

FCAC 6.1.4 Oxidizer classification (6055)

IFC: E102.1.7, E102.1.7.2 (New), E102.1.7.1, TABLE E102.1.7.2 (New), TABLE E104.1

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

E102.1.7 Oxidizers. Examples include:

1. Gases: oxygen, ozone, oxides of nitrogen, fluorine and chlorine (reaction with flammables is similar to that of oxygen).
2. Liquids: bromine, hydrogen peroxide, nitric acid, perchloric acid, sulfuric acid.
3. Solids: chlorates, chromates, chromic acid, iodine, nitrates, nitrites, perchlorates, peroxides.

Add new text as follows:

E102.1.7.2 Oxidizer classification. The UN's Globally Harmonized System (GHS) is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (29 CFR 1910.1200 and 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the classifications available in product safety data sheets. For the classification of solid and liquid oxidizers, GHS relies on relevant quantitative test data that measures burning rate, a key indicator of the severity of the hazard.

To assist code officials, an alignment between the GHS and IFC oxidizer hazard classes is provided in Table E102.1.7.2. This alignment is provided as a tool to assist fire code officials and should not be used as the sole means for hazardous materials classification.

E102.1.7.1 Examples of liquid and solid oxidizers according to hazard.

Examples include:

Class 4: ammonium perchlorate (particle size greater than 15 microns), ammonium permanganate, guanidine nitrate, hydrogen peroxide solutions more than 91 percent by weight, perchloric acid solutions more than 72.5 percent by weight, potassium superoxide, tetranitromethane.

Class 3: ammonium dichromate, calcium hypochlorite (over 50 percent by weight), chloric acid (10 percent maximum concentration), hydrogen peroxide solutions (greater than 52 percent up to 91 percent), mono-(trichloro)-tetra-(monopotassium dichloro)-penta-s-triazinetriene, nitric acid, (fuming—more than 86 percent concentration), perchloric acid solutions (60 percent to 72 percent by weight), potassium bromate, potassium chlorate, potassium dichloro-s-triazinetriene (potassium dichloro-isocyanurate), potassium perchlorate (99 percent), potassium permanganate (greater than 97.5 percent), sodium bromate, sodium chlorate and sodium chlorite (over 40 percent by weight).

Class 2: barium bromate, barium chlorate, barium hypochlorite, barium perchlorate, barium permanganate, 1-bromo-3-chloro-5, 5-dimethylhydantoin, calcium chlorate, calcium chlorite, calcium hypochlorite (50 percent or less by weight), calcium perchlorate, calcium permanganate, calcium peroxide (75 percent), chromium trioxide (chromic acid), copper chlorate, halane (1, 3-dichloro-5, 5-dimethylhydantoin), hydrogen peroxide (greater than 27.5 percent up to 52 percent), lead perchlorate, lithium chlorate, lithium hypochlorite (more than 39 percent available chlorine), lithium perchlorate, magnesium bromate, magnesium chlorate, magnesium perchlorate, mercurous chlorate, nitric acid (more than 40 percent but less than 86 percent), perchloric acid solutions (more than 50 percent but less than 60 percent), potassium peroxide, potassium superoxide, silver peroxide, sodium chlorite (40 percent or less by weight), sodium dichloro-s-triazinetriene anhydrous (sodium dichloroisocyanurate anhydrous), sodium perchlorate, sodium perchlorate monohydrate, sodium permanganate, sodium peroxide, sodium persulfate (99 percent), strontium chlorate, strontium perchlorate, thallium chlorate, urea hydrogen peroxide, zinc bromate, zinc chlorate and zinc permanganate.

Class 1: all inorganic nitrates (unless otherwise classified), all inorganic nitrites (unless otherwise classified), ammonium persulfate, barium peroxide, hydrogen peroxide solutions (greater than 8 percent up to 27.5 percent), lead dioxide, lithium hypochlorite (39 percent or less available chlorine), lithium peroxide, magnesium peroxide, manganese dioxide, nitric acid (40 percent concentration or less), perchloric acid solutions (less than 50 percent by weight), potassium dichromate, potassium monopersulfate (45 percent KHSO₅ or 90 percent triple salt), potassium percarbonate, potassium persulfate, sodium carbonate peroxide, sodium dichloro-s-triazinetriene dihydrate, sodium dichromate, sodium perborate (anhydrous), sodium perborate monohydrate, sodium perborate tetra-hydrate, sodium percarbonate, strontium peroxide, trichloro-s-triazinetriene (trichloroisocyanuric acid) and zinc peroxide.

Add new text as follows:

TABLE E102.1.7.2
Oxidizer comparison (IFC vs. GHS)

<u>IFC Hazard Class</u>	<u>GHS Hazard Category</u>
<u>Oxidizer, Class 4</u>	<u>H271, Category 1</u>
<u>Oxidizer, Class 3</u>	<u>H271, Category 1</u>
<u>Oxidizer, Class 2</u>	<u>H272, Category 2</u>
<u>Oxidizer, Class 1</u>	<u>H272, Category 3</u>

Revise as follows:

**TABLE E104.1
REFERENCED STANDARDS**

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
CGA P-20—2009	<i>Standard for Classification of Toxic Mixtures</i>	E103.1.3.1
CGA P-23—2008	<i>Standard for Categorizing Gas Mixtures Containing Flammable and Nonflammable Components</i>	E102.1.2
<u>UN (Rev.7, 2017)</u>	<u>UN Recommendations on the Transport of Dangerous Goods, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards, Chapter 2.13 and 2.14</u>	<u>E102.1.7.2</u>

Reason: Oxidizing solids and liquids can cause fires to burn more intensely, they can cause substances that do not normally burn to ignite, and can even cause explosions due to shock or contamination. Oxidizers are commonly used in the pool industry, in agriculture (fertilizers), in healthcare (disinfectants), and are precursors to explosives (rocket fuel, ammunition, and improvised explosive devices). Unregulated storage of oxidizers has led to serious injuries, property damage, and hundreds of deaths, including the ammonium nitrate explosion in West Texas in 2013 where 150 buildings were damaged or destroyed and 15 people (mostly emergency responders) were killed. Fire Code officials must enforce the hazardous materials provisions of the International Fire Code (IFC) and the International Building Code (IBC) to ensure that people and property in our communities are safe. The current subjective definitions of oxidizers make it difficult for Fire Code officials to verify the proper classification of different oxidizers and to enforce proper storage and use. Consequences of missing or incorrect classification include increased risk of fires that burn more intensely than expected. This puts people at risk, elevates danger to fire fighters who may enter spaces with unknown physical hazards, and increases preventable hazards in locations that may store any quantity of oxidizer.

Additional United Nations (UN) reference is added to provide Fire Code officials the option to utilize relevant quantitative test data for the classification of oxidizers that measures burning rate for oxidizing solids and liquids. Differences in burning rate among chemicals provide key indicators of the severity of the hazard. The UN's Globally Harmonized System (GHS) is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (29 CFR 1910.1200 and 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the information readily available on product Safety Data Sheets (SDSs). Adding a comparison between IFC and GHS definitions can better inform code officials faced with validating classifications of hazardous materials.

IFC and GHS reference alignment:

The alignment with IFC oxidizer classes and GHS oxidizer categories is based upon comparison of 30 oxidizing solids defined by the International Fire Code (Appendix E) and the Globally Harmonized System (GHS) of classification. The IFC classes and corresponding GHS categories, as outlined below, were not statistically different based on a Chi-Squared goodness of fit test ($p = 0.102$).

Oxidizer alignment: IFC vs. GHS
 IFC Hazard Class 4H271, Category 1
 GHS Hazard Category 3
 IFC Hazard Class 3H271, Category 1
 GHS Hazard Category 2
 IFC Hazard Class 2H272, Category 2
 GHS Hazard Category 3
 IFC Hazard Class 1H272, Category 3
 GHS Hazard Category 4

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: <https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. There would be no change in cost of construction, if the GHS categories were used to inform IFC oxidizer classes.

Oxidizers used for maintenance purposes (e.g., pool chemicals) already have reduced MAQ restrictions (see 2021 International Fire Code, Table 5003.1.1(1), footnote k), and this proposal would be unlikely to have any cost impact on either construction or to the business itself for these types of chemicals.

Ammonium nitrate fertilizer has specific storage guidelines per IFC, which would still apply and any changes in this proposal would have no cost impact on this large industry.

Oxidizer storage in M- and S-occupancies is already permitted in large quantities, which eliminates the need to construct an expensive H-occupancy.

FCAC 6.1.5 (a) & (b) Appendix E: IFC-GHS comparison (6124)

IFC: E103.2, SECTION E104 (New), E104.1 (New), E104.2 (New), TABLE E104.2 (New), SECTION E105

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Fire Code

E103.2 Evaluation questions.

The following are sample evaluation questions:

1. What is the material? Correct identification is important; exact spelling is vital. Checking labels and SDS and asking responsible persons should be among the highest priorities.
2. What are the concentration and strength?
3. What is the physical form of the material? Liquids, gases and finely divided solids have differing requirements for spill and leak control and containment.
4. How much material is present? Consider in relation to permit amounts, *maximum allowable quantity per control area* (from Group H occupancy requirements), amounts that require detached storage and overall magnitude of the hazard.
5. What other materials (including furniture, equipment and building components) are close enough to interact with the material?
6. What are the likely reactions?
7. What is the activity involving the material?
8. How does the activity impact the hazardous characteristics of the material? Consider vapors released or hazards otherwise exposed.
9. What must the material be protected from? (For example, other materials, temperature, shock, pressure.)
10. What effects of the material must people and the environment be protected from?
11. How can protection be accomplished? Consider:
 - 11.1. Proper containers and equipment.
 - 11.2. Separation by distance or construction.
 - 11.3. Enclosure in cabinets or rooms.
 - 11.4. Spill control, drainage and containment.
 - 11.5. Control system ventilation, special electrical, detection and alarm, extinguishment, explosion venting, limit controls, exhaust scrubbers and excess flow control.
 - 11.6. Administrative (operational) control signs, ignition source control, security, personnel training, established procedures, storage plans and emergency plans.

Evaluation of the hazard is a strongly subjective process; therefore, the person charged with this responsibility must gather as much relevant data as possible so that the decision will be objective and within the limits prescribed in laws, policies and standards.

It could be necessary to cause the responsible persons in charge to have tests made by qualified persons or testing laboratories to support contentions that a particular material or process is or is not hazardous. See Section 104.8.2

Add new text as follows:

SECTION E104

GHS HAZARDOUS MATERIALS DEFINITIONS CONTENT

E104.1 Hazardous materials definitions. The categorization and classification of hazardous materials enables the code user to determine the applicability of requirements based on hazard category and class related to the physical and health hazards of materials. The current definitions found in Chapter 2 have been developed using criteria found in NFPA codes and standards, model fire prevention codes, NIOSH, requirements of the U.S. DOT, and by U.S. OSHA.

The chemical industry has grown substantially since the inception of the IFC hazard definitions. Large-scale global production and distribution of common and specialty chemicals has become mainstream. In the 1990s, the United Nations (UN) developed the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) to create international congruency among chemical suppliers. The GHS is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials.

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) published a revised Hazard Communication Standard (29 CFR 1910.1200) to align with the GHS in March 2012. It became effective in May 2012. All manufacturers selling, producing or transporting chemicals in the United States are now required to comply with the GHS and provide this standardized hazard information on all Safety Data Sheets (SDSs).

Safety Data Sheets are a primary source of information for identifying hazards for chemicals and mixtures containing hazardous materials. It can be helpful for fire code officials to become familiar with the GHS definitions and how they relate to IFC hazard definitions.

E104.2 GHS Hazardous Materials Definitions Comparison Table Table E104.2 provides a tabular presentation of the various definitions published within the International Fire Code. In addition, the table presents corresponding definitions, where available, from the 2012 edition of the Hazard Communication Standard developed by the Occupational Health and Safety Administration (OSHA) along with applicable hazard statement codes. OSHA's 2012 Hazard Communication Standard aligns with the United Nations' Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The Table is not meant to imply perfect alignment between IFC and GHS definitions.

TABLE E104.2
IFC AND GHS HAZARD DEFINITION COMPARISON

IFC MATERIAL	IFC CLASS	IFC DEFINITION	GHS 2017 (REV 7) CLASSIFICATION (H-CODE AND CATEGORY); HAZARD STATEMENT; DEFINITION
<u>Aerosol</u>		<u>A combination of a container, a propellant and a material that is dispensed. Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.</u>	<u>Any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state</u>
<u>Aerosol</u>	<u>Level 1</u>	<u>Those with a total chemical heat of combustion that is less than or equal to 8,600 Btu/lb (20 kJ/g).</u>	<p><u>H223, Category 3; Pressurized container: May burst if heated:</u></p> <p>1) <u>Any aerosol that contains \leq 1% flammable components (by mass) and that has a heat of combustion < 20 kJ/g; or</u></p> <p>2) <u>Any aerosol that contains $> 1\%$ (by mass) flammable components or which has a heat of combustion of ≥ 20 kJ/g but which, based on the results of the ignition distance test, the enclosed space ignition test or the aerosol foam flammability test, does not meet the criteria for Category 1 or Category 2</u></p>
<u>Aerosol</u>	<u>Level 2</u>	<u>Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20 kJ/g), but less than or equal to 13,000 Btu/lb (30 kJ/g).</u>	<p><u>H223, Category 2; Flammable aerosol. Pressurized container: May burst if heated:</u></p> <p>1) <u>Any aerosol that dispenses a spray that, based on the results of the ignition distance test, does not meet the criteria for Category 1, and which has:</u></p> <p>(a) <u>a heat of combustion of ≥ 20 kJ/g;</u></p> <p>(b) <u>a heat of combustion of < 20 kJ/g along with an ignition distance of ≥ 15 cm; or</u></p> <p>(c) <u>a heat of combustion of < 20 kJ/g and an ignition distance of < 15 cm along with either, in the enclosed space ignition test a time:</u></p> <p style="padding-left: 40px;">(i) <u>- a time equivalent of ≤ 300 s/m³; or</u></p> <p style="padding-left: 40px;">(ii) <u>- a deflagration density of ≤ 300 g/m³; or</u></p> <p>2) <u>Any aerosol that dispenses a foam that, based on the results of the aerosol foam flammability test, does not meet the criteria for Category 1, and which has a flame height of ≥ 4 cm and a flame duration of ≥ 2 s.</u></p>

<u>Aerosol</u>	<u>Level 3</u>	Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30kJ/g).	<p><u>H222, Category 1; Extremely flammable aerosol. Pressurized container: May burst if heated:</u></p> <p><u>1) Any aerosol that contains $\geq 85\%$ flammable components (by mass) and has a heat of combustion of ≥ 30 kJ/g;</u></p> <p><u>2) Any aerosol that dispenses a spray that, in the ignition distance test, has an ignition distance of ≥ 75 cm; or</u></p> <p><u>3) Any aerosol that dispenses a foam that, in the foam flammability test, has:</u></p> <p><u>(a) a flame height of ≥ 20 cm and a flame duration of ≥ 2 s; or</u></p> <p><u>(b) a flame height of ≥ 4 cm and a flame duration of ≥ 7 s.</u></p>
<u>Combustible liquid</u>	-	A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:	<u>A flammable liquid means a liquid having a flash point of not more than 93°C</u>
<u>Combustible liquid</u>	<u>II</u>	<u>Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).</u>	<u>H226, Category 3; Flammable liquid and vapour: Flash point $\geq 23^{\circ}\text{C}$ and $\leq 60^{\circ}\text{C}$</u>
<u>Combustible Liquid</u>	<u>IIIA</u>	<u>Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C)</u>	<u>H227, Category 4; Combustible liquid: Flash point $> 60^{\circ}\text{C}$ and $\leq 93^{\circ}\text{C}$</u>
<u>Combustible Liquid</u>	<u>IIIB</u>	<u>Liquids having closed cup flash points at or above 200°F (93°C).</u>	<u>N/A</u>

<u>Compressed Gas</u>	-	<p><u>A material or mixture of materials that:</u></p> <p><u>1) Is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure, and</u></p> <p><u>2) Has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) which is either liquefied, nonliquefied or in solution, except those gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (282 kPa) at 68°F (20°C).</u></p> <p><u>States of compressed gases:</u></p> <p><u>1) Nonliquefied compressed gases are gases, other than those in solution, which are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C).</u></p> <p><u>2) Liquefied compressed gases are gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C).</u></p> <p><u>3) Compressed gases in solution are nonliquefied gases that are dissolved in a solvent.</u></p> <p><u>4) Compressed gas mixtures consist of a mixture of two or more compressed gases contained in a packaging, the hazard properties of which are represented by the properties of the mixture as a whole.</u></p>	<p><u>Gases under pressure 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.</u></p> <p>-</p> <p><u>H280, compressed gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is entirely gaseous at -50°C (-58°F), including all gases with a critical temperature ≤ -50°C (-58°F).</u></p> <p>-</p> <p><u>H280, liquefied gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is partially liquid at temperatures above -50°C (-58°F).</u></p> <p><u>H280, dissolved gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is dissolved in a liquid phase solvent.</u></p>
<u>Corrosive</u>	-	<p><u>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 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.</u></p>	<p><u>H314, Category 1 (1A, 1B, 1C); Causes severe skin burns and eye damage: Skin corrosion refers to the production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.</u></p>
<u>Cryogenic fluid</u>	-	<p><u>A fluid having a boiling point lower than -130°F (-89.9°C) at 14.7 pounds per square inch atmosphere (psia) (an absolute pressure of 101.3 kPa)</u></p>	<p><u>H281, refrigerated liquefied gas; Contains refrigerated gas; May cause cryogenic burns or injury: A gas which is made partially liquid because of its low temperature.</u></p>

<u>Cryogenic - Flammable</u>	-	<u>A cryogenic fluid that is flammable in its vapor state.</u>	<u>H220, Category 1A; Extremely flammable gas; Gases, which at 20°C and a standard pressure of 101.3 kPa:</u> <u>(a) are ignitable when in a mixture of 13% or less by volume in air; or</u> <u>(b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B</u> <u>Category 1A includes Pyrophoric gases and Chemically unstable gases H281, refrigerated liquefied gas would also apply</u>
<u>Cryogenic - Inert</u>	-	<u>A cryogenic fluid that is inert.</u>	<u>H281, refrigerated liquefied gas; Contains refrigerated gas; May cause cryogenic burns or injury; A gas which is made partially liquid because of its low temperature.</u>
<u>Cryogenic - Oxidizing</u>	-	<u>An oxidizing gas in the cryogenic state.</u>	<u>H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.</u> <u>H281, refrigerated liquefied gas would also apply</u>
<u>Explosives</u>	-	<u>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 and igniters.</u> <u>The term "Explosive" includes any material determined to be within the scope of USC Title 18: Ch. 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn CFR Parts 100-185.</u>	<u>An explosive substance (or mixture) is a solid or liquid substance (or mixture of substances) 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 substances are included even when they do not evolve gases.</u>
<u>Explosives</u>	<u>Unstable Explosives</u>	-	<u>H200; Unstable Explosive: Unstable explosives are those which are thermally unstable and/or too sensitive for normal handling, transport and use. Special precautions are necessary.</u>
<u>Explosives</u>	<u>Division 1.1</u>	<u>Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.</u>	<u>H201; Explosive; mass explosion hazard: Substances, mixtures and articles which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously).</u>
<u>Explosives</u>	<u>Division 1.2</u>	<u>Explosives that have a projection hazard but not a mass explosion hazard.</u>	<u>H202; Explosive; severe projection hazard: Substances, mixtures and articles which have a projection hazard but not a mass explosion hazard.</u>

<u>Explosives</u>	<u>Division 1.3</u>	<u>Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.</u>	<u>H203; Explosive; fire, blast or projection hazard: Substances, mixtures, and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard:</u> <u>(i) combustion of which gives rise to considerable radiant heat; or</u> <u>(ii) which burn one after another, producing minor blast or projection effects or both;</u>
<u>Explosives</u>	<u>Division 1.4</u>	<u>Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.</u>	<u>H204; Fire or projection hazard: Substances, mixtures and articles which present no significant hazard: substances, mixtures and articles 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 instantaneous explosion of almost the entire contents of the package.</u>
<u>Explosives</u>	<u>Division 1.4G</u>	<u>Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visual or audible effects by combustion or deflagration that complies with the construction, chemical composition and labeling regulations of the DOTn for fireworks, UN 0336, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR Parts 1500 and 1507.</u>	<u>N/A</u>
<u>Explosives</u>	<u>Division 1.5</u>	<u>Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.</u>	<u>H205; May mass explode in fire: Very insensitive substances or mixtures which have a mass explosion hazard: substances and mixtures which have a mass explosion hazard but are so insensitive that there is very little probability or initiation or of transition from burning to detonation under normal conditions.</u>
<u>Explosives</u>	<u>Division 1.6</u>	<u>Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.</u>	<u>Extremely insensitive articles which do not have a mass explosion hazard: articles which predominantly contain extremely insensitive substances or mixtures and which demonstrate a negligible probability of accidental initiation or propagation.</u>

<u>Flammable Gas</u>	<u>Gaseous</u>	<p><u>A material which is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure [a material that has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa)] which:</u></p> <p><u>1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13% or less by volume with air; or</u></p> <p><u>2. Has a flammable range at 14.7 psia (101 kPa) with air of not less than 12%, regardless of the lower limit. The limits specified shall be determined at 14.7 psia (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.</u></p>	<p><u>A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa</u></p> <p>-</p> <p><u>H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa:</u></p> <p><u>(a) are ignitable when in a mixture of 13% or less by volume in air; or</u></p> <p><u>(b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B</u></p> <p><u>Category 1A includes Pyrophoric gases and Chemically unstable gases</u></p> <p><u>H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either:</u></p> <p><u>(a) a lower flammability limit of more than 6% by volume in air; or</u></p> <p><u>(b) a fundamental burning velocity of less than 10 cm/s</u></p> <p>-</p> <p><u>H280, compressed gas would also apply</u></p>
----------------------	----------------	--	--

<u>Flammable Gas</u>	<u>Liquefied</u>	<p><u>A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20 °C) and which is flammable.</u></p>	<p><u>A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa</u></p> <p>-</p> <p><u>H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa:</u></p> <p><u>(a) are ignitable when in a mixture of 13% or less by volume in air; or</u></p> <p><u>(b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B</u></p> <p><u>Category 1A includes Pyrophoric gases and Chemically unstable gases</u></p> <p>-</p> <p><u>H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either:</u></p> <p><u>(a) a lower flammability limit of more than 6% by volume in air; or (b) a fundamental burning velocity of less than 10 cm/s</u></p> <p>-</p> <p><u>AND</u></p> <p>-</p> <p><u>A gas which when packaged under pressure, is partially liquid at temperatures above -50°C. A distinction is made between:</u></p> <p><u>(a) High pressure liquefied gas: a gas with a critical temperature between -50°C and +65°C and</u></p> <p><u>(b) Low pressure liquefied gas: a gas with a critical temperature above +65°C. Refrigerated liquefied gas A gas which when packaged is made partially liquid because of its low temperature. Dissolved gas A gas which when packaged under pressure is dissolved in a liquid phase solvent.</u></p> <p><u>H280, liquefied gas would also apply</u></p>
<u>Flammable Liquid</u>	-	<p><u>A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows</u></p>	<p><u>A liquid having a flash point of not more than 93°C. A flammable liquid is classified in one of the four categories for this class according to the following table:</u></p>
<u>Flammable Liquid</u>	<u>IA</u>	<p><u>Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).</u></p>	<p><u>H224, Category 1; Extremely flammable liquid and vapour:</u></p> <p><u>Flash point < 23°C and initial boiling point <= 35°C</u></p>

<u>Flammable Liquid</u>	<u>IB</u>	<u>Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).</u>	<u>H225, Category 2; Highly flammable liquid and vapour.</u> <u>Flash point < 23°C and initial boiling point > 35°C</u>
<u>Flammable Liquid</u>	<u>IC</u>	<u>Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).</u>	<u>H226, Category 3; Flammable liquid and vapour.</u> <u>Flash point >= 23°C and <= 60°C</u>
<u>Flammable Solid</u>	-	<u>A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption of moisture, spontaneous chemical change or retaining 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 1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.0866 inch (2.2 mm) per second along its major axis.</u>	<u>A flammable solid is a solid which is readily combustible, or may cause or contribute to fire through friction.</u> - <u>A flammable solid is classified in one of the two categories for this class using method N.1 as described in Part III, sub-section 33.2.1 of the Manual of Tests and Criteria, according to:</u> - <u>H228, Category 1; Flammable solid: Burning rate test: Substances or mixtures other than metal powders:</u> <u>(a) wetted zone does not stop fire; and</u> <u>(b) burning time < 45 s or burning rate > 2.2 mm/s</u> <u>Metal powders: burning time <= 5 min</u> - <u>H228, Category 2; Flammable solid: Burning rate test: Substances or mixtures other than metal powders:</u> <u>(c) wetted zone stops the fire for at least 4 min; and</u> <u>(d) burning time < 45 s or burning rate > 2.2 mm/s</u> <u>Metal powders: burning time > 5 min and <= 10 min</u>

Highly Toxic	-	<p><u>A material which produces a lethal dose or lethal concentration which falls within any of the following categories:</u></p> <p><u>1. A chemical that has a median lethal dose (LD50) of 50 mg or less per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each.</u></p> <p><u>2. A chemical that has a medial lethal dose (LD50) of 200 mg or less per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each.</u></p> <p><u>3. 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 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g.</u></p>	<p><u>Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture.</u></p> <p>-</p> <p><u>Oral</u></p> <p><u>H300, Category 1; Fatal if swallowed: LD50 ≤ 5 mg/kg bodyweight</u></p> <p>-</p> <p><u>H300, Category 2; Fatal if swallowed: LD50 > 5 ≤ 50 mg/kg bodyweight</u></p> <p>-</p> <p><u>Dermal</u></p> <p><u>H310, Category 1; Fatal in contact with skin: LD50 ≤ 50 mg/kg bodyweight</u></p> <p>-</p> <p><u>H310, Category 2; Fatal in contact with skin: LD50 > 50 ≤ 200 mg/kg bodyweight</u></p> <p>-</p> <p><u>Inhalation</u></p> <p><u>H330, Category 1; Fatal if inhaled:</u></p> <p><u>Gases: LC50 ≤ 100 ppm (4 hr) ≈ 200 ppm (1 hr)</u></p> <p>-</p> <p><u>Vapours: LC50 ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr)</u></p> <p><u>Dust/mist: LC50 ≤ 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr)</u></p>
Inert Gas	-	<p><u>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.</u></p>	<p><u>Gases under pressure are gases which are contained in receptacles at a pressure of 200 kPa (gauge) or more at 20°C or which are liquefied or liquefied and refrigerated. They comprise compressed gases, liquefied gases, dissolved gases, and refrigerated liquefied gases.</u></p> <p><u>See Compressed gases/Gases under pressure.</u></p>

<u>Organic Peroxide</u>	-	<u>An organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides can present an explosion hazard (detonation or deflagration) or they can be shock sensitive. They can also decompose into various unstable compounds over an extended period of time.</u>	<u>Organic peroxides are liquid or solid organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term also includes organic peroxide formulations (mixtures). Organic peroxides are thermally unstable substances or mixtures, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties:</u> - <u>(a) be liable to explosive decomposition;</u> <u>(b) burn rapidly;</u> <u>(c) be sensitive to impact or friction;</u> <u>(d) react dangerously with other substances.</u>
<u>Organic peroxide</u>	<u>UD</u>	<u>Organic peroxides that are capable of detonation. These peroxides pose an extremely high-explosion hazard through rapid explosive decomposition</u>	<u>H240, Organic Peroxide, Type A; Heating may cause an explosion: (a) Any organic peroxide which, as packaged, can detonate or deflagrate rapidly will be defined as organic peroxide TYPE A;</u>
<u>Organic Peroxide</u>	<u>I</u>	<u>Describes those formulations that are capable of deflagration but not detonation.</u>	<u>H241, Organic Peroxide, Type B; Heating may cause a fire or explosion:</u> <u>(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</u> <u>will be defined as organic peroxide TYPE B;</u>

<u>Organic Peroxide</u>	<u>II</u>	<u>Describes those formulations that burn very rapidly and that pose a moderate reactivity hazard</u>	<p><u>H242, Organic Peroxide, Type C; Heating may cause a fire:</u></p> <p><u>(c) Any organic peroxide possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as organic peroxide TYPE C;</u></p> <p>-</p> <p><u>H242, Organic Peroxide, Type D; Heating may cause a fire:</u></p> <p><u>(d) Any organic peroxide which in laboratory testing:</u></p> <p>-</p> <p><u>(i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or</u></p> <p><u>(ii) does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or</u></p> <p><u>(iii) does not detonate or deflagrate at all and shows a medium effect when heated under confinement; will be defined as organic peroxide TYPE D;</u></p>
<u>Organic Peroxide</u>	<u>III</u>	<u>Describes those formulations that burn rapidly and that pose a moderate reactivity hazard.</u>	<p><u>H242, Organic Peroxide, Type E; Heating may cause a fire:</u></p> <p><u>(e) Any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as organic peroxide TYPE E;</u></p>
<u>Organic Peroxide</u>	<u>IV</u>	<u>Describes those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.</u>	<p><u>H242, Organic Peroxide, Type F; Heating may cause a fire:</u></p> <p><u>(f) 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 will be defined as organic peroxide TYPE F;</u></p>

<u>Organic peroxide</u>	<u>V</u>	<u>Describes those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.</u>	<p><u>H240, Organic Peroxide, Type G; Heating may cause a fire:</u></p> <p><u>(g) 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 explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60 °C or higher for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point of not less than 150 °C is used for desensitization, will be defined as organic peroxide TYPE G. If the organic peroxide is not thermally stable or a diluent having a boiling point less than 150 °C is used for desensitization, it shall be defined as organic peroxide TYPE F.</u></p>
<u>Oxidizer</u>		<p><u>A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition.</u></p>	<p><u>An oxidizing solid is a solid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.</u></p> <p><u>An oxidizing liquid is a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.</u></p>
<u>Oxidizer</u>	<u>4</u>	<u>An oxidizer that can undergo an explosive reaction due to contamination or exposure to a thermal or physical shock that causes a severe increase in the burning rate of combustible materials with which it comes into contact. Additionally, the oxidizer causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.</u>	<p><u>H271, Category 1; May cause fire or explosion; strong oxidizer:</u></p> <p>–</p> <p><u>Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Test O.1—Any substance or mixture 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. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose.</u></p> <p><u>Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.</u></p>

<u>Oxidizer</u>	<u>3</u>	<u>An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes in contact.</u>	<p>H271, Category 1; May cause fire or explosion; <u>strong oxidizer</u>;</p> <p><u>Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Test O.1—Any substance or mixture 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. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose.</u></p> <p><u>Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.</u></p>
<u>Oxidizer</u>	<u>2</u>	<u>An oxidizer that will cause a moderate increase in the burning rate of combustible materials with which it comes in contact.</u>	<p>H272, Category 2; May intensify fire, oxidizer</p> <p>-</p> <p><u>Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Test O.1—Any substance or mixture 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. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:1 mixture (by mass) of calcium peroxide and cellulose and the criteria for Category 1 are not met.</u></p> <p>-</p> <p><u>Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) 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 a 40% aqueous sodium chlorate solution and cellulose; and the criteria for Category 1 are not met.</u></p>

<u>Oxidizer</u>	<u>1</u>	<u>An oxidizer that does not moderately increase the burning rate of combustible materials.</u>	<p>H272, Category 3; May intensify fire, oxidizer</p> <p>-</p> <p><u>Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Test O.1—Any substance or mixture 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. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose and the criteria for Categories 1 and 2 are not met.</u></p> <p><u>Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria):</u> <u>Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) 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 a 65% aqueous nitric acid solution and cellulose; and the criteria for Categories 1 and 2 are not met.</u></p>
<u>Oxidizing gas</u>	<u>Gaseous</u>	<u>A gas that can support and accelerate combustion of other materials more than air does.</u>	<p><u>Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.</u></p> <p>-</p> <p>H270, Category 1; May cause or intensify fire; oxidizer: <u>Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.</u></p> <p>H280, compressed gas would also apply</p>
<u>Oxidizing gas</u>	<u>Liquefied</u>	<u>An oxidizing gas that is liquefied (liquefied gases are gases that, in a packaging under the charged pressure, are partially liquid at 68°F (20°C).</u>	<p><u>Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.</u></p> <p>-</p> <p>H270, Category 1; May cause or intensify fire; oxidizer: <u>Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.</u></p> <p>H280, liquefied gas would also apply</p>
<u>Pyrophoric</u>		<u>A chemical with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).</u>	<u>Separate definitions based upon physical state, see below:</u>

<u>Pyrophoric</u>	<u>Solid</u>	<u>A solid with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).</u>	<p>H250, Category 1; Pyrophoric solid, Catches fire spontaneously if exposed to air: A pyrophoric solid is a solid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air.</p> <p>Classification criteria: The solid ignites within 5 min of coming into contact with air.</p>
<u>Pyrophoric</u>	<u>Liquid</u>	<u>A liquid with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).</u>	<p>H250, Category 1; Pyrophoric liquid, Catches fire spontaneously if exposed to air: A pyrophoric liquid is a liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air.</p> <p>Classification criteria: 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. Testing is performed at 25 ±2°C and 50 ±5% relative humidity.</p>
<u>Pyrophoric</u>	<u>Gas</u>	<u>A gas with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).</u>	<p>H220, Category 1A; Extremely flammable gas. May ignite spontaneously if exposed to air: A pyrophoric gas is a flammable gas that is liable to ignite spontaneously in air at a temperature of 54°C or below.</p> <p>H280, compressed (or liquefied) gas would also apply.</p>

<p><u>Toxic</u></p>		<p>A chemical falling within any of the following categories:</p> <p>1. A chemical that has a median lethal dose (LD50) of more than 50 mg per kg, but not more than 500 mg per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each.</p> <p>2. A chemical that has a medial lethal dose (LD50) of more than 200 mg per kg but not more than 1,000 mg per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each.</p> <p>3. A chemical that has a median lethal concentration (LC50) in air of more than 200 ppm but not more than 2,000 ppm by volume or less 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 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g</p>	<p><u>Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture.</u></p> <p>-</p> <p><u>Oral</u></p> <p><u>H301, Category 3; Toxic if swallowed: LD50 > 50 ≤ 300 mg/kg bodyweight</u></p> <p>-</p> <p><u>H302, Category 4; Harmful if swallowed: LD50 > 300 ≤ 2,000 mg/kg bodyweight</u></p> <p>-</p> <p><u>Dermal</u></p> <p><u>H311, Category 3, Toxic in contact with skin: LD50 > 200 ≤ 1,000 mg/kg bodyweight</u></p> <p>-</p> <p><u>Inhalation</u></p> <p><u>H330, Category 2; Fatal if inhaled:</u></p> <p><u>Gases: LC50 > 100 ppm (4 hr) ≈ 200 ppm (1 hr) ≤ 500 ppm (4 hr) ≈ 1,000 ppm (1 hr)</u></p> <p>-</p> <p><u>Vapours: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 2 mg/l (4 hr) ≈ 8 mg/l (1 hr)</u></p> <p>-</p> <p><u>Dust/mist: LC50 > 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr) ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr)</u></p> <p>-</p> <p><u>H331, Category 3; Toxic if inhaled:</u></p> <p><u>Gases: LC50 > 500 ppm (4 hr) ≈ 1,000 ppm (1 hr) ≤ 2,500 ppm (4 hr) ≈ 5,000 ppm (1 hr)</u></p> <p><u>Vapours: LC50 > 2 mg/l (4 hr) ≈ 8 mg/l (1 hr) ≤ 10 mg/l (4 hr) ≈ 40 mg/l (1 hr)</u></p> <p>-</p> <p><u>Dust/mist: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 1 mg/l (4 hr) ≈ 4 mg/l (1 hr)</u></p>
---------------------	--	---	---

<u>Unstable (reactive)</u>		<u>A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials are subdivided as follows:</u>	<p><u>Self-reactive substances or mixtures are thermally unstable liquids or solid substances or mixtures liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes substances and mixtures classified under the GHS as explosives, organic peroxides or as oxidizing.</u></p> <p><u>A self-reactive substance or mixture 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.</u></p>
<u>Unstable (reactive)</u>	<u>4</u>	<u>Materials that in themselves are readily capable of detonation or of 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.</u>	<p><u>H240, Type A; Heating may cause an explosion: (a) Any self-reactive substance or mixture which can detonate or deflagrate rapidly, as packaged, will be defined as self-reactive substance TYPE A;</u></p>
<u>Unstable (reactive)</u>	<u>3</u>	<u>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 the elevated temperatures and pressures.</u>	<p><u>H241, Type B; Heating may cause a fire or explosion: (b) Any self-reactive substance or mixture possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package will be defined as self-reactive substance TYPE B;</u></p>
<u>Unstable (reactive)</u>	<u>2</u>	<p><u>Materials that in themselves are 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.</u></p>	<p><u>H242, Type C; Heating may cause a fire: (c) Any self-reactive substance or mixture possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as self-reactive substance TYPE C;</u></p> <p>-</p> <p><u>H242, Type D; Heating may cause a fire: (d) Any self-reactive substance or mixture which in laboratory testing:</u></p> <p><u>(i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or</u></p> <p><u>(ii) does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or</u></p> <p><u>(iii) does not detonate or deflagrate at all and shows a medium effect when heated under confinement;</u></p> <p><u>will be defined as self-reactive substance TYPE D;</u></p>

<u>Unstable (Reactive)</u>	<u>1</u>	<p><u>Materials that in themselves are normally stable but which can become unstable at elevated temperatures and pressures.</u></p>	<p>H242, Type E; Heating may cause a fire: (e) <u>Any self-reactive substance or mixture which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as self-reactive substance TYPE E;</u></p> <p>H242, Type F; Heating may cause a fire: (f) <u>Any self-reactive substance or mixture 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 will be defined as self-reactive substance</u></p> <p><u>TYPE F;</u></p> <p>-</p> <p><u>(g) Any self-reactive substance or mixture 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 to 75 °C for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150 °C is used for desensitization will be defined as self-reactive substance TYPE G. If the mixture is not thermally stable or a diluent having a boiling point less than 150 °C is used for desensitization, the mixture shall be defined as self-reactive substance TYPE F</u></p>
<u>Unstable (reactive) gas</u>	<u>Gaseous</u>		<p><u>A chemically unstable gas is a flammable gas that is able to react explosively even in the absence of air or oxygen.</u></p> <p>-</p> <p><u>H220, Category 1A, Category A; Extremely flammable gas. May react explosively even in the absence of air: Flammable gases which are chemically unstable at 20 °C and a standard pressure of 101.3 kPa.</u></p> <p>-</p> <p><u>H220, Category 1A, Category B; Extremely flammable gas. May react explosively even in the absence of air at elevated pressure and/or temperature: Flammable gases which are chemically unstable at a temperature greater than 20 °C and/or a standard pressure greater than 101.3 kPa.</u></p> <p>-</p> <p><u>H280, compressed gas would also apply.</u></p>

<u>Water reactive</u>	<u>3</u>	<u>Materials that react explosively with water without requiring heat or confinement.</u>	<u>H260, Category 1; In contact with water releases flammable gases which may ignite spontaneously. Any substance or mixture 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 substance over any one minute. (UN/DOT test methods: Test N.5, Part III, sub-section 33.4.1.4)</u>
<u>Water reactive</u>	<u>2</u>	<u>Materials that react violently with water or have the ability to boil water. Materials that produce flammable, toxic or other hazardous gases, or evolve enough heat to cause autoignition of combustibles upon exposure to water or moisture.</u>	<u>H261, Category 2; In contact with water releases flammable gas: Any substance or mixture 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 kilogram of substance per hour, and which does not meet the criteria for Category 1.</u>
<u>Water reactive</u>	<u>1</u>	<u>Materials that react with water with some release of energy, but not violently.</u>	<u>H261, Category 3; In contact with water releases flammable gas: Any substance or mixture 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 liters per kilogram of substance per hour, and which does not meet the criteria for Categories 1 and 2.</u>

a. The table illustrates that there is not perfect alignment between the IFC and GHS definitions and provides information on similarities and difference between the two classification systems.

Revise as follows:

SECTION ~~E104~~ E105 REFERENCED STANDARDS

Reason: Fire Code officials must enforce the hazardous materials provisions of the International Fire Code (IFC) and the International Building Code (IBC) to ensure that people and property in our communities are safe. Consequences of missing or incorrect classification include increased fire and life safety risk and can lead to misclassification of an occupancy.

United Nations (UN) reference is added to provide Fire Code officials the option to compare IFC and GHS hazardous materials definitions. The UN's Globally Harmonized System (GHS) is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (29 CFR 1910.1200 and 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the information readily available in product Safety Data Sheets (SDSs). Adding a comparison between IFC and GHS definitions to illustrate the differences and similarities better informs code officials faced with validating classifications of hazardous materials.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: <https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. If the GHS categories were used to inform IFC hazard classification, there would be no change in the cost of construction.

New Section 203 Occupancy Classification (6288)

IFC: SECTION 202, 203 (New), 203.1 (New), 203.1.1 (New), 203.2 (New), 203.2.1 (New), 203.2.2 (New), 203.2.3 (New), 203.2.4 (New), 203.3 (New), 203.4 (New), 203.5 (New), 203.6 (New), 203.7 (New), 203.8 (New), 203.8.1 (New), 203.8.2 (New), 203.8.3 (New), 203.9 (New), 203.9.1 (New), 203.10 (New), 203.10.1 (New), 203.10.2 (New), 203.10.3 (New), 203.11 (New), 203.12 (New), 203.13 (New), 203.13.1 (New), 203.14 (New), 203.15 (New), 203.15.1 (New), 203.16 (New), 203.16.1 (New), 203.17 (New), 203.17.1 (New), 203.18 (New), 203.19 (New), 203.20 (New), 203.21 (New), 203.22 (New), 203.23 (New), 203.23.1 (New), 203.23.2 (New), 203.23.3 (New), 203.23.4 (New), 203.24 (New), 203.24.1 (New), 203.24.1.1 (New), 203.24.1.2 (New), 203.24.2 (New), 203.25 (New), 203.25.1 (New), 203.25.2 (New), 203.25.3 (New), 203.25.4 (New), 203.25.5 (New), 203.26 (New), 203.26.1 (New), 203.26.2 (New), 203.26.3 (New), 203.26.4 (New), 203.27 (New), 203.27.1 (New), 203.27.2 (New), 203.28 (New), 203.29 (New), 203.30 (New), 203.31 (New), 203.31.1 (New), 203.31.2 (New), 203.32 (New), 203.32.1 (New), 203.32.2 (New), 203.33 (New), 203.33.1 (New), 203.33.2 (New), 203.34 (New), 203.35 (New), 203.35.1 (New), 203.36 (New), 203.36.1 (New), 203.36.2 (New), 203.36.3 (New)

Proponents: Crystal Sujeski, California Fire Chiefs Association, representing California Fire Chiefs Association (crystal.sujeski@fire.ca.gov); Robert Marshall, San Mateo Consolidated Fire Department, representing San Mateo Consolidated Fire Department (rmarshall@smcfire.org)

2021 International Fire Code

Delete without substitution:

~~OCCUPANCY CLASSIFICATION.~~ For the purposes of this code, certain occupancies are defined as follows:

~~[BG] Group A, Assembly.~~ Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption; or awaiting transportation.

~~[BG] Accessory with places of religious worship.~~ Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 per room or space are not considered separate occupancies.

~~[BG] Assembly Group A-1.~~ Group A occupancy includes assembly uses, usually with fixed seating, intended for the production and viewing of performing arts or motion pictures including, but not limited to:

- ~~Motion picture theaters~~
- ~~Symphony and concert halls~~
- ~~Television and radio studios admitting an audience~~
- ~~Theaters~~

~~[BG] Assembly Group A-2.~~ Group A-2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:

- ~~Banquet halls~~
- ~~Casinos (gaming areas)~~
- ~~Night clubs~~
- ~~Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)~~
- ~~Taverns and bars~~

~~[BG] Assembly Group A-3.~~ Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A, including, but not limited to:

- ~~Amusement arcades~~
- ~~Art galleries~~
- ~~Bowling alleys~~
- ~~Community halls~~
- ~~Courtrooms~~
- ~~Dance halls (not including food or drink consumption)~~
- ~~Exhibition halls~~
- ~~Funeral parlors~~
- ~~Greenhouses with public access for the conservation and exhibition of plants~~
- ~~Gymnasiums (without spectator seating)~~
- ~~Indoor swimming pools (without spectator seating)~~
- ~~Indoor tennis courts (without spectator seating)~~
- ~~Lecture halls~~
- ~~Libraries~~
- ~~Museums~~
- ~~Places of religious worship~~
- ~~Pool and billiard parlors~~

~~Waiting areas in transportation terminals~~

[BG] Assembly Group A-4. Group A-4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

~~Arenas
Skating rinks
Swimming pools
Tennis courts~~

[BG] Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

~~Amusement park structures
Bleachers
Grandstands
Stadiums~~

[BG] Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

[BG] Small assembly spaces. The following rooms and spaces shall not be classified as assembly occupancies:

1. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
2. A room or space used for assembly purposes that is less than 750 square feet (70 m²) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

[BG] Small buildings and tenant spaces. A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.

[BG] Special amusement areas. Special amusement areas shall comply with Section 411 of the *International Building Code*.

[BG] Group B, Business. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

~~Airport traffic control towers
Ambulatory care facilities
Animal hospitals, kennels and pounds
Banks
Barber and beauty shops
Car wash
Civic administration
Clinic-outpatient
Dry cleaning and laundries: pick-up and delivery stations and self-service
Educational occupancies for students above the 12th grade, including higher education laboratories
Electronic data processing
Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m²) in area.
Laboratories: testing and research
Motor vehicle showrooms
Post offices
Print shops
Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
Radio and television stations
Telephone exchanges
Training and skill development not in a school or academic program (This shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the age served, and where not classified as a Group A occupancy).~~

[BG] Airport traffic control towers. Airport traffic control towers shall comply with Section 412.2 of the *International Building Code*.

[BG] Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422 of the *International Building Code*.

[BG] Higher education laboratories. Higher education laboratories shall comply with Section 428 of the *International Building Code*.

[BG] Group E, Educational. Educational Group E occupancy includes, among others, the use of a building or structure, or

a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

[BG] Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 of the International Building Code and have occupant loads of less than 100 per room or space shall be classified as Group A-3 occupancies.

[BG] Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 2¹/₂ years of age who receive educational, supervision or *personal care services* for less than 24 hours per day.

[BG] Five or fewer children. A facility having five or fewer children receiving such care shall be classified as part of the primary occupancy.

[BG] Five or fewer children in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer children receiving such care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

[BG] Within places of worship. Rooms and spaces within places of worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4 of the *International Building Code*.

[BG] Group F, Factory Industrial. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H high hazard or Group S storage occupancy.

[BG] Factory Industrial F-1 Moderate hazard occupancy. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages; over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Energy storage systems (ESS) in dedicated-use buildings
- Engines (including rebuilding)
- Food processing and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m²) in area.
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- Motion pictures and television filming (without spectators)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Refuse incineration
- Shoes
- Soaps and detergents

Textiles
Tobacco
Trailers
Upholstering
Water/sewer treatment facilities
Wood, distillation
Woodworking (cabinet)

[BG] Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6 of the *International Building Code*.

[BG] Factory Industrial F-2 Low-hazard Occupancy. Factory industrial uses involving the fabrication or manufacturing of noncombustible materials that, during finishing, packaging or processing do not involve a significant fire hazard, shall be classified as Group F-2 occupancies and shall include, but not be limited to, the following:

Beverages, up to and including 16 percent alcohol content
Brick and masonry
Ceramic products
Foundries
Glass products
Gypsum
Ice
Metal products (fabrication and assembly)

Group H, High-hazard. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 5003.8.3, based on the maximum allowable quantity limits for control areas set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Section 415 of the *International Building Code*. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with this code.

High-hazard Group H-1. Buildings and structures containing materials that pose a *detonation* hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:

Detonable pyrophoric materials
Explosives:

- Division 1.1
- Division 1.2
- Division 1.3
- Division 1.4
- Division 1.5
- Division 1.6

Organic peroxides, unclassified detonable
Oxidizers, Class 4
Unstable (reactive) materials, Class 3 detonable, and Class 4

High-hazard Group H-2. Buildings and structures containing materials that pose a *deflagration* hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or *combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)
Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the *International Building Code*
Cryogenic fluids, flammable
Flammable gases
Organic peroxides, Class I
Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)
Pyrophoric liquids, solids and gases, nondetonable

Unstable (reactive) materials, Class 3, nondetonable
Water-reactive materials, Class 3

High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

- ~~Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less~~
- ~~Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the International Building Code~~
- ~~Consumer fireworks, 1.4G (Class C, Common)~~
- ~~Cryogenic fluids, oxidizing~~
- ~~Flammable solids~~
- ~~Organic peroxides, Class II and III~~
- ~~Oxidizers, Class 2~~
- ~~Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less~~
- ~~Oxidizing gases~~
- ~~Unstable (reactive) materials, Class 2~~
- ~~Water-reactive materials, Class 2~~

High-hazard Group H-4. Buildings and structures containing materials that are health hazards shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

- ~~Corrosives~~
- ~~Highly toxic materials~~
- ~~Toxic materials~~

High-hazard Group H-5. Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those listed in Tables 5003.1.1(1) and 5003.1.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.11 of the International Building Code.

Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

Occupancies containing explosives not classified as H-1. The following occupancies containing explosive materials shall be classified as follows:

- ~~1.Division 1.3 explosive materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire hazard to mass explosion hazard shall be allowed in Group H-2 occupancies.~~
- ~~2.Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.~~

Uses other than Group H. The storage, use or handling of hazardous materials as described in one or more of the following items shall not cause the occupancy to be classified as Group H, but it shall be classified as the occupancy that it most nearly resembles:

- ~~1.Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the International Building Code.~~
- ~~2.Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to Chapter 57.~~
- ~~3.Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.~~
- ~~4.Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers in accordance with Section 707 of the International Building Code or 1-hour horizontal assemblies in accordance with Section 711 of the International Building Code, or both.~~
- ~~5.Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).~~
- ~~6.Liquor stores and distributors without bulk storage.~~
- ~~7.Refrigeration systems.~~
- ~~8.The storage or utilization of materials for agricultural purposes on the premises.~~
- ~~9.Stationary storage battery systems installed in accordance with Section 1207.~~
- ~~10. Corrosive personal or household products in their original packaging used in retail display.~~
- ~~11.Commonly used corrosive building materials.~~
- ~~12.Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol products shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.~~

- ~~13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the *maximum allowable quantity per control area* in Group M or S occupancies complying with Section 5003.8.3.5.1.~~
- ~~14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided that such storage conforms to the quantity limits and requirements of this code.~~
- ~~15. Stationary fuel cell power systems installed in accordance with this code.~~
- ~~16. *Capacitor energy storage systems* in accordance with this code.~~
- ~~17. Group B higher education laboratory occupancies complying with Section 428 of the International Building Code and Chapter 38 of this code.~~
- ~~18. Distilling or brewing of beverages conforming to the requirements of this code.~~
- ~~19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of this code.~~

[BG] Group I, Institutional. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

[BG] Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions indicated below and shall comply with Section 420 of the *International Building Code*. This group shall include, but not be limited to, the following:

- ~~Alcohol and drug centers~~
- ~~Assisted living facilities~~
- ~~Congregate care facilities~~
- ~~Group homes~~
- ~~Halfway houses~~
- ~~Residential board and care facilities~~
- ~~Residential board and custodial care facilities~~
- ~~Social rehabilitation facilities~~

[BG] Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving custodial care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

[BG] Six to 16 persons receiving custodial care. A facility housing not fewer than six and not more than 16 persons receiving custodial care shall be classified as Group R-4.

[BG] Institutional Group I-2. Institutional Group I-2 occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

- ~~Foster care facilities~~
- ~~Detoxification facilities~~
- ~~Hospitals~~
- ~~Nursing homes~~
- ~~Psychiatric hospitals~~

[BG] Occupancy Conditions. Buildings of Group I-2 shall be classified as one of the following occupancy conditions and shall comply with Section 407 of the *International Building Code*:

[BG] Condition 1. This occupancy condition shall include facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics, or inpatient stabilization units for psychiatric or detoxification, including, but not limited to, nursing homes and foster care facilities.

[BG] Condition 2. This occupancy condition shall include facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics, or inpatient stabilization units for psychiatric or detoxification, including, but not limited to, hospitals.

[BG] Five or fewer persons receiving medical care. A facility with five or fewer persons receiving medical care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

[BG] Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures which are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are

generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

- Correctional centers
- Detention centers
- Jails
- Prerelease centers
- Prisons
- Reformatories

Buildings of Group I-3 shall be classified as one of the following occupancy conditions and shall comply with Section 408 of the *International Building Code*:

[BG] Condition 1. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via *means of egress* without restraint. A Condition 1 facility is permitted to be constructed as Group R.

[BG] Condition 2. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied *smoke compartment* to one or more other *smoke compartments*. Egress to the exterior is impeded by locked exits.

[BG] Condition 3. This occupancy condition shall include buildings in which free movement is allowed within individual *smoke compartments*, such as within a residential unit comprised of individual *sleeping units* and group activity spaces, where egress is impeded by remote-controlled release of *means of egress* from such *smoke compartment* to another *smoke compartment*.

[BG] Condition 4. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

[BG] Condition 5. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

[BG] Institutional Group I-4, day care facilities. Institutional Group I-4 shall include buildings and structures occupied by more than five persons of any age who receive custodial care for less than 24 hours by persons other than parents or guardians; relatives by blood, marriage, or adoption; and in a place other than the home of the person cared for. This group shall include, but not be limited to, the following:

- Adult day care
- Child day care

[BG] Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children 2½ years or less of age, where the rooms in which the children are cared for are located on a *level of exit discharge* serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

[BG] Five or fewer occupants receiving care in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer persons receiving custodial care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

[BG] Five or fewer occupants receiving care. A facility having five or fewer persons receiving custodial care shall be classified as part of the primary occupancy.

[BG] Within a place of religious worship. Rooms and spaces within places of religious worship providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] Group M, Mercantile. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Greenhouses with public access that maintain plants for display and sale
- Markets
- Motor fuel dispensing facilities
- Retail or wholesale stores
- Sales rooms

[BG] Motor fuel dispensing facilities. Motor fuel dispensing facilities shall comply with Section 406.7 of the *International Building Code*.

[BG] Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 5704.3.4.1.

[BG] Group R, Residential. Residential Group R includes, among others, the use of a building or structure, or a portion

thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2 of the *International Building Code*. Group R occupancies not constructed in accordance with the *International Residential Code* as permitted by Sections 310.4.1 and 310.4.2 of the *International Building Code* shall comply with Section 420 of the *International Building Code*.

[BG] Residential Group R-1. Residential Group R-1 occupancies containing *sleeping units* where the occupants are primarily transient in nature, including:

- ~~Boarding houses (transient) with more than 10 occupants~~
- ~~Congregate living facilities (transient) with more than 10 occupants~~
- ~~Hotels (transient)~~
- ~~Motels (transient)~~

[BG] Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

- ~~Apartment houses~~
- ~~Congregate living facilities (nontransient) with more than 16 occupants~~

- ~~Boarding houses (nontransient)~~
- ~~Convents~~
- ~~Dormitories~~
- ~~Fraternities and sororities~~
- ~~Monasteries~~
- ~~Hotels (nontransient)~~
- ~~Live/work units~~
- ~~Motels (nontransient)~~
- ~~Vacation timeshare properties~~

[BG] Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- ~~Buildings that do not contain more than two *dwelling units*~~
- ~~Care facilities that provide accommodations for five or fewer persons receiving care~~
- ~~Congregate living facilities (nontransient) with 16 or fewer occupants~~

- ~~Boarding houses (nontransient)~~
- ~~Convents~~
- ~~Dormitories~~
- ~~Fraternities and sororities~~
- ~~Monasteries~~
- ~~Congregate living facilities (transient) with 10 or fewer occupants~~

- ~~Boarding houses (transient)~~
- ~~Lodging houses (transient) with five or fewer guestrooms and 10 or fewer occupants~~

[BG] Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code*.

[BG] Lodging houses. Owner-occupied *lodging houses* with five or fewer guestrooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code*.

[BG] Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. Buildings of Group R-4 shall be classified as one of the occupancy conditions indicated below.

This group shall include, but not be limited to, the following:

- ~~Alcohol and drug centers~~
- ~~Assisted living facilities~~
- ~~Congregate care facilities~~
- ~~Group homes~~
- ~~Halfway houses~~
- ~~Residential board and care facilities~~
- ~~Social rehabilitation facilities~~

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the *International Building Code*.

[BG] Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] Group S, Storage. Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

[BG] Group S-1 moderate-hazard storage. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- Aerosols, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Beverages over 16 percent alcohol content
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber
- Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 5003.1.1(1) (see Section 406.8 of the International Building Code)
- Photo engravings
- Resilient flooring
- Self-service storage facility (mini-storage)
- Silks
- Soaps
- Sugar
- Tires, bulk storage of Tobacco, cigars, cigarettes and snuff
- Upholstery and mattresses
- Wax candles

[BG] Aircraft hangars. Aircraft hangars used for storage or repair shall comply with Section 412.3 of the *International Building Code*.

[BG] Motor vehicle repair garages. Motor vehicle repair garages shall comply with Section 406.8 of the *International Building Code*.

[BG] Group S-2 low-hazard storage. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

- Asbestos
- Beverages up to and including 16 percent alcohol
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers

~~Fresh fruits and vegetables in nonplastic trays or containers~~
~~Frozen foods~~
~~Glass~~
~~Glass bottles, empty or filled with noncombustible liquids~~
~~Gypsum board~~
~~Inert pigments~~
~~Ivory~~
~~Meats~~
~~Metal cabinets~~
~~Metal desks with plastic tops and trim~~
~~Metal parts~~
~~Metals~~
~~Mirrors~~
~~Oil filled and other types of distribution transformers~~
~~Porcelain and pottery~~
~~Public parking garages, open or enclosed~~
~~Stoves~~
~~Talc and soapstones~~
~~Washers and dryers~~

[BG] Public parking garages. ~~Public parking garages shall comply with Section 406.4 of the *International Building Code* and the additional requirements of Section 406.5 of the *International Building Code* for open parking garages or Section 406.6 of the *International Building Code* for enclosed parking garages.~~

[BG] Combustible storage. ~~High piled stock or rack storage, or attic, under floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the *International Building Code*.~~

[BG] Accessory storage spaces. ~~A room or space used for storage purposes that is accessory to another occupancy shall be classified as part of that occupancy.~~

[BG] Group U, Miscellaneous. ~~Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:~~

~~Agricultural buildings~~
~~Aircraft hangar, accessory to a one or two family residence (see Section 412.4 of the *International Building Code*)~~
~~Barns~~
~~Carports~~
~~Communication equipment structures with a gross floor area of less than 1,500 square feet (139 m²)~~
~~Fences more than 7 feet (2134 mm) in height~~
~~Grain silos, accessory to a residential occupancy~~
~~Livestock shelters~~
~~Private garages~~
~~Retaining walls~~
~~Sheds~~
~~Stables~~
~~Tanks~~
~~Towers~~

[BG] Private garages and carports. ~~Private garages and carports shall comply with Section 406.3 of the *International Building Code*.~~

[BG] Residential aircraft hangars. ~~Aircraft hangars accessory to a one or two family residence shall comply with Section 412.4 of the *International Building Code*.~~

[BG] Greenhouses. ~~Greenhouses not classified as another occupancy shall be classified as Use Group U.~~

Add new text as follows:

203 OCCUPANCY CLASSIFICATION AND USE

203.1 Occupancy classification. Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with {Section 508} of the *International Building Code*. Where a structure is

proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with {Section 503.1.4} of the International Building Code.

1. Assembly: Groups A-1, A-2, A-3, A-4 and A-5.

2. Business: Group B.

3. Educational: Group E.

4. Factory and Industrial: Groups F-1 and F-2.

5. High Hazard: Groups H-1, H-2, H-3, H-4 and H-5.

6. Institutional: Groups I-1, I-2, I-3 and I-4.

7. Mercantile: Group M.

8. Residential: Groups R-1, R-2, R-3 and R-4.

9. Storage: Groups S-1 and S-2.

10. Utility and Miscellaneous

203.1.1 Use designation. Occupancy groups contain subordinate uses having similar hazards and risks to building occupants. Uses include, but are not limited to, those functional designations specified within the occupancy group descriptions in {Section 203.1}. Certain uses require specific limitations and controls in accordance with the provisions of this code and {Chapter 4} of the International Building Code.

203.2 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

203.2.1 Small buildings and tenant spaces. A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.

203.2.2 Small assembly spaces. The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

-

2. A room or space used for assembly purposes that is less than 750 square feet (70 m2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

203.2.3 Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

203.2.4 Accessory to places of religious worship. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 per room or space are not considered separate occupancies.

203.3 Assembly Group A-1. Group A-1 occupancy includes assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

Motion picture theaters

Symphony and concert halls

Television and radio studios admitting an audience

Theaters

203.4 Assembly Group A-2. Group A-2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls

Casinos (gaming areas)

Nightclubs

Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)

Taverns and bars

203.5 Assembly Group A-3. Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades

Art galleries

Bowling alleys

Community halls

Courtrooms

Dance halls (not including food or drink consumption)

Exhibition halls

Funeral parlors

Greenhouses for the conservation and exhibition of plants that provide public access

Gymnasiums (without spectator seating)

Indoor swimming pools (without spectator seating)

Indoor tennis courts (without spectator seating)

Lecture halls

Libraries

Museums

Places of religious worship

Pool and billiard parlors

Waiting areas in transportation terminals

203.6 Assembly Group A-4. Group A-4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating

including, but not limited to:

Arenas

Skating rinks

Swimming pools

Tennis courts

203.7 Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing

outdoor activities including, but not limited to:

Amusement park structures

Bleachers

Grandstands

Stadiums

203.8 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers

Ambulatory care facilities

Animal hospitals, kennels and pounds

Banks

Barber and beauty shops

Car wash

Civic administration

Clinic-outpatient

Dry cleaning and laundries: pick-up and delivery stations and self-service

Educational occupancies for students above the 12th grade, including higher education laboratories.

Electronic data processing

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m2) in area.

Laboratories: testing and research

Motor vehicle showrooms

Post offices

Print shops

Professional services (architects, attorneys, dentists, physicians, engineers, etc.)

Radio and television stations

Telephone exchanges

Training and skill development not in a school or academic program (This shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).

203.8.1 Airport traffic control towers. Airport traffic control towers shall comply with {Section 412.2} of the International Building Code.

203.8.2 Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422 of the International

Building Code.

203.8.3 Higher education laboratories. Higher education laboratories shall comply with {Section 428} of the International Building Code.

203.9 Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

203.9.1 Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 of the International Building Code and have occupant loads of less than 100 per room or space shall be classified as Group A-3 occupancies.

203.10 Group E, day care facilities This group includes buildings and structures or portions thereof occupied by more than five children older than 2 1/2 years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

203.10.1 Within places of religious worship. Rooms and spaces within places of religious worship providing such day care during religious functions shall be classified as part of the primary occupancy.

203.10.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy.

203.10.3 Five or fewer children in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.

203.11 Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4 of the International Building Code.

203.12 Factory Industrial Group F. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling,

disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H

hazardous or Group S storage occupancy.

203.13 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)

Appliances

Athletic equipment

Automobiles and other motor vehicles

Bakeries

Beverages: over 16-percent alcohol content

Bicycles

Boats

Brooms or brushes

Business machines

Cameras and photo equipment

Canvas or similar fabric

Carpets and rugs (includes cleaning)

Clothing

Construction and agricultural machinery

Disinfectants

Dry cleaning and dyeing

Electric generation plants

Electronics

Energy storage systems (ESS) in dedicated use buildings

Engines (including rebuilding)

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m2) in area

Furniture

Hemp products

Jute products

Laundries

Leather products

Machinery

Metals

Millwork (sash and door)

Motion pictures and television filming (without spectators)

Musical instruments

Optical goods

Paper mills or products

Photographic film

Plastic products

Printing or publishing

Recreational vehicles

Refuse incineration

Shoes

Soaps and detergents

Textiles

Tobacco

Trailers

Upholstering

Water/sewer treatment facilities

Wood; distillation

Woodworking (cabinet)

203.13.1 Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6 of the International Building Code.

203.14 Low-hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or

processing does not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

Beverages: up to and including 16-percent alcohol content

Brick and masonry

Ceramic products

Foundries

Glass products

Gypsum

Ice

Metal products (fabrication and assembly)

203.15 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or

health hazard in quantities in excess of those allowed in control areas complying with Section 5003.8.3, based on the maximum allowable quantity limits for control areas set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Section 415 of the International Building Code. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with this code.

203.15.1 Uses other than Group H. The storage, use or handling of hazardous materials as described in one or more of the following items shall not cause the occupancy to be classified as Group H, but it shall be classified as the occupancy that it most nearly resembles:

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the International Building Code.

2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to Chapter 57.

-

3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.

4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all

other areas of the building by 1-hour fire barriers in accordance with Section 707 of the International Building Code or 1-hour horizontal assemblies in accordance with Section 711 of the International Building Code, or both.

-

5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).

6. Liquor stores and distributors without bulk storage.

-

7. Refrigeration systems.

8. The storage or utilization of materials for agricultural purposes on the premises.

-

9. Stationary storage battery systems installed in accordance with {Section 1206.15}.

10. Corrosive personal or household products in their original packaging used in retail display.

-

11. Commonly used corrosive building materials.

12. Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.

-

13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 5003.8.3.5.1.

14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements of this code.

-

15. Stationary fuel cell power systems installed in accordance with this code.

16. Capacitor energy storage systems in accordance with this code.

-

17. Group B higher education laboratory occupancies complying with Section 428 of the International Building Code and Chapter 38 of this code.

18. Distilling or brewing of beverages conforming to the requirements of this code.

-

19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of this code.

203.16 Hazardous materials. Hazardous materials in any quantity shall conform to the requirements of this code, and Section 414 of the International Building Code.

203.16.1 Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

203.17 High-hazard Group H-1. Buildings and structures containing materials that pose a detonation hazard shall be

classified as Group H-1. Such materials shall

include, but not be limited to, the following:

Detonable pyrophoric materials

Explosives:

Division 1.1

Division 1.2

Division 1.3

Division 1.4

Division 1.5

Division 1.6

Organic peroxides, unclassified detonable

Oxidizers, Class 4

Unstable (reactive) materials, Class 3 detonable and Class 4

203.17.1 Occupancies containing explosives not classified as H-1. The following occupancies containing explosive materials shall be classified as follows:

1. Division 1.3 explosive materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass explosion hazard shall be allowed in Group H-2 occupancies.

2. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

203.18 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from

accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

-

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with {Section 414.1.3} of the International Building Code

Cryogenic fluids, flammable

Flammable gases

Organic peroxides, Class I

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Pyrophoric liquids, solids and gases, nondetonable

Unstable (reactive) materials, Class 3, nondetonable

Water-reactive materials, Class 3

203.19 High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less

Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with {Section 414.1.3} of the International Building Code

Consumer fireworks, 1.4G (Class C, Common)

Cryogenic fluids, oxidizing

Flammable solids

Organic peroxides, Class II and III

Oxidizers, Class 2

Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less

Oxidizing gases

Unstable (reactive) materials, Class 2

Water-reactive materials, Class 2

203.20 High-hazard Group H-4. Buildings and structures containing materials that are health hazards shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives

Highly toxic materials

Toxic materials

Revise as follows:

203.21 High-hazard Group H-5. Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those specified in {Tables 5003.1.1(1)} and {5003.1.1(2)} shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with {Section 415.11} of the International Building Code.

Add new text as follows:

203.22 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are incapable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

203.23 Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions specified in Section 203.22.1 or 203.22.2 and shall comply with Section 420 of the International Building Code. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Residential board and custodial care facilities

Social rehabilitation facilities

203.23.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

203.23.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

203.23.3 Six to 16 persons receiving custodial care. A facility housing not fewer than six and not more than 16 persons receiving custodial care shall be classified as Group R-4.

203.23.4 Five or fewer persons receiving custodial care. A facility with five or fewer persons receiving custodial care shall be classified as Group R-3 or shall comply with the International Residential Code provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or with Section P2904 of the International Residential Code.

203.24 Institutional Group I-2. Institutional Group I-2 occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five

persons who are incapable of self-preservation. This group shall include, but not be limited to, the following:

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes

Psychiatric hospitals

203.24.1 Occupancy Conditions. Buildings of Group I-2 shall be classified as one of the following occupancy conditions and shall comply with Section 407 of the International Building Code:

203.24.1.1 Condition 1. This occupancy condition shall include facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to nursing homes and foster care facilities.

203.24.1.2 Condition 2. This occupancy condition shall include facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to hospitals.

203.24.2 Five or fewer persons receiving medical care. A facility with five or fewer persons receiving medical care shall be classified as Group R-3 or shall comply with the {International Residential Code} provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

203.25 Institutional Group I-3. Institutional Group I-3 occupancy shall include buildings and structures which are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

Correctional centers

Detention centers

Jails

Prerelease centers

Prisons

Reformatories

-

Buildings of Group I-3 shall be classified as one of the following occupancy conditions specified in Sections 203.24.1 through 203.24.5 and shall comply with Section 408 of the International Building Code.

203.25.1 Condition 1. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via means of egress without restraint. A Condition 1 facility is permitted to be constructed as Group R.

203.25.2 Condition 2. This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments. Egress to the exterior is impeded by locked exits.

203.25.3 Condition 3. This occupancy condition shall include buildings in which free movement is allowed within individual smoke compartments, such as within a residential unit comprised of individual sleeping units and group activity spaces, where egress is impeded by remote-controlled release of means of egress from such smoke compartment to another smoke compartment.

203.25.4 Condition 4. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

203.25.5 Condition 5. This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

203.26 Institutional Group I-4, day care facilities. Institutional Group I-4 shall include buildings and structures occupied by more than five persons of any age who receive custodial care for less than 24 hours by persons other than parents or guardians, relatives by blood, marriage, or adoption, and in a place, other than the home of the person cared for. This group shall include, but not be limited to, the following:

Adult day care

Child day care

203.26.1 Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children 21/2 years or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms have an exit door directly to the exterior, shall be classified as Group E.

203.26.2 Within a place of religious worship. Rooms and spaces within places of religious worship providing such care during religious functions shall be classified as part of the primary occupancy.

203.26.3 Five or fewer persons receiving care. A facility having five or fewer persons receiving custodial care shall be classified as part of the primary occupancy.

203.26.4 Five or fewer persons receiving care in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer persons receiving custodial care shall be classified as a Group R-3 occupancy or shall comply with the International Residential Code.

203.27 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and where the public has access. Mercantile occupancies shall include, but not be limited to, the following:

Department stores

Drug stores

Greenhouses with public access that maintain plants for display and sale

Markets

Motor fuel-dispensing facilities

Retail or wholesale stores

Sales rooms

203.27.1 Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 5704.3.4.1.

203.27.2 Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7 of the International Building Code.

203.28 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2 of the International Building Code. Group R occupancies not constructed in accordance with the {International Residential Code} as permitted by Sections 301.4.1 and 301.4.2 of the International Building Code shall comply with Section 420 of the International Building Code.

203.29 Residential Group R-1. Residential Group R-1 occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient) with more than 10 occupants

Congregate living facilities (transient) with more than 10 occupants

Hotels (transient)

Motels (transient)

203.30 Residential Group R-2. Residential Group R-2 occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses

Congregate living facilities (non-transient) with more than 16 occupants

Boarding houses (non-transient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Hotels (non-transient)

Live/work units

Motels (non-transient)

Vacation timeshare properties

203.31 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two dwelling units

Care facilities that provide accommodations for five or fewer persons receiving care

Congregate living facilities (non-transient) with 16 or fewer occupants

Boarding houses (non-transient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Congregate living facilities (transient) with 10 or fewer occupants

Boarding houses (transient)

Lodging houses (transient) with five or fewer questrooms and 10 or fewer occupants

203.31.1 Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the International Residential Code provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

203.31.2 Lodging houses. Owner-occupied lodging houses with five or fewer quest rooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the International Residential Code provided that an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

203.32 Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. Buildings of Group R-4 shall be classified as one of the occupancy conditions specified in Section 203.31.1 or 203.31.2. Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the International Building Code. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Social rehabilitation facilities

203.32.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

203.32.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

203.33 Storage Group S. Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

203.33.1 Accessory storage spaces. A room or space used for storage purposes that is less than 100 square feet (9.3 m²) in area and accessory to another occupancy shall be classified as part of that occupancy. The aggregate area of such rooms or spaces shall not exceed the allowable area limits of Section 508.2 of the International Building Code.

203.33.2 Combustible storage. High-piled stock or rack storage, or attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the International Building Code.

203.34 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3

Aircraft hangar (storage and repair)

Bags: cloth, burlap and paper

Bamboos and rattan

Baskets

Belting: canvas and leather

Beverages over 16-percent alcohol content

Books and paper in rolls or packs

Boots and shoes

Buttons, including cloth covered, pearl or bone

Cardboard and cardboard boxes

Clothing, woolen wearing apparel

Cordage

Dry boat storage (indoor)

Furniture

Furs

Glues, mucilage, pastes and size

Grains

Horns and combs, other than celluloid

Leather

Linoleum

Lumber

Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 5003.1.1(1) (see Section 406.8 of the International Building Code)

Photo engravings

Resilient flooring

Self-service storage facility (mini-storage)

Silks

Soaps

Sugar

Tires, bulk storage of Tobacco, cigars, cigarettes and snuff

Upholstery and mattresses

Wax candles

203.35 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials, such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

Asbestos

Beverages up to and including 16-percent alcohol

Cement in bags

Chalk and crayons

Dairy products in non-waxed coated paper containers

Dry cell batteries

Electrical coils

Electrical motors

Empty cans

Food products

Foods in noncombustible containers

Fresh fruits and vegetables in non-plastic trays or containers

Frozen foods

Glass

Glass bottles, empty or filled with noncombustible liquids

Gypsum board

Inert pigments

Ivory

Meats

Metal cabinets

Metal desks with plastic tops and trim

Metal parts

Metals

Mirrors

Oil-filled and other types of distribution transformers

Public parking garages, open or enclosed

Porcelain and pottery

Stoves

Talc and soap stones

Washers and dryers

203.35.1 Public parking garages. Public parking garages shall comply with Section 406.4 of the International Building Code and the additional requirements of Section 406.5 of the International Building Code for open parking garages or Section 406.6 of the International Building Code for enclosed parking garages.

203.36 Miscellaneous Group U. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings

Aircraft hangar, accessory to a one- or two-family residence (see Section 412.4 of the International Building Code)

Barns

Carports

Communication equipment structures with a gross floor area of less than 1,500 square feet (139 m²)

Fences more than 7 feet (2134 mm) in height

Grain silos, accessory to a residential occupancy

Livestock shelters

Private garages

Retaining walls

Sheds

Stables

Tanks

Towers

203.36.1 Greenhouses. Greenhouses not classified as another occupancy shall be classified as Use Group U.

203.36.2 Private garages and carports. Private garages and carports shall comply with Section 406.3 of the International Building Code.

203.36.3 Residential aircraft hangars. Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4 of the International Building Code.

Reason: The Occupancy Classification and Use Chapter 3 of the International Building Code (IBC) was incorporated in the International Fire Code (IFC) Chapter 2 General Definitions more than 10 years ago. The IBC Chapter 3 provides the criteria by which buildings and structures are classified into use groups and occupancies. The balance of the code, occupancy classification is fundamental in the setting of features of construction; occupant safety requirements, especially building limitations; means of egress; fire protection systems; and interior finishes. The International Fire Code does use the occupancy groups throughout the code, so it is a valid reason to have them duplicated here for reference within the code itself. The problem with having the occupancies mixed in the definitions is that the alphabetical order gets interrupted at the "O" letter where the occupancy classification list starts. An additional problem is that some occupancy groups have special conditions and fall as subsections in the IBC. This formatting does not easily translate into the traditional alphabetical sequence of definitions. The tracking of code changes between the IBC and the IFC seems to be problematic, and the result is two different definitions for the same term. This leads to confusion when a code pointers

send you to provisions in both codes. This proposal separates out the occupancy classifications from the alphabetical order in Section 202 in the IFC and adds a new Section 203 for the correlation of Occupancy Classification and Use with the IBC. The numbering of the sections and subsections gives structure for tracking and allows for subsections when needed.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The proposal is reformatting organization of provisions, editorial with no regulatory changes.

Valet Waste (6626)

IFC: 202 (New), 304.1, 304.1.1 (New), 304.1.2, 304.1.3, 304.1.4, 304.1.4.1

Proponents: Tracie Dutter, Contra Costa County Fire Protection District, representing California Fire Chiefs Association (tracie.dutter@cccfd.org)

2021 International Fire Code

Add new text as follows:

202 Valet waste. A waste collection service that collects and removes the waste from the doorsteps of tenants.

304.1 Waste accumulation prohibited. Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

Add new text as follows:

304.1.1 Valet Waste. Valet waste collection is prohibited.

Exception: Where approved by the fire code official.

Revise as follows:

304.1.1.2 Waste material. Accumulations of wastepaper, wood, hay, straw, weeds, litter or combustible or flammable waste or rubbish of any type shall not be permitted to remain on a roof or in any *court*, yard, vacant lot, alley, parking lot, open space, or beneath a *grandstand*, *bleacher*, pier, wharf, manufactured home, recreational vehicle or other similar structure.

304.1.2.3 Vegetation. Weeds, grass, vines or other growth that is capable of being ignited and endangering property, shall be cut down and removed by the *owner* or occupant of the premises. Vegetation clearance requirements in wildland-urban interface areas shall be in accordance with the *International Wildland-Urban Interface Code*.

304.1.3.4 Space underneath seats. Spaces underneath *grandstand* and *bleacher* seats shall be kept free from combustible and flammable materials. Except where enclosed in not less than 1-hour *fire-resistance-rated* construction in accordance with the *International Building Code*.

304.1.3.4.1 Spaces underneath grandstands and bleachers. Spaces underneath *grandstands* and *bleachers* shall not be occupied or utilized for purposes other than *means of egress* except where equipped with an *automatic sprinkler system* in accordance with Section 903.2.1.5.1, or separated with *fire barriers* and *horizontal assemblies* in accordance with Section 1030.1.1.1.

Reason: Valet waste collection services allow tenants, typically in R-2 occupancies, to place their trash and recyclables in the corridor outside their units to be picked up by a collection service, which comes by on a regularly scheduled basis. This code change proposal would prohibit valet waste collection unless approved by the fire code official. There are currently no provisions in the IFC that specifically allow or prohibit valet waste; however, this code change proposal to prohibit valet waste is consistent with the current requirements of the IFC, including the following sections:

304.1: Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

304.2: Storage of combustible rubbish shall not produce conditions that will create a nuisance or a hazard to the public health, safety or welfare.

1031.2: Required exit accesses, exits and exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency where the building area served by the means of egress is occupied.

1031.3: A means of egress shall be free from obstructions that would prevent its use, including the accumulation of snow and ice.

1031.6: ... Furnishings, decorations or other objects shall not be placed so as to obstruct exits, access thereto, egress therefrom, or visibility thereof....

Valet waste collection will increase the amount of combustibles in corridors, which can lead to increased fires in corridors. Fires in corridors and the accumulation of combustibles impeding the path of egress through corridors can prevent

tenants from safely exiting a building during a fire.

Valet waste will also have an impact on firefighters. Waste and collection containers will interfere with hose lines being pulled along corridors. Additionally, in limited visibility firefighters follow the wall to find their way. Waste and collection containers will create obstructions for firefighters attempting to follow the wall.

The fire code has long protected means of egress and provided for fire safety in buildings. We need to continue to protect means of egress, because when all else goes wrong, people must be able to get out of a building.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact.

Access Doors (7009)

IFC: 3206.7, 3206.7.1, 3206.7.2

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Revise as follows:

3206.7 Fire department access doors. Where fire department access doors are required by Table 3206.2, fire department access doors shall be provided in accordance Sections 3206.7.1 through ~~3206.7.8~~ 3206.7.7.

~~3206.7.1 Exterior walls without fire department access doors. Where Located~~

~~Fire department access doors are not required in an exterior wall that does not face a fire apparatus access road provided that all of the following conditions occur:~~

Where exterior walls surrounding high-piled storage areas face fire apparatus access roads, such walls shall be provided with fire department access doors. Fire department access doors are not required in an exterior wall that does not face a fire apparatus access road.

Exception: Fire department access doors are not required in an exterior wall that faces a fire apparatus access road provided that all of the following conditions exist:

1. The opposite exterior wall faces a fire apparatus access road.
2. The opposite exterior wall is provided with fire department access doors.
3. The entire interior surface of the exterior wall is less than 150 feet (45 720 mm) away from a fire department access door.
4. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

~~**3206.7.2 Where located.** Where exterior walls surrounding high-piled storage areas face fire apparatus access roads, such walls shall be provided with fire department access doors.~~

Reason: Please see Figure 1 in the attached drawing as an example of what the intent of this code change is. The language as it's currently written is impractical for the following reasons:

1. Section 3206.7.1 (access doors are required where exterior walls do NOT face an access road unless conditions 1-4 are met) is in conflict with Section 3206.7.2 (access doors are only required where exterior walls face an access road).
2. Access from a side of a building that does not have an access road is impractical. The building in most cases is small enough not to require access roads along one side of the building, thereby allowing access from other sides due to the size of the building.
3. This will create a problem in existing buildings when one business moves out and another moves in, thereby forcing the new tenant to cut holes in exterior building walls.
4. If the side of the building that does not require access roads abuts another building, then in many cases openings are not allowed along that side of the building, thereby creating a conflict in the code. Please see Figure 2 in the attached drawing as an example.

Cost Impact: The code change proposal will decrease the cost of construction

Pallet Stops (7012)

IFC: 3208.3.1

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc. (jm@klausbruckner.com)

2021 International Fire Code

Revise as follows:

3208.3.1 Flue space protection. Longitudinal F flue spaces required by Table 3208.3 above the first tier of storage in ~~single, double or multiple row~~ rack storage installations shall, where required by the *fire code official*, be equipped with *approved* protection devices. Where required by the fire code official, other approved methods, including but not limited to "keep clear" stickers or other marking, are acceptable methods of transverse flue space maintenance. Such devices or approved methods shall not be removed or modified.

Reason: The use of mechanical means (such as L brackets) was originally intended as an inexpensive method of preventing obstruction of flue spaces. It was originally intended for longitudinal flue spaces where forklift operators can potentially push pallets too far back to a point where the longitudinal flue spaces are blocked. These days jurisdictions are requiring elaborate and expensive methods of maintaining transverse flue spaces when in most cases simple markings with the use of "keep clear" stickers can accomplish similar results. Forklift operators cannot "push" pallets into transverse flue spaces, especially into the rack uprights. The expense associated with installing mechanical means such as the ones shown in the attached figure (as an example) for small businesses (when simple stickers accomplish the same intent) is unjustified.

Cost Impact: The code change proposal will decrease the cost of construction. This may reduce cost of construction only for jurisdictions that specifically were requiring mechanical means of maintaining transverse flue spaces.

New Chapter- Temporary Heating and Cooking (7063)

IFC: 105.5.53 (New), 105.5.54 (New), 105.5.55 (New), 40 (New), 4001.1 (New), 4001.2 (New), 4001.3 (New), 4001.4 (New), 4001.4.1 (New), 4001.4.2 (New), 4001.4.3 (New), 4001.5, 4001.6, 4001.6.1, 4001.6.2, 4001.6.3, 4001.6.4 (New), 4001.7 (New), 4001.8 (New), 4001.9 (New), 4001.10.1 (New), 4001.10 (New), 4002 (New), 4002.1.1, 4002.1, 4002.1.3, 4002.1.2, 4002.1.4, 4002.1.5, 4003 (New), 4003.1, 4003.1.1, 4003.1.2, 4003.1.2.1, 4003.1.2.1.1, 4003.1.2.1.2, 4003.1.2.2, 4003.1.2.1.3, 4003.1.2.1.4, 4003.1.2.2.3, 4003.1.2.2.1, 4003.1.2.2.2, 4003.1.2.2.4, 4003.1.2.3, 4003.1.2.3.1, 4003.1.2.3.2, 4003.1.2.3.3, 4003.1.2.3.4, 4004.2, 4004.4, 4004.5, 4004.6, 4005 (New), 4005.1 (New), 4005.1.1 (New), 4005.1.2 (New), 4005.1.3 (New), 4005.1.6 (New), 4005.1.5 (New), 4004 (New), 4004.1 (New), 4004.3 (New), SECTION 4006, 313.1, 308.1.5, 3107.12, 605.1, 4006.1, 4006.2, 4006.3, 4006.4, 4006.4.1, 4006.4.2, 4006.5, 4006.6, 4006.7, 4006.7.1, 4006.7.2, 4006.7.3, 4006.7.4, 4006.7.5, 4006.7.5.1, 4006.7.5.2, 4006.8, 4006.8.1, 4006.8.2, 4006.8.3, 4006.8.4, 4006.8.5, 4006.9, 4006.9.1, 4006.9.1.1, 4006.9.1.2, 4006.9.1.3, 4006.9.2, 4006.9.3, 4006.9.4, 4006.10, 4006.10.1, 4006.10.2, 4006.10.3

Proponents: Timothy Spears, South San Joaquin County Fire Authority, representing South San Joaquin County Fire Authority (tim.spears@cityoftracy.org)

2021 International Fire Code

Add new text as follows:

105.5.53 Temporary heating or cooking in tents or membrane structures. An operational permit is required to operate temporary heating or cooking equipment within tents or membrane structures.

105.5.54 Temporary heating or cooking in wildfire risk areas. Where required by local regulations, an operational permit is required to operate temporary heating or cooking equipment in wildfire risk areas

105.5.55 Temporary heating for construction sites. An operational permit is required to operate temporary heating equipment in structures during the course of construction, alteration or demolition.

40

Temporary Heating and Cooking Operations

4001.1 General 4001.1 General. The provisions of this chapter shall apply to the use, operation, testing and maintenance of mobile and portable equipment and devices used for temporary heating and cooking. Temporary heating and cooking operations with open flames shall also comply with any additional applicable requirements in Section 308.

Exception: Temporary heating devices used in the course of construction, alteration and demolition of structures shall comply with Section 3304.

Revise as follows:

4001.2 Permits Operational permits shall be obtained as set forth in Section 105.5.

Add new text as follows:

4001.3 Listed Equipment Mobile and portable equipment and devices used for temporary heating and cooking shall be listed and labeled. The installation, maintenance and use of equipment and devices shall be in accordance with their listing and the manufacturer's instructions.

4001.4 Operation and Maintenance The building owner or the equipment owner/operator shall operate and maintain the equipment in accordance with the manufacturer's operating instructions and this section.

-

4001.4.1 Wildfire Risk Area Temporary heating and cooking operations shall be in accordance with applicable local wildfire risk area regulations

4001.4.2 Attendance Mobile and portable heating and cooking equipment shall be constantly attended while in use and until cooled to a safe temperature.

4001.4.3 Fire extinguishers. Not fewer than one portable fire extinguisher complying with Section 906 with a minimum 4-A rating or other approved on-site fire-extinguishing equipment shall be available for immediate utilization.

Revise as follows:

~~3107.12.7~~ **4001.5 Electrical heating and cooking equipment.** Electrical cooking and heating equipment shall comply with NFPA 70 and this chapter.

~~3107.13~~ **4001.6 LP-gas.** The storage, handling and use of LP-gas and LP-gas equipment shall be in accordance with Sections ~~3107.13.1 through 3107.13.3~~ 4001.6.1 through 4001.6.4

~~3107.13.1~~ **4001.6.1 General.** LP-gas equipment such as containers, tanks, piping, hoses, fittings, valves, tubing and other related components shall be *approved* and in accordance with Chapter 61 and with the *International Fuel Gas Code*.

~~3107.13.2~~ **4001.6.2 Location of containers.** LP-gas containers and tanks shall be located outside in accordance with Table 6104.3. Pressure relief devices shall be pointed away from the ~~tent or membrane structure~~, any building or structure and shall be in accordance with Chapter 61.

~~3107.13.3~~ **4001.6.3 Protection and security.** Portable LP-gas containers, tanks, piping, valves and fittings that are located outside and are being used to fuel equipment inside a *tent or membrane structure* shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an *approved* location. Portable LP-gas containers shall be secured to prevent unauthorized movement.

Add new text as follows:

4001.6.4 Refueling Exchanging of LP containers shall be conducted in accordance with Chapter 61. Liquid transfer of LP gas shall be in accordance with Chapter 7 of NFPA 58.

4001.7 Oil-fired Heaters Oil-fired cooking and heating equipment shall comply with Section 605 and this chapter.

4001.8 Refueling of Flammable and Combustible Liquid Fueled Equipment Refueling operations for liquid fueled equipment or devices shall be conducted in accordance with section 5705 and all of the following:

- 1 Refueling operations for liquid fueled equipment or devices shall be conducted by trained personnel in accordance with the manufacturer's instructions and this code.
- 2 The equipment or device shall be turned off and allowed to cool prior to refueling.
- 3 Operations shall be conducted in a well-ventilated area, at a minimum of 10 feet from any building or structure.

Revise as follows:

4001.9 Cooking Operations. Portable cooking equipment using combustible oils or solids shall comply with all of the following:

1. A noncombustible lid shall be immediately available. The lid shall be of sufficient size to cover the cooking well completely.
- 2 Equipment shall be placed on a non-combustible surface
- 3 A portable fire extinguisher for protection appropriate to the cooking media shall be provided at a location approved by the fire code official

4001.10.1 Correction of Unsafe Conditions The fire code official shall be authorized to require the owner, the owner's authorized agent, operator or user of the equipment to abate or cause to be abated or corrected such unsafe operations or conditions either by removal, repair, rehabilitation, disposal or other approved corrective action in compliance with this code.

4001.10 Hazard abatement. Operations or conditions deemed unsafe or hazardous by the fire code official shall be abated. Equipment and devices that are modified or damaged and constitute an electrical shock or fire hazard shall not be used.

Add new text as follows:

4002 PORTABLE ELECTRICAL HEATING APPLIANCES

Revise as follows:

~~603.9.1~~ **4002.1.1 Listed and labeled.** Only *listed* and *labeled* portable, electric space heaters shall be used.

~~603.9~~ **4002.1 Portable, electric space heaters.** Where not prohibited by other sections of this code, portable, electric space heaters shall be permitted to be used in all occupancies in accordance with Sections 603.9.1 through 603.9.5.

~~603-9.3- 4002.1.3~~ **Extension cords.** Portable, electric space heaters shall not be plugged into extension cords.

~~603-9.2- 4002.1.2~~ **Power supply.** Portable, electric space heaters shall be plugged directly into an *approved* receptacle.

~~603-9.4- 4002.1.4~~ **Prohibited areas.** Portable, electric space heaters shall not be operated within 3 feet (914 mm) of any combustible materials. Portable, electric space heaters shall be operated only in locations for which they are *listed*.

~~603-9.5- 4002.1.5~~ **Group I-2 occupancies and ambulatory care facilities.** Where used in Group I-2 and ambulatory care facilities, portable, electric space heaters shall be limited to those having a heating element that cannot exceed a temperature of 212°F (100°C), and such heaters shall only be used in nonsleeping staff and employee areas.

Add new text as follows:

4003 Portable Fuel-Fired Heating Appliances

Revise as follows:

605.5 4003.1 Portable unvented heaters.

Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4 and ambulatory care facilities.

Exceptions:

1. Portable unvented fuel-fired heaters *listed* in accordance with UL 647 are permitted to be used in one- and two-family dwellings, where operated and maintained in accordance with the manufacturer's instructions.
2. Portable outdoor gas-fired heating appliances in accordance with Section ~~605.5.2~~ 4003.1.2

~~605.5.1 4003.1.1~~ **Prohibited locations.** Unvented fuel-fired heating equipment shall not be located in, or obtain combustion air from, any of the following rooms or spaces: sleeping rooms, bathrooms, toilet rooms or storage closets.

~~605.5.2 4003.1.2~~ **Portable outdoor gas-fired heating appliances.** Portable gas-fired heating appliances located outdoors shall be in accordance with ~~Sections 605.5.2.1 through 605.5.2.3.4.~~ 4003.1.2.1 through 4003.1.2.4

~~605.5.2.2 4003.1.2.1~~ **Use and operation.** Portable outdoor gas-fired heating appliances shall be used and operated in accordance with Sections ~~605.5.2.2.1 4003.1.2.1.1 through 605.5.2.2.4.~~ 4003.1.2.1.4

~~605.5.2.2.1 4003.1.2.1.1~~ **Listing and approval.** Only *listed* and *approved* portable outdoor gas-fired heating appliances utilizing a fuel gas container that is integral to the appliance shall be used. Portable outdoor gas-fired heating appliances shall be *listed* and *labeled* in accordance with ANSI Z83.26/CSA 2.37.

~~605.5.2.2.2 4003.1.2.1.2~~ **Use and maintenance.** Portable outdoor gas-fired heating appliances shall be used and maintained in accordance with the manufacturer's instructions.

~~605.5.2.1 4003.1.2.2~~ **Location.** Portable outdoor gas-fired heating appliances shall be used and located in accordance with Sections ~~605.5.2.1.1 through 605.5.2.1.4.~~ 4003.1.2.2.1 through 4003.1.2.2.4

~~605.5.2.2.3 4003.1.2.1.3~~ **Tip-over switch.** Portable outdoor gas-fired heating appliances shall be equipped with a tilt or tip-over switch that automatically shuts off the flow of gas if the appliance is tilted more than 15 degrees (0.26 rad) from the vertical.

~~605.5.2.2.4 4003.1.2.1.4~~ **Guard against contact.** The heating element or combustion chamber of portable outdoor gas-fired heating appliances shall be provided with a permanent integral guard ~~permanently guarded~~ so as to prevent accidental contact by persons or material.

~~605.5.2.1.3 4003.1.2.2.3~~ **Clearance to combustible materials.** Portable outdoor gas-fired heating appliances shall not be located beneath, or closer than 5 feet (1524 mm) to combustible decorations and combustible overhangs, awnings, sunshades or similar combustible attachments to buildings. Portable gas-fired heating appliances used within tents, canopies, or membrane structures shall not be located within 10 (3048 mm) feet of combustible materials.

605.5.2.1.1 4003.1.2.2.1 Prohibited locations.

The storage or use of portable outdoor gas-fired heating appliances is prohibited in any of the following locations, except where permitted by Chapter 61, or where the appliance is used in accordance with its listing:

1. Inside of any occupancy where connected to the fuel gas container.
2. Inside of tents, canopies and membrane structures.

3. On exterior balconies.

Exception: As permitted in Chapter 61.

~~605.5.2.1.2~~ 4003.1.2.2.2 Clearance to buildings. Portable outdoor gas-fired heating appliances shall be located not less than 5 feet (1524 mm) from buildings.

~~605.5.2.1.4~~ 4003.1.2.2.4 Proximity to exits. Portable outdoor gas-fired heating appliances shall not be located within 5 feet (1524 mm) of *exits* or *exit discharges*. Portable gas-fired heating appliances used within tents, canopies, or membrane structures shall not be located within 10 feet (3048 mm) of exits or exit discharges.

~~605.5.2.3~~ 4003.1.2.3 Gas containers. Fuel gas containers for portable outdoor gas-fired heating appliances shall comply with Sections ~~605.5.2.3.1 through 605.5.2.3.4~~. 4003.1.2.3.1 through 4003.1.2.3.4

~~605.5.2.3.1~~ 4003.1.2.3.1 Approved containers. Only *approved* DOTn or ASME gas containers shall be used.

~~605.5.2.3.2~~ 4003.1.2.3.2 Container replacement. Replacement of fuel gas containers in portable outdoor gas-fired heating appliances shall not be conducted while the public is present.

~~605.5.2.3.3~~ 4003.1.2.3.3 Container capacity. The maximum individual capacity of gas containers used in connection with portable outdoor gas-fired heating appliances shall not exceed 20 pounds (9 kg).

~~605.5.2.3.4~~ 4003.1.2.3.4 Indoor storage prohibited. Gas containers shall not be stored inside of buildings except in accordance with Section 6109.9.

~~308.1.4~~ 4004.2 Open-flame cooking devices. Charcoal burners and other open-flame cooking devices shall not be operated on combustible balconies or within 10 feet (3048 mm) of combustible construction.

Exceptions:

1. One- and two-family *dwelling*s.
2. Where buildings, balconies and decks are protected by an *automatic sprinkler system*.
3. LP-gas cooking devices having LP-gas container with a water capacity not greater than 2¹/₂ pounds [nominal 1 pound (0.454 kg) LP-gas capacity].

~~3107.12.6~~ 4004.4 Outdoor cooking. Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet (6096 mm) of ~~a tent or membrane structure, any building or structure of combustible construction, or of any potential ignition source.~~

~~3107.12.5~~ 4004.5 Cooking tents. *Tents* with sidewalls or drops where cooking is performed shall be separated from other *tents* or *membrane structures* by not less than 20 feet (6096 mm).

~~3107.12.4~~ 4004.6 Operations. Operations such as warming of foods, cooking demonstrations and similar operations that use solid flammables, butane or other similar devices that do not pose an ignition hazard, shall be *approved*.

Add new text as follows:

4005 Portable Electrical Cooking Appliances

4005.1 Portable Electrical Cooking Appliances Portable electric cooking appliances shall be permitted to be used in all occupancies in accordance with Sections 4005.1.1 through 4005.1.5.

4005.1.1 Listed and Labeled Portable electric cooking appliances shall be listed and labeled, and shall be used in accordance with their listing and the manufacturer's instructions.

4005.1.2 Power Supply Portable electric cooking appliances shall be plugged directly into an approved receptacle or connected to a relocatable power tap rated 20 amps.

-

4005.1.3 Extension Cords Portable electric cooking appliances shall not be plugged into extension cords.

4005.1.6 Prohibited Areas Portable electric cooking appliances shall not be operated within 3 feet (914 mm) of any combustible materials or in H occupancies. Portable electric cooking appliances shall be operated only in locations for which they are listed.

-

4005.1.5 Temporary Connections Where portable electric cooking appliances are used for temporary operations, the appliance shall be disconnected from the power supply when not in use.

4004 Portable Fuel-fired Cooking Appliances

4004.1 Portable Fuel-Fired Cooking Appliances Portable fuel-fired cooking appliances shall be permitted to be used in all occupancies in accordance with this section.

4004.3 Indoor Cooking Portable fuel-fired cooking appliances used indoors shall not be located within 10 feet (3048 mm) of exits or combustible materials.

Revise as follows:

SECTION ~~319~~ 4006 MOBILE FOOD PREPARATION VEHICLES

313.1 General.

Fueled equipment including, but not limited to, motorcycles, mopeds, lawn-care equipment, portable generators and ~~portable cooking equipment~~, shall not be stored, operated or repaired within a building.

Exceptions:

1. Buildings or rooms constructed for such use in accordance with the *International Building Code*.
2. Where allowed by Section 314.
3. Storage of equipment utilized for maintenance purposes is allowed in *approved* locations where the aggregate fuel capacity of the stored equipment does not exceed 10 gallons (38 L) and the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.
4. Fuel-fired portable heating and cooking equipment stored, operated, or repaired in accordance with Chapter 40.

308.1.5 Location near combustibles. Open flames such as from candles, ~~and~~ lanterns, ~~kerosene heaters and gas-fired heaters~~ shall not be located on or near decorative material or similar combustible materials.

3107.12 Heating and cooking equipment. Temporary ~~H~~ heating and cooking equipment shall be in accordance with Chapter 40. Permanent heating and cooking equipment shall be in accordance with Chapter 6 and Sections 3107.12.1 through 3107.12.7.3.

605.1 General. The design, construction, installation, operation, alteration, repair and maintenance of nonportable gas-fired appliances and systems shall comply with the provisions of this section and the *International Fuel Gas Code*. The design, construction, installation, operation, alteration, repair and maintenance of nonportable solid fuel-fired and oil-fired appliances and systems shall comply with the provisions of this section and the *International Mechanical Code*. ~~The construction and use of portable fuel-fired appliances not connected to a fixed fuel piping system, such as blow torches, melting pots and weed burners, shall comply with this section.~~

~~319.1~~ 4006.1 General. Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors shall comply with this section.

~~319.2~~ 4006.2 Permit required. Permits shall be required as set forth in Section 105.5.

~~319.3~~ 4006.3 Exhaust hood. Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood in accordance with Section 606.

~~319.4~~ 4006.4 Fire protection. Fire protection shall be provided in accordance with Sections ~~319.4.1 and 319.4.2~~, 4006.4.1 and 4006.4.2

~~319.4.1~~ 4006.4.1 Fire protection for cooking equipment. Cooking equipment shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.

~~319.4.2~~ 4006.4.2 Fire extinguisher. Portable fire extinguishers shall be provided in accordance with Section 906.4.

~~319.5~~ 4006.5 Appliance connection to fuel supply piping. Gas cooking appliances shall be secured in place and connected to fuel-supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.

~~319.6~~ 4006.6 Cooking oil storage containers. Cooking oil storage containers within mobile food preparation vehicles shall have a maximum aggregate volume not more than 120 gallons (454 L), and shall be stored in such a way as to not

be toppled or damaged during transport.

~~319.7~~ 4006.7 Cooking oil storage tanks. Cooking oil storage tanks within mobile food preparation vehicles shall comply with Sections ~~319.7.1 through 319.7.5.2~~, 4006.7.1 through 4006.7.5.2

~~319~~ 4006.7.1 Metallic storage tanks. Metallic cooking oil storage tanks shall be *listed* in accordance with UL 80 or UL 142, and shall be installed in accordance with the tank manufacturer's instructions.

~~319~~ 4006.7.2 Nonmetallic storage tanks. Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall comply with both of the following:

1. Tanks shall be *listed* for use with cooking oil, including maximum temperature to which the tank will be exposed during use.
2. Tank capacity shall not exceed 200 gallons (757 L) per tank.

~~319~~ 4006.7.3 Cooking oil storage system components. Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.

~~319~~ 4006.7.4 Design criteria. The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.

~~319~~ 4006.7.5 Tank venting. Normal and emergency venting shall be provided for cooking oil storage tanks.

~~319~~ 4006.7.5.1 Normal vents. Normal vents shall be located above the maximum normal liquid line, and shall have a minimum effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.

~~319~~ 4006.7.5.2 Emergency vents. Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.

~~319~~ 4006.8 LP-gas systems. Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections 319.8.1 through 319.8.5.

~~319~~ 4006.8.1 Maximum aggregate volume. The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds (91 kg) propane capacity.

~~319~~ 4006.8.2 Protection of container. LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.

~~319~~ 4006.8.3 LP-gas container construction. LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.

~~319~~ 4006.8.4 Protection of system piping. LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.

~~319~~ 4006.8.5 LP-gas alarms. A *listed* LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with the manufacturer's instructions.

~~319~~ 4006.9 CNG systems. Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections ~~319~~ 4006.9.1 through ~~319~~ 4006.9.4.

~~319~~ 4006.9.1 CNG containers supplying only cooking fuel. CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections ~~319~~ 4006.9.1.1 through ~~319~~ 4006.9.1.3.

~~319~~ 4006.9.1.1 Maximum aggregate volume. The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds (590 kg) water capacity.

~~319~~ 4006.9.1.2 Protection of container. CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.

~~319~~ 4006.9.1.3 CNG container construction. CNG containers shall be an NGV-2 cylinder.

~~319~~ 4006.9.2 CNG containers supplying transportation and cooking fuel. Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.

~~319~~ 4006.9.3 Protection of system piping. CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage and damage from vibration.

~~319~~ 4006.9.4 Methane alarms. A *listed* methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.

~~319~~ 4006.10 Maintenance. Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections ~~319~~ 4006.10.1 through ~~319~~ 4006.10.3.

~~319~~ 4006.10.1 Exhaust system. The exhaust system, including hood, grease-removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 606.3.

~~319~~ 4006.10.2 Fire protection systems and devices. *Fire protection systems* and devices shall be maintained in accordance with Section 901.6.

~~319~~ 4006.10.3 Fuel gas systems. LP-gas containers installed on the vehicle and fuel-gas piping systems shall be inspected annually by an *approved* inspection agency or a company that is registered with the US Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free from damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every 3 years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the *approved* inspection agency shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.

Reason: During the COVID 19 Pandemic, it was noted by many fire and building officials that the code requirements surrounding temporary heating and cooking, especially in tents and canopies was disjointed and often confusing. In addition, some types of heating and cooking appliances were not adequately covered. Adding to the confusion is the rewrite of Chapter 6 to align with things that occur in buildings, making those things that occur in tents and membrane structures less applicable to Chapter 6 provisions. It was felt that relocating all temporary heating and cooking should be relocated to a new chapter 40. This involved moving things from Chapter 3, 6, and 31 all to a new location.

The group did not move any requirements for temporary heating on construction sites as it was felt that having all requirements for fire safety during construction co-located was better from a usability standpoint.

The requirements found in the new Chapter 40 are largely not new, just relocations. And while there are some new sections, they are intended to be in line with existing text relocated here.

Specifically, the following things are new:

3 new operational permits are being proposed. One deals with cooking and heating in tents. One deals with the use of temporary heating and cooking in designated wildfire hazard zones, and the last deals with temporary heating and cooking at construction sites.

The general section, 4001, contains a pointer to 308 to make sure those requirements are utilized appropriately. The additional requirements are largely taken from other sections to provide code continuity with other sections. For example, 4001.3 is taken from language in 3304.1. 4001.4 is taken from section 605, and 307.5.

Several operational requirements found in 3107 have been relocated to the new chapter.

Items on oil filled heaters and refueling of fuel fired appliances have been based on 3304 language.

4001.9 is copied from section 3106.

The hazard abatement language in the new 4001.10 is taken from 601 and 313.1.1.

Section 4002 is all relocated from 603.9.

Section 4003 is all relocated from 605.5. There is a change in language in 4003.1.2.1.4 to clear up ambiguous language from the current code.

4003.1.2.2.1 has a new pointer to Chapter 31 in the main section rather than as an exception in the same section.

The new language in 4003.1.2.2.3 and 4003.1.2.2.4 are taken from 3107.12.3 to remain consistent with those sections.

Section 4004 applies to portable fuel-fired equipment. A new section 4004.3 was introduced for indoor cooking, but is consistent with 3107.12.3.

the change in 4004.4 is intended to clarify that this should apply to all structures, not just tents and membrane structures.

4005 is for portable electrical cooking appliances. This was largely pulling from other sections such as 603.9. 4005.1.2 is intended to allow for the safe use of crockpots and other appliances with intermittent loads. We also clarified that cooking should not occur in H occupancies. This use should be moved to a B occupancy portion of the building. 4005.1.5 is intended to ensure that an appliance cannot accidentally be cycled back on.

319, another form of temporary cooking would be relocated to the new chapter as well. There are no changes proposed here, only renumbering.

The last portion of the proposal modifies existing language in other chapters to point to the new chapter, and to modify the scoping provisions of those sections.

605.1 is modified to point to chapter 40 for temporary activities

313 is changed to refer to the new Chapter 40 and to remove the reference to cooking in the charging language.

308.1.5 is modified to remove those things covered in the new chapter.

And 3107.12 is modified to refer the user to chapter 40 for temporary heating and cooking, and stay there for permanent heating and cooking that might occur here.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal moves existing requirements from other locations to a new common chapter. New language is also taken from other places, and is largely covered by listings and instructions from manufacturers.

Flue Spaces (7069)

IFC: 3208.3

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Revise as follows:

3208.3 Flue spaces. Rack storage areas protected with an *automatic sprinkler system* shall be provided with flue spaces in accordance with Table 3208.3. The space taken by rack uprights that is not obstructed by commodities or solid shelving is allowed to be included in the transverse flue space measurement. Required flue spaces shall be maintained.

Reason: The issue of whether rack uprights can be included as part of the flue space measurement has come up for question more often in recent years. NFPA 13, 2019 Edition, Figures A.3.3.171(a) - (k) show that rack uprights can be included in the measurement of flue spaces.

Bibliography: NFPA 13, 2019 Edition, Figures A.3.3.171(a) - (k)

Cost Impact: The code change proposal will not increase or decrease the cost of construction. We believe that the proposed code change is only a clarification of flue spaces. However it may decrease the cost of construction depending on how it was interpreted by jurisdictions.

Higher Education Labs (7075)

IFC: Chapter 38

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Delete without substitution:

CHAPTER 38 HIGHER EDUCATION LABORATORIES

SECTION 3801 GENERAL

Revise as follows:

3801.1 Scope. Higher education laboratories complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in *control areas* set forth in Chapter 50 without requiring classification as a Group II occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the *International Building Code*.

3801.2 Application. The provisions of this chapter shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by this chapter, the storage, use and handling of hazardous materials shall comply with the provisions in Chapters 50 through 67 and the *International Building Code* for quantities not exceeding the maximum allowable quantity.

Delete without substitution:

SECTION 3802 DEFINITIONS

Revise as follows:

3802.1 Definitions.

The following terms are defined in Chapter 2:

CHEMICAL FUME HOOD.

GLOVE BOX.

HIGHER EDUCATION LABORATORY.

LABORATORY SUITE.

SPECIAL EXPERT.

SECTION 3803 GENERAL SAFETY PROVISIONS

3803.1 Scope. Laboratories and *laboratory suites* applying the requirements of this chapter shall be in accordance with the general safety provisions in Sections 3803.1.1 through 3803.2.2.

3803.1.1 Chemical safety reviews. Operating and emergency procedures planning and documentation shall be provided in accordance with Sections 5001.3.3.11 through 5001.3.3.17. Such documentation shall be prepared by laboratory safety personnel or *special experts*, and shall be made available in the workplace for reference and review by employees. Copies of such documentation shall be made available to the *fire code official* for review upon request.

3803.1.2 Chemical handling. Receiving, transporting on site, unpacking and dispensing of hazardous materials shall be carried out by persons trained in proper handling of such materials and shall be performed in accordance with Chapters 50 through 67, as applicable.

3803.1.3 Warning signage. Warning signs shall be provided in accordance with Section 5003.5.

3803.1.4 Maintenance of equipment, machinery and processes. Maintenance of equipment, machinery and processes used with hazardous materials shall comply with Section 5003.2.6.

3803.1.5 Time-sensitive materials. Containers of materials that have the potential to become hazardous during prolonged storage shall be dated when first opened, and shall be managed in accordance with NFPA 45, Section 8.3.4.4.1.

~~3803.1.6 Hazardous wastes.~~ Storage, dispensing, use and handling of hazardous waste shall comply with this chapter and Chapters 50 through 67, as applicable.

~~3803.1.7 Automatic fire-extinguishing systems.~~ New laboratories in new or existing buildings that increase maximum allowable quantities of hazardous materials based on the requirements in this chapter shall be equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1.

~~3803.2 Hazardous materials storage and use.~~ Hazardous materials storage, handling and use in laboratories and *laboratory suites* complying with Chapter 38 shall be in accordance with this chapter and Chapters 50 through 67.

~~3803.2.1 Container size.~~

The maximum container size for all hazardous materials shall be 5.3 gallons (20 L) for liquids, 50 pounds (22.7 kg) for solids, 100 cubic feet (2.83 m³) for *health hazard* gases per Table 5003.1.1(2) and 500 cubic feet (14.15 m³) for all other gases in accordance with Table 5003.1.1(1).

~~Exception:~~ Hazardous waste collection containers, for other than Class I *flammable liquids* and Class II *combustible liquids*, are permitted to exceed 5.3 gallons (20 L) where *approved*.

~~3803.2.2 Density.~~ Quantities of Class I *flammable liquids* in storage and use shall not exceed 8 gallons (30 L) per 100 square feet (9.29 m²) of floor area. Densities shall be reduced by 25 percent on the 4th through 6th floors of the building, and by 50 percent above the 6th floor. Regardless of the density, the *maximum allowable quantity per control area or laboratory suite* in accordance with this chapter, shall not be exceeded.

~~Exception:~~

Designated hazardous waste collection areas or rooms within a *laboratory suite* or *control area* are not limited, but such materials shall not exceed the maximum allowable quantity per *laboratory suite* or *control area*.

SECTION 3804 LABORATORY SUITE CONSTRUCTION

~~3804.1 General.~~ Where *laboratory suites* are provided, they shall be constructed in accordance with this chapter and Section 428 of the International Building Code.

~~3804.1.1 Laboratory suites.~~ The number of *laboratory suites* and percentage of maximum allowable quantities of hazardous materials in *laboratory suites* shall be in accordance with Table 3804.1.1.

**TABLE 3804.1.1
DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR**

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE ^a	NUMBER OF LAB SUITES PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS ^b
Above grade plane	21+	Not Allowed	Not Allowed	Not Allowed
	16-20	25	1	2 ^c
	11-15	50	1	2 ^c
	7-10	50	2	2 ^c
	4-6	75	4	1
	3	100	4	1
Below grade plane	1-2	100	6	1
	1	75	4	1
	2-Lower than 2	50 Not Allowed	2 Not Allowed	1 Not Allowed

- a. Percentages shall be of the maximum allowable quantity per control area shown in Table 5003.1.1(1) and Table 5003.1.1(2), with all increases allowed in the footnotes to those tables.
- b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
- c. Vertical fire barriers separating laboratory suites from other spaces on the same floor are permitted to be 1-hour rated.

3804.1.1.1 Separation from other nonlaboratory areas.

~~Laboratory suites shall be separated from other portions of the building in accordance with the most restrictive of the following:~~

- ~~1. Fire barriers and horizontal assemblies as required in Table 3804.1.1. Fire barriers shall be constructed in accordance with Section 707 of the International Building Code and horizontal assemblies shall be constructed in accordance with Section 711 of the International Building Code.~~

~~**Exception:** Where an individual laboratory suite occupies more than one story, the fire-resistance rating of intermediate floors contained within the laboratory suite shall comply with the requirements of the International Building Code.~~

- ~~2. Separations as required in Section 508 of the International Building Code.~~

3804.1.1.2 Separation from other laboratory suites. ~~Laboratory suites shall be separated from other laboratory suites in accordance with Table 3804.1.1.~~

3804.1.1.3 Floor assembly fire resistance.

~~The floor assembly supporting laboratory suites and the construction supporting the floor of laboratory suites shall have a fire-resistance rating of not less than 2 hours.~~

~~**Exception:** The floor assembly of laboratory suites and the construction supporting the floor of laboratory suites are permitted to be 1-hour fire-resistance-rated in buildings of Types IIA, IIIA and VA construction, provided that the building is three or fewer stories.~~

3804.1.1.4 Maximum number. ~~The maximum number of laboratory suites shall be in accordance with Table 3804.1.1. Where a building contains both laboratory suites and control areas, the total number of laboratory suites and control areas within a building shall not exceed the maximum number of laboratory suites in accordance with Table 3804.1.1.~~

3804.1.1.5 Means of egress. ~~Means of egress shall be in accordance with Chapter 10.~~

3804.1.1.6 Standby or emergency power. ~~Higher education laboratory suites shall be provided with emergency or standby power in accordance with Section 1203.2.14.~~

3804.1.1.7 Ventilation. ~~Ventilation shall be in accordance with the International Mechanical Code and Chapter 7 of NFPA 45.~~

3804.1.1.8 Liquid-tight floor. ~~Portions of laboratory suites where hazardous materials are present shall be provided with a liquid-tight floor.~~

~~3804.1.1.9 Automatic fire-extinguishing systems.~~ Buildings containing *laboratory suites* shall be equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1.

~~3804.1.2 Percentage of maximum allowable quantity in each laboratory suite.~~ The percentage of maximum allowable quantities of hazardous materials in each *laboratory suite* shall be in accordance with Table 3804.1.1.

Delete without substitution:

SECTION 3805 NONSPRINKLERED LABORATORIES

Revise as follows:

~~3805.1 Scope.~~ Storage and use of hazardous materials in existing laboratories located within existing buildings not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 is permitted where such use complies with Section 3803, Chapters 50 through 67, as applicable, and Sections 3805.2 through 3805.4.

~~3805.2 Nonsprinklered laboratories.~~ The maximum allowable quantities of hazardous materials in storage and use in *control areas* in laboratories located in buildings not equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be in accordance with Table 5003.1.1(1), Table 5003.1.1(2) and Table 5003.8.3.2, except as modified by Sections 3805.2.1 and 3805.2.2.

~~3805.2.1 Restricted materials storage.~~

~~Where approved by the fire code official, storage of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed within a laboratory control area at 25 percent of Table 5003.1.1(1) limits for a building equipped throughout with an automatic sprinkler system.~~

- ~~1. Class 4 oxidizers.~~
- ~~2. Pyrophorics.~~

~~The percentage of the maximum allowable quantity per control area shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 oxidizers or pyrophoric materials.~~

~~Additional quantity increases shall be prohibited, and such materials shall be stored in accordance with all of the following:~~

- ~~1. Containers shall be completely sealed and stored in accordance with the manufacturers' recommendations.~~
- ~~2. Storage shall be within approved hazardous material storage cabinets in accordance with Section 5003.8.7, or shall be located in an inert atmosphere glove box in accordance with NFPA 45, Section 7.11.~~
- ~~3. The storage cabinet or glove box shall not contain any storage of incompatible materials.~~

~~3805.2.2 Restricted materials use.~~

~~Where approved by the fire code official, use of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25 percent of Table 5003.1.1(1) limits for buildings equipped throughout with an automatic sprinkler system.~~

- ~~1. Class 4 oxidizers.~~
- ~~2. Pyrophorics.~~

~~The percentage of the maximum allowable quantity per control area shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 oxidizers or pyrophoric materials.~~

~~Additional quantity increases shall be prohibited, and such materials shall be stored in accordance with all of the following:~~

- ~~1. Use shall be within an approved chemical fume hood listed in accordance with UL 1805, or in an inert atmosphere glove box in accordance with NFPA 45, Section 7.11, or other approved equipment designed for the specific hazard of the material.~~
- ~~2. Combustible materials shall be kept not less than 2 feet (610 mm) away from the work area, except for those items directly related to the research.~~
- ~~3. A portable fire extinguisher appropriate for the specific material shall be provided within 20 feet (6096 mm) of the use in accordance with Section 906.~~

~~3805.3 Restricted materials automatic fire detection.~~ An automatic fire detection system shall be installed in all existing laboratories in nonsprinklered buildings in accordance with this section. Detectors shall be connected to the building's fire alarm control unit where a fire alarm system is provided. Detector initiation shall activate the occupant notification system in accordance with Section 907.5 where connected to the building's fire alarm control unit. Activation of the detection system shall sound a local alarm in buildings not equipped with a fire alarm notification system.

~~3805.3.1 System supervision and monitoring.~~ Automatic fire detection systems shall be electronically supervised and monitored by an *approved* supervising station or, where *approved*, shall initiate an audible and visual signal at a constantly attended, on-site location.

~~3805.4 Percentage of maximum allowable quantity per control area.~~ The percentage of *maximum allowable quantities per control area* of hazardous materials shall comply with Table 3805.4.

TABLE 3805.4
DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING NONSPRINKLERED LABORATORIES

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA ^{a, c}	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS ^{b, c, d}
Above grade plane	Higher than 9	5	1	2 ^e
	7-9	10	2	2 ^e
	4-6	25	22	2 ^e
	3	75	4	1
	1-2	100		1
Below grade plane	1	100	3	1
	2	75	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

- a. Percentages shall be of the maximum allowable quantity per control area shown in Table 5003.1.1(1) and Table 5003.1.1(2), excluding all increases allowed in the footnotes to those tables.
- b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
- c. Vertical fire barriers separating control areas from other spaces on the same floor are permitted to be 1-hour fire-resistance rated.
- d. See Section 414.2.4 of the International Building Code for additional requirements.
- e. The percentage of the maximum allowable quantity per control area shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 oxidizers or pyrophoric materials.

Delete without substitution:

SECTION 3806 EXISTING SPRINKLERED LABORATORIES

Revise as follows:

3806.1 Scope. Storage and use of hazardous materials in existing laboratories within buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be in accordance with Section 3803 and with Chapters 50 through 67, as applicable, except as modified by this section.

3806.2 Hazardous materials storage and use.

Storage and use of hazardous materials within *control areas* in new and existing laboratories equipped with an *automatic sprinkler system* shall be in accordance with this section and Chapters 50 through 67, as applicable.

Exception: Existing laboratories in buildings equipped throughout with an *automatic sprinkler system* meeting the requirements for *laboratory suites* are permitted to comply with Section 3804.

3806.2.1 Percentage of maximum allowable quantities per control area. The percentage of *maximum allowable quantities per control area* of hazardous materials shall be in accordance with Table 3806.2.1.

**TABLE 3806.2.1
DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING SPRINKLERED LABORATORIES**

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA ^a	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS ^{b, d}
Above grade plane	21+	5	1	2 ^e
	11-20	10	1	2 ^e
	7-10	25	2	2 ^e
	4-6	50	2	2 ^e
	3	75	3	1
	1-2	100	4	1
Below grade plane	1	100	3	1
	2	75	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

- a. Percentages shall be of the maximum allowable quantity per control area shown in Table 5003.1.1(1) and Table 5003.1.1(2), with all increases allowed in the footnotes to those tables.
- b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
- c. Vertical fire barriers separating control areas from other spaces on the same floor are permitted to be 1-hour fire-resistance rated.
- d. See Section 414.2.4 of the International Building Code for additional requirements.

CHEMICAL FUME HOOD. A ventilated enclosure designed to contain and exhaust fumes, gases, vapors, mists and particulate matter generated within the hood.

GLOVE BOX. A sealed enclosure in which items inside the box are handled exclusively using long gloves sealed to ports in the enclosure.

HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

LABORATORY SUITE. A fire-rated enclosed laboratory area that will provide one or more laboratory spaces, within a Group B educational occupancy, that are permitted to include ancillary uses such as offices, bathrooms and corridors that are contiguous with the laboratory area, and are constructed in accordance with Chapter 38.

[A] SPECIAL EXPERT. An individual who has demonstrated qualifications in a specific area, outside the practice of architecture or engineering, through education, training and experience.

Reason: Since the adoption of the codes, we have realized that there are many issues associated to providing an exception for higher education lab:

1. The idea that higher education labs are safer than other types of labs is in this proponent's opinion a mistake. Based on our experience in providing hazardous materials code compliance services, there are universities that are extremely well maintained with a great system of tracking hazardous materials while there are other universities where students are given "carte blanche" on how they store and use chemicals without any system of tracking quantities.

2. The storage and use of smaller containers has been given as the reason for allowing higher quantities. While that is the case for university labs, it's also the case for ANY lab. Why are higher education labs being treated differently than other labs?

3. The only fatality incident in a lab that we are aware of occurred at UCLA in 2008. While increasing flammable/combustible liquids might an option for higher education labs (since the majority of the issues in upper floors are related to flammable/combustible liquids), increasing other chemicals such as pyrophorics may have may have consequences. The fatality at UCLA was from an incident involving pyrophorics.

4. Contamination from fire fighting water (i.e. fire hose discharge) spilling to lower levels in labs located in high rise can create additional liability for fire departments.

Cost Impact: The code change proposal will increase the cost of construction

The cost of construction for higher education labs will increase as a result of this code change.

Heat Detectors (7108)

IFC: 1207.11.6

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, Riverside County Fire Dept., representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Fire Code

Revise as follows:

1207.11.6 Fire detection. ESS installed in group R-3 and R-4 occupancies shall comply with the following:

1. Rooms and areas within *dwelling units, sleeping units* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11 ~~Section 907.2.10~~.
2. A listed heat alarm ~~heat detector listed and interconnected to the smoke alarms~~ shall be installed in locations ~~within dwelling units, sleeping units and attached garages~~ where smoke alarms cannot be installed based on their listing.

Reason: The purpose of this proposal is to:

1. Divide the single paragraph into distinct parts for clarity, separating the charging language from the provisions to provide single-station or multi-station smoke alarms per the code.
2. Correct the section pointer to section 907.2.10 to the revised location in the 2021 IFC, 907.2.11.
3. Clarify the intent is to provide both heat detection and alarm annunciation in the ESS location through the use of listed heat alarms.

The term heat detector was replaced because the heat detectors do not include a local annunciator. A heat detector is only required to detect a heat event, and safety officials want an audible alarm.

The term interconnected is removed from this section as the requirements for interconnection are provided in section 907.2.11 of the code.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal clarifies existing code language.

Vehicle Impact (7154)

IFC: 1207.11.7, 1207.11.7.1 (New), 1207.11.7.2 (New), 1207.11.7.3 (New), 1207.11.7.3.1 (New), 1207.11.7.3.2 (New), 1207.11.7.3.3 (New), Figure 1207.11.7.1 (New), Figure 1207.11.7.3 (New)

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, Riverside County Fire Dept., representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Fire Code

Revise as follows:

1207.11.7 Protection from impact. ~~Stationary storage battery systems~~ ESS installed in a location subject to vehicle damage shall comply with Section 1207.11.1 or 1207.11.2 as applicable. ~~be protected by approved barriers. Appliances in garages shall also be installed in accordance with Section 304.3 of the International Mechanical Code.~~

Add new text as follows:

1207.11.7.1 Garages Where an ESS is installed in the normal driving path of vehicle travel, defined as a line perpendicular to the garage vehicle opening to the back wall, extending 3 ft. (914 mm) to either side along the back wall and to a height of 48 in. (1219 mm), (See Figure 1207.11.7.1) it shall be protected by barriers designed to resist, deflect, or visually deter vehicle impact. Barriers shall comply with Section 1207.11.3.

Exception: Where the clear height of the vehicle garage opening is 7 ft 6 in. (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.

-

1207.11.7.2 Other locations subject to vehicle impact Where an ESS is installed in a location other than as defined in 1207.11.7.1, and subject to vehicle damage, it shall be protected by approved barriers that comply with 1207.11.7.3

1207.11.7.3 Impact Protection Options Where the ESS is in the normal driving path of vehicle travel, one of the following methods shall be used. (See Figure 1207.11.7.3)

-

1207.11.7.3.1 Bollards Bollard construction shall comply with one of the following:

1. 48 in. L x 3 in. Dia. (1219 mm x 76 mm) SCH. 80 steel pipe embedded in a concrete pier 12 in. (304 mm) deep and 6 in. (152 mm) diameter, with 36 in. (914 mm) of pipe exposed, filled with concrete, and spaced at a maximum interval of 60 in. (1524 mm) Each bollard shall be located not less than 6 in. (152 mm) from an ESS.
2. 36 in. H x 3 in. (914 mm x 76 mm) Dia. SCH. 80 steel pipe fully welded to an 8 in. x 8 in. x ¼ in. (203 mm x 203 mm x 6.4 mm) thick steel plate and bolted to a concrete floor by means of (4) ½ in. (13 mm) concrete anchors with 3 in. (76 mm) minimum embedment. Spacing shall be 60 in. (1524 mm) maximum, and each bollard shall be located not less than 6 in. (152 mm) from the ESS.
3. Pre-manufactured steel pipe bollards shall be filled with concrete and anchored in accordance with the manufacturer's installation instructions, 60 in. maximum spacing. Located not less than 6 in. (152mm) from the ESS.

1207.11.7.3.2 Wheel barriers Wheel barrier construction shall comply with one of the following:

-

1. 6" H x 6" W (152 mm x 152 mm) wheel barrier made of concrete or polymer, anchored to the concrete floor every 36 in. (914 mm) minimum and located not less than 54 in. (1372 mm) from the ESS.. Minimum (2) ½ in. (13 mm) diameter concrete anchors with 3 in. (76 mm) embedment per barrier shall be used. Spacing between barriers shall be a maximum of 36 in. (914 mm).

2. Pre-manufactured wheel barriers shall be anchored in accordance with the manufacturers installation instructions.

1207.11.7.3.3 Other Methods

1. Approved method designed to resist a 2000 lb impact in the direction of travel at 24 in. above grade.

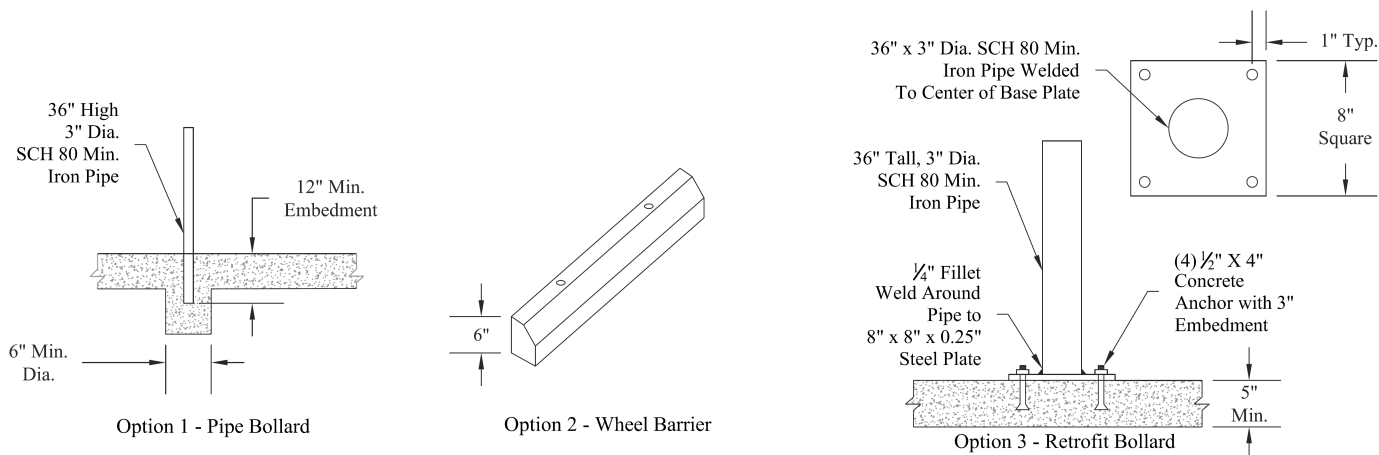


Figure 1207.11.7.3
Impact Protection Options

Reason:

Summary

First, a minor editorial change is needed to replace stationary storage battery system with ESS . This should have been part of a global change last cycle .

Second, the last sentence referring to appliances has been removed. Section 304.3 is related to the elevation of ignition sources not vehicle impact protection. The concern about raising ignition sources has historically been applied to fuel-fired appliances such as water heaters. These types of appliances are the only equipment able to be listed as flammable vapor ignition resistant. Even when a water heater has not been evaluated to ANSI Z21.10, only the actual ignition source needs to be elevated above 18", not the entire water heater. It's important to note that NFPA 70 does not consider the area below 18" a classified location in above-grade residential garages .

The third and most substantial change addresses the need for a clearly defined area in which a residential garage ESS installation would trigger the "Subject to Vehicle Damage" requirement found in 1207.11.7. The existing language has led to widely varying interpretations and enforcement of impact protection.

- **New language (1207.11.1)** has been added to define this area and set the expectation that the barriers are intended to deflect, resist, or visually deter an impact. This language mirrors the existing Section 312.3 in the IFC.
- A minimum installation height of 48" within the likely impact area has been added to allow elevation of the ESS as a permissible mitigation option. An exception to this 48" minimum has been included to recognize that a reduced garage opening height would thereby limit vehicle height and allow a lower placement of equipment before additional protection is needed. This exception is inspired by existing IMC Commentary:

"The height of the vehicle entry opening of the garage or carport can be used as a guide in determining how tall of a vehicle could be driven into the garage or carport"

- A new Figure 1207.11.7.1 has been added to illustrate the zones in which a typical residential garage ESS installation would trigger the need for impact protection. This figure is based on existing IMC commentary related to the installation of fuel-fired appliances that may pose a fire hazard when damaged. The IMC commentary Figure 304.6 (2) has been modified to reflect common ESS installation locations and takes a similar approach to mitigating the risk of impact.
- New language (1207.11.7.2) has been added to address other than garage locations that may also have vehicle access such as residential driveways, and also allows some flexibility to the AHJ and installer for larger, non-typical, or custom residential garages where the normal path of vehicle travel falls outside of the area defined in 1207.11.7.1.

Finally, the prescriptive barrier and post designs per IBC 1607.10 or IFC 312.2 may be appropriate for an energy storage system in a public access parking lot, garage, or other thoroughway. We are therefore not proposing any changes to 1207.4.5. However, the forces assumed in these sections are not representative of the impact scenarios expected in a private residential garage reserved for permanent occupants.

For example, the calculation in IBC 1607.8.3 results in approx. 12K lb-force applied to the anchorage, which causes readily available bollard to concrete connections to fail. This effectively eliminates the possibility of retrofitting a floor mounted bollard as a solution. Additionally, the posts described in IFC 312.2 can not be reasonably installed in an existing residential garage, and although uncommon especially those with tensioned concrete slabs. This leaves AHJs and installers with no guidelines for a retrofit bollard designed to deter vehicle operators from carelessly striking the ESS units. While IFC Section 312.3 does allow an alternative approach, designers, installers, and code officials will benefit from more explicit guidance within Section 1207.11. In new construction posts designed in accordance with Section 312 may be feasible, however it is unlikely that a homebuilder would be able to anticipate the installation of an ESS in a specific location in a garage. The proposed options for impact protection were inspired by existing IMC commentary figure 304.6(2). These options have been modified to provide a consistent amount of force resistance across the available choices, something the IMC commentary does not do. These options more reasonably reflect the expected impact scenario described in the commentary text:

“The barriers shown in the commentary figure will not eliminate all possibility of a motor vehicle contacting the appliances but will offer a reasonable warning to a driver who is slowly navigating near the appliances”

And:

“Although this section does not specifically require the impact protection provided to stop any type of vehicle at any speed, the intent is for the impact protection to cause the driver to want to stop vehicle movement out of concern for damage that could be occurring. The choice of the type, structural capacity and the location of barriers is the responsibility of the designer.”

Between limiting the locations that ESS Batteries can be installed, and defining the requirements when impact protection is required, the result will be an improved level of protection from the risk of vehicle impacts, and damage mitigation if incidents do occur.

Technical Justification

An engineering review of the impact protection guidance found across the I-Codes and ASCE 7-16 was completed. Specifically Section 312 of both the prior and existing IFC, Section 4.5.3 of ASCE 7-16, and commentary language and figures associated with Section 304.6 of the IMC.

It is important to recognize that the prescription of the IFC Section 312 for bollards in public driving areas does not lead to a bollard that will resist 12k lbs. as prior editions of the code suggested.. In actual testing ((Harrison (SwRI), Evaluation of collision protection provided by vehicle impact bollards and propane cylinder exchange cabinets 2013)) the static resistance was between 900 lbs. at 36" (2.7k lbs. reaction) and 11k lbs. at 36" (33k lbs. reaction).

ASCE 7-16 specifies vehicle barrier systems must resist 6k lbs. load at between 18" and 27" (9k to 13.5k lbs. reaction) There are no commonly available retrofittable bollards that can do this in an average residential garage without adding thickness to the concrete.

The IMC commentary figure when back calculated sets a bar of physical resistance which seems more appropriate to this risk and allows for solutions that are more practical to apply. For example, the bollard shown in IMC commentary Figure 304.6(2) will take an impact of about 625 lbs. load applied at 24", resulting in a 1250 lb reaction force at the post to base plate connection. Likely outcomes based on this force include:

- No damage at 0.5 mph impact from an average passenger car.
- Bollard would deflect permanently a few inches at a 2 mph collision speed
- Anchor bolts would shear off or blowout at a 5 mph collision speed.

The limitation is mostly the concrete to base plate connection. The IRC requires a 2500-3000 psi mix for garages, and garages are often of stronger mix, especially in freeze prone areas. The average garage concrete slab will fall within these specifications: 2500 - 4000 psi concrete with 5" min thickness. Using 1/2" epoxy anchors this equates to roughly a 2mph impact that could be sustained without significant damage to the bollard. This is aligned with a standard Uline 4.5" bollard with 1/8" wall thickness and a 8x8x3/8" base plate. More strength requires a larger base plate, as the limitation is the connection to the concrete.

The bolt down bollard specified in this proposal will take a 2000 lb impact, 24" off the ground with no damage, given 3000 psi concrete. More than 6" of permanent deflection would require a very significant force, and then only touching the face of the ESS. This seems a reasonable level of protection, and clearance distance.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Bibliography:

Harrison, O. (2013). Evaluation of Collision Protection provided by vehicle impact bollards and propane cylinder exchange cabinets (Rep. No. 18.19083.01.107.FR1). Southwest Research Institute.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal clarifies and gives more technical rigor to the requirements.

Rooftop-mounted PV Panel Systems (7163)

IBC: 503.1, Figure 503.1 (New)

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (joecainpe@gmail.com); Kevin Reinertson, Riverside County Fire Dept., representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov)

2021 International Building Code

Revise as follows:

503.1 General. Unless otherwise specifically modified in Chapter 4 and this chapter, *building height*, number of *stories* and *building area* shall not exceed the limits specified in Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. *Building height*, number of *stories* and *building area* provisions shall be applied independently. For the purposes of determining area limitations, height limitations and type of construction, each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

Exceptions:

1. Other than structural requirements, rooftop-mounted photovoltaic (PV) panel systems shall not constitute an additional story or additional floor area and may exceed the height limit of a building provided the following conditions are met:

1.1. For all occupancies, the highest point of the PV panel system shall meet the lower of the two values below:

1. 3' above the allowable building height per this code.

2. 3' above the roof of the building immediately below.

1.2. For installations on low-slope roofs (roof slope $< 2:12$) in other than Group R-3 and R-4 occupancies, the highest point of the PV panel system shall meet the lower of the two values below:

1. 10' above the allowable building height per this code.

2. 10' above the roof of the building immediately below.

2. Other than structural requirements, photovoltaic (PV) support structures installed on the roof of an open parking structure shall not constitute an additional story or additional floor area and may exceed the height limit as specified in Exception 1 (above) when the following conditions are met (see Figure 503.1):

1. The area within the perimeter of PV support structures has maximum rectangular dimension of 40 feet by 150 feet.

2. The distance between PV support structures is a minimum of 10 feet clear.

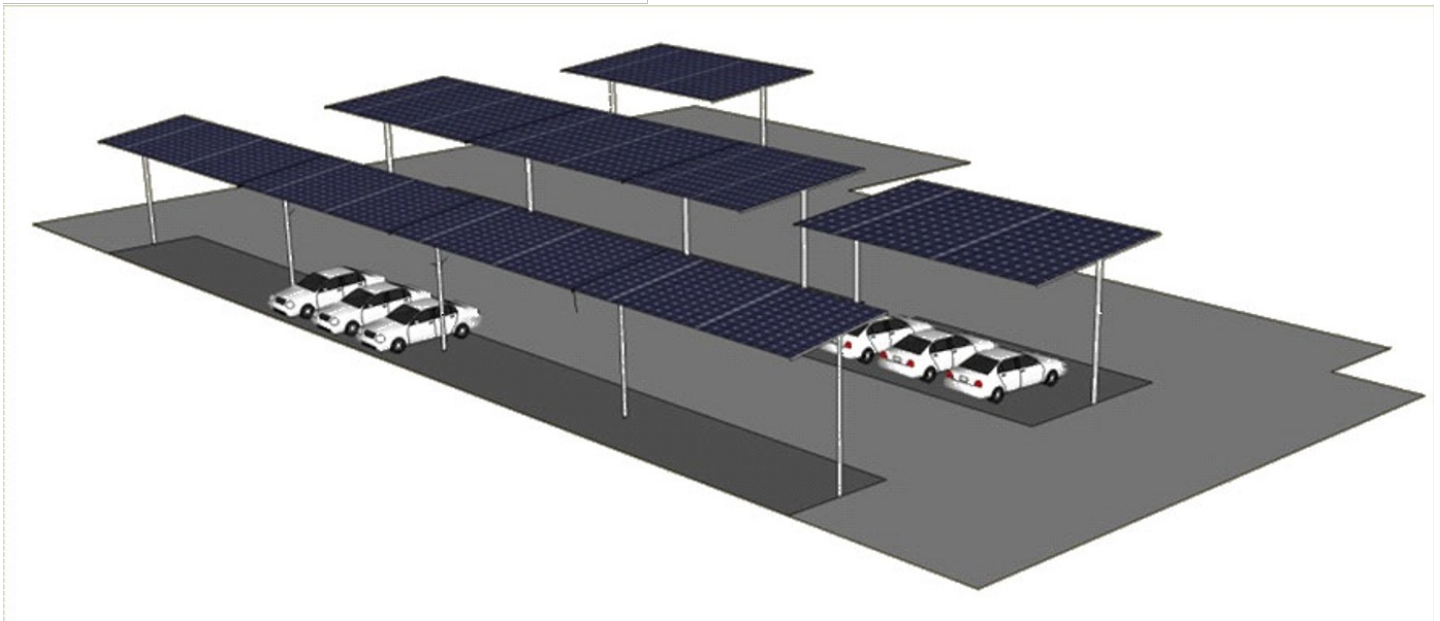
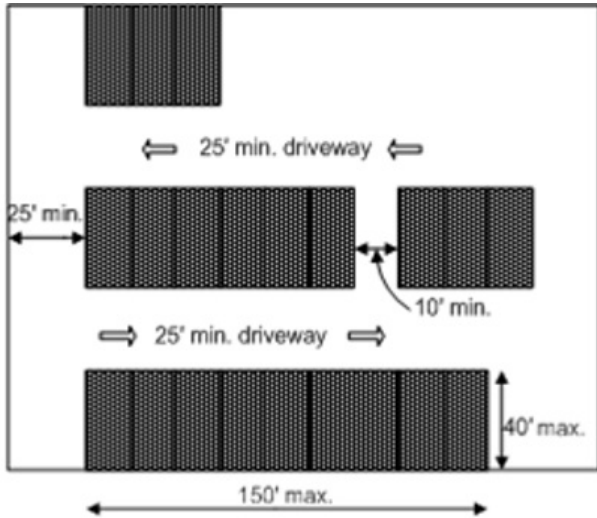
3. The driveway aisle separating PV support structures has a minimum width of 25 feet clear.

4. PV support structures are used only for parking purposes with no storage.

5. PV support structures are completely open on all sides (other than necessary structural supports) with no interior partitions.

Add new text as follows:

Figure 503.1 Location of PV Support Structures on Open Parking Structures



Reason: The primary objective of this proposal is to provide exceptions to clarify that elevated PV support structures can be installed on top of a multi-story parking garage under certain conditions without impacting restrictions on number of stories, height or area. Likewise, under certain conditions, rooftop-mounted PV systems do not cause a building to be noncompliant with these provisions.

The exceptions in this proposal are similar to exceptions that have existed in the California Building Code for several cycles, with support of the fire service and without any compromises in safety to the building or fire fighters. These exceptions will not impact the ability to fight fires on top of buildings.

Without the exceptions proposed here, rooftop solar structures can be interpreted to constitute an additional story of the building, increase the overall building height or where there is a use underneath such as elevated PV support structures, increase the floor area of the building. As a result, solar installations may not be allowed in buildings that are built to the maximum height, story or floor area. The proposed code revision provides an exemption for photovoltaic systems from these code restrictions.

Exception 1: This amendment allows solar PV systems to be installed above the maximum building height specified by code with limitation. This amendment will make it feasible to install rooftop solar PV systems on top of buildings that are built to the maximum height which is especially common in existing buildings. It will also make it practical for PV panels to be installed above the roof with the required tilt angle and be at a height that avoids interference with vents and equipment on the roof. **Exception 2:** The amendment allows solar PV panel installations over parking stalls to be installed without being considered a story or floor area, these restrictions may prevent solar PV systems from being installed in buildings that have the maximum number of stories or floor area which is especially common in existing buildings. The exception requires minimum spacing between solar PV panel structures to allow fire access and provide a fire break.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. It encourages the use of solar without adversely impacting safety.

Class IIB Liquids (7440)

IFC: 5001.1, 5701.2

Proponents: Elley Klausbruckner, Klausbruckner & Associates, Inc., representing Klausbruckner & Associates, Inc.

2021 International Fire Code

Revise as follows:

5001.1 Scope.

Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or wholesale sales occupancies, medicines, foodstuff, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
2. Alcoholic beverages in retail or wholesale sales occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.
4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOT) regulations.
5. Building materials not otherwise regulated by this code.
6. Refrigeration systems (see Section 608).
7. Stationary storage battery systems regulated by Section 1207.
8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.
9. *Corrosives* utilized in personal and household products in the manufacturer's original consumer packaging in Group M occupancies.
10. The storage of beer, distilled spirits and wines in barrels and casks.
11. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.
12. Specific provisions for flammable liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
13. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, Chapter 57 applies.
14. Storage and display of aerosol products complying with Chapter 51.
15. Storage and use of *flammable or combustible liquids* that do not have a fire point when tested in accordance with ASTM D92, not otherwise regulated by this code.
16. *Flammable or combustible liquids* with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion, not otherwise regulated by this code.
17. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.

18. Class IIIB Liquids in containers with a flashpoint at or above 450°F (121°C) that are not pumped or heated above 150°F (65°C) in a sprinklered building when protected as follows:

18.1 Class IV ordinary combustible commodity when in metal containers.

18.2 High Hazard ordinary combustible commodity when in plastic containers, and separated from ordinary combustibles by a minimum of 10'.

5701.2 Nonapplicability.

This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters of this code, including:

1. Specific provisions for *flammable liquids* in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
2. Medicines, foodstuffs, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Quantities of alcoholic beverages in retail or wholesale sales or storage occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
4. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, this chapter applies.
5. Refrigeration systems (see Section 608).
6. Storage and display of aerosol products complying with Chapter 51.
7. Storage and use of liquids that do not have a fire point when tested in accordance with ASTM D92.
8. Liquids with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion.
9. Liquids without *flash points* that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons.
10. The storage of beer, distilled spirits and wines in barrels and casks.
11. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.
12. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.
13. The off-site transportation of *flammable* or *combustible liquids* where in accordance with Department of Transportation (DOTn) regulation.

14. Class IIIB Liquids in containers with a flashpoint at or above 450°F (121°C) that are not pumped or heated above 150°F (65°C) in a sprinklered building when protected as follows:

14.1 Class IV ordinary combustible commodity when in metal containers.

14.2 High Hazard ordinary combustible commodity when in plastic containers, and separated from ordinary combustibles by a minimum of 10'.

Reason: Table 5003.1.1(1) footnote f, allows unlimited quantities of Class IIIB liquids in buildings throughout with an approved fire sprinkler system in accordance with Section 903.3.1.1 (i.e. NFPA 13). In a recent informal interpretation by ICC staff, an issue came up that may affect how users view Class IIIB Liquids in sprinklered buildings. The staff interpretation stated that if Class IIIB liquids are allowed in unlimited quantities, if the building is protected per NFPA 13, and if NFPA 13 references NFPA 30 (e.g. 2019 Edition of NFPA 13, Section 26.2), then you continue the referenced sections through to the end (i.e. Class IIIB liquids have to be protected per NFPA 30). The issue that arises from this is for some threshold quantities, NFPA 30 requirements for Class IIIB Liquids (i.e. control area, 2019 Edition of NFPA 30, Table 16.5.2.3) have similar requirements for Class IIIA in an H-Occupancy (i.e. IFC Table 5704.3.6.3(4)). To this end, the proponent is proposing an exception for at least the higher flashpoint IIIB Liquids (>450 °F). The proposed exception is based on FM Data Sheet 7-29 for protection of "atypical ignitable liquids". FM Data Sheet 7-29, further describes "atypical ignitable liquids" with the following statement:

"Based on the results of several research test programs, FM Global has defined a closed-cup flash point threshold at which liquids will not support fire spread across an unheated liquid pool. This does not mean these liquids will not burn; in

fact, they still represent a severe fire hazard when stored in small plastic containers or larger containers with cardboard packaging, and when they are heated above 150°F (65°C) or pumped."

Please note that once ignited, these liquids are still capable of high heat release, which is why protection in accordance with Class IV commodity (for liquids in metal containers) and High Hazard/Group A Plastics commodity (for liquids in plastic containers) is proposed, similar to what is required in FM Data Sheet 7-29, Sections 2.1.3.

While this fix does not solve all issues associated with how to protect unlimited quantities of IIIB liquids in a sprinklered building, it does address some of the issues with IIIB Liquids with higher than normal flashpoint.

Bibliography: 1. NFPA 30, 2018 Edition, Table 16.5.2.3
2. Factory Mutual Data Sheet 7-29, Sections

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Depending on how protection of Class IIIB liquids have been interpreted, it is unsure as to whether this will increase or decrease the cost of construction.

Cooking separation from tents 3106.5.1 (7453)

IFC: 3106.5.1, 3107.4, 3107.12.5, 3107.12.5.1 (New), 3107.12.6

Proponents: Crystal Sujeski, California Fire Chiefs Association, representing California Fire Chiefs Association (crystal.sujeski@fire.ca.gov)

2021 International Fire Code

Revise as follows:

3106.5.1 Separation from tents or structures.

~~Cooking appliances or devices operations shall be in compliance with Section 3107.12, that produce sparks or grease-laden vapors or flying embers (firebrands) shall not be used within 20 feet (6096 mm) of a tent or temporary structure.~~

Exceptions:

- ~~1. Designated cooking tents not occupied by the public when approved by the fire code official.~~
- ~~2. Tents or structures where cooking appliances are protected with an automatic fire extinguishing system in accordance with Section 904.13.~~

3107.4 Open or exposed flame. Open flame or other devices emitting flame, fire or heat or any *flammable* or *combustible liquids*, gas, charcoal or ~~other cooking device~~ or any other unapproved devices shall not be permitted inside or located within ~~20-10~~ feet (~~6096~~ 3048 mm) of the *tent* or *membrane structures* while open to the public unless *approved by the fire code official*.

Exception: Cooking devices shall comply with section 3107.12

3107.12.5 Separation of cooking tents. *Tents* with sidewalls or drops where cooking is performed shall be separated from ~~other non-cooking tents~~ or *membrane structures* by not less than ~~20~~ 10 feet (~~6096~~ 3048 mm).

Exception: Small tents limited to 100 square feet that are accessory to the cooking operations of the cooking tent and are not occupied by the public.

3107.12.5.1 Groups of cooking tents. Cooking tents may be placed side by side when the following conditions are met:

1. The area of the cooking tents has a maximum area of 700 square feet.
2. Each grouping of tents shall have a fire break clearance of at least 12 feet.
3. A fire access aisle separating rows of cooking tents has a minimum width of 16 feet clear.

3107.12.6 Outdoor cooking operations. ~~Outdoor~~ cooking that produces sparks or grease-laden vapors shall not be performed within ~~20~~ 10 feet (6096 mm) of a *tent* or *membrane structure* when the following conditions are met:

1. Cooking devices shall be isolated from the public.
2. Cooking devices shall be maintained and used according to the manufactures instructions.

Exception: Designated cooking tents with an automatic sprinkler systems installed in accordance with 903.3.1.1.

Reason: The proposal is to correlate many different provision in the International Fire Code (IFC) that relate to cooking, open flame and separation from tents. With the advancement of flame retardant materials required for tents the over restrictive regulation of 20 feet separation is excessive and not feasible in many outdoor events and activities. Historically the 20 foot separation was prior to requirement of tent materials applied with flame retardant properties. The current International Building Code (IBC) at 10 feet and greater, doesn't require a lot of openings to be protected any longer because the danger of radiant heat transfer is less at that distance, and convective/ conductive heat transfer is almost non-existent beyond 10 feet.

Additional IFC Sections that have a separation provisions:

- 305.2. has hot ashes minimum 10' from combustibles
- 307.4 exception 1 allows open burning in approved containers 15' from structures
- 307.4.3 portable outdoor fireplace 15'
- 308.1.4 open flame cooking devices 10' from combustible construction
- 3103.2 exception 2.1 and 2.2 700 square feet, side by side fire break of 12'

Gas grills are outdoor cooking appliances that are typically listed to ANSI Z21.58. The clearances may be determined by the manufacturer's installation requirements. Gas grills typically have controls to regulate the flame.

This proposal will allow for special events to have cooking operations done in a safe and consistent manner, while supporting vendors and event planners. This also removes conflicts within the code.

The grouping of cooking tents is modeled from the permit provisions in 3103.2. It correlates the 700 square feet provision. The rationale of the 16 feet fire department access is to allow for one fire apparatus or one ambulance, or allowable room for a golf cart with and pedestrian traffic.

Cost Impact: The code change proposal will decrease the cost of construction. The cost will allow for special events to have cooking operations done in a safe and consistent manner, while supporting vendors and event planners. This also removes conflicts within the code.

Elevated PV Support Structures (7528)

IBC: 202 (New), 3111.3.5 (New), 3111.3.5.1 (New), 3111.3.5.2 (New), 3111.3.6, 3111.3.6.1

Proponents: Larry Sherwood, on behalf of Sustainable Energy Action Committee, representing Interstate Renewable Energy Council (Larry@irecusa.org); Kevin Reinertson, representing California Fire Chiefs Association FPO (kevin.reinertson@fire.ca.gov); Benjamin Davis, CA Solar & Storage Association, representing CA Solar & Storage Association (ben@calssa.org); Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), representing SEIA (JoeCainPE@gmail.com)

2021 International Building Code

Add new text as follows:

202 Definitions

PHOTOVOLTAIC (PV) PANEL SYSTEM, GROUND-MOUNTED. An independent photovoltaic (PV) panel system without useable space underneath, installed directly on the ground.

PHOTOVOLTAIC (PV) SUPPORT STRUCTURE, ELEVATED. An independent photovoltaic (PV) panel support structure designed with useable space underneath with minimum clear height of 7 feet 6 inches (2286 mm), intended for secondary use such as providing shade or parking of motor vehicles.

3111.3.5 Elevated photovoltaic (PV) support structures *Elevated PV support structures shall comply with either 3111.3.5.1 or 3111.3.5.2.*

Exception: *Elevated PV support structures that are installed over agricultural use.*

3111.3.5.1 PV panels installed over open-grid framing or non-combustible deck. *Elevated PV support structures with PV panels installed over open-grid framing or over a noncombustible deck shall have PV panels tested, listed, and labeled with a fire type rating in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Photovoltaic panels marked “not fire rated” shall not be installed on elevated PV support structures.*

3111.3.5.2 PV panels installed over a roof assembly *Elevated PV support structures with a PV panel system installed over a roof assembly shall have a fire classification in accordance with Section 1505.9.*

Revise as follows:

3111.3.5.6 Ground-mounted photovoltaic (PV) panel systems. Ground-mounted photovoltaic panel systems shall be designed and installed in accordance with Chapter 16 and the *International Fire Code*.

3111.3.5.6.1 Fire separation distances. Ground-mounted photovoltaic panel systems shall be subject to the *fire separation distance* requirements determined by the local jurisdiction.

Reason: The primary purpose of this proposal is to establish appropriate fire testing and listing criteria for overhead photovoltaic (PV) support structures that could have people or vehicles in the space beneath them. Sometimes referred to as “solar shade structures,” they are most commonly constructed over vehicle parking spaces of surface parking lots, are sometimes built on the uppermost level of parking garages, but could be built in a variety of locations with or without cars parked beneath. Overhead PV structures are referenced in 2021 IBC Section 1607.14.4, and in 2019 California Building Code Section 503.1, but without any definitions.

In 2021 IBC Section 1607.14.4.3, these structures are described as “Structures with open grid framing and without a roof deck or sheathing supporting photovoltaic panel systems.”

In 2019 California Building Code Section 503.1, Exception 2, these structures are described as: “... solar photovoltaic panels supported by a structure with no use underneath...” In Exception 3, there is a more-specific description by location: “... solar photovoltaic panels supported by a structure over parking stalls ...”

Ground-mounted photovoltaic panel systems are referenced in the 2021 I-codes, in IBC Sections 1607.4.4 and 3111.3.5; in IRC Section R324.7; and in IFC Section 1205.5.

For the proposed definition of Elevated PV Support Structure note the minimum height threshold of 7'-6" is consistent with IBC 1003.2.

Most PV panels in the marketplace have been fire tested and assigned a “type rating” in accordance with UL 1703. However, some PV panels might not have that fire testing, and could be marked “not fire rated.” This proposal

clarifies that PV panels marked “not fire rated” cannot be used on elevated/overhead PV structures that could have people or cars beneath them, with or without a full roof assembly.

Where elevated PV structures have PV panels mounted over open-grid framing with no roof deck or sheathing cannot achieve a “fire classification” because there is no combustible roof covering to ignite in a UL 2703 spread-of-flame or burning brand test. Therefore, it is sufficient protection to install only type-rated modules. The same is true when PV panels are installed directly over noncombustible metal sheathing without a stand-off mounting system.

Where elevated PV structures have a roof assembly and PV panels are rooftop mounted over that roof assembly, then those structures must have a fire classification according to Section 1505.9. There are several different stakeholder groups that will benefit from this proposal.

This proposal was prepared by the Sustainable Energy Action Committee (SEAC), a forum for all stakeholders (including, but not limited to, AHJs, designers, engineers, contractors, first responders, manufacturers, suppliers, utilities, and testing labs) to collaboratively identify and find solutions for issues that affect the installation and use of solar energy systems, energy storage systems, demand response, and energy efficiency. The purpose is to facilitate the deployment and use of affordable, clean and renewable energy in a safe, efficient, and sustainable manner.

All recommendations from SEAC are approved by diverse stakeholders through a consensus process.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. It encourages the use of solar without adversely impacting safety.

Construction Safety Chapter 33 - Electronic Systems (7577)

IFC: 3301.3 (New), 3303.1.1, 3303.7.1 (New), 3303.7.2 (New), 3303.7.3 (New), 3303.7.4 (New), 3303.9.1, 3303.4, 3305.1 (New), 3305.2 (New), 3305.2.1 (New), 3305.5.2 (New), 3310.2 (New), SECTION 202 (New), SECTION 202

Proponents: Joseph R Cervantes, Space Age Electronics, representing Space Age Electronics
(joseph.cervantes@1sae.com)

2021 International Fire Code

Add new text as follows:

3301.3 Equivalency. Nothing in this chapter is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed in this section. The use of electronic technologies approved by the AHJ shall be permitted.

Revise as follows:

3303.1.1 Components of site safety plans. *Site safety plans* shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where *approved*, and signage locations in accordance with Section 3305.8.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of *flammable* and *combustible liquids* and other hazardous materials.
11. Provisions for site security.
12. Changes that affect this plan.
13. Other site-specific information required by the *fire code official*.
14. Shall be developed in accordance with NFPA 1620.

Add new text as follows:

3303.7.1 Temporary electronic systems. Electronic systems used to alert of possible fire or other emergency conditions on a construction site shall be permitted as approved by the AHJ.

3303.7.2 Listing. The electronic systems shall be listed by the manufacture for their intended purpose.

3303.7.3 Commissioning and decommissioning. Temporary electronic systems shall be approved for use on a temporary basis during construction activities and shall be commissioned and decommissioned at the express written consent of the local fire official.

3303.7.4 Locations. Temporary electronic systems shall be placed in the locations of highest possible combustibility during construction activities. Device and sensor locations shall be determined based on but not limited to the combustibility of the following :

1. Hot work locations.
2. Trash Chutes.
3. Trash Bins.

4. Combustible Material Storage locations.
5. Locations with flammable material storage.
6. Locations where there is a high likelihood of electrically induced combustion of materials.
7. Temporary shelters and trailers.
8. Other locations as required by the local fire or building official.

Revise as follows:

3303.9.1 Smoke detectors and smoke alarms. Smoke detectors and smoke alarms located in an area where airborne construction dust is expected shall be covered to prevent exposure to dust or shall be temporarily removed. Smoke detectors and alarms that were removed shall be replaced upon conclusion of dust-producing work. Smoke detectors and smoke alarms that were covered shall be inspected and cleaned, as necessary, upon conclusion of dust-producing work.

Exception: Temporary electronic systems listed for the construction environment.

3303.4 Qualifications. ~~Site safety directors shall acquire training specific to their roles and responsibilities. The site safety director shall be a competent person with knowledge of the applicable fire protection codes and standards, available fire protection systems, and fire inspection procedures.~~ Upon request, the training and qualifications of the site safety director shall be submitted to the *fire code official* for approval.

Add new text as follows:

3305.1 Temporary Protection During Construction, Alteration, or Demolition. During construction, alteration, or demolition, the use of temporary electronically supervised fire sprinkler protection approved by the AHJ shall be permitted as supplemental protection.

3305.2 Fire department command post. In high-rise buildings under construction, a fire department command post shall be provided in a location approved by the fire authority.

3305.2.1 Components of fire department command post. The fire department a command post shall be provided with information in accordance with 3303.1.1.

3305.5.2 Temporary Protection Systems During Construction, Alteration, or Demolition. During construction, alteration, or demolition, the use of temporary electronic systems, approved by the AHJ, shall be permitted as supplemental protection. Placement shall be in accordance with 3307.4.

3310.2 Means of Notification and Alerting During Working Hours. Appropriate means of automatic, site wide alerting and notification to all construction workers for evacuation during normal site working hours shall be provided in approved locations on the construction site. The system shall be comprised of alerting devices such as bells, horns, speakers, lights, beacons, call points or text displays that provides audible, tactile or visible outputs, or any combination thereof, sufficient for alerting workers and listed for its intended purpose, by the manufacture.

Revise as follows:

ALARM NOTIFICATION APPLIANCE. A fire alarm system component such as a bell, horn, speaker, call point, light or text display that provides audible, tactile or visible outputs, or any combination thereof. See also "Audible alarm notification appliance" or "Visible alarm notification appliance."

AUTOMATIC SMOKE DETECTION SYSTEM. A fire alarm system or temporary electronic system that has initiation devices that utilize smoke detectors for protection of an area such as a room or space with detectors to provide early warning of fire.

ALARM VERIFICATION FEATURE. A feature of automatic fire detection, temporary electronic system and alarm systems to reduce unwanted alarms wherein smoke detectors report alarm conditions for a minimum period of time, or confirm alarm conditions within a given time period, after being automatically reset, in order to be accepted as a valid alarm-initiation signal.

Add new definition as follows:

CALL POINT A Call Point allows a site wide alarm to be raised from any unit on a construction site used to initiate an evacuation alarm signal or other emergency alert functions.

Revise as follows:

FIRE PROTECTION SYSTEM. *Approved devices, equipment, temporary electronic system, and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof.*

Add new definition as follows:

TEMPORARY ELECTRONIC SYSTEMS A temporary system comprised of electronic units to provide indication and warning of emergency situations.

TEMPORARY CONSTRUCTION DUST PROOF SMOKE SENSOR A temporary device used to sense visible or invisible particles of combustion that can differentiate from construction dust.

Revise as follows:

BATTERY TYPES. For the purposes of this code, certain types are defined as follows: BATTERY TYPES. For the purposes of this code, certain types are defined as follows: as follows:

Add new definition as follows:

WIRELESS ALARM SYSTEM CONTROL UNIT. A system component of a temporary electronic system that receives inputs from automatic, manual fire alarm or alarm system devices and may be capable of supplying power to off-premises transmitter(s). The control unit has an independent power source for a length acceptable to the local fire authority. Failure of the control unit shall not inhibit the function of the alarm system alerting where means of notification are used for alerting of an emergency situation with the system.

Reason: Based on reporting from the NFPA 241 Technical Committee report from Feb. 2020, the US Average Annual Fire responses number from 3,750 due to new construction, 2650 from alterations and 2,130 from demolition. That combines to 8,530 total per year. These fires cost well over \$300 million per occurrence and injure around 130 humans. In the year 2020, there were 89 major incidents with 42 fatalities and 24 injuries.

Currently, Chapter 33 of the IFC/IBC outlines "general" fire safety precautions for all structures and all occupancies during construction and demolition operations. In general, these requirements seek to maintain required levels of fire protection, limit fire spread, establish the appropriate operation of equipment and promote prompt response to fire emergencies. Unfortunately, because there have been adaptations to new technology with long code cycles, the model code was not able to be proposed for amendment until now to create the allowance and definitions for use and approval by the local authorities having jurisdiction. With the proliferation of light weight timber in construction, the ability to provide more specific detection capabilities for earlier notification of a fire incident, the need for sensors and technology that is temporary in nature and made for the construction environment is critical to help aide in the quickest response possible by first responders.

These changes and adds will provide means to send new technology to 3rd party nationally recognized laboratories for review and approvals because it gives the basis for design and deployment of these temporary systems.

Bibliography: NFPA codes & standards

Many large and costly fires involving buildings under construction underscore the need for more widespread use of NFPA 241, Standard for Safeguarding Construction, Alteration and Demolition Operations, to address a range of related hazards.

From NFPA Journal®

- Massive fires in buildings under construction have public safety and fire service officials alarmed. What can be done to prevent these destructive blazes? Read "Danger: Construction" from the September/October 2017 issue of NFPA Journal.
- The arson issue: take steps to protect buildings under construction against arson. Read '24/7 If Necessary' from the September/October 2017 issues of NFPA Journal.
- Read the May/June 2017 NFPA Journal feature, "Hot Work, Safe Work," on the lessons learned from the U.S. Chemical Safety and Hazard Investigation Board's review of hot work incidents.
- The March/April 2017 NFPA Journal article, "Burned Again," reported on fires in properties being built by AvalonBay in New Jersey.

A few media posts:

<https://www.kron4.com/news/santa-clara-condo-construction-fire-classified-as-undetermined-investigation-complete/><https://www.sfchronicle.com/bayarea/article/Massive-fire-breaks-out-at-construction-site-in-14059190.php>

<https://certifiedsitesafety.com/what-to-know-fire-prevention-program-manager/><https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.150>

<https://www.chron.com/news/houston-texas/houston/article/Fire-official-speculates-on-cause-of-Montrose-5347617.php>

<https://www.nydailynews.com/news/national/houston-construction-worker-recalls-horror-escape-licking-flames-article-1.1736137>

<https://www.sfchronicle.com/bayarea/article/Massive-fire-breaks-out-at-construction-site-in-14059190.php?psid=cX56u>

<https://www.denverpost.com/2018/05/14/denver-construction-site-fires/>

<https://www.enr.com/articles/44497-builders-seek-new-defenses-against-construction-fires><https://www.enr.com/articles/46190-multifamily-builder-launches-fire-elimination-strategy-for-wood-frames><https://www.nbcbayarea.com/news/local/fire-under-construction-apartment-complex-oakland/168422/>

<https://www.sfchronicle.com/bayarea/article/East-Bay-housing-development-fire-marks-fifth-13329636.php>

<https://www.9news.com/article/news/local/body-found-in-debris-of-massive-construction-fire-near-downtown-denver/73-526642133>

https://tucson.com/news/local/photos-huge-fire-destroys-tucson-student-housing-project/collection_4644a2e6-73d4-11e8-80fb-9b4fed6fd727.html#1

<https://www.nbcnewyork.com/news/local/massive-fire-reported-in-somerset-county-nj/2258665/>

<https://www.firstcoastnews.com/article/news/local/construction-company-issues-statement-following-massive-3-alarm-fire-at-baymeadows-apartment-building/77-03070081-46f6-4b62-99b2-b80861da48dd>

<https://www.nbcboston.com/news/local/construction-site-fire-covers-seaport-in-thick-black-smoke/2060747/>

<https://www.actionnewsjax.com/news/local/duval-county/video-massive-fire-engulfs-building-off-baymeadows/6XTR4QKRURGBZCLKUUINDNA4NY/>

<https://www.nbcwashington.com/news/local/2-alarm-fire-in-alexandria-closes-route-1-firefighters-say/2212859/>

<https://mynews4.com/news/local/crews-battle-large-apartment-fire-in-south-reno-residents-evacuated>

<https://constructionfiresafety.org/fire-service-resources>

<https://www.osha.gov/news/newsreleases/region2/02192008-0>

<https://www.thedenverchannel.com/news/local-news/at-least-4-buildings-under-construction-engulfed-in-flames-near-c-470-in-douglas-county>

Cost Impact: The code change proposal will decrease the cost of construction

At \$300 Million per occurrence for fire and \$50 million on average for water damage due to water and flooding, the need for construction site temporary systems will be but a fraction of the costs of the builders risk premiums for contractors. Contractors will be able to negotiate their insurance rates with underwriters and reduce their costs overall.

Two Way Communications Chapter 1009 (7606)

IBC: 1009.8, UL Chapter 35 (New)

Proponents: Joseph R Cervantes, Space Age Electronics, representing Space Age Electronics
(joseph.cervantes@1sae.com)

2021 International Building Code

Revise as follows:

1009.8 Two-way communication.

A two-way communication system complying with Sections 1009.8.1, 1009.8.2, UL 2525 and in accordance with NFPA 72 shall be provided at the landing serving each elevator or bank of elevators on each accessible floor that is one or more stories above or below the *level of exit discharge*.

Exceptions:

1. Two-way communication systems are not required at the landing serving each elevator or bank of elevators where the two-way communication system is provided within *areas of refuge* in accordance with Section 1009.6.5.
2. Two-way communication systems are not required on floors provided with *ramps* conforming to the provisions of Section 1012.
3. Two-way communication systems are not required at the landings serving only service elevators that are not designated as part of the *accessible means of egress* or serve as part of the required *accessible route* into a facility.
4. Two-way communication systems are not required at the landings serving only freight elevators.
5. Two-way communication systems are not required at the landing serving a private residence elevator.
6. Two-way communication systems are not required in Group I-2 or I-3 facilities.

Add new standard(s) as follows:

2525: UL STANDARD FOR SAFETY Two-Way Emergency Communications Systems for Rescue Assistance

Reason: This proposal is being generated to create a pointer from the IBC 1009.8.1 to the appropriate NFPA standard for 2 Way Wired Emergency Communications Systems in buildings referenced in the model standard. As a critical emergency communications system for ADA Accessibility, there must be language added to the model code so that the local authority having jurisdiction can point to the appropriate standard section for permit, installation, approval and service and routine maintenance of this life safety system. These systems are required to meet the minimum requirements of NFPA 72 CH 24.10 and UL 2525 UL STANDARD FOR SAFETY Two-Way Emergency Communications Systems for Rescue Assistance

Example: Email evidence from local jurisdiction: At the City of XXX XXXXX, we only enforce the code as it is written or as we have amended it. Neither in CBC chapter 4 or 10 does the code send the user to install per NFPA 72. Therefore, the 2-way communication for area of refuge and for stair unlocking is not required to comply with NFPA 72. In addition, the code does not use UL 2525 as a referenced standard so it is unenforceable. Perhaps, for upcoming building codes, this will be changed and, at that time, we would be glad to look into this issue. At this time, these systems are reviewed and inspected as any other low voltage system that is not fire alarm.

Bibliography: [International Building Code] [2015 Edition] [International Code Council] [2014] [259-260]
[<https://codes.iccsafe.org/public/document/toc/542/>]
[National Fire Alarm and Signaling Code] [NFPA 72, 2016 Edition] [National Fire Protection Association] [2015]
[<http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=72>]

Cost Impact: The code change proposal will increase the cost of construction
Enforcement of NFPA 72 and UL 2525 as the referenced standards for 2 Way Communications Systems will increase local agency revenues for permitting and approvals of these systems.