



Guidance Document

Controlling Quantities of Hazardous Chemicals in Fire Control Zones

Overview:

The EHS department monitors lab activities for type, quantities and proper storage of hazardous materials. This is achieved through the following measures:

- **Chemical procurement and inventory:** The Environmental Health and Safety (EHS) Department procures hazardous chemicals for the campus. EHS completes risk assessments for new materials or new hazard classes of materials. EHS verifies there are sufficient controls in place to minimize risk. The EHS Department maintains an inventory of chemicals by laboratory.
- **Material storage:** Hazardous materials are stored in approved containers, separated by reactive groups. Laboratories across campus are equipped with flammable storage cabinets, cabinets for safe storage of acids and bases and cabinets for hazardous compressed gases. Containers of chemicals are labeled with the material name. Explosion-proof refrigerators are used for storage of temperature sensitive flammable chemicals.
- **Periodic walk through:** The EHS department periodically conducts a walkthrough of laboratory spaces and reviews chemical use, storage and quantity.

For facilities with B-occupancy group ratings, the quantity of hazardous materials will be limited to those allowed in the 2012 International Building Code (IBC) tables 307.1(1) and 307.1(2). These tables are summarized in Appendix 1 Storage Quantities (Tables 1 and 2), Appendix 2 Use for Closed Systems (Tables 3 and 4), and Appendix 3 Use for Open Systems (Tables 5 and 6).

For hazardous materials in use, the maximum allowable quantity is dependent upon whether the system is closed or open. Use the following definitions when assessing whether materials are used in an open or closed system.

- **Closed System** – The use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Example of a closed system would be product conveyed through a piping system into a closed vessel, system or piece of equipment.
- **Open System** – The use of a solid or liquid hazardous material involving a vessel or system that is continuously open to the atmosphere during normal operations and where vapors are liberated, or the product is exposed to the atmosphere during normal operations. Example of an open system would be dispensing material into a beaker or tank.

For facilities with H-occupancy group ratings, the type and quantity of hazardous materials will be limited to the specific requirement for the type of H-occupancy (H-1, H-2, etc.) as defined in the IBC.

Records:

Capital Planning and Construction maintains a central file on their shared drive that houses the control area maps for each building. The hyperlink to this file is as follows: I:\Capital Planning and Construction\Operational Permits (Shared with EHS)\CPC Files

Document Control Log

Revision #	Revision Description	Date
1	Initial issue	11/13/2015
2		

Appendix 1 – Storage Quantities for Hazardous Materials

<p align="center">Table 1 Maximum Allowable Quantity per Control Area Storage of Hazardous Material Posing a Health Hazard</p>																		
Material	Fire Protection Method	Solid - Pounds					Liquid – Gallons (Pounds)[Cubic Feet at NTP]					Gas – Cubic Feet at NTP						
		Floor Location					Floor Location					Floor Location						
		Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth		
Corrosive																		
Liquids – Solids	Base (No Cabinet or sprinkler)	3750	5000	3750	2500	625	375	500	375	250	62.5	N/A						
	Sprinklered (No Cabinet)	7500	10000	7500	5000	1250	750	1000	750	500	125							
	Cabinet (Non-sprinklered)	7500	10000	7500	5000	1250	750	1000	750	500	125							
	Cabinet and sprinklered	1500	20000	1500	10000	2500	1500	2000	1500	1000	250							
Gas	Base (No Cabinet or sprinkler)	N/A					[112.5]	[150]	[112.5]	[75]	[18.75]	608	810	608	405	101		
	Sprinklered (No Cabinet)						[225]	[300]	[225]	[150]	[37.5]	1216	1620	1216	810	202		
	Cabinet (Non-sprinklered)						[225]	[300]	[225]	[150]	[37.5]	1216	1620	1216	810	202		
	Cabinet and sprinklered						[450]	[600]	[450]	[300]	[75]	2432	3240	2432	1620	404		
Highly Toxic*																		
Liquids - Solids	Base (No Cabinet or sprinkler)	7.5	10	7.5	5	1.25	(7.5)	(10)	(7.5)	(5)	(1.25)	N/A						
	Sprinklered (No Cabinet)	15	20	15	10	2.5	(15)	(20)	(15)	(10)	(2.5)							
	Cabinet (Non-sprinklered)	15	20	15	10	2.5	(15)	(20)	(15)	(10)	(2.5)							
	Cabinet and sprinklered	30	40	30	20	5	(30)	(40)	(30)	(20)	(5)							
Gas	Base (No Cabinet or sprinkler)	N/A					0	0	0	0	0	0	0	0	0	0		
	Sprinklered (No Cabinet)						0	0	0	0	0	0	0	0	0	0	0	0
	Cabinet (Non-sprinklered)						[3]	[4]	[3]	[2]	[0.5]	15	20	15	10	2.5		
	Cabinet and sprinklered						[6]	[8]	[6]	[4]	[1]	30	40	30	20	5		
Toxic																		
Liquids - Solids	Base (No Cabinet or sprinkler)	375	500	375	250	62.5	(375)	(500)	(375)	(250)	(62.5)	N/A						
	Sprinklered (No Cabinet)	750	1000	750	500	125	(750)	(1000)	(750)	(500)	(125)							
	Cabinet (Non-sprinklered)	750	1000	750	500	125	(750)	(1000)	(750)	(500)	(125)							
	Cabinet and sprinklered	1500	2000	1500	1000	250	(1500)	(2000)	(1500)	(1000)	(250)							
Gas	Base (No Cabinet or sprinkler)	N/A					[112.5]	[150]	[112.5]	[75]	[18.75]	608	810	608	405	101		
	Sprinklered (No Cabinet)						[225]	[300]	[225]	[150]	[37.5]	1215	1620	1215	810	202		
	Cabinet (Non-sprinklered)						[225]	[300]	[225]	[150]	[37.5]	1215	1620	1215	810	202		
	Cabinet and sprinklered						[450]	[600]	[450]	[300]	[75]	2430	3240	2430	1620	404		

Note: The aggregate quantity in use and storage shall not exceed the quantity listed for storage

* Cabinets shall be approved exhausted gas cabinets for storing highly toxic gas

Table 2
Maximum Allowable Quantity per Control Area
Storage of Hazardous Material Posing a Physical Hazard

Material	Fire Protection Method	Solid – Pounds (Cubic Feet)					Liquid – Gallons (Pounds)					Gas – Cubic Feet at NTP				
		Floor Location					Floor Location					Floor Location				
		Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth
Combustible																
Liquid – Class II	Base (No Cabinet or sprinkler)	N/A					90	120	90	60	15	N/A				
	Sprinklered (No Cabinet)						180	240	180	120	30					
	Cabinet (Non-sprinklered)						180	240	180	120	30					
	Cabinet and sprinklered						360	480	360	240	60					
Liquid – Class III-A	Base (No Cabinet or sprinkler)	N/A					247.5	330	247.5	165	41.2	N/A				
	Sprinklered (No Cabinet)						495	660	495	330	82.4					
	Cabinet (Non-sprinklered)						495	660	495	330	82.4					
	Cabinet and sprinklered						990	1320	990	660	165					
Liquid – Class III-B	Base (No Cabinet or sprinkler)	N/A					9900	13200	9900	6600	1650	N/A				
	Sprinklered (No Cabinet)						N.L	N.L	N.L	N.L	N.L					
	Cabinet (Non-sprinklered)						19800	26400	19800	13200	3300					
	Cabinet and sprinklered						N.L	NL	N.L	N.L	N.L					
Fibers – Loose	Base (No Cabinet or sprinkler)	(75)	(100)	(75)	(50)	(12.5)	N/A					N/A				
	Sprinklered (No Cabinet)	(75)	(100)	(75)	(50)	(12.5)										
	Cabinet (Non-sprinklered)	(75)	(100)	(75)	(50)	(12.5)										
	Cabinet and sprinklered	(75)	(100)	(75)	(50)	(12.5)										
Fibers – Baled	Base (No Cabinet or sprinkler)	(750)	(1000)	(750)	(500)	(125)	N/A					N/A				
	Sprinklered (No Cabinet)	(750)	(1000)	(750)	(500)	(125)										
	Cabinet (Non-sprinklered)	(750)	(1000)	(750)	(500)	(125)										
	Cabinet and sprinklered	(750)	(1000)	(750)	(500)	(125)										
Dust	Base (No Cabinet or sprinkler)	*	*	*	*	*	N/A					N/A				
Flammable																
Solid	Base (No Cabinet or sprinkler)	93.7	125	93.7	62.5	15.6	N/A					N/A				
	Sprinklered (No Cabinet)	187.5	250	187.5	125	31.2										
	Cabinet (Non-sprinklered)	187.5	250	187.5	125	31.2										
	Cabinet and sprinklered	375	500	375	250	62.4										
Gas	Base (No Cabinet or sprinkler)	N/A					(112.5)	(150)	(112.5)	(75)	(18.7)	750	1000	750	500	125
	Sprinklered (No Cabinet)						(225)	(300)	(225)	(150)	(37.5)	1500	2000	1500	1000	250
	Cabinet (Non-sprinklered)						(225)	(300)	(225)	(150)	(37.5)	1500	2000	1500	1000	250
	Cabinet and sprinklered						(450)	(600)	(450)	(300)	(75)	3000	4000	3000	2000	500
Liquid – 1A	Base (No Cabinet or sprinkler)	N/A					22.5	30	22.5	15	3.7	N/A				
	Sprinklered (No Cabinet)						45	60	45	30	7.5					

	Cabinet (Non-sprinklered)						45	60	45	30	7.5	
	Cabinet and sprinklered						90	120	90	60	15	
Liquid – 1B + 1C	Base (No Cabinet or sprinkler)	N/A					90	120	90	60	15	N/A
	Sprinklered (No Cabinet)						180	240	180	120	30	
	Cabinet (Non-sprinklered)						180	240	180	120	30	
	Cabinet and sprinklered						360	480	360	240	60	
Liquid** – Combination 1A + 1B + 1C	Base (No Cabinet or sprinkler)	N/A					90	120	90	60	15	N/A
	Sprinklered (No Cabinet)						180	240	180	120	30	
	Cabinet (Non-sprinklered)						180	240	180	120	30	
	Cabinet and sprinklered						360	480	360	240	60	
Cryogenic	Base (No sprinkler)	N/A					33.7	45	33.7	22.5	5.6	N/A
	Sprinklered						67.5	90	67.5	45	11.2	
Organic Peroxides												
Unclassified detonable	Base (No Cabinet or sprinkler)	0	0	0	0	0	0	0	0	0	0	N/A
	Sprinklered (No Cabinet)	0.75	1	0.75	0.5	0.1	(0.75)	(1)	(0.75)	(0.5)	(0.1)	
	Cabinet (Non-sprinklered)	0	0	0	0	0	0	0	0	0	0	
	Cabinet and sprinklered	1.5	2	1.5	1	0.2	(1.5)	(2)	(1.5)	(1)	(0.2)	
Class I	Base (No Cabinet or sprinkler)	3.75	5	3.75	2.5	0.6	(3.75)	(5)	(3.75)	(2.5)	(0.6)	N/A
	Sprinklered (No Cabinet)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	
	Cabinet (Non-sprinklered)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	
	Cabinet and sprinklered	15	20	15	10	2.4	(15)	(20)	(15)	(10)	(2.4)	
Class II	Base (No Cabinet or sprinkler)	37.5	50	37.5	25	6.2	(37.5)	(50)	(37.5)	(25)	(6.2)	N/A
	Sprinklered (No Cabinet)	75	100	75	50	12.4	(75)	(100)	(75)	(50)	(12.4)	
	Cabinet (Non-sprinklered)	75	100	75	50	12.4	(75)	(100)	(75)	(50)	(12.4)	
	Cabinet and sprinklered	150	200	150	100	25	(150)	(200)	(150)	(100)	(25)	
Class III	Base (No Cabinet or sprinkler)	93.75	125	93.75	62.5	15.6	(93.75)	(125)	(93.75)	(62.5)	(15.6)	N/A
	Sprinklered (No Cabinet)	187.5	250	187.5	125	31.2	(187.5)	(250)	(187.5)	(125)	(31.2)	
	Cabinet (Non-sprinklered)	187.5	250	187.5	125	31.2	(187.5)	(250)	(187.5)	(125)	(31.2)	
	Cabinet and sprinklered	375	500	375	250	62.5	(375)	(500)	(375)	(250)	(62.5)	
Class IV	Base (No Cabinet or sprinkler)	N.L.										N/A
	Sprinklered (No Cabinet)											
	Cabinet (Non-sprinklered)											
	Cabinet and sprinklered											
Class V	Base (No Cabinet or sprinkler)	N.L.										N/A
	Sprinklered (No Cabinet)											
	Cabinet (Non-sprinklered)											
	Cabinet and sprinklered											
Oxidizer												

Gas	Base (No Cabinet or sprinkler)	N/A					(112.5)	(150)	(112.5)	(75)	(18.7)	1125	1500	1125	750	187.5
	Sprinklered (No Cabinet)						(225)	(300)	(225)	(150)	(37.5)	2250	3000	2250	1500	375
	Cabinet (Non-sprinklered)						(225)	(300)	(225)	(150)	(37.5)	2250	3000	2250	1500	375
	Cabinet and sprinklered						(450)	(600)	(450)	(300)	(75)	4500	6000	4500	3000	750
Cryogenic	Base (No sprinkler)	N/A					33.7	45	33.7	22.5	5.6	N/A				
	Sprinklered						67.5	90	67.5	45	11.2					
Class 4	Base (No Cabinet or sprinkler)	0	0	0	0	0	0	0	0	0	N/A					
	Sprinklered (No Cabinet)	0.75	1	0.75	0.5	0.1	(0.75)	(1)	(0.75)	(0.5)						(0.1)
	Cabinet (Non-sprinklered)	0	0	0	0	0	0	0	0	0						0
	Cabinet and sprinklered	1.5	2	1.5	1	0.2	(1.5)	(2)	(1.5)	(1)						(0.2)
Class 3	Base (No Cabinet or sprinkler)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	N/A				
	Sprinklered (No Cabinet)	15	20	15	10	2.5	(15)	(20)	(15)	(10)	(2.5)					
	Cabinet (Non-sprinklered)	15	20	15	10	2.5	(15)	(20)	(15)	(10)	(2.5)					
	Cabinet and sprinklered	30	40	30	20	5	(30)	(40)	(30)	(20)	(5)					
Class 2	Base (No Cabinet or sprinkler)	187.5	250	187.5	125	31.2	(187.5)	(250)	(187.5)	(125)	(31.2)	N/A				
	Sprinklered (No Cabinet)	375	500	375	250	62.5	(375)	(500)	(375)	(250)	(62.5)					
	Cabinet (Non-sprinklered)	375	500	375	250	62.5	(375)	(500)	(375)	(250)	(62.5)					
	Cabinet and sprinklered	750	1000	750	500	125	(750)	(1000)	(750)	(500)	(125)					
Class 1	Base (No Cabinet or sprinkler)	3000	4000	3000	2000	500	(3000)	(4000)	(3000)	(2000)	(500)	N/A				
	Sprinklered (No Cabinet)	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L					
	Cabinet (Non-sprinklered)	6000	8000	6000	4000	1000	(6000)	(8000)	(6000)	(4000)	(1000)					
	Cabinet and sprinklered	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L					
Pyrophoric																
	Base (No Cabinet or sprinkler)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sprinklered (No Cabinet)	3	4	3	2	0.5	(3)	(4)	(3)	(2)	(0.5)	37.5	50	37.5	25	6.5
	Cabinet (Non-sprinklered)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cabinet and sprinklered	6	8	6	4	1	(6)	(8)	(6)	(4)	(1)	75	100	75	50	12.5
Unstable Reactive																
Class 4	Base (No Cabinet or sprinkler)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sprinklered (No Cabinet)	0.75	1	0.75	0.5	0.1	(0.75)	(1)	(0.75)	(0.5)	(0.1)	7.5	10	7.5	5	1.2
	Cabinet (Non-sprinklered)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cabinet and sprinklered	1.5	2	1.5	1	0.2	(1.5)	(2)	(1.5)	(1)	(0.2)	15	20	15	10	2.5
Class 3***	Base (No Cabinet or sprinkler)	3.75	5	3.75	2.5	0.6	(3.75)	(5)	(3.75)	(2.5)	(0.6)	37.5	50	37.5	25	6.2
	Sprinklered (No Cabinet)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	75	100	75	50	12.5
	Cabinet (Non-sprinklered)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	75	100	75	50	12.5
	Cabinet and sprinklered	15	20	15	10	2.5	(15)	(20)	(15)	(10)	(2.5)	150	200	150	100	25
Class 2	Base (No Cabinet or sprinkler)	37.5	50	37.5	25	6.2	(37.5)	(50)	(37.5)	(25)	(6.2)	187.5	250	187.5	125	31.2
	Sprinklered (No Cabinet)	75	100	75	50	12.5	(75)	(100)	(75)	(50)	(12.5)	375	500	375	250	62.5
	Cabinet (Non-sprinklered)	75	100	75	50	12.5	(75)	(100)	(75)	(50)	(12.5)	375	500	375	250	62.5

	Cabinet and sprinklered	150	200	150	100	25	(150)	(200)	(150)	(100)	(25)	750	1000	750	500	125
Class 1	Base (No Cabinet or sprinkler)	N.L					N.L					N.L				
	Sprinklered (No Cabinet)															
	Cabinet (Non-sprinklered)															
	Cabinet and sprinklered															
Water Reactive																
Class 3	Base (No Cabinet or sprinkler)	3.75	5	3.75	2.5	0.6	(3.75)	(5)	(3.75)	(2.5)	(0.6)	N/A				
	Sprinklered (No Cabinet)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)					
	Cabinet (Non-sprinklered)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)					
	Cabinet and sprinklered	15	20	15	10	2.5	(15)	(20)	(15)	(10)	(2.5)					
Class 2	Base (No Cabinet or sprinkler)	37.5	50	37.5	25	6.2	(37.5)	(50)	(37.5)	(25)	(6.2)	N/A				
	Sprinklered (No Cabinet)	75	100	75	50	12.5	(75)	(100)	(75)	(50)	(12.5)					
	Cabinet (Non-sprinklered)	75	100	75	50	12.5	(75)	(100)	(75)	(50)	(12.5)					
	Cabinet and sprinklered	150	200	150	100	25	(150)	(200)	(150)	(100)	(25)					
Class 1	Base (No Cabinet or sprinkler)	N.L					N.L					N/A				
	Sprinklered (No Cabinet)															
	Cabinet (Non-sprinklered)															
	Cabinet and sprinklered															

Note: The aggregate quantity in use and storage shall not exceed the quantity listed for storage

Note – Explosive materials will be specifically evaluated for use and quantity. Quantities will be compared to the IBC requirements.

N/A – Not Applicable

N.L. – Not Limited

* 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 IBC section 414.1.3

** Containing not more than the maximum allowable quantity per control area for Class 1A, 1B or 1C flammable liquids

Appendix 2 – Quantity of Hazardous Materials in Use – Closed Systems

Table 3 Maximum Allowable Quantity per Control Area Use – Closed Systems of Hazardous Material Posing a Health Hazard																		
Material	Fire Protection Method	Solid - Pounds					Liquid – Gallons (Pounds)[Cubic Feet at NTP]					Gas – Cubic Feet at NTP						
		Floor Location					Floor Location					Floor Location						
		Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth		
Corrosive																		
Liquids – Solids	Base (No sprinkler)	3750	5000	3750	2500	625	375	500	375	250	62.5	N/A						
	Sprinklered	7500	10000	7500	5000	1250	750	1000	750	500	125	N/A						
Gas	Base (No Cabinet or sprinkler)	N/A					[112.5]	[150]	[112.5]	[75]	[18.75]	608	810	608	405	101		
	Sprinklered (No Cabinet)						[225]	[300]	[225]	[150]	[37.5]	1216	1620	1216	810	202		
	Cabinet (Non-sprinklered)						[225]	[300]	[225]	[150]	[37.5]	1216	1620	1216	810	202		
	Cabinet and sprinklered						[450]	[600]	[450]	[300]	[75]	2432	3240	2432	1620	404		
Highly Toxic*																		
Liquids - Solids	Base (No sprinkler)	7.5	10	7.5	5	1.25	(7.5)	(10)	(7.5)	(5)	(1.25)	N/A						
	Sprinklered	15	20	15	10	2.5	(15)	(20)	(15)	(10)	(2.5)	N/A						
Gas	Base (No Cabinet or sprinkler)	N/A					0	0	0	0	0	0	0	0	0	0		
	Sprinklered (No Cabinet)						0	0	0	0	0	0	0	0	0	0	0	0
	Cabinet (Non-sprinklered)						[3]	[4]	[3]	[2]	[0.5]	15	20	15	10	2.5		
	Cabinet and sprinklered						[6]	[8]	[6]	[4]	[1]	30	40	30	20	5		
Toxic																		
Liquids - Solids	Base (No sprinkler)	375	500	375	250	62.5	(375)	(500)	(375)	(250)	(62.5)	N/A						
	Sprinklered	750	1000	750	500	125	(750)	(1000)	(750)	(500)	(125)	N/A						
Gas	Base (No Cabinet or sprinkler)	N/A					[112.5]	[150]	[112.5]	[75]	[18.75]	608	810	608	405	101		
	Sprinklered (No Cabinet)						[225]	[300]	[225]	[150]	[37.5]	1215	1620	1215	810	202		
	Cabinet (Non-sprinklered)						[225]	[300]	[225]	[150]	[37.5]	1215	1620	1215	810	202		
	Cabinet and sprinklered						[450]	[600]	[450]	[300]	[75]	2430	3240	2430	1620	404		

Note: The aggregate quantity in use and storage shall not exceed the quantity listed for storage

* Cabinets shall be approved exhausted gas cabinets for storing highly toxic gas

Table 4
Maximum Allowable Quantity per Control Area
Use – Closed Systems of Hazardous Material Posing a Physical Hazard

Material	Fire Protection Method	Solid – Pounds (Cubic Feet)					Liquid – Gallons (Pounds)					Gas – Cubic Feet at NTP				
		Floor Location					Floor Location					Floor Location				
		Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth
Combustible																
Liquid – Class II	Base (No sprinkler)	N/A					90	120	90	60	15	N/A				
	Sprinklered	N/A					180	240	180	120	30	N/A				
Liquid – Class III-A	Base (No sprinkler)	N/A					247.5	330	247.5	165	41.2	N/A				
	Sprinklered	N/A					495	660	495	330	82.4	N/A				
Liquid – Class III-B	Base (No sprinkler)	N/A					9900	13200	9900	6600	1650	N/A				
	Sprinklered	N/A					N.L	N.L	N.L	N.L	N.L	N/A				
Fibers – Loose	Base (No sprinkler)	(75)	(100)	(75)	(50)	(12.5)	N/A					N/A				
	Sprinklered	(75)	(100)	(75)	(50)	(12.5)	N/A					N/A				
Fibers – Baled	Base (No sprinkler)	(750)	(1000)	(750)	(500)	(125)	N/A					N/A				
	Sprinklered	(750)	(1000)	(750)	(500)	(125)	N/A					N/A				
Dust	Base (No sprinkler)	*	*	*	*	*	N/A					N/A				
Flammable																
Solid	Base (No sprinkler)	93.7	125	93.7	62.5	15.6	N/A					N/A				
	Sprinklered	187.5	250	187.5	125	31.2	N/A					N/A				
Gas	Base (No Cabinet or sprinkler)	N/A					(112.5)	(150)	(112.5)	(75)	(18.7)	750	1000	750	500	125
	Sprinklered (No Cabinet)	N/A					(225)	(300)	(225)	(150)	(37.5)	1500	2000	1500	1000	250
	Cabinet (Non-sprinklered)	N/A					(225)	(300)	(225)	(150)	(37.5)	1500	2000	1500	1000	250
	Cabinet and sprinklered	N/A					(450)	(600)	(450)	(300)	(75)	3000	4000	3000	2000	500
Liquid – 1A	Base (No sprinkler)	N/A					22.5	30	22.5	15	3.7	N/A				
	Sprinklered	N/A					45	60	45	30	7.5	N/A				
Liquid – 1B + 1C	Base (No sprinkler)	N/A					90	120	90	60	15	N/A				
	Sprinklered	N/A					180	240	180	120	30	N/A				
Liquid** – Combination 1A + 1B + 1C	Base (No sprinkler)	N/A					90	120	90	60	15	N/A				
	Sprinklered	N/A					180	240	180	120	30	N/A				
Cryogenic	Base (No sprinkler)	N/A					33.7	45	33.7	22.5	5.6	N/A				
	Sprinklered	N/A					67.5	90	67.5	45	11.2	N/A				
Organic Peroxides																
Unclassified detonable	Base (No sprinkler)	0	0	0	0	0	0	0	0	0	N/A					
	Sprinklered	0.18	0.25	0.18	0.12	0.03	(0.18)	(0.25)	(0.18)	(0.12)	(0.03)	N/A				
Class I	Base (No sprinkler)	0.75	1	0.75	0.5	0.12	(0.75)	(1)	(0.75)	(0.5)	(0.12)	N/A				

	Sprinklered	1.5	2	1.5	1	0.24	(1.5)	(2)	(1.5)	(1)	(0.24)					
Class II	Base (No sprinkler)	37.5	50	37.5	25	6.2	(37.5)	(50)	(37.5)	(25)	(6.2)	N/A				
	Sprinklered	75	100	75	50	12.4	(75)	(100)	(75)	(50)	(12.4)					
Class III	Base (No sprinkler)	93.75	125	93.75	62.5	15.6	(93.75)	(125)	(93.75)	(62.5)	(15.6)	N/A				
	Sprinklered	187.5	250	187.5	125	31.2	(187.5)	(250)	(187.5)	(125)	(31.2)					
Class IV	Base (No sprinkler)	N.L.					N.L.					N/A				
	Sprinklered	N.L.					N.L.									
Class V	Base (No sprinkler)	N.L.					N.L.					N/A				
	Sprinklered	N.L.					N.L.									
Oxidizer																
Gas	Base (No Cabinet or sprinkler)	N/A					(112.5)	(150)	(112.5)	(75)	(18.7)	1125	1500	1125	750	187.5
	Sprinklered (No Cabinet)						(225)	(300)	(225)	(150)	(37.5)	2250	3000	2250	1500	375
	Cabinet (Non-sprinklered)						(225)	(300)	(225)	(150)	(37.5)	2250	3000	2250	1500	375
	Cabinet and sprinklered						(450)	(600)	(450)	(300)	(75)	4500	6000	4500	3000	750
Cryogenic	Base (No sprinkler)	N/A					33.7	45	33.7	22.5	5.6	N/A				
	Sprinklered						67.5	90	67.5	45	11.2					
Class 4	Base (No sprinkler)	0	0	0	0	0	0	0	0	0	N/A					
	Sprinklered	0.18	0.25	0.18	0.12	0.03	(0.18)	(0.25)	(0.18)	(0.12)						(0.03)
Class 3	Base (No sprinkler)	1.5	2	1.5	1	0.25	(1.5)	(2)	(1.5)	(1)	(0.25)	N/A				
	Sprinklered	3	4	3	2	0.5	(3)	(4)	(3)	(2)	(0.5)					
Class 2	Base (No sprinkler)	187.5	250	187.5	125	31.2	(187.5)	(250)	(187.5)	(125)	(31.2)	N/A				
	Sprinklered	375	500	375	250	62.5	(375)	(500)	(375)	(250)	(62.5)					
Class 1	Base (No sprinkler)	3000	4000	3000	2000	500	(3000)	(4000)	(3000)	(2000)	(500)	N/A				
	Sprinklered	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L	N.L					
Pyrophoric																
	Base (No sprinkler)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Sprinklered	0.75	1	0.75	0.5	0.12	(0.75)	(1)	(0.75)	(0.5)	(0.12)	7.5	10	7.5	5	1.25
Unstable Reactive																
Class 4	Base (No Cabinet or sprinkler)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Sprinklered (No Cabinet)	0.18	0.25	0.18	0.12	0.03	(0.18)	(0.25)	(0.18)	(0.12)	(0.03)	1.5	2	1.5	1	0.25
	Cabinet (Non-sprinklered)	N/A					N/A					0	0	0	0	0
	Cabinet and sprinklered											3	4	3	2	0.5
Class 3	Base (No Cabinet or sprinkler)	0.75	1	0.75	0.5	0.12	(0.75)	(1)	(0.75)	(0.5)	(0.12)	7.5	10	7.5	5	1.25
	Sprinklered (No Cabinet)	1.5	2	1.5	1	0.24	(1.5)	(2)	(1.5)	(1)	(0.24)	15	20	15	10	2.5
	Cabinet (Non-sprinklered)	N/A					N/A					15	20	15	10	2.5
	Cabinet and sprinklered											30	40	30	20	5
Class 2	Base (No Cabinet or sprinkler)	37.5	50	37.5	25	6.2	(37.5)	(50)	(37.5)	(25)	(6.2)	187.5	250	187.5	125	31.2
	Sprinklered (No Cabinet)	75	100	75	50	12.5	(75)	(100)	(75)	(50)	(12.5)	375	500	375	250	62.5
	Cabinet (Non-sprinklered)	N/A					N/A					375	500	375	250	62.5

	Cabinet and sprinklered							750	1000	750	500	125
Class 1	Base (No Cabinet or sprinkler)	N.L										
	Sprinklered (No Cabinet)											
	Cabinet (Non-sprinklered)											
	Cabinet and sprinklered											
Water Reactive												
Class 3	Base (No sprinkler)	3.75	5	3.75	2.5	0.6	(3.75)	(5)	(3.75)	(2.5)	(0.6)	N/A
	Sprinklered	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	
Class 2	Base (No sprinkler)	37.5	50	37.5	25	6.2	(37.5)	(50)	(37.5)	(25)	(6.2)	N/A
	Sprinklered	75	100	75	50	12.5	(75)	(100)	(75)	(50)	(12.5)	
Class 1	Base (No sprinkler)	N.L										N/A
	Sprinklered											

Note: The aggregate quantity in use and storage shall not exceed the quantity listed for storage

Note – Explosive materials will be specifically evaluated for use and quantity. Quantities will be compared to the IBC requirements.

N/A – Not Applicable

N.L. – Not Limited

* 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 IBC section 414.1.3

** Containing not more than the maximum allowable quantity per control area for Class 1A, 1B or 1C flammable liquids

Appendix 3 – Quantity of Hazardous Materials in Use – Open Systems

<p align="center">Table 5 Maximum Allowable Quantity per Control Area Use – Open Systems of Hazardous Material Posing a Health Hazard</p>																
Material	Fire Protection Method	Solid - Pounds					Liquid – Gallons (Pounds)[Cubic Feet at NTP]					Gas – Cubic Feet at NTP				
		Floor Location					Floor Location					Floor Location				
		Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth
Corrosive																
Liquids – Solids	Base (No sprinkler)	750	1000	750	500	125	75	100	75	50	12.5	N/A				
	Sprinklered	1500	2000	1500	1000	250	150	200	150	100	25	N/A				
Gas	Base (No sprinkler)	N/A					0	0	0	0	0	0	0	0	0	0
	Sprinklered	N/A					0	0	0	0	0	0	0	0	0	0
Highly Toxic*																
Liquids - Solids	Base (No sprinkler)	2.3	3	2.3	1.5	0.375	(2.3)	(3)	(2.3)	(1.5)	(0.37)	N/A				
	Sprinklered	4.6	6	4.6	3	0.75	(4.6)	(6)	(4.6)	(3)	(0.75)	N/A				
Gas	Base (No sprinkler)	N/A					0	0	0	0	0	0	0	0	0	
	Sprinklered	N/A					0	0	0	0	0	0	0	0	0	
Toxic																
Liquids - Solids	Base (No sprinkler)	93.7	125	93.7	62.5	15.6	(93.7)	(125)	(93.7)	(62.5)	(15.6)	N/A				
	Sprinklered	187.5	250	187.5	125	31.2	(187.5)	(250)	(187.5)	(125)	(31.2)	N/A				
Gas	Base (No sprinkler)	N/A					0	0	0	0	0	0	0	0	0	
	Sprinklered	N/A					0	0	0	0	0	0	0	0	0	

Note: The aggregate quantity in use and storage shall not exceed the quantity listed for storage

* Cabinets shall be approved exhausted gas cabinets for storing highly toxic gas

Table 6
Maximum Allowable Quantity per Control Area
Use – Open Systems of Hazardous Material Posing a Physical Hazard

Material	Fire Protection Method	Solid – Pounds (Cubic Feet)					Liquid – Gallons (Pounds)					Gas – Cubic Feet at NTP				
		Floor Location					Floor Location					Floor Location				
		Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth	Bsmnt	First	Second	Third	Fourth
Combustible																
Liquid – Class II	Base (No sprinkler)	N/A					22.5	30	22.5	15	3.75	N/A				
	Sprinklered	N/A					45	60	45	30	7.5	N/A				
Liquid – Class III-A	Base (No sprinkler)	N/A					60	80	60	40	10	N/A				
	Sprinklered	N/A					120	160	120	80	20	N/A				
Liquid – Class III-B	Base (No sprinkler)	N/A					2475	3300	2475	1650	412.5	N/A				
	Sprinklered	N/A					N.L	N.L	N.L	N.L	N.L	N/A				
Fibers – Loose	Base (No sprinkler)	(15)	(20)	(15)	(10)	(2.5)	N/A					N/A				
	Sprinklered	(30)	(40)	(30)	(20)	(5)	N/A					N/A				
Fibers – Baled	Base (No sprinkler)	(150)	(200)	(150)	(100)	(25)	N/A					N/A				
	Sprinklered	(300)	(400)	(300)	(200)	(50)	N/A					N/A				
Dust	Base (No sprinkler)	*	*	*	*	*	N/A					N/A				
Flammable																
Solid	Base (No sprinkler)	18.75	25	18.75	12.5	3.1	N/A					N/A				
	Sprinklered	37.5	50	37.5	25	6.2	N/A					N/A				
Gas	Base (No Cabinet or sprinkler)	N/A					N/A					N/A				
	Sprinklered (No Cabinet)	N/A					N/A					N/A				
	Cabinet (Non-sprinklered)	N/A					N/A					N/A				
	Cabinet and sprinklered	N/A					N/A					N/A				
Liquid – 1A	Base (No sprinkler)	N/A					7.5	10	7.5	5	1.25	N/A				
	Sprinklered	N/A					15	20	15	10	2.5	N/A				
Liquid – 1B + 1C	Base (No sprinkler)	N/A					22.5	30	22.5	15	3.7	N/A				
	Sprinklered	N/A					45	60	45	30	7.5	N/A				
Liquid** – Combination 1A + 1B + 1C	Base (No sprinkler)	N/A					22.5	30	22.5	15	3.7	N/A				
	Sprinklered	N/A					45	60	45	30	7.5	N/A				
Cryogenic	Base (No sprinkler)	N/A					7.5	10	7.5	5	1.25	N/A				
	Sprinklered	N/A					15	20	15	10	2.5	N/A				
Organic Peroxides																
Unclassified detonable	Base (No sprinkler)	0	0	0	0	0	0	0	0	0	N/A					
	Sprinklered	0.18	0.25	0.18	0.12	0.03	(0.18)	(0.25)	(0.18)	(0.12)	(0.03)	N/A				
Class I	Base (No sprinkler)	0.75	1	0.75	0.5	0.12	(0.75)	(1)	(0.75)	(0.5)	(0.12)	N/A				

	Sprinklered	1.5	2	1.5	1	0.24	(1.5)	(2)	(1.5)	(1)	(0.24)	
Class II	Base (No sprinkler)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	N/A
	Sprinklered	15	20	15	10	2.4	(15)	(20)	(15)	(10)	(2.4)	
Class III	Base (No sprinkler)	18.75	25	18.75	12.5	3.1	(18.75)	(25)	(18.75)	(12.5)	(3.1)	N/A
	Sprinklered	37.5	50	37.5	25	6.2	(37.5)	(50)	(37.5)	(25)	(6.2)	
Class IV	Base (No sprinkler)	N.L.					N.L.					N/A
	Sprinklered	N.L.					N.L.					
Class V	Base (No sprinkler)	N.L.					N.L.					N/A
	Sprinklered	N.L.					N.L.					
Oxidizer												
Gas	Base (No Cabinet or sprinkler)	N/A					N/A					N/A
	Sprinklered (No Cabinet)	N/A					N/A					
	Cabinet (Non-sprinklered)	N/A					N/A					
	Cabinet and sprinklered	N/A					N/A					
Cryogenic	Base (No sprinkler)	N/A					7.5	10	7.5	5	1.25	N/A
	Sprinklered	N/A					15	20	15	10	2.5	
Class 4	Base (No sprinkler)	0	0	0	0	0	0	0	0	0	0	N/A
	Sprinklered	0.18	0.25	0.18	0.12	0.03	(0.18)	(0.25)	(0.18)	(0.12)	(0.03)	
Class 3	Base (No sprinkler)	1.5	2	1.5	1	0.25	(1.5)	(2)	(1.5)	(1)	(0.25)	N/A
	Sprinklered	3	4	3	2	0.5	(3)	(4)	(3)	(2)	(0.5)	
Class 2	Base (No sprinkler)	37.5	50	37.5	25	6.25	(37.5)	(50)	(37.5)	(25)	(6.25)	N/A
	Sprinklered	75	100	75	50	12.5	(75)	(100)	(75)	(50)	(12.5)	
Class 1	Base (No sprinkler)	750	1000	750	500	125	(750)	(1000)	(750)	(500)	(125)	N/A
	Sprinklered	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
Pyrophoric												
	Base (No sprinkler)	0	0	0	0	0	0	0	0	0	0	N/A
	Sprinklered	0	0	0	0	0	0	0	0	0	0	
Unstable Reactive												
Class 4	Base (No Cabinet or sprinkler)	0	0	0	0	0	0	0	0	0	0	N/A
	Sprinklered (No Cabinet)	0.18	0.25	0.18	0.12	0.03	(0.18)	(0.25)	(0.18)	(0.12)	(0.03)	
	Cabinet (Non-sprinklered)	N/A					N/A					
	Cabinet and sprinklered	N/A					N/A					
Class 3	Base (No Cabinet or sprinkler)	0.75	1	0.75	0.5	0.12	(0.75)	(1)	(0.75)	(0.5)	(0.12)	N/A
	Sprinklered (No Cabinet)	1.5	2	1.5	1	0.24	(1.5)	(2)	(1.5)	(1)	(0.24)	
	Cabinet (Non-sprinklered)	N/A					N/A					
	Cabinet and sprinklered	N/A					N/A					
Class 2	Base (No Cabinet or sprinkler)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	N/A
	Sprinklered (No Cabinet)	15	20	15	10	2.4	(15)	(20)	(15)	(10)	(2.4)	
	Cabinet (Non-sprinklered)	N/A					N/A					

	Cabinet and sprinklered											
Class 1	Base (No Cabinet or sprinkler)	N.L					N.L					N/A
	Sprinklered (No Cabinet)											
	Cabinet (Non-sprinklered)											
	Cabinet and sprinklered											
Water Reactive												
Class 3	Base (No sprinkler)	0.75	1	0.75	0.5	0.12	(0.75)	(1)	(0.75)	(0.5)	(0.12)	N/A
	Sprinklered	1.5	2	1.5	1	0.24	(1.5)	(2)	(1.5)	(1)	(0.24)	
Class 2	Base (No sprinkler)	7.5	10	7.5	5	1.2	(7.5)	(10)	(7.5)	(5)	(1.2)	N/A
	Sprinklered	15	20	15	10	2.4	(15)	(20)	(15)	(10)	(2.4)	
Class 1	Base (No sprinkler)	N.L					N.L					N/A
	Sprinklered											

Note: The aggregate quantity in use and storage shall not exceed the quantity listed for storage

Note – Explosive materials will be specifically evaluated for use and quantity. Quantities will be compared to the IBC requirements.

N/A – Not Applicable

N.L. – Not Limited

* 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 IBC section 414.1.3

** Containing not more than the maximum allowable quantity per control area for Class 1A, 1B or 1C flammable liquids