

SAEMS – RCRA 2011

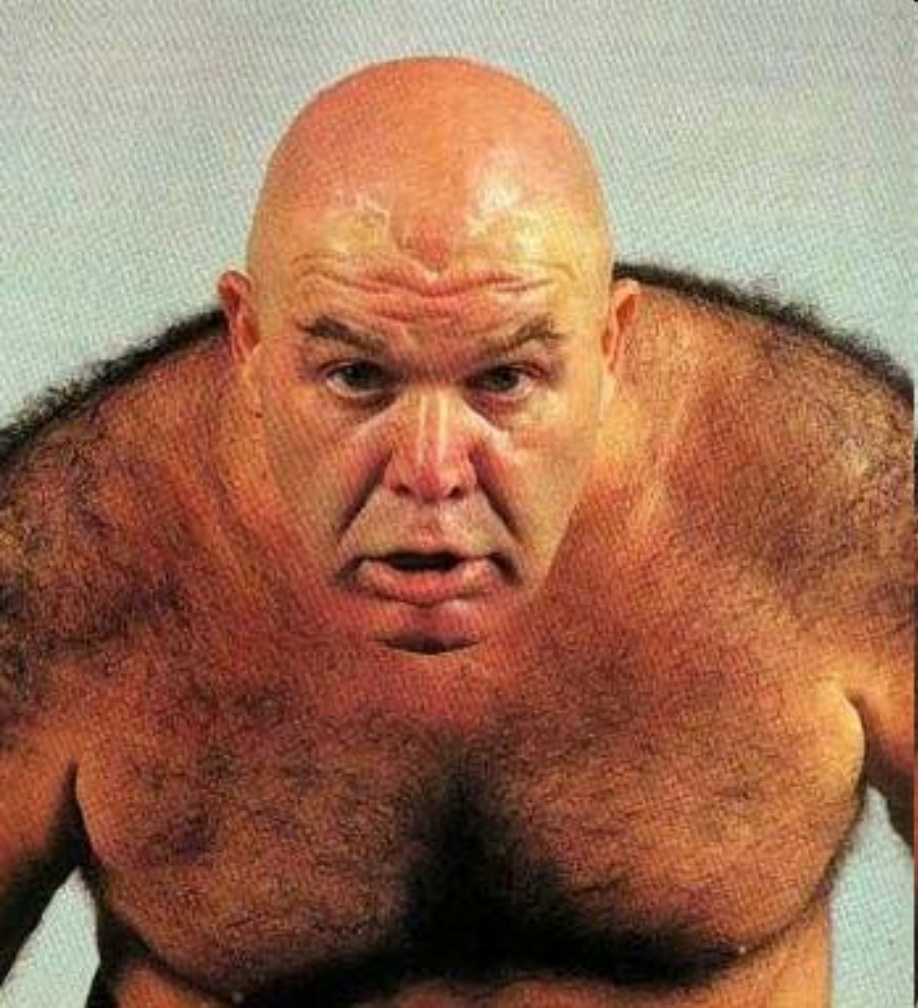
Dan Uthe

Uthe Fire Consulting

(520) 235-3584

e-mail: danuthe1@gmail.com





RCRA vs. IFC

RCRA vs. IFC

- RCRA regulates hazardous waste
- International Fire Code (IFC) regulates general fire safety and hazardous materials
- Almost all hazardous wastes are also hazardous materials
- Generators must comply with both sets of regulations



IFC Definition

Hazardous Materials – those chemicals and substances which are physical or health hazards as defined and classified in the IFC, whether the materials are in usable or waste condition.



RCRA Definition

- Hazardous Waste is a "solid waste" which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:




RCRA Definition Continued

- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored or disposed of, or otherwise mismanaged; or
- Cause or contribute to an increase in mortality, or an increase in irreversible or incapacitating illness.



IFC

- Many of the IFC chapters provide requirements for hazardous materials or hazardous waste activities, which chapters apply is driven by:
 1. Hazards of the commodity: physical hazard or health hazard
 2. State of the commodity: Solid, Liquid, Gas
 3. Quantity of the material on site
 4. Open or closed use (dispensing vs. storage)
- 

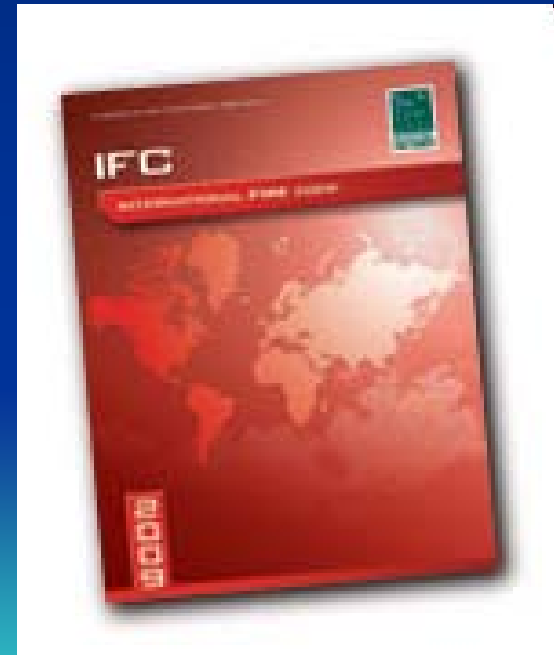
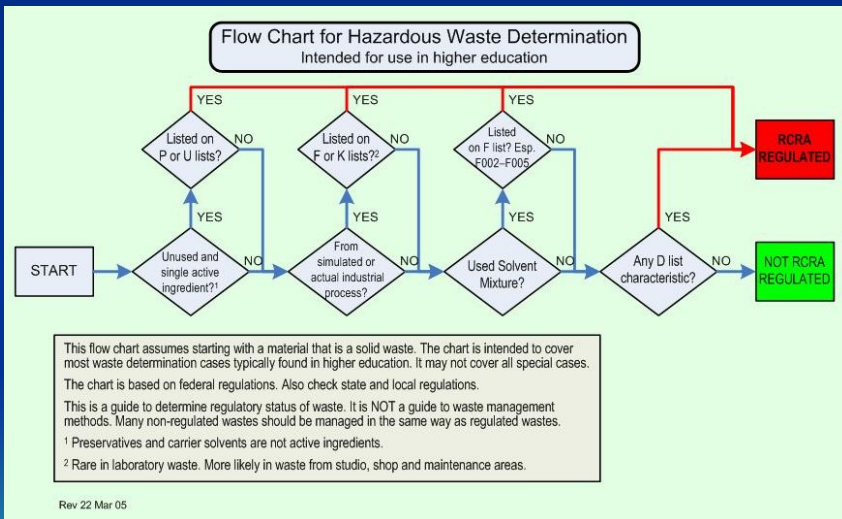
IFC

- There are 45 chapters in the IFC. Of that number, 38 have specific requirements for hazardous materials.
- National Fire Protection Association (NFPA) standards provide detailed instructions as to use, handling and storage of hazardous materials/waste.

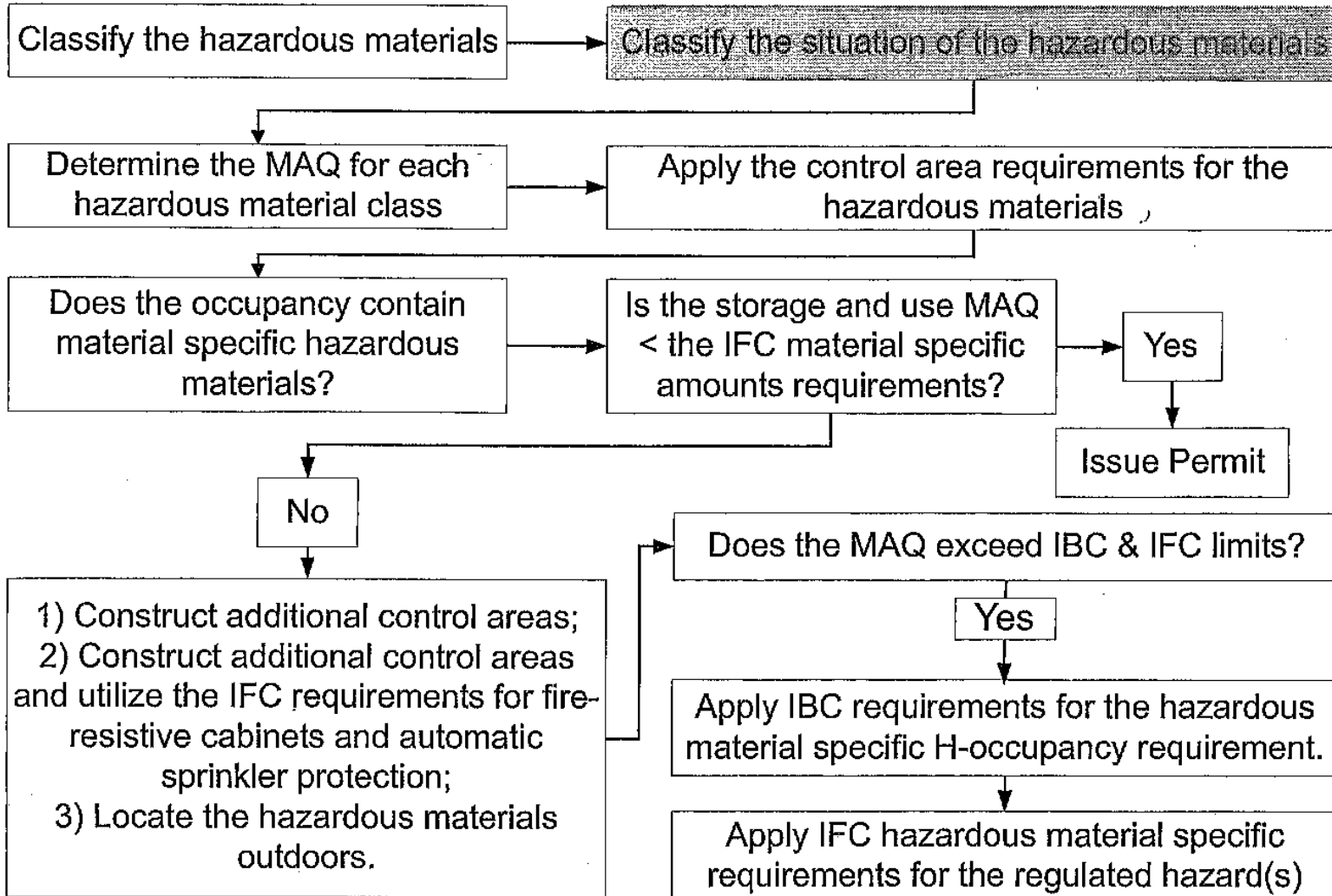


RCRA vs. IFC

- RCRA waste determination vs. IFC hazardous material classification



Hazardous Materials Decision Tree



RCRA has 4 categories and a list

- Ignitable



- Corrosive



- Toxic



- Reactive



IFC has 2 categories

- Physical (9 sub categories)
- Health (2 sub categories)



IFC - Physical

- Explosives
- Flammable and combustible liquids
- Flammable solids and gases
- Organic peroxides
- Oxidizers
- Pyrophoric
- Unstable/Reactive
- Water reactive
- Cryogenic

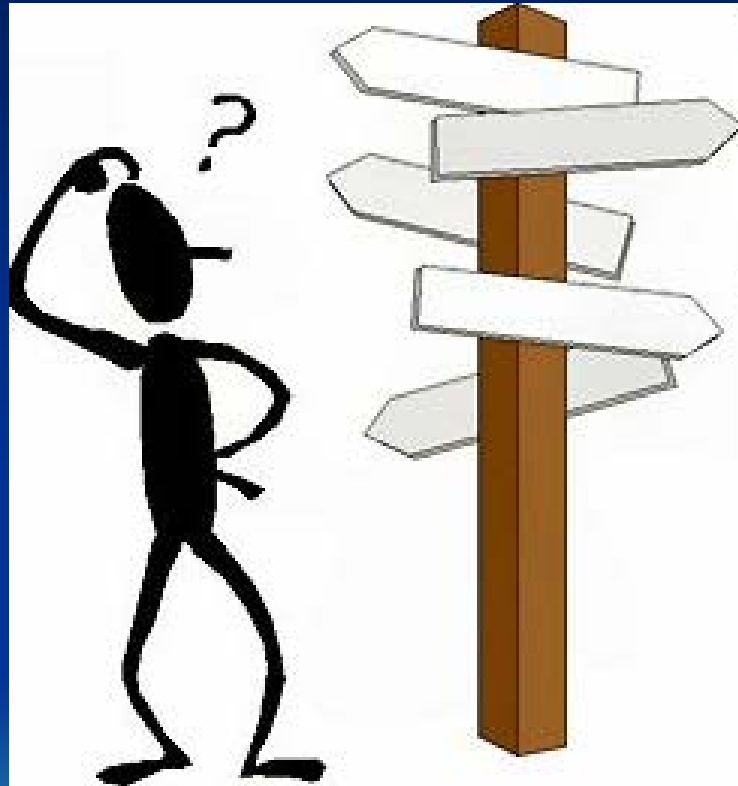


IFC - Health

- Toxic and Highly toxic
- Corrosive



Definitions of hazardous materials vs. hazardous waste differ



...sometimes significantly

IFC

- Flammable liquid = Flash Point is <100 degree F, several sub-classes:
Flammable liquids are 1-A, 1-B or 1-C
- Combustible liquid have several sub-classes:
Class II - FP is 100-140, Class III A - FP is 140-200 and III B – FP is >200
- Differing code requirements

RCRA

- Ignitable Waste –
Flash Point is
<140 degrees F



IFC

- Toxic/highly toxic is based on LD 50 (Lethal Dose) and the IDLH
- **Lethal Dose 50 (LD 50)** - standard measure of the toxicity of a material that will kill half of the sample population of a specific test animal in a specified period through exposure via ingestion, skin contact, or injection.



RCRA

- Based on TCLP (toxic characteristic leaching procedure) lab results



IFC

- Corrosive defined by test procedure in DOT - 49 CFR 173.137, basically its effect on organic tissue.
- Note: not on inanimate objects.



RCRA

- Corrosive: Ph of <2 or >12.5 or corrodes steel at a rate of >6.35 mm per year when applying a standardized test method
- Note: refers exclusively to effects on an inanimate object



RCRA vs. IFC

- IFC Reactive: Reacts with water (Three classes ranging from mild reaction to explosive)
- RCRA Reactive: reacts with water (any type of reaction)



RCRA vs. IFC

Listed Waste

- IFC - has no listed materials. Relies on MSDS information to classify materials
- RCRA - four categories of listed hazardous waste: F,K,P,U
(If it is on the list it is a hazardous waste)



IFC - HAZARDOUS MATERIALS GENERAL REQUIREMENTS

- Chapter 27 has the general requirements for the storage, use and handling of **ALL** hazardous materials.
- This includes virgin products, products in process, as well as hazardous wastes awaiting disposal and/or treatment.



IFC -HAZARDOUS MATERIALS GENERAL REQUIREMENTS

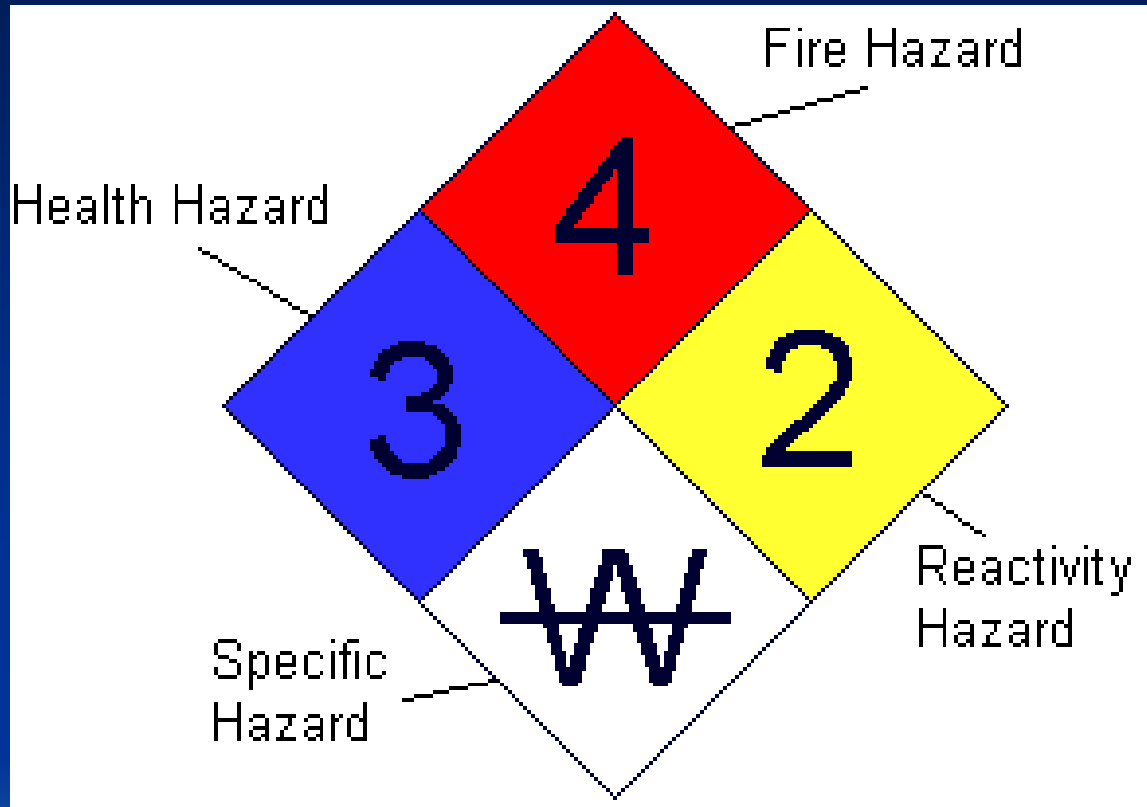
- Containers shall remain closed when not in use
- Empty containers shall be free of residue or maintained specified for storage of a hazardous material
- MSDS – shall be readily available for all hazardous materials
- Container shall be marked



IFC - HAZARDOUS MATERIALS GENERAL REQUIREMENTS

- Restrictions on sources of ignition
- Smoking is prohibited
- Personnel training and written procedures
- Security
- Fire extinguishers maintained and available
- Separation of incompatible materials
- Hazardous identification signs

NFPA 704 provides guidance on a system of markings for the identification of hazardous materials hazards.



The degree of hazard is communicated via a numbering system 0 through 4, with 4 being the most hazardous.

IFC - HAZARDOUS MATERIALS GENERAL REQUIREMENTS

- Underground storage tank requirements: secondary containment, leak detection, interval testing of all components, Note: also regulated by Arizona Department of Environmental Quality
- Aboveground tanks: regulated by IFC and zoning. There are setback requirements in both codes





IFC - HAZARDOUS MATERIALS GENERAL REQUIREMENTS

Release of hazardous materials

- Hazardous materials shall not be released into: sewer, storm drains, ditches, drainage canal, creek, stream, river, lake, or tidal waterway, or, on the ground, sidewalk, highway, or into the atmosphere.





IFC - HAZARDOUS MATERIALS GENERAL REQUIREMENTS

Clean-up of a hazardous material

- The person, firm or corporation responsible of an unauthorized release shall be responsible for cleanup at not cost to the jurisdiction. When deemed necessary by the fire code official, cleanup may be initiated by the fire department or by an authorized firm or individual. All costs shall be born by the responsible party.

IFC - Maximum Allowable Quantities (MAQ)

- Chapter 27 contain the tables to determine the maximum allowable quantities (MAQ).
- Tables are set up as a grid which can be applied by knowing the situation, state, hazard category and location of the material.



IFC - Maximum Allowable Quantities (MAQ)

Table Locations:

- **Indoor Conditions**

- Table 2701.1.1 (1) Physical Hazards
- Table 2703.1.1 (2) Health Hazards

- **Outdoor Conditions**

- Table 2703.1.1 (3) Physical Hazards
- Table 2703.1.1 (4) Health Hazards

- **Wholesale storage and display and Retail**

- Table 2703.11



Explaining the MAQ Table

TABLE 2703.1.1(1)
 MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD^{a, i, m, n}

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b			USE-OPEN SYSTEMS ^b	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible liquid ^{c, 1}	II IIIA IIIB	H-2 or H-3 H-2 or H-3 Not Applicable	Not Applicable	120 ^{d, e} 330 ^{d, e} 13,200 ^{e, f}	Not Applicable	Not Applicable	120 ^d 330 ^d 13,200 ^f	Not Applicable	Not Applicable	30 ^d 80 ^d 3,300 ^f
Combustible fiber	Loose Baled	H-3	(100) (1,000)	Not Applicable	Not Applicable	(100) (1,000)	Not Applicable	Not Applicable	(20) (200)	Not Applicable
Cryogenic Flammable	Not Applicable	H-2	Not Applicable	45 ^d	Not Applicable	Not Applicable	45 ^d	Not Applicable	Not Applicable	10 ^d
Consumer fireworks (Class C Common)	1.4G	H-3	125 ^{d, e, 1}	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Cryogenic Oxidizing	Not Applicable	H-3	Not Applicable	45 ^d	Not Applicable	Not Applicable	45 ^d	Not Applicable	Not Applicable	10 ^d
Explosives	Division 1.1	H-1	1 ^{e, g}	(1) ^{e, g}	Not Applicable	0.25 ^g	(0.25) ^g	Not Applicable	0.25 ^g	(0.25) ^g
	Division 1.2	H-1	1 ^{e, g}	(1) ^{e, g}		0.25 ^g	(0.25) ^g		0.25 ^g	(0.25) ^g
	Division 1.3	H-1 or H-2	5 ^{e, g}	(5) ^{e, g}		1 ^g	(1) ^g		1 ^g	(1) ^g
	Division 1.4	H-3	50 ^{e, g}	(50) ^{e, g}		50 ^g	(50) ^g		Not Applicable	Not Applicable
	Division 1.4G	H-3	125 ^{d, e, 1}	Not Applicable		Not Applicable	Not Applicable		Not Applicable	Not Applicable
	Division 1.5	H-1	1 ^{e, g}	(1) ^{e, g}		0.25 ^g	(0.25) ^g		0.25 ^g	(0.25) ^g
Division 1.6	H-1	1 ^{d, e, g}	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable		
Flammable gas	Gaseous Liquefied	H-2	Not Applicable	Not Applicable 30 ^{d, e}	1,000 ^{d, e} Not Applicable	Not Applicable	Not Applicable 30 ^{d, e}	1,000 ^{d, e} Not Applicable	Not Applicable	Not Applicable
Flammable liquids ^c	IA	H-2 or H-3	Not Applicable	30 ^{d, e}	Not Applicable	Not Applicable	30 ^d	Not Applicable	Not Applicable	10 ^d
	IB and IC			120 ^{d, e}			120 ^d			30 ^d
Combination Flammable liquid (IA, IB, IC)	Not Applicable	H-2 or H-3	Not Applicable	120 ^{d, e, h}	Not Applicable	Not Applicable	120 ^{d, h}	Not Applicable	Not Applicable	30 ^{d, h}
Flammable solid	Not Applicable	H-3	125 ^{d, e}	Not Applicable	Not Applicable	125 ^d	Not Applicable	Not Applicable	25 ^d	Not Applicable
Organic peroxide	UD	H-1	1 ^{e, g}	(1) ^{e, g}	Not Applicable	0.25 ^g	(0.25) ^g	Not Applicable	0.25 ^g	(0.25) ^g
	I	H-2	5 ^{d, e}	(5) ^{d, e}		1 ^d	(1) ^d		1 ^d	(1) ^d
	II	H-3	50 ^{d, e}	(50) ^{d, e}		50 ^d	(50) ^d		10 ^d	(10) ^d
	III	H-3	125 ^{d, e}	(125) ^{d, e}		125 ^d	(125) ^d		25 ^d	(25) ^d
	IV	Not Applicable	Not Limited	Not Limited		Not Limited	Not Limited		Not Limited	Not Limited
V	Not Applicable	Not Limited	Not Limited	Not Limited	Not Limited	Not Limited	Not Limited			

(continued)

IFC - Maximum Allowable Quantities (MAQ)

- You can increase the MAQs with the installation of fire sprinklers and/or approved storage cabinets, or with a control area.
 - Through the use of fire resistive construction within the building it can divide the building 4 areas, thus allowing 4 times the MAQs.



IFC - Maximum Allowable Quantities (MAQ)

- If you exceed the MAQ of a hazardous material it is a change of use for the building that may kick in many other requirements: fire sprinklers, fire alarms, upgraded building construction, upgraded electrical systems, liquid tight flooring, zoning restrictions, secondary spill containment, hazardous material management plans, and hazardous materials inventory statements.

Need help with fire code issues?

Contact:

TUCSON FIRE DEPARTMENT

Business Assistance Unit

(520) 791-4502



SAEMS - RCRA 2011

Questions?

