N/A	20 <sup>d,g</sup>	N/A	N/A
	Liquefied	4	N/A	N/A	(4) <sup>d,g</sup>	N/A	N/A	(4) <sup>d,g</sup>	N/A	N/A
Toxic	N/A	4	500 <sup>c,d</sup>	(500) <sup>c,d</sup>	N/A	500 <sup>d</sup>	(500) <sup>d</sup>	N/A	125 <sup>d</sup>	(125) <sup>d</sup>
Toxic gas	Gaseous	4	N/A	N/A	810 <sup>c,d</sup>	N/A	N/A	810 <sup>c,d</sup>	N/A	N/A
	Liquefied	4	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A	(150) <sup>c,d</sup>	N/A	N/A

N/A: Not applicable. NL: Not limited. NP: Not permitted.

UD: Unclassified detonable For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 scf = 0.0283 Nm<sup>3</sup>.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Table values in parentheses correspond to the unit name in parentheses at the top of the column. The aggregate quantity in use and storage is not permitted to exceed the quantity listed for storage.

<sup>b</sup>Measured at NTP or 70°F (21°C) and absolute pressure of 14.7 psi (101.3 kPa).

<sup>c</sup>Quantities are permitted to be increased 100 percent where stored or used in approved cabinets, gas cabinets, exhausted enclosures, gas rooms explosives magazines, or safety cans, as appropriate for the material stored, in accordance with this code. Where footnote d also applies, the increase for both footnote c and footnote d is permitted to be applied accumulatively.

<sup>d</sup>Maximum quantities are permitted to be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with NFPA 13. Where footnote c also applies, the increase for both footnote c and footnote d is permitted to be applied accumulatively.

<sup>e</sup>The permitted quantities are not limited in a building equipped throughout with an automatic sprinkler system in accordance with NFPA 13.

<sup>f</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>g</sup>Allowed only where stored or used in gas rooms or approved cabinets, exhausted gas cabinets or exhausted enclosures, as specified in this code. [5000: Table 34.1.3.1]

<sup>h</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>i</sup>Permitted only in buildings equipped throughout with an automatic sprinkler system in accordance with NFPA 13.

<sup>j</sup>None allowed in unsprinklered buildings unless stored or used in gas rooms or in approved gas cabinets or exhausted enclosures, as specified in this code.

<sup>k</sup>With pressure-relief devices for stationary or portable containers vented directly outdoors or to an exhaust hood. [55: Table 6.3.1.1]

<sup>l</sup>Flammable gases in the fuel tanks of mobile equipment or vehicles are permitted to exceed the MAQ where the equipment is stored and operated in accordance with the fire code.

<sup>m</sup>The permitted quantities are not limited in a building equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13 and designed in accordance with the protection criteria contained in Chapter 16 of NFPA 30.

<sup>n</sup>Containing not more than the maximum allowable quantity per control area of Class I-A, Class I-B, or Class I-C flammable liquids, individually.

<sup>o</sup>Additional storage locations are required to be separated by a minimum of 300 ft (92 m).

<sup>p</sup>In mercantile occupancies, storage of LP-gas is limited to a maximum of 200 lb (91 kg) in nominal 1 lb (0.45 kg) LP-gas containers.

<sup>q</sup>See NFPA 58, Liquefied Petroleum Gas Code, for liquefied petroleum gas (LP-gas) requirements. LP-gas is not within the scope of NFPA 400.

### 5.2.1.2 Assembly Occupancies.

The MAQ of hazardous materials per control area in assembly occupancies shall be as specified in [Table 5.2.1.2](#).

**Table 5.2.1.2 Maximum Allowable Quantities (MAQ) of Hazardous Materials per Control Area in Assembly Occupancies**

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,l</sup>	I and II	N/A	10	N/A
	III-A	N/A	60	N/A
	III-B	N/A	120	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Explosives <sup>d,e,f,g</sup>	See note	See note	See note	See note
Flammable gas <sup>c,h</sup>	Gaseous	N/A	N/A	NP
	Liquefied	N/A	N/A	(20)
	Liquefied Petroleum	N/A	N/A	(20)
Flammable solid	N/A	5	N/A	N/A
Oxidizers	4	NP	NP	N/A
	3	10 <sup>i</sup>	1 gal <sup>i</sup>	N/A
	2	250	25	N/A
	1	4,000	400	N/A
Oxidizing gas <sup>h</sup>	Gaseous	N/A	N/A	NP <sup>h</sup>
	Liquefied	N/A	N/A	NP <sup>h</sup>
Organic peroxides	I	NP	NP	N/A
	II	NP	NP	N/A
	III	25	(25)	N/A
	IV	NL	NL	N/A
	V	NL	NL	N/A
Pyrophoric materials	N/A	1	(1)	NP
Unstable Reactive	4	¼	(¼)	NP
	3	1	(1)	NP
	2	10	(10)	NP <sup>h</sup>
	1	NL	NL	NP
Water-reactive	3	1	(1)	N/A
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1,000	100	NP
Highly toxic	N/A	3	(3)	NP <sup>j</sup>
Toxic	N/A	125	(125)	NP <sup>j</sup>

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [measured at 70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.

<sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids is permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).

<sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.

<sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.

<sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.

<sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.

<sup>g</sup>The storage and use of small arms ammunition, and components thereof, are permitted where in accordance with NFPA 495.

<sup>h</sup>Containers, cylinders, or tanks not exceeding 250 scf<sup>3</sup> (7.1 m<sup>3</sup>) content measured at 70°F (21°C) and 14.7 psi (101 kPa) and used for maintenance purposes, patient care, or operation of equipment shall be permitted.

<sup>i</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>j</sup>Gas cylinders not exceeding 20 scf<sup>3</sup> (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods. [5000: Table 34.1.3.2(a)]

<sup>k</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>l</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

### 5.2.1.3 Educational Occupancies.

The MAQ of hazardous materials per control area in educational occupancies shall be as specified in Table 5.2.1.3.

#### Table 5.2.1.3 Maximum Allowable Quantities (MAQ) of Hazardous Materials per Control Area in Educational Occupancies

Material	Class	Solid Pounds	Liquid Gallons <sup>m</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,o</sup>	I and II	N/A	10	N/A
	III-A	N/A	60	N/A
	III-B	N/A	120 <sup>n</sup>	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A
Explosives <sup>d,e,f,g</sup>	See note	See note	See note	See note
Flammable gas <sup>c,h</sup>	Gaseous	N/A	N/A	NP
	Liquefied	N/A	N/A	(20)
	Liquefied Petroleum	N/A	N/A	(20) <sup>k</sup>
Flammable solid	N/A	5	N/A	N/A
Oxidizers	4	NP	NP	N/A
	3	10 <sup>i</sup>	1 <sup>i</sup>	N/A
	2	250	25	N/A
	1	4,000 <sup>j</sup>	400 <sup>j</sup>	N/A
Oxidizing gas <sup>h</sup>	Gaseous	N/A	N/A	NP
	Liquefied	N/A	N/A	NP <sup>h</sup>
Organic peroxides	I	NP	NP	N/A
	II	NP	NP	N/A
	III	25	(25)	N/A
	IV	NL	NL	N/A
	V	NL	NL	N/A
Pyrophoric materials	N/A	1	(1)	NP
Unstable Reactive	4	¼	(¼)	NP
	3	1	(1)	NP
	2	10	(10)	NP <sup>h</sup>
	1	NL	NL	NP
Water-reactive	3	1	(1)	N/A



Material	Class	Solid Pounds	Liquid Gallons <sup>m</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1,000	100	NP
Highly toxic	N/A	3	(3)	NP <sup>l</sup>
Toxic	N/A	125	(125)	NP <sup>l</sup>

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [measured at 70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.

<sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids is permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).

<sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.

<sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.

<sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.

<sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.

<sup>g</sup>The storage and use of small arms ammunition, and components thereof, are permitted where in accordance with NFPA 495

<sup>h</sup>Containers, cylinders, or tanks not exceeding 250 scf (7.1 m<sup>3</sup>) content measured at 70°F (21°C) and 14.7 psi (101 kPa) and used for maintenance purposes, patient care, or operation of equipment shall be permitted.

<sup>i</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>j</sup>The permitted quantities are not limited in a building protected throughout by automatic sprinkler systems in accordance with NFPA 13.

<sup>k</sup>Storage in laboratories only; additional 20 lb (9 kg) units are permitted where minimum 20 ft (6.1 m) separation is provided.

<sup>l</sup>Gas cylinders not exceeding 20 scf (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods.

<sup>m</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>n</sup>Storage shall be permitted to be increased 100% if the building is protected throughout with an automatic sprinkler system installed in accordance with NFPA 13.

<sup>o</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

#### 5.2.1.4 Day-Care Occupancies.

The MAQ of hazardous materials per control area in day-care occupancies shall be as specified in [Table 5.2.1.4](#).

**Table 5.2.1.4 Maximum Allowable Quantities (MAQ) of Hazardous Materials per Control Area in Day-Care Occupancies**

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,m</sup>	I and II	N/A	10	N/A
	III-A	N/A	60	N/A
	III-B	N/A	120 <sup>n</sup>	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A
Explosives <sup>d,e,f,g</sup>	See note	See note	See note	See note
Flammable gas <sup>c,g</sup>	Gaseous	N/A	N/A	N/A
	Liquefied	N/A	N/A	(20)
	Liquefied Petroleum	N/A	N/A	(20)
Flammable solid	N/A	5 lb	N/A	N/A
Oxidizers	4	NP	NP	N/A
	3	10 <sup>i</sup>	1 <sup>i</sup>	N/A
	2	250	25	N/A
	1	4,000 <sup>h</sup>	400 <sup>h</sup>	N/A
Oxidizing gas <sup>g</sup>	Gaseous	N/A	N/A	NP <sup>g</sup>
	Liquefied	N/A	N/A	NP <sup>g</sup>

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Organic peroxides	I	NP	NP	N/A
	II	NP	NP	N/A
	III	25	(25)	N/A
	IV	NL	NL	N/A
	V	NL	NL	N/A
Pyrophoric materials	N/A	1	(1)	NP
Unstable Reactive	4	¼ lb	(¼) lb	NP
	3	1	(1)	NP
	2	10	(10)	NP <sup>g</sup>
	1	NL	NL	NP
Water-reactive	3	1	(1)	N/A
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1,000	100	NP
Highly toxic	N/A	3	(3)	NP <sup>j</sup>
Toxic	N/A	125	(125)	NP <sup>j</sup>

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [measured at 70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.

<sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids is permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).

<sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.

<sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.

<sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.

<sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.

<sup>g</sup>Containers, cylinders, or tanks not exceeding 250 scf (7.1 m<sup>3</sup>) content measured at 70°F (21°C) and 14.7 psi (101 kPa) and used for maintenance purposes, patient care, or operation of equipment shall be permitted.

<sup>h</sup>The permitted quantities are not limited in a building protected throughout by automatic sprinkler systems in accordance with NFPA 13.

<sup>i</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>j</sup>Gas cylinders not exceeding 20 scf (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods.

<sup>k</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>l</sup>Storage shall be permitted to be increased 100% if the building is protected throughout with an automatic sprinkler system installed in accordance with NFPA 13.

<sup>m</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

### 5.2.1.5 Health Care Occupancies.

The MAQ of hazardous materials per control area in health care occupancies shall be as specified in Table 5.2.1.5.

**Table 5.2.1.5 Maximum Allowable Quantities (MAQ) of Hazardous Materials per Control Area in Health Care Occupancies**

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,m</sup>	I and II	N/A	10	N/A
	III-A	N/A	60	N/A
	III-B	N/A	120 <sup>n</sup>	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A
Explosives <sup>d,e,f</sup>	See note	See note	See note	See note
Flammable gas <sup>c,g</sup>	Gaseous	N/A	N/A	NP
	Liquefied	N/A	N/A	(20)
	Liquefied Petroleum	N/A	N/A	(20)

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Flammable solid	N/A	5	N/A	N/A
Oxidizers	4	NP	NP	N/A
	3	10 <sup>h</sup>	1 <sup>h</sup>	N/A
	2	250	25	N/A
	1	4,000 <sup>i</sup>	400 <sup>i</sup>	N/A
Oxidizing gas <sup>g</sup>	Gaseous	N/A	N/A	NP <sup>g</sup>
	Liquefied	N/A	N/A	NP <sup>g</sup>
Organic peroxides	I	NP	NP	N/A
	II	NP	NP	N/A
	III	1,500	(1,500)	N/A
	IV	100,000	(100,000)	N/A
	V	NL	NL	N/A
Pyrophoric materials	N/A	NP	NP	NP
Unstable Reactive	4	NP	NP	NP
	3	NP	NP	NP
	2	10	(10)	NP <sup>g</sup>
	1	NL	NL	NP
Water-reactive	3	1	(1)	N/A
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1,000	100	NP
Highly toxic	N/A	3	(3)	NP <sup>i</sup>
Toxic	N/A	125	(125)	NP <sup>i</sup>

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [measured at 70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.

<sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids is permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).

<sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.

<sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.

<sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.

<sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.

<sup>g</sup>Containers, cylinders, or tanks not exceeding 250 scf (7.1 m<sup>3</sup>) content measured at 70°F (21°C) and 14.7 psi (101 kPa) and used for maintenance purposes, patient care, or operation of equipment shall be permitted.

<sup>h</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>i</sup>The permitted quantities are not limited in a building protected throughout by automatic sprinkler systems in accordance with NFPA 13.

<sup>j</sup>Gas cylinders not exceeding 20 scf (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods.

<sup>k</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>l</sup>Storage shall be permitted to be increased 100% if the building is protected throughout with an automatic sprinkler system installed in accordance with NFPA 13.

<sup>m</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

### 5.2.1.6 Ambulatory Health Care Occupancies.

The MAQ of hazardous materials per control area in ambulatory health care occupancies shall be as specified in [Table 5.2.1.6](#).

**Table 5.2.1.6 Maximum Allowable Quantities (MAQ) of Hazardous Materials per Control Area in Ambulatory Health Care Occupancies**

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup>
				(at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,m</sup>	I and II	N/A	10	N/A
	I and II	N/A	60	N/A

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
	I and II	N/A	120 <sup>n</sup>	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A
Explosives <sup>d,e,f</sup>	See note	See note	See note	See note
Flammable gas <sup>c,g</sup>	Gaseous	N/A	N/A	NP
	Liquefied	N/A	N/A	(20)
	Liquefied Petroleum	N/A	N/A	(20)
Flammable solid	N/A	5	N/A	N/A
Oxidizers	4	NP	NP	NP
	3	10 <sup>h</sup>	1 <sup>h</sup>	NP
	2	250	25	NP
	1	4,000 <sup>i</sup>	400 <sup>i</sup>	NP
Oxidizing gas <sup>g</sup>	Gaseous	N/A	N/A	NP <sup>g</sup>
	Liquefied	N/A	N/A	NP <sup>g</sup>
Organic peroxides	I	NP	NP	N/A
	II	NP	NP	N/A
	III	25	(25)	N/A
	IV	NL	NL	N/A
	V	NL	NL	N/A
Pyrophoric materials	N/A	NP	NP	NP
Unstable Reactive	4	NP	NP	NP
	3	NP	NP	NP
	2	10	(10)	NP <sup>g</sup>
	1	NL	NL	NP
Water-reactive	3	1	(1)	N/A
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1,000	100	NP

<b>Material</b>	<b>Class</b>	<b>Solid Pounds</b>	<b>Liquid Gallons<sup>k</sup> (lb)</b>	<b>Gas<sup>a</sup> (at NTP) scf (lb)</b>
Highly toxic	N/A	3	(3)	NP <sup>j</sup>
Toxic	N/A	125	(125)	NP <sup>j</sup>

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.

<sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids is permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).

<sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.

<sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.

<sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.

<sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.

<sup>g</sup>Containers, cylinders, or tanks not exceeding 250 scf (7.1 m<sup>3</sup>) content measured at 70°F (21°C) and 14.7 psi (101 kPa) and used for maintenance purposes, patient care, or operation of equipment shall be permitted.

<sup>h</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>i</sup>The permitted quantities are not limited in a building protected throughout by automatic sprinkler systems in accordance with NFPA 13.

<sup>j</sup>Gas cylinders not exceeding 20 scf (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods.

<sup>k</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>l</sup>Storage shall be permitted to be increased 100% if the building is protected throughout with an automatic sprinkler system installed in accordance with NFPA 13.

<sup>m</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of



components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

### 5.2.1.7 Detention and Correctional Occupancies.

The MAQ of hazardous materials per control area in detention and correctional occupancies shall be as specified in Table 5.2.1.7.

**Table 5.2.1.7 Maximum Allowable Quantities (MAQ) of Hazardous Materials per Control Area in Detention and Correctional Occupancies**

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,l</sup>	I and II	N/A	10	N/A
	III-A	N/A	60	N/A
	III-B	N/A	120	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A
Explosives <sup>d,e,f,g</sup>	See note	See note	See note	See note
Flammable gas <sup>c,h</sup>	Gaseous	N/A	N/A	NP
	Liquefied	N/A	N/A	(20)
	Liquefied Petroleum	N/A	N/A	(20)
Flammable solid	N/A	5	N/A	N/A
Oxidizers	4	NP	NP	N/A
	3	10 <sup>i</sup>	1 <sup>i</sup>	N/A
	2	250	25	N/A
	1	4,000	400	N/A
Oxidizing gas <sup>h</sup>	Gaseous	N/A	N/A	NP
	Liquefied	N/A	N/A	N/A
Organic peroxides	I	NP	NP	N/A
	II	NP	NP	N/A
	III	25	(25)	N/A
	IV	NL	NL	N/A
	V	NL	NL	N/A
Pyrophoric materials	NA	1	(1)	NP
Unstable Reactives	4	1/4	(1/4)	NP

Material	Class	Solid Pounds	Liquid Gallons <sup>k</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
	3	1	(1)	NP
	2	10	(10)	NP <sup>h</sup>
	1	NL	NL	NP
Water-reactive	3	1	(1)	N/A
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1,000	100	NP
Highly toxic	N/A	3	(3)	NP <sup>i</sup>
Toxic	N/A	125	(125)	NP <sup>i</sup>

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [measured at 70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.

<sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids is permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).

<sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.

<sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.

<sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.

<sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.

<sup>g</sup>The storage and use of small arms ammunition, and components thereof, are permitted where in accordance with NFPA 495.

<sup>h</sup>Containers, cylinders, or tanks not exceeding 250 scf (7.1 m<sup>3</sup>) content measured at 70°F (21°C) and 14.7 psi (101 kPa) and used for maintenance purposes, patient care, or operation of equipment shall be permitted.

<sup>i</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>j</sup>Gas cylinders not exceeding 20 scf (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods.

<sup>k</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>l</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

### 5.2.1.8 Residential Occupancies.

The MAQ of hazardous materials per control area in residential occupancies, including lodging and rooming houses, hotels, dormitories, apartments, and residential board and care facilities, shall be as specified in [Table 5.2.1.8](#).

**Table 5.2.1.8 Maximum Allowable Quantities of Hazardous Materials per Control Area in Residential Occupancies Consisting of Lodging and Rooming Houses, Hotels, Dormitories, Apartments, and Residential Board and Care Facilities**

Material	Class	Solid Pounds	Liquid Gallons <sup>1</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,m</sup>	I and II	N/A	10	N/A
	III-A	N/A	60	N/A
	III-B	N/A	120	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A
Explosives <sup>d,e,f,g</sup>	See note	See note	See note	See note
Flammable gas <sup>c,h</sup>	Gaseous	N/A	N/A	NP
	Liquefied <sup>i</sup>	N/A	N/A	(20)
	Liquefied Petroleum	N/A	N/A	(20)
Flammable solid	N/A	5	N/A	N/A
Oxidizers	4	NP	NP	N/A
	3	10 <sup>i</sup>	1 <sup>i</sup>	N/A
	2	250	25	N/A
	1	4,000	400	N/A
Oxidizing gas <sup>h</sup>	Gaseous	N/A	N/A	NP <sup>l</sup>
	Liquefied	N/A	NL	N/A
Organic peroxides	I	NP	NP	N/A

Material	Class	Solid Pounds	Liquid Gallons <sup>1</sup> (lb)	Gas <sup>a</sup> (at NTP) scf (lb)
	II	NP	NP	N/A
	III	25	(25)	N/A
	IV	NL	NL	N/A
	V	NL	NL	N/A
Pyrophoric materials	N/A	1	(1)	NP
Unstable Reactives	4	¼	(¼)	NP
	3	1	(1)	NP
	2	10	(10)	NP <sup>h</sup>
	1	NL	NL	NP
Water-reactive	3	1	(1)	N/A
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1,000	100	NP
Highly toxic	N/A	3	(3)	NP <sup>k</sup>
Toxic	N/A	125	(125)	NP <sup>k</sup>

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [measured at 70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

<sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.

<sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids are permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).

<sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.

<sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.

<sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.

<sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.

<sup>g</sup>The storage and use of small arms ammunition, and components thereof, are permitted where in accordance with NFPA 495.

<sup>h</sup>Containers, cylinders, or tanks not exceeding 250 scf (7.1 m<sup>3</sup>) content measured at 70°F (21°C) and 14.7 psi (101 kPa) and used for maintenance purposes, patient care, or operation of equipment shall be permitted.

<sup>i</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.

<sup>j</sup>Storage containers are not permitted to exceed 0.325 ft<sup>3</sup> (0.0092 m<sup>3</sup>) capacity.

<sup>k</sup>Gas cylinders not exceeding 20 scf (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods.

<sup>l</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.

<sup>m</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

### 5.2.1.9 Mercantile Occupancies.

The MAQ of hazardous materials per control area in mercantile occupancies shall be as specified in Table 5.2.1.1.3, with increased quantities permitted where storage or display areas comply with 5.2.1.13.

### 5.2.1.10 Business Occupancies.

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#### 5.2.1.10.1

The MAQ of hazardous materials per control area in business occupancies, other than laboratories, shall be as specified in Table 5.2.1.10.1.

**Table 5.2.1.10.1 Maximum Allowable Quantities (MAQ) of Hazardous Materials per Control Area in Business Occupancies**

Material	Class	Solid Pounds	Liquid Gallons <sup>j</sup> (lb)	Gas <sup>a,i</sup> (at NTP) scf (lb)
Flammable and combustible liquid <sup>b,c,k</sup>	I and II	N/A	10	N/A
	III-A	N/A	60	N/A
	III-B	N/A	120	N/A
Cryogenic fluid	Flammable	N/A	10	N/A
	Oxidizing	N/A	10	N/A
Explosives <sup>d,e,f,g</sup>	See note	See note	See note	See note
Flammable gas <sup>c</sup>	Gaseous	N/A	N/A	1000
	Liquefied	N/A	N/A	(20)

Material	Class	Solid Pounds	Liquid Gallons <sup>j</sup> (lb)	Gas <sup>a,i</sup> (at NTP) scf (lb)
	Liquefied Petroleum	N/A	N/A	(20)
Flammable solid	N/A	5	N/A	N/A
Oxidizers	4	NP	NP	NP
	3	10 <sup>h</sup>	1 <sup>h</sup>	NP
	2	250	25	NP
	1	4,000	400	NP
Oxidizing gas	Gaseous	N/A	N/A	1500
	Liquefied	NA	15	N/A
Organic peroxides	I	NP	NP	N/A
	II	NP	NP	N/A
	III	1500	(1500)	N/A
	IV	100,000	(100,000)	N/A
	V	NL	NL	N/A
Pyrophoric materials	N/A	1	(1)	10
Unstable reactives	4	¼	(¼)	2
	3	1	(1)	10
	2	10	(10)	750
	1	NL	NL	NL
Water-reactive	3	1	(1)	N/A
	2	10	(10)	N/A
	1	NL	NL	N/A
Corrosives	N/A	1000	(100)	810
Highly toxic <sup>i</sup>	N/A	3	(3)	20
Toxic <sup>i</sup>	N/A	125	(125)	810

For SI units, 1 lb = 0.454 kg; 1 gal = 3.785 L; 1 scf ft<sup>3</sup> = 0.0283 m<sup>3</sup>.

NTP: Normal temperature and pressure [measured at 70°F (21°C) and 14.7 psi (101 kPa)]. N/A: Not applicable. NP: Not permitted. NL: Not limited.

Note: The hazardous material categories and MAQs that are shaded in this table are not regulated by NFPA 400 but are provided here for informational purposes. See Chapter 2 for the reference code or standard governing these materials and establishing the MAQs. In accordance with 1.1.1.2, materials having multiple hazards that fall within the scope of NFPA 400 shall comply with NFPA 400.

- <sup>a</sup>Unlimited amounts of gas are permitted to be used for personal medical or emergency medical use.
- <sup>b</sup>Storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or 60 gal (227 L) of Class IIIA liquids is permitted where stored in safety cabinets with an aggregate quantity not to exceed 180 gal (681 L).
- <sup>c</sup>Fuel in the tank of operating mobile equipment is permitted to exceed the specified quantity where the equipment is operated in accordance with this code.
- <sup>d</sup>The use of explosive materials required by federal, state, or municipal agencies while engaged in normal or emergency performance of duties is not required to be limited. The storage of explosive materials is required to be in accordance with the requirements of NFPA 495.
- <sup>e</sup>The storage and use of explosive materials in medicines and medicinal agents in the forms prescribed by the official United States Pharmacopeia or the National Formulary are not required to be limited.
- <sup>f</sup>The storage and use of propellant-actuated devices or propellant-actuated industrial tools manufactured, imported, or distributed for their intended purposes are required to be limited to 50 lb (23 kg) net explosive weight.
- <sup>g</sup>The storage and use of small arms ammunition, and components thereof, are permitted where in accordance with NFPA 495.
- <sup>h</sup>A maximum quantity of 220 lb (99 kg) of solid or 22 gal (83 L) of liquid Class 3 oxidizer is permitted where such materials are necessary for maintenance purposes, operation, or sanitation of equipment. Storage containers and the manner of storage are required to be approved.
- <sup>i</sup>Gas cylinders not exceeding 20 scf (0.57 m<sup>3</sup>) measured at 70°F (21°C) and 14.7 psi (101 kPa) are permitted in gas cabinets or fume hoods.
- <sup>j</sup>Conversion. Where quantities are indicated in pounds and when the weight per gallon of the liquid is not provided to the AHJ, a conversion factor of 10 lb/gal (1.2 kg/L) shall be used.
- <sup>k</sup>Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50% by volume water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn, shall not be limited, where packaged in individual containers that do not exceed a 1.3-gallon capacity. [30:9.1.4(4)]

## 2. Revise Annex J to read as follows:

### **Annex J Hazardous Material Definitions Comparison Table**

*This annex is not part of the requirements of this NFPA document but is included for informational purposes only.*

#### **J.1**

There are multiple published definitions for the various classifications of hazardous material. Table J.1 provides a tabular presentation of the various definitions published within NFPA 400 as well as the source NFPA document for those definitions that are extracted. In addition, the table presents corresponding definitions, where available, from both the 2012 edition of the *International Fire Code* as well as from the 2012 edition of the *Hazard Communication Standard* developed by the Occupational Health and Safety Administration (OSHA). OSHA's 2012 *Hazard Communication Standard* aligns with the United Nations' Globally Harmonized System of Classification and Labeling of Chemicals.

#### **Table J.1 Hazardous Material Definitions Comparison**

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
Combustible Liquid	II	30	Any liquid that has a flash point at or above 100°F (37.8°C) and below 140°F (60°C)	Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).	<b>Flammable liquid Category 3:</b> Flash point ≥ 23°C (73.4°F) and ≤60°C (140°F).
	IIIA	30	Any liquid that has a flash point at or above 140°F (60°C) and below 200°F (93°C)	Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).	<b>Flammable liquid Category 4:</b> Flash point > 60°C (140°F) and ≤93°C (199.4°F).
	IIIB	30	Any liquid that has a flash point at or above 200°F (93°C).	Liquids having closed cup flash points at or above 200°F (93°C).	
Consumer fireworks		1124	Small fireworks devices containing restricted amounts of pyrotechnic composition, designed primarily to produce visible or audible effects by combustion, that comply with the construction, chemical composition, and labeling regulations of the U.S. Consumer Product Safety Commission (CPSC), as set forth in CPSC 16 CFR 1500 and 1507, 49 CFR 172, and APA <i>Standard 87-1, Standard for the Construction and Approval for</i>	Any composition or device for the purpose of producing a visible or an audible effect for entertainment purposes by combustion, deflagration or detonation that meets the definition of 1.4G fireworks or 1.3G fireworks as set forth herein.	



Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			<i>Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics.</i>		
Combustible metals		484			<p><b>Flammable solid</b> means a solid which is a readily combustible solid, or which may cause or contribute to fire through friction. Powders of metals or metal alloys shall be classified as flammable solids when they can be ignited and the reaction spreads over the whole length of the sample in 10 min or less. <b>Category 1:</b> Burning rate test: Metal powders: burning time ≤ 5 min. <b>Category 2:</b> Burning rate test: Metal powders: burning time &gt; 5 min and ≤ 10 min.</p>
	Flammable	55			
	Oxidizing	55			
Cryogenic fluid	Inert	55		A fluid having a boiling point lower than –130°F (–89.9°C) at 14.7 pounds per square inch atmosphere (psia) (an absolute	<p><b>Gases under pressure</b> are gases which are contained in a receptacle at a pressure of 200 kPa (gauge) or more at 20 °C, or which are liquefied or liquefied</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				pressure of 101.3 kPa).	and refrigerated. <b>Liquefied gas:</b> A gas which when under pressure is partially liquid at temperatures above -50°C (-58°F). A distinction is made between: (a) High pressure liquefied gas: a gas with a critical temperature <sup>1</sup> between -50°C (-58°F) and +65°C (149°F); and (b) Low pressure liquefied gas: a gas with a critical temperature <sup>1</sup> above +65°C (149°F).
Explosives		495	Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion.	A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G. The term "Explosive"	An <b>explosive chemical</b> is a solid or liquid chemical which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic chemicals are included even when they do not evolve gases. A <b>pyrotechnic chemical</b> is a chemical designed to produce an effect by heat, light, sound,

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				<p>includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn 49 CFR Parts 100-185.</p>	<p>gas or smoke or a combination of these as the result of non-detonative self-sustaining exothermic chemical reactions.</p> <p>An <b>explosive item</b> is an item containing one or more explosive chemicals.</p> <p>A <b>pyrotechnic item</b> is an item containing one or more pyrotechnic chemicals.</p> <p>An <b>unstable explosive</b> is an explosive which is thermally unstable and/or too sensitive for normal handling, transport, or use.</p> <p>An <b>intentional explosive</b> is a chemical or item which is manufactured with a view to produce a practical explosive or pyrotechnic effect.</p> <p><b>Division 1.1:</b> Chemicals and items which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously);</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p data-bbox="1166 300 1421 516"><b>Division 1.2:</b> Chemicals and items which have a projection hazard but not a mass explosion hazard;</p> <p data-bbox="1166 531 1421 863"><b>Division 1.3:</b> Chemicals and items which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard:</p> <p data-bbox="1166 877 1421 1020">(i) Combustion of which gives rise to considerable radiant heat; or</p> <p data-bbox="1166 1035 1421 1178">(ii) Which burn one after another, producing minor blast or projection effects or both;</p> <p data-bbox="1166 1192 1421 1864"><b>Division 1.4:</b> Chemicals and items which present no significant hazard: chemicals and items which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>instantaneous explosion of almost the entire contents of the package;</p> <p><b>Division 1.5:</b> Very insensitive chemicals which have a mass explosion hazard: chemicals which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions;</p> <p><b>Division 1.6:</b> Extremely insensitive items which do not have a mass explosion hazard: items which contain only extremely insensitive detonating chemicals and which demonstrate a negligible probability of accidental initiation or propagation.</p>
Flammable gas	Gaseous	55	A material that is a gas at 20°C (68°F) or less at an absolute pressure of 101.325 kPa (14.7 psia), that is ignitable at an absolute pressure of 101.325 kPa (14.7 psia) when in	A material which is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a boiling point of	<b>Flammable gas</b> means a gas having a flammable range with air at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi). <b>Category 1:</b> Gases, which at 20°C (68°F) and a standard

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			a mixture of 13 percent or less by volume with air, or that has a flammable range at an absolute pressure of 101.325 kPa (14.7 psia) with air of at least 12 percent, regardless of the lower limit.	68°F (20°C) or less at 14.7 psia (101 kPa)] which: 1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or 2. Has a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit. The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.	pressure of 101.3 kPa (14.7 psi): (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit. <b>Category 2:</b> Gases, other than those of Category 1, which, at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi), have a flammable range while mixed in air.
	Liquefied	55	A liquefied compressed gas that, when under a charged pressure, is partially liquid at a temperature of 20°C (68°F) and is flammable.	A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is flammable.	<b>Gases under pressure</b> are gases which are contained in a receptacle at a pressure of 200 kPa (gauge) or more at 20 °C, or which are liquefied or liquefied and refrigerated. <b>Liquefied gas:</b> A gas which when under pressure is partially liquid at temperatures above -50°C (-58°F). A distinction is made between:

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					(a) High pressure liquefied gas: a gas with a critical temperature between $-50^{\circ}\text{C}$ ( $-58^{\circ}\text{F}$ ) and $+65^{\circ}\text{C}$ ( $149^{\circ}\text{F}$ ); and (b) Low pressure liquefied gas: a gas with a critical temperature above $+65^{\circ}\text{C}$ ( $149^{\circ}\text{F}$ ). The critical temperature is the temperature above which a pure gas cannot be liquefied, regardless of the degree of compression.
	Liquefied Petroleum (LP)	58		A material which is composed predominantly of the following hydrocarbons or mixtures of them: propane, propylene, butane (normal butane or isobutane) and butylenes.	
Flammable Liquids	I-A	30	Liquids are those having Any liquid that has a flash point below $73^{\circ}\text{F}$ ( $22.8^{\circ}\text{C}$ ) and a boiling point below $100^{\circ}\text{F}$ ( $37.8^{\circ}\text{C}$ ).	Liquids having a flash point below $73^{\circ}\text{F}$ ( $23^{\circ}\text{C}$ ) and having a boiling point below $100^{\circ}\text{F}$ ( $38^{\circ}\text{C}$ ).	<b>Flammable liquid</b> means a liquid having a flash point of not more than $93^{\circ}\text{C}$ ( $199.4^{\circ}\text{F}$ ). <b>Category 1:</b> Flash point $< 23^{\circ}\text{C}$ ( $73.4^{\circ}\text{F}$ ) and initial boiling point $\leq 35^{\circ}\text{C}$ ( $95^{\circ}\text{F}$ ).
	I-B	30	Liquids are those having Any liquid	Liquids having a flash point below	<b>Flammable liquid</b> <b>Category 2:</b> Flash

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			that has a flash point below 73°F (22.8°C) and a boiling point at or above 100°F (37.8°C).	73°F (23°C) and having a boiling point at or above 100°F (38°C).	point < 23°C (73.4°F) and initial boiling point > 35°C (95°F).
	I-C	30	Liquids are those havingAny liquid that has a flash point at or above 73°F (22.8°C) andbut below 100°F (37.8°C).	Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).	<b>Flammable liquid Category 3:</b> Flash point ≥ 23°C (73.4°F) and ≤60°C (140°F).
Flammable solid		400	A solid substance, other than a substance defined as a blasting agent or explosive, that is liable to cause fire resulting from friction or retained heat from manufacture, that has an ignition temperature below 212°F (100°C), or that burns so vigorously or persistently when ignited that it creates a serious hazard.	A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption of moisture, spontaneous chemical change or retained heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR Part	<b>Flammable solid</b> means a solid which is a readily combustible solid, or which may cause or contribute to fire through friction. Readily combustible solids are powdered, granular, or pasty chemicals which are dangerous if they can be easily ignited by brief contact with an ignition source, such as a burning match, and if the flame spreads rapidly. <b>Category 1:</b> Burning rate test: Chemicals other than metal powders: (a) Wetted zone does not stop fire; and (b) Burning time < 45 s or burning rate > 2.2 mm/s



Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.1 inch (2.5 mm) per second along its major axis.	<p>Metal powders: burning time ≤ 5 min</p> <p><b>Category 2:</b> Burning rate test:</p> <p>Chemicals other than metal powders:</p> <p>(a) Wetted zone stops the fire for at least 4 min; and</p> <p>(b) Burning time &lt; 45 s or burning rate &gt; 2.2 mm/s</p> <p>Metal powders: burning time &gt; 5 min and ≤ 10 min</p> <p>Test Method for burning rate is provided in the UN TDG Manual of Tests and Criteria</p>
Inert Gas	Gaseous	55	A nonreactive, nonflammable, noncorrosive gas such as argon, helium, krypton, neon, nitrogen, and xenon.	<p>A gas that is capable of reacting with other materials only under abnormal conditions such as high temperatures, pressures and similar extrinsic physical forces.</p> <p>Within the context of the code, inert gases do not exhibit either physical or health hazard properties as defined (other than acting as a simple asphyxiant) or hazard properties other</p>	<p><b>Simple asphyxiant</b> means a substance or mixture that displaces oxygen in the ambient atmosphere, and can thus cause oxygen deprivation in those who are exposed, leading to unconsciousness and death. (In HCS 2012, not in GHS)</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				<p>than those of a compressed gas. Some of the more common inert gases include argon, helium, krypton, neon, nitrogen and xenon.</p>	
	Liquefied	55	<p>A nonreactive, nonflammable, noncorrosive gas such as argon, helium, krypton, neon, nitrogen, and xenon.</p>	<p>A gas that is capable of reacting with other materials only under abnormal conditions such as high temperatures, pressures and similar extrinsic physical forces. Within the context of the code, inert gases do not exhibit either physical or health hazard properties as defined (other than acting as a simple asphyxiant) or hazard properties other than those of a compressed gas. Some of the more common inert gases include argon, helium, krypton, neon, nitrogen and xenon.</p>	<p><b>Simple asphyxiant</b> means a substance or mixture that displaces oxygen in the ambient atmosphere, and can thus cause oxygen deprivation in those who are exposed, leading to unconsciousness and death. (In HCS 2012, not in GHS)</p>
Organic peroxide	UD	400		<p>Unclassified detonable: Organic</p>	<p><b>Organic peroxide</b> means a liquid or</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				peroxides that are capable of detonation. These peroxides pose an extremely high-explosion hazard through rapid explosive decomposition.	<p>solid organic chemical which contains the bivalent -O-O- structure and as such is considered a derivative of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term organic peroxide includes organic peroxide mixtures containing at least one organic peroxide. Organic peroxides are thermally unstable chemicals, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties:</p> <ul style="list-style-type: none"> <li>(a) Be liable to explosive decomposition; (b) Burn rapidly;</li> <li>(c) Be sensitive to impact or friction;</li> <li>(d) React dangerously with other substances</li> </ul> <p><b>Organic peroxide</b>  <b>TYPE A:</b> Any organic peroxide which, as packaged, can</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					detonate or deflagrate rapidly. <b>Organic peroxide TYPE B:</b> Any organic peroxide possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package.
	I	400	Class I shall describe those formulations that are more severe than a Class II but do not detonate.	Describes those formulations that are capable of deflagration but not detonation.	<b>Organic peroxide TYPE C:</b> Any organic peroxide possessing explosive properties when the chemical as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion.
	II	400	Class II shall describe those formulations that burn very rapidly and that present a severe reactivity hazard.	Describes those formulations that burn very rapidly and that pose a moderate reactivity hazard.	<b>Organic peroxide TYPE D:</b> Any organic peroxide which in laboratory testing meets the following criteria: (i) Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or (ii) Does not detonate at all, deflagrates slowly and shows no violent effect when

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					heated under confinement; or (iii) Does not detonate or deflagrate at all and shows a medium effect when heated under confinement.
	III	400	Class III shall describe those formulations that burn rapidly and that present a moderate reactivity hazard.	Describes those formulations that burn rapidly and that pose a moderate reactivity hazard.	<b>Organic peroxide TYPE E:</b> Any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement.
	IV	400	Class IV shall describe those formulations that burn in the same manner as ordinary combustibles and that present a minimal reactivity hazard.	Describes those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.	<b>Organic peroxide TYPE F:</b> Any organic peroxide 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.
	V	400	Class V shall describe those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and	Describes those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.	<b>Organic peroxide TYPE G:</b> Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			that present no reactivity hazard.		explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C (140°F) or higher for a 50 kg (110 lb) package), and, for liquid mixtures, a diluent having a boiling point of not less than 150°C (302°F) is used for desensitization. If the organic peroxide is not thermally stable or a diluent having a boiling point less than 150°C (302°F) is used for desensitization, it shall be defined as organic peroxide TYPE F.
Oxidizer	4	400	An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and that causes a severe increase in the burning rate of combustible materials with which it comes into contact.	An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and that causes a severe increase in the burning rate of combustible materials with which it comes into contact. Additionally, the	<b>Oxidizing solid</b> means a solid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material. <b>Oxidizing liquid</b> means a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				oxidizer causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.	<p>contribute to, the combustion of other material. <b>Oxidizing liquid Category 1:</b> Any chemical which, in the 1:1 mixture, by mass, of chemical and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of chemical and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.</p> <p><b>Oxidizing solid Category 1:</b> Any chemical which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose.</p>
	3	400	An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes into contact or a solid oxidizer classified as Class 3 when	An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes in contact.	<b>Oxidizing liquid Category 2:</b> Any chemical which, in the 1:1 mixture, by mass, of chemical and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			tested in accordance with the test protocol set forth in G.1.		<p>rise time of a 1:1 mixture, by mass, of 40% aqueous sodium chlorate solution and cellulose; and the criteria for Category 1 are not met.</p> <p><b>Oxidizing solid</b>  <b>Category 2:</b> Any chemical which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for Category 1 are not met.</p>
	2	400	An oxidizer that causes a moderate increase in the burning rate of combustible materials with which it comes into contact or a solid oxidizer classified as Class 2 when tested in accordance with the test protocol set forth in G.1.	An oxidizer that will cause a moderate increase in the burning rate of combustible materials with which it comes in contact.	<p><b>Oxidizing solid</b> means a solid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material. <b>Oxidizing liquid</b> means a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other</p>



Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>material. <b>Oxidizing liquid Category 3:</b> Any chemical which, in the 1:1 mixture, by mass, of chemical and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 65% aqueous nitric acid and cellulose; and the criteria for Categories 1 and 2 are not met.</p> <p><b>Oxidizing solid Category 3:</b> Any chemical which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for Categories 1 and 2 are not met.</p>
	1	400	An oxidizer that does not moderately increase the burning rate of combustible materials with which it comes into	An oxidizer that does not moderately increase the burning rate of combustible materials.	

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			contact or a solid oxidizer classified as Class 1 when tested in accordance with the test protocol set forth in G.1.		
Oxidizing gas	Gaseous	55	A gas that can support and accelerate combustion of other materials.		<b>Oxidizing gas</b> means any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.
	Liquefied	55	A gas that can support and accelerate combustion of other materials.		Oxidizing gas means any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.
Pyrophoric		400	A chemical with an autoignition temperature in air at or below 130°F (54.4°C).	A chemical with an autoignition temperature in air, at or below a temperature of 130°F (54°C).	<b>Pyrophoric liquid</b> means a liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air; <b>Category 1:</b> The liquid ignites within 5 min when added to an inert carrier and exposed to air, or it ignites or chars a filter paper on contact with air within 5 min. <b>Pyrophoric solid</b> means a solid which,

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					even in small quantities, is liable to ignite within five minutes after coming into contact with air: <b>Category 1:</b> The solid ignites within 5 min of coming into contact with air.
Pyrophoric Gas	Gaseous	55	A gas with an autoignition temperature in air at or below 54.4°C (130°F).		<b>Pyrophoric gas</b> means a chemical in a gaseous state that will ignite spontaneously in air at a temperature of 130 °F (54.4 °C) or below. (In HCS 2012, Not GHS)
	Liquefied	55	A gas with an autoignition temperature in air at or below 54.4°C (130°F).		<b>Pyrophoric gas</b> means a chemical in a gaseous state that will ignite spontaneously in air at a temperature of 130 °F (54.4 °C) or below. (In HCS 2012, Not GHS)
Unstable (reactive) Gas	4	55	Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.		A <b>chemically unstable gas</b> is a flammable gas that is able to react explosively even in the absence of air or oxygen. (In GHS, Rev.4; Not HCS 2012) <b>Category A:</b> Flammable gases which are chemically unstable at 20°C and

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					a standard pressure of 101.3 kPa. <b>Category B:</b> Flammable gases which are chemically unstable at a temperature greater than 20°C and/or a pressure greater than 101.3 kPa.
	3	55	Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation.		
	2	55	Materials that readily undergo violent chemical change at elevated temperatures and pressures.		
	1	55	A gas that, in the pure state or as commercially produced, will vigorously polymerize, decompose, or condense, become self-reactive, or otherwise undergo a violent chemical		

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			change under conditions of shock, pressure, or temperature.		
Unstable Reactive	4	400	Materials are those that, in themselves, are readily capable of detonation, explosive decomposition, or explosive reaction at normal temperatures and pressures and include, among others, materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures.	Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.	<p><b>Self-reactive chemicals</b> are thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes chemicals classified under this section as explosives, organic peroxides, oxidizing liquids or oxidizing solids.</p> <p>A self-reactive chemical is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.</p> <p><b>Self-reactive chemical TYPE A:</b> Any self-reactive chemical which can detonate or deflagrate rapidly, as packaged.</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p><b>Self-reactive chemical TYPE B:</b> Any self-reactive chemical possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package.</p>
	3	400	<p>Materials are those that, in themselves, are capable of detonation, explosive decomposition, or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation, and include, among others, materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures.</p>	<p>Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class includes materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures.</p>	<p><b>Self-reactive chemicals</b> are thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes chemicals classified under this section as explosives, organic peroxides, oxidizing liquids or oxidizing solids. A self-reactive chemical is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>effect when heated under confinement.</p> <p><b>Self-reactive chemical TYPE C:</b> Any self-reactive chemical possessing explosive properties when the chemical as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion.</p> <p><b>Self-reactive chemical TYPE D:</b> Any self-reactive chemical which in laboratory testing meets the following criteria:</p> <ul style="list-style-type: none"> <li>(i) Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement;</li> <li>or</li> <li>(ii) Does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or</li> <li>(iii) Does not detonate or deflagrate at all and shows a medium effect when heated under confinement</li> </ul>
	2	400	Materials are those that readily	Materials that in themselves are	<b>Self-reactive chemicals</b> are

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			undergo violent chemical change at elevated temperatures and pressures and include, among others, materials that exhibit an exotherm at temperatures less than or equal to 30°F (-1°C) when tested by differential scanning calorimetry.	normally unstable and readily undergo violent chemical change but do not detonate. This class includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that can undergo violent chemical change at elevated temperatures and pressures.	thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes chemicals classified under this section as explosives, organic peroxides, oxidizing liquids or oxidizing solids. A self-reactive chemical is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement. <b>Self-reactive chemical TYPE E:</b> Any self-reactive chemical which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement. <b>Self-reactive chemical TYPE F:</b> Any self-reactive chemical which, in



Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					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.
	1	400	Materials are those that, in themselves, are normally stable, but that can become unstable at elevated temperatures and pressures and include among others, materials that change or decompose on exposure to air, light, or moisture and that exhibit an exotherm at temperatures greater than 30°F (-1°C), but less than or equal to 57°F (14°C), when tested by differential scanning calorimetry.	Materials that in themselves are normally stable but which can become unstable at elevated temperatures and pressure.	<p><b>Self-reactive chemicals</b> are thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes chemicals classified under this section as explosives, organic peroxides, oxidizing liquids or oxidizing solids.</p> <p>A self-reactive chemical is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.</p> <p><b>Self-reactive chemical TYPE G:</b></p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					Any self-reactive chemical which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C (140°F) to 75°C (167°F) for a 50 kg (110 lb) package), and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150°C (302°F) is used for desensitization. If the mixture is not thermally stable or a diluent having a boiling point less than 150°C (302°F) is used for desensitization, the mixture shall be defined as self-reactive chemical TYPE F.
Water-reactive	3	400	Materials whose heat of mixing is greater or equal to 600 cal/g.	Materials that react explosively with water without requiring heat or confinement.	<b>Chemicals which, in contact with water, emit flammable gases</b> are solid or liquid chemicals

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.</p> <p><b>Category 1:</b> Any chemical which reacts vigorously with water at ambient temperatures and demonstrates generally a tendency for the gas produced to ignite spontaneously, or which reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is equal to or greater than 10 liters per kilogram of chemical over any one minute.</p>
	2	400	Materials whose heat of mixing is at or above 100 cal /g and less than 600 cal/g.	<p>Materials that react violently with water or have the ability to boil water.</p> <p>Materials that produce flammable, toxic or other hazardous gases, or evolve enough heat to cause autoignition or ignition of combustibles upon</p>	<p><b>Chemicals which, in contact with water, emit flammable gases</b></p> <p><b>Category 2:</b> Any chemical which reacts readily with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 20 liters per</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				exposure to water or moisture.	kilogram of chemical per hour, and which does not meet the criteria for Category 1.
	1	400	Materials whose heat of mixing is at or above 30 cal/g and less than 100 cal/g.	Materials that react with water with some release of energy, but not violently.	<b>Chemicals which, in contact with water, emit flammable gases Category 3:</b> Any chemical which reacts slowly with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 1 liter per kilogram of chemical per hour, and which does not meet the criteria for Categories 1 and 2.
Corrosive		400	A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact.	A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. A chemical shall be considered corrosive if, when tested on the intact skin of albino rabbits by the method described in DOTn 49 CFR 173.137, such chemical destroys	<b>Skin corrosion</b> is the production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
				or changes irreversibly the structure of the tissue at the point of contact following an exposure period of 4 hours. This term does not refer to action on inanimate surfaces.	the skin, complete areas of alopecia, and scars. Histopathology should be considered to evaluate questionable lesions.
Corrosive Gas	Gaseous	55	A gas that causes visible destruction of or irreversible alterations in living tissue by chemical action at the site of contact.		<b>Skin corrosion</b> is the production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia, and scars. Histopathology should be considered to evaluate questionable lesions.
	Liquefied	55	A gas that causes visible destruction of or irreversible alterations in living tissue by chemical		<b>Skin corrosion</b> is the production of irreversible damage to the skin; namely, visible necrosis through the

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			action at the site of contact.		epidermis and into the dermis, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia, and scars. Histopathology should be considered to evaluate questionable lesions.
Highly toxic		400	A material that produces a lethal dose or lethal concentration that falls within any of the following categories: (1) a chemical that has a median lethal dose (LD50) of 50 mg/kg or less of body weight when administered orally to albino rats weighing between 200 g and 300 g each; (2) a chemical that has a median lethal dose (LD50) of 200 mg/kg or less of body weight when	A material which produces a lethal dose or lethal concentration which falls within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each. 2. A chemical that has a median lethal dose (LD50) of 200 milligrams or less	<b>Acute toxicity</b> refers to those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours. <b>Oral Category 1:</b> LD50 ≤5 mg/kg; <b>Oral Category 2:</b> LD50 >5 and ≤ 50; <b>Dermal Category 1:</b> LD50 ≤ 50; <b>Dermal Category 2:</b> LD50 >50 and ≤ 200.

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			<p>administered by continuous contact for 24 hours, or less if death occurs within 24 hours, with the bare skin of albino rabbits weighing between 2 kg and 3 kg each or albino rats weighing 200 g and 300 g each; (3) a chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 mg/L or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour, or less if death occurs within 1 hour, to albino rats weighing between 200 g and 300 g each.</p>	<p>per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.</p> <p>3. A chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume or dust, when administered by continuous inhalation for one hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.</p>	
Highly toxic gas	Gaseous	55	<p>A chemical that has a median lethal concentration (LC50) in air of 200 ppm by volume or less of gas or vapor, or 2 mg/L or less of mist, fume, or dust, when administered by</p>		<p><b>Acute toxicity</b> refers to those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			<p>continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 g and 300 g (0.44 lb and 0.66 lb) each.</p>		<p>inhalation exposure of 4 hours.</p> <p><b>Inhalation - Gases Category 1:</b> LD50 ≤ 100;</p> <p><b>Inhalation - Gases Category 2:</b> LD50 &gt;100 and ≤ 500;</p> <p><b>Inhalation - Vapors Category 1:</b> LD50 ≤ 0.5;</p> <p><b>Inhalation - Vapors Category 2:</b> LD50 &gt;0.5 and ≤ 2.0;</p> <p><b>Inhalation - Dusts and Mists Category 1:</b> LD50 ≤ 0.05;</p> <p><b>Inhalation - Dusts and Mists Category 2:</b> LD50 &gt;0.05 and ≤ 0.5;</p> <p><b>Inhalation - Dusts and Mists Category 3:</b> LD50 &gt;0.5 and ≤ 1.0.</p>
	Liquefied	55	<p>A chemical that has a median lethal concentration (LC50) in air of 200 ppm by volume or less of gas or vapor, or 2 mg/L or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing</p>		<p><b>Acute toxicity</b> refers to those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours.</p> <p><b>Inhalation - Gases Category 1:</b> LD50 ≤ 100;</p>



Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			between 200 g and 300 g (0.44 lb and 0.66 lb) each.		<p><b>Inhalation - Gases Category 2:</b> LD50 &gt;100 and ≤ 500;</p> <p><b>Inhalation - Vapors Category 1:</b> LD50 ≤ 0.5;</p> <p><b>Inhalation - Vapors Category 2:</b> LD50 &gt;0.5 and ≤ 2.0;</p> <p><b>Inhalation - Dusts and Mists Category 1:</b> LD50 ≤ 0.05;</p> <p><b>Inhalation - Dusts and Mists Category 2:</b> LD50 &gt;0.05 and ≤ 0.5;</p> <p><b>Inhalation - Dusts and Mists Category 3:</b> LD50 &gt;0.5 and ≤ 1.0.</p>
Toxic		400	A material that produces a lethal dose or a lethal concentration within any of the following categories: (1) a chemical or substance that has a median lethal dose (LD50) of more than 50 mg/kg but not more than 500 mg/kg of body weight when administered orally to albino rats weighing between 200 g and 300 g each; (2) a chemical or	A chemical falling within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of more than 50 milligrams per kilogram, but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each. 2. A chemical that has a median lethal dose (LD50) of more	<p><b>Acute toxicity</b> refers to those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours.</p> <p><b>Oral Category 2:</b> LD50 &gt;5 and ≤ 50;</p> <p><b>Oral Category 3:</b> LD50 &gt;50 and ≤ 300;</p> <p><b>Oral Category 4:</b> LD50 &gt;300 and ≤ 2000;</p> <p><b>Dermal Category 2:</b> LD50 &gt;50 and ≤ 200;</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			<p>substance that has a median lethal dose (LD50) of more than 200 mg/kg but not more than 1000 mg/kg of body weight when administered by continuous contact for 24 hours, or less if death occurs within 24 hours, with the bare skin of albino rabbits weighing between 2 kg and 3 kg each; (3) a chemical or substance that has a median lethal concentration (LC50) in air of more than 200 parts per million but not more than 2000 parts per million by volume of gas or vapor, or more than 2 mg/L but not more than 20 mg/L, of mist, fume, or dust when administered by continuous inhalation for 1 hour, or less if death occurs within 1 hour, to albino rats weighing between 200 g and 300 g each.</p>	<p>than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each. 3. A chemical that has a median lethal concentration (LC50) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than 2 milligrams per liter but not more than 20 milligrams per liter of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.</p>	<p><b>Dermal Category 3:</b> LD50 &gt;200 and ≤ 1000; <b>Dermal Category 4:</b> LD50 &gt;1000 and ≤ 2000; <b>Inhalation - Gases Category 2:</b> LD50 &gt;100 and ≤ 500; <b>Inhalation - Gases Category 3:</b> LD50 &gt;500 and ≤ 2500; <b>Inhalation - Gases Category 4:</b> LD50 &gt;2500 and ≤ 20000; <b>Inhalation - Vapors Category 3:</b> LD50 &gt;2.0 and ≤ 10.0; <b>Inhalation - Vapors Category 4:</b> LD50 &gt;10.0 and ≤ 20.0; <b>Inhalation - Dusts and Mists Category 4:</b> LD50 &gt;1.0 and ≤ 5.0.</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
Toxic gas	Gaseous	55	A gas with a median lethal concentration (LC50) in air of more than 200 ppm, but not more than 2000 ppm by volume of gas or vapor, or more than 2 mg/L, but not more than 20 mg/L of mist, fume, or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 g and 300 g (0.44 lb and 0.66 lb) each.		<p><b>Acute toxicity</b> refers to those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours.</p> <p><b>Oral Category 2:</b> LD50 &gt;5 and ≤ 50;  <b>Oral Category 3:</b> LD50 &gt;50 and ≤ 300;  <b>Oral Category 4:</b> LD50 &gt;300 and ≤ 2000;</p> <p><b>Inhalation - Gases Category 2:</b> LD50 &gt;100 and ≤ 500;  <b>Inhalation - Gases Category 3:</b> LD50 &gt;500 and ≤ 2500;  <b>Inhalation - Gases Category 4:</b> LD50 &gt;2500 and ≤ 20000;  <b>Inhalation - Vapors Category 3:</b> LD50 &gt;2.0 and ≤ 10.0;  <b>Inhalation - Vapors Category 4:</b> LD50 &gt;10.0 and ≤ 20.0;  <b>Inhalation - Dusts and Mists Category 4:</b> LD50 &gt;1.0 and ≤ 5.0.</p>
	Liquefied	55	A gas with a median lethal concentration (LC50) in air of		

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
			<p>more than 200 ppm, but not more than 2000 ppm by volume of gas or vapor, or more than 2 mg/L, but not more than 20 mg/L of mist, fume, or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 g and 300 g (0.44 lb and 0.66 lb) each.</p>		
					<p>Gas means a substance which (i) at 50°C has a vapour pressure greater than 300 kPa (absolute); or (ii) is completely gaseous at 20°C at a standard pressure of 101.3 kPa. (In GHS, Not HCS 2012)</p>
					<p>Liquid means a substance or mixture which at 50 °C has a vapour pressure of not more than 300 kPa (3 bar), which is not completely gaseous at 20°C and at a standard pressure of 101.3 kPa, and which has a melting point or initial</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>melting point of 20°C or less at a standard pressure of 101.3 kPa. A viscous substance or mixture for which a specific melting point cannot be determined shall be subjected to the ASTM D4359-90 test; or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). (In GHS, Not HCS 2012)</p>
					<p>Solid means a substance or mixture which does not meet the definitions of liquid or gas. (In GHS, Not HCS 2012)</p>
					<p><i>Flammable Aerosol</i> means any non-refillable receptacle containing a gas compressed, liquefied or dissolved under pressure, and fitted with a release device allowing the contents to be ejected as particles in suspension in a gas,</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>or as a foam, paste, powder, liquid or gas.</p> <p><b>Aerosol Category 1:</b>            Contains <math>\geq 85\%</math> flammable components and the chemical heat of combustion is <math>\geq 30</math> kJ/g; or</p> <p>a) For spray aerosols, in the ignition distance test, ignition occurs at a distance <math>\geq 75</math> cm (29.5 in), or</p> <p>b) For foam aerosols, in the aerosol foam flammability test</p> <p>(i) The flame height is <math>\geq 20</math> cm (7.87 in) and the flame duration <math>\geq 2</math> s; or</p> <p>(ii) The flame height is <math>\geq 4</math> cm (1.57 in) and the flame duration <math>\geq 7</math> s</p> <p><b>Aerosol Category 2:</b>            Contains <math>&gt; 1\%</math> flammable components, or the heat of combustion is <math>\geq 20</math> kJ/g; and</p> <p>a) for spray aerosols, in the ignition distance test, ignition occurs at a distance <math>\geq 15</math> cm (5.9 in), or in the enclosed space ignition test, the (i) Time equivalent is <math>\leq 300</math> s/m<sup>3</sup>; or (ii)</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>Deflagration density is <math>\leq 300 \text{ g/m}^3\text{b}</math>) For foam aerosols, in the aerosol foam flammability test, the flame height is <math>\geq 4</math> cm and the flame duration is <math>\geq 2</math> s and it does not meet the criteria for Category 1. (Definition from HCS 2012; GHS Rev 4 includes non-flammable aerosols)</p>
					<p><b>Gases under pressure</b> are gases which are contained in a receptacle at a pressure of 200 kPa (29 psi) (gauge) or more, or which are liquefied or liquefied and refrigerated. They comprise compressed gases, liquefied gases, dissolved gases and refrigerated liquefied gases.</p>
					<p><b>Skin irritation</b> is the production of reversible damage to the skin following the application of a test substance for up to 4 hours. A chemical which is corrosive to metals means a chemical which by chemical action will</p>

Material Classification	Class	Controlling Document	400 Definition	2012 IFC Definition	HCS 2012/UN Definition
					<p>materially damage, or even destroy, metals.</p>
					<p>A <b>self-heating chemical</b> is a solid or liquid chemical, other than a pyrophoric liquid or solid, which, by reaction with air and without energy supply, is liable to self-heat; this chemical differs from a pyrophoric liquid or solid in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days).  NOTE: Self-heating of a substance or mixture is a process where the gradual reaction of that substance or mixture with oxygen (in air) generates heat. If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance or mixture will rise which, after an induction time, may lead to self-ignition and combustion.</p>



## **Substantiation:**

This TIA makes corrections to Table 5.2.1.1.3 and to Tables 5.2.1.2-5.2.1.10.1 as described below. In addition, this TIA corrects errors to definitions in Annex J.

1) Corrections to Table 5.2.1.1.3 NFPA 400-2016.

Four changes were made to Table 5.2.1.1.3. The changes are explained in (a-d) below.

a) Change to Unstable reactives rows

The Column on Use-Closed Systems (Gas) for Unstable reactives is currently listed as NL (for not limited) likely because NFPA 5000-2009 had listed it as NL. NFPA 5000-2012 lists this as N/A (for not applicable) and not NL. This entry should be N/A since it refers to Unstable reactive gases that are covered by another line in the table. The order of Class 4 or 3 detonable was also changed to match text in NFPA 55.

b) The terms “gaseous” and “liquefied” have been properly relocated to the top of the column describing the Class of Unstable reactives as shown in NFPA 55.

c) Footnotes o and p have been deleted for flammable gas in the LP row for the Use-Closed Systems Gas column to match the extracted text in the 2016 edition of NFPA 55.

d) Editorial correction to add “See note” to the last column in the Explosives category.

2) Tables 5.2.1.2-5.2.1.8 and 5.2.1.10.1 have been corrected to show parentheses around numbers in the Liquid Gallons (lb) column of the table that are in pound units. Without the parentheses, these numbers appear to be gallons, not pounds. In Table 5.2.1.10.1, however, parentheses were added in the column on liquid gallons of corrosives when in fact the amount shown is in gallons and not in pounds as implied by the parentheses. Shading has been removed from the Oxidizing gas row in Tables 5.2.1.7 and 5.2.1.8 since these are gases are covered by the tables and the shading implies that they are not covered materials. Finally, minor corrections were made to footnotes so the SI units footnote was consistent and so that the superscript 3 was removed from the term scf in footnotes h and j in Table 5.2.1.2 and footnote i in Table 5.2.1.10.1.

3) The definition of Combustible Liquids Class IIIA has been corrected in Annex J. The definition of flammable liquids has also been slightly modified to match the text in the current edition of NFPA 30.

## **Emergency Nature:**

NFPA 400 contains errors and omissions that were overlooked during the regular revision process and contains conflicts with other NFPA standards from which it extracts.

*Anyone may submit a comment by the closing date indicated above. To submit a comment, please identify the number of the TIA and forward to the [Secretary, Standards Council](#), 1 Batterymarch Park, Quincy, MA 02169-7471.*