Laboratory Code Requirement Matrix

Based on the 2001 California Building Standards Code

(Stanford University Fire Marshal's Office, Environmental Health & Safety Department)

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
1. Occupancy Classification	Laboratories and areas which do not exceed the exempt amounts of hazardous materials listed in Tables 3D & 3E of the California Building Code (CBC) [CBC 304.2.2.1]	Laboratories and areas where combustible dust is manufactured, used or generated in such a manner that concentrations and conditions create a fire or explosion potential; occupancies with a quantity of material in the building in excess of those listed in Table 3-D, which present a moderate explosion hazard or a hazard from accelerated burning, including, but not limited to : 1. Class I organic peroxides. 2. Class 3 nondetonatable unstable (reactive) materials. 3. Pyrophoric gases. 4. Flammable or oxidizing gases.	Laboratories and areas where flammable solids, other than combustible dust, are manufactured, used or generated. Division 3 occupancies also include uses in which the quantity of material in the building in excess of those listed in Table 3-D presents a high physical hazard, including, but not limited to: 1. Class II, III or IV organic peroxides. 2. Class 1 or 2 oxidizers. 3. Class I, II or III-A flammable or combustible liquids that are used or stored in normally closed containers or systems & containers or systems pressurized	Laboratories and areas having quantities of materials in excess of those listed in Table 3-E that are health hazards, including: 1. Corrosives. Exception: Stationary lead-acid battery systems 2. Toxic materials. 3. Highly Toxic Materials. 4. Irritants. 5. Sensitizers. 6. Other Health hazards. [CBC 307.1.1] NOTE: quantity of materials in hazard categories other than above need to be < Table 3-D and 3-E amounts.	Laboratories and similar areas used for scientific experimentation or research having quantities of materials not in excess of those listed in Table 3-D.1 & 3-I and not otherwise classified as Group B occupancies. Such laboratories may be classified as Group B occupancies when the quantities of materials are not in excess of those listed in Table 3-D & 3-E. Laboratories having quantities of materials in excess of those listed in Table 3-E and which are located below the fourth story may be classified as a Group H, Division 7 occupancy.

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		5. Class I, II or III-A flammable or combustible liquids which are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 lb/in^2 (psi) gage. (Exception: aerosols.) 6. Class 3 oxidizers. 7. Class 3 water-reactive materials. [CBC 307.1.1] NOTE: quantity of materials in hazard categories other than above need to be < Table 3-D and 3-E amounts.	at 15 lb/in^2 (psi) gage or less & aerosols. 4. Class III-B combustible liquids. 5. Pyrophoric liquids or solids. 6. Class 1 or 2 water-reactive materials. 7. Flammable solids in storage. 8. Flammable or oxidizing cryogenic fluids (other than inert). 9. Class I unstable (reactive) gas or Class 2 unstable (reactive) materials. 10. Storage of Class 1.4G (Class C, Common) fireworks. [CBC 307.1.1] NOTE: quantity of materials in hazard categories other than above need to be < Table		[CBC 307.1.1]

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	B	H-2	H-3	H-7	H-8
			3-D and 3-E amounts.		
2. Restriction on location within building	None if the building is Type I construction. If not Type I, 12th story or below depending on building construction type. [CBC Table 5-B] Storage of flammable liquids in containers and portable tanks shall follow CFC 7902.5. Class I flammable liquids shall not be stored in basements. [CFC 7905.10]	None if the building is Type I construction. If not Type I, 2nd story or below depending on type of building construction. [CBC Table 5-B] Class I, II & IIIA liquid use, dispensing & mixing rooms not allowed in basement. [CBC 307.1.3] Not less than 25 percent of the perimeter wall of the occupancy shall be an exterior wall. See CBC 307.3 for applicable exceptions	None if building is Type I construction. If not type I, 5th story or below depending on building construction type. [CBC Table 5-B] Class I liquid storage room not allowed in basements. [CBC 307.1.4] Not less than 25 percent of the perimeter wall of the occupancy shall be an exterior wall. See CBC 307.3 for applicable exceptions	3rd story or below depending on building construction type. [CBC Table 5-B]	10th story or below depending on type of building construction. Existing labs above 10th story may have their use continued. [CBC Table 5-B & 307.13.4]

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3. Corridor construction	1-hour rated slab-to-slab or tunnel, rated floor/ceiling assembly. 20-min smoke rated corridor doors, self closing or automatic closing. [CBC 1004.3.4.3.1]	1-hour rated slab-to-slab or tunnel, rated floor/ceiling assembly. 45-min smoke rated corridor doors, self closing or automatic closing. [CBC 1007.4.3]	1-hour rated slab-to-slab or tunnel, rated floor/ceiling assembly. 45-min smoke rated corridor doors, self closing or automatic closing [CBC 1007.4.3]	1-hour rated slab-to-slab or tunnel, rated floor/ceiling assembly. 45-min smoke rated corridor doors, self closing or automatic closing [CBC 1007.4.3]	1-hour rated slab-to-slab or tunnel, rated floor/ceiling assembly. 45-min smoke rated corridor doors, self closing or automatic closing. [CBC 1007.4.3]
4. Floor construction	No special requirements per CBC &CFC.	Except for surfacing, floors shall be of non-combustible, liquid tight construction. [CBC 307.2.2] [CFC 8003.1.13, 8003.6.1.4, 8003.7.1.4]	Except for surfacing, floors shall be of non-combustible, liquid tight construction. [CBC 307.2.2] [CFC 8003.1.13, 8003.6.1.4, 8003.7.1.4]	Except for surfacing, floors shall be of non-combustible, liquid tight construction. [CBC 307.2.2] [CFC 8003.14.1.2, 8003.12.1.2, 8003.1.13]	Liquid-tight floors, which comply with ASTM D 2843 (O1 greater than 25) and ASTM E 84 (Class 1), shall be required. [CBC 307.2.12]
5. Special construction when labs are located above the 3rd story	No requirement.	No requirement.	No requirement.	Not permitted above the 3rd story. [CBC Table 5B]	For the 5th floor & above, provide horizontal exit for each floor constructed as required for a 2-hr occupancy separation; separate exhaust system for each side; no side shall be less

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
					than 30% of the total floor area; at least one elevator serving each side. [CBC 1007.4.7]
6. Special construction for laboratories	1-hour occupancy separation between labs and other portions of the building. [CBC 304.2.2.1] NOTE: Subject to the AHJ's approval, 1-hour separation between individual labs may be waived.	See CBC Section 307.1.3 requirements including exterior exit, occupancy separation et al. for use, dispensing and mixing rooms of Classes 1, ll & lll A flammable or combustible liquids.	See CBC Section 307.1.4 requirements including exterior exit, occupancy separation et al. for storage rooms of Classes 1, ll & lll A flammable or combustible liquids.	See CBC Table 3-B for occupancy separation requirements.	Continuous 1-hour rated occupancy separation between laboratory suites of up to 10,000 sq. ft. each. Labs, shops and similar areas in Group H 8 Occupancies shall not require an occupancy separation from each other when the use of the area is determined to be compatible. Classrooms and offices directly related to the use shall not require an occupancy separation. [CBC 307.2.12] [CBC Tables 3-D.1, 3-I]

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7. Exits from labs and Travel through Intervening Rooms.	2 exits when lab is over 200 sq. ft. [CBC 304.2.2.1] Labs > 200 sq. ft must have one exit door directly to rated corridor, enclosed stairway or outside. [CBC 1004.2.2]	2 exits when lab is over 200 sq. ft. [CBC 1007.4.1] Labs > 200 sq. ft must have one exit door directly to rated corridor, enclosed stairway or outside. [CBC 1004.2.2]	2 exits when lab is over 200 sq. ft. [CBC 1007.4.1] Labs > 200 sq. ft must have one exit door directly to rated corridor, enclosed stairway or outside. [CBC 1004.2.2]	2 exits when lab is over 200 sq. ft. [CBC 1007.4.1] Labs > 200 sq. ft must have one exit door directly to rated corridor, enclosed stairway or outside. [CBC 1004.2.2]	2 exits when lab is over 200 sq. ft. [CBC 1007.4.1] Labs > 200 sq. ft must have one exit door directly to rated corridor, enclosed stairway or outside. [CBC 1004.2.2]
8. Travel distance to an exit or exit-access door	75 feet maximum to an exit or an exit-access door. [CBC 304.2.2.1]	75 feet maximum to an exit or an exit-access door. Additional 100 feet increase allowed within a corridor. [CBC 1007.4.2]	75 feet maximum to an exit or an exit-access door. Additional 100 feet increase allowed within a corridor. [CBC 1007.4.2]	100 feet maximum to an exit or a corridor. [CBC 1007.4.2] .	75 feet to an exit or an exit access door [CBC 1007.4.2] 100 feet maximum to an exit or a corridor. [CBC 1007.4.2]
9. Exit door swing	Direction of exit travel when area served has an occupant load of 50 or more. [CBC 1003.3.1.5]	Direction of exit travel regardless of the occupant load served . [CBC 1007.4.4]	Direction of exit travel regardless of the occupant load served . [CBC 1007.4.4]	Direction of exit travel regardless of the occupant load served . [CBC 1007.4.4]	Direction of exit travel regardless of the occupant load served . [CBC 1007.4.4]

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10. Exit door hardware	Pivoted, balanced or side-hinged swinging type. [CBC 1003.3.1.5]	No latch or lock unless it is panic hardware. [CBC 1007.4.5]	No latch or lock unless it is panic hardware. [CBC 1007.4.5]	No latch or lock unless it is panic hardware. [CBC 1007.4.5]	No latch or lock unless it is panic hardware. [CBC 1007.4.5]
11. Corridor door requirements	Self-closing or automatic closing , 20-min rated with smoke gasketing. [CBC 1004.3.4.3.2.1] See item #6 for occupancy separation requirements.	Self-closing or automatic closing with smoke gasketing, 45-min rated; 100 sq. inches maximum of wired glass set in steel frames. [CBC 1007.4.3]	Self-closing or automatic closing with smoke gasketing, 45-min rated; 100 sq. inches maximum of wired glass set in steel frames. [CBC 1007.4.3]	Self-closing or automatic closing with smoke gasketing, 45-min rated; 100 sq. inches maximum of wired glass set in steel frames. [CBC 1007.4.3]	Self-closing or automatic closing with smoke gasketing, 45 min. rated; 100 sq. inches maximum of wired glass set in steel frames. [CBC 1018]
12. Spill control for hazardous materials liquids *For Santa Clara County see local amendments to the Fire Code.	No requirement.	Rooms, buildings or areas used for the storage of hazardous materials liquids in individual vessels having a capacity of more than 55 gallons or when the aggregate capacity of multiple vessels exceeds 1000 gallons shall be provided with spill control to prevent the flow of liquids to adjoining areas. Floors shall be	Rooms, buildings or areas used for the storage of hazardous materials liquids in individual vessels having a capacity of more than 55 gallons or when the aggregate capacity of multiple vessels exceeds 1000 gallons shall be provided with spill control to prevent the flow of liquids to adjoining areas. Floors shall be	Rooms, buildings or areas used for the storage of hazardous materials liquids in individual vessels having a capacity of more than 55 gallons or when the aggregate capacity of multiple vessels exceeds 1000 gallons shall be provided with spill control to prevent the flow of liquids to adjoining areas. Floors shall be	No requirement .

	B	H-2	H-3	H-7	H-8
		constructed to contain a spill from the largest single vessel. When liquid-tight sills or dikes are provided, they are not required at perimeter openings which are provided with an open-grate trench across the opening that connects to an approved collection system. [CFC 8003.1.3.2] Open containers and systems Buildings, rooms or areas where hazardous materials liquids are dispensed into vessels exceeding a 1.1- gallon capacity or used in open systems exceeding a 5.3-gallon capacity shall be provided with spill control in accordance with CFC Section	constructed to contain a spill from the largest single vessel. When liquid-tight sills or dikes are provided, they are not required at perimeter openings which are provided with an open-grate trench across the opening that connects to an approved collection system. [CFC 8003.1.3.2] Open containers and systems Buildings, rooms or areas where hazardous materials liquids are dispensed into vessels exceeding a 1.1- gallon capacity or used in open systems exceeding a 5.3-gallon capacity shall be provided with spill control in accordance with CFC Section	constructed to contain a spill from the largest single vessel. When liquid-tight sills or dikes are provided, they are not required at perimeter openings which are provided with an open-grate trench across the opening that connects to an approved collection system. [CFC 8003.1.3.2] Open containers and systems Buildings, rooms or areas where hazardous materials liquids are dispensed into vessels exceeding a 1.1- gallon capacity or used in open systems exceeding a 5.3-gallon capacity shall be provided with spill control in accordance with CFC Section	

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		8003.1.3.2. [CFC 8004.2.2.5.1] Closed containers and systems Buildings, rooms or areas where hazardous materials liquids are used in individual vessels exceeding a 55-gallon capacity shall be provided with spill control in accordance with CFC Section 8003.1.3.2. [CFC 8004.2.3.6.1] For spill control of flammable and combustible liquids, refer to CFC 7902.3.4 for storage and CFC 7903.2.3.4.4 for Use-Open systems. For Santa Clara County provide spill control	8003.1.3.2. [CFC 8004.2.2.5.1] Closed containers and systems Buildings, rooms or areas where hazardous materials liquids are used in individual vessels exceeding a 55-gallon capacity shall be provided with spill control in accordance with CFC Section 8003.1.3.2. [CFC 8004.2.3.6.1] For spill control of flammable and combustible liquids, refer to CFC 7902.3.4 for storage and CFC 7903.2.3.5.4 for Use-Closed systems.. For Santa Clara County provide spill control	8003.1.3.2 [CFC 8004.2.2.5.1] Closed containers and systems Buildings, rooms or areas where hazardous materials liquids are used in individual vessels exceeding a 55-gallon capacity shall be provided with spill control in accordance with CFC Section 8003.1.3.2. For Santa Clara County provide spill control regardless of hazard category, or vessel size for non-exempt quantities. [NS:800.22]	

Laboratory Occupancy Classification	B	H-2	H-3	H-7	H-8
		regardless of hazard category, or vessel size for non-exempt quantities. [NS:800.22]	regardless of hazard category, or vessel size for non-exempt quantities. [NS:800.22]		
13. Secondary containment for hazardous materials liquids and solids *For Santa Clara County see local amendments to the Fire Code.	No requirement.	When required by Table 8003.1-A, buildings, rooms or areas used for the storage of hazardous materials liquids or solids shall be provided with secondary containment when the capacity exceeds the amounts stated in CFC Section 8003.1.3.3. Secondary containment for indoor storage areas shall be designed to contain a spill from the largest vessel plus the design flow volume of fire-protection water calculated for a period of 20 minutes. Monitoring method required to detect hazardous materials in the	When required by Table 8003.1-A, buildings, rooms or areas used for the storage of hazardous materials liquids or solids shall be provided with secondary containment when the capacity exceeds the amounts stated in CFC Section 8003.1.3.3. Secondary containment for indoor storage areas shall be designed to contain a spill from the largest vessel plus the design flow volume of fire-protection water calculated for a period of 20 minutes. Monitoring method required to detect hazardous materials in the	When required by Table 8003.1-A, buildings, rooms or areas used for the storage of hazardous materials liquids or solids shall be provided with secondary containment when the capacity exceeds the amounts stated in CFC Section 8003.1.3.3. Secondary containment for indoor storage areas shall be designed to contain a spill from the largest vessel plus the design flow volume of fire-protection water calculated for a period of 20 minutes. Monitoring method required to detect hazardous materials in the	No requirement

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
		secondary containment system.. [CFC 8003.1.3.3] For indoor Use-open and Use-closed systems, secondary containment shall be provided when required by CFC Table 8004.2-A for capacities exceeding the amounts stated in CFC Section 8004.2.2.5.2 and 8004.2.3.6.2. For secondary containment of flammable and combustible liquids, refer to CFC 7902.3.4 for storage and CFC 7903.2.3.4.4 for Use-open systems. For Santa Clara County provide secondary containment regardless of hazard category, or	secondary containment system.. [CFC 8003.1.3.3] For indoor Use-open and Use-closed systems, secondary containment shall be provided when required by CFC Table 8004.2-A for capacities exceeding the amounts stated in CFC Section 8004.2.2.5.2 and 8004.2.3.6.2. For secondary containment of flammable and combustible liquids, refer to CFC 7902.3.4 for storage and CFC 7903.2.3.4.4 for Use-closed systems. For Santa Clara County provide secondary containment regardless of hazard category, or	secondary containment system.. [CFC 8003.1.3.3] For indoor Use-open and Use-closed systems, secondary containment shall be provided when required by CFC Table 8004.2-A for capacities exceeding the amounts stated in CFC Section 8004.2.2.5.2 and 8004.2.3.6.2. For Santa Clara County provide secondary containment regardless of hazard category, or vessel size for non-exempt quantities. [NS:800.22]	

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	B	H-2	H-3	H-7	H-8
		vessel size for non-exempt quantities. [NS:800.22]	vessel size for non-exempt quantities. [NS:800.22]		
14. Ventilation system emergency shut-off	No requirement.	Manual shut-off outside the room adjacent to principal access door. [CBC 1202.2.3] Exception: When exhaust systems conveying explosive, corrosive, combustible, flammable or highly toxic dusts, mists, fumes, vapors or gases are 100 % exhausted to the outside, an emergency ventilation system shutoff is not required. [CBC Sect. 1202.2.3]	Manual shut-off outside the room adjacent to principal access door. [CBC 1202.2.3] Exception: When exhaust systems conveying explosive, corrosive, combustible, flammable or highly toxic dusts, mists, fumes, vapors or gases are 100 % exhausted to the outside, an emergency ventilation system shutoff is not required. [CBC Sect. 1202.2.3]	Located outside the room adjacent to principal access door. [CBC Sect. 1202.2.3] Exception: When exhaust systems conveying explosive, corrosive, combustible, flammable or highly toxic dusts, mists, fumes, vapors or gases are 100 % exhausted to the outside, an emergency ventilation system shutoff is not required. [CBC Sect. 1202.2.3]	Located outside the room adjacent to principal access door. Exception: When exhaust systems conveying explosive, corrosive, combustible, flammable or highly toxic dusts, mists, fumes, vapors or gases are 100 % exhausted to the outside, an emergency ventilation system shutoff is not required. [CBC Sect. 1202.2.3]
15. Hazardous material requirements on floors 1,2,3 and 1st basement level	Storage of Class I flammable liquids not allowed in basements. [CFC 7902.5.10.1]	Rooms for use, dispensing & mixing of Class I, II & IIIA liquids not allowed in basements. [CBC 307.1.3]	Storage of Class I flammable liquids not allowed in basements. [CBC 307.1.4]	Storage of Class I flammable liquids not allowed in basements. [CFC 7902.5.10.1]	Storage of Class 1 flammable liquids allowed up to exempt amounts listed in Table 3-D.1.

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16. Hazardous material requirements on floors 4,5,6 and 2nd & 3rd basement level	Storage of Class I flammable liquids not allowed in basements. [CFC 7902.5.10.1] .	Rooms for use, dispensing & mixing of Class I, II & IIIA liquids not allowed in basements. [CBC 307.1.3]	Storage of Class I flammable liquids not allowed in basements. [CBC 307.1.4]	H-7 not permitted above the 3rd story. [CBC Table 5-B]	75% of exempt amounts listed in Tables 3-D.1 & 3-I.
17. Hazardous material requirements on floors 7,8,9,10 and below 3rd basement level	Storage of Class I flammable liquids not allowed in basements. [CFC 7902.5.10.1] .	Rooms for use, dispensing & mixing of Class I, II & IIIA liquids not allowed in basements. [CBC 307.1.3]	Storage of Class I flammable liquids not allowed in basements. [CBC 307.1.4]	H-7 not permitted above the 3rd story. [CBC Table 5-B]	50% of exempt amounts listed in Tables 3-D.1 & 3-I.
18. Hazardous material requirements above 10th Floor	Allowed in Type l and Type ll-FR (up to 12th floor) construction only	Allowed in Type I construction only.	Allowed in Type I construction only.	H-7 not allowed above the 3rd story.	H-8 not allowed above the 10th story.
19. "Ganged" exhaust ducts	Separate and distinct systems for incompatible materials, as necessary. [CMC 505.2] [Note: Large exhaust air flow and small amounts of chemicals in use in lab	Separate and distinct systems for incompatible materials, as necessary. [CMC 505.2] [Note: Large exhaust air flow and small amounts of chemicals in use in	Separate and distinct systems for incompatible materials, as necessary. [CMC 505.2] [Note: Large exhaust air flow and small amounts of chemicals in use in	Separate and distinct systems for incompatible materials, as necessary. [CMC 505.2] [Note: Large exhaust air flow and small amounts of chemicals in use in	Exhaust ducts from each laboratory unit shall be separately ducted to a point outside the building, to a mechanical space or to a shaft. Connection to a common duct may occur at those points.

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	fume hood systems may not result in mixture of vapors in exhaust duct systems sufficient to cause an adverse incompatible reaction.] Exhaust ducts from a maximum of two floors may be "ganged" inside a single shaft providing no dampers on the exhaust duct openings.	lab fume hood systems may not result in mixture of vapors in exhaust duct systems sufficient to cause an adverse incompatible reaction.] Exhaust ducts from a maximum of two floors may be "ganged" inside a single shaft providing no dampers on the exhaust duct openings.	lab fume hood systems may not result in mixture of vapors in exhaust duct systems sufficient to cause an adverse incompatible reaction.] Exhaust ducts from a maximum of two floors may be "ganged" inside a single shaft providing no dampers on the exhaust duct openings.	lab fume hood systems may not result in mixture of vapors in exhaust duct systems sufficient to cause an adverse incompatible reaction.] Exhaust ducts from a maximum of two floors may be "ganged" inside a single shaft providing no dampers on the exhaust duct openings.	Exhaust ducts within the same laboratory unit may be combined within that laboratory unit. [CBC 307.5.5] Exhaust ducts from a maximum of two floors may be "ganged" inside a single shaft providing no dampers on the exhaust duct openings.
20. Fume hood exhaust duct exposed to rated corridors	See item 21 below for duct penetrations through fire walls.	See item 21 below for duct penetrations through fire walls.	See item 21 below for duct penetrations through fire walls	See item 21 below for duct penetrations through fire walls .	Fume hood exhaust ducts exposed to fire-resistive exit corridors shall be separated from the corridor by one-hour fire-resistive construction. [CBC Sect. 307.2.12]
21. Fire/smoke dampers in fume hood exhaust ducts	Generally not allowed by NFPA 45 Section 6-10.3. Duct penetrations through fire walls shall be protected by other means.	Generally not allowed by NFPA 45 Section 6-10.3. Duct penetrations through fire walls shall be protected by other	Generally not allowed by NFPA 45 Section 6-10.3. Duct penetrations through fire walls shall be protected by other	Generally not allowed by NFPA 45 Section 6-10.3. Duct penetrations through fire walls shall be protected by other	Expressly prohibited by CBC 307.5.5. [CBC 307.5.5]

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		means.	means.	means.	
22. Emergency power	No requirement.	Standby power required, designed and installed in accordance with the Electrical Code. . [CBC 307.2.6]	Standby power required for storage of Class II organic peroxides, designed and installed in accordance with the Electrical Code. [CBC 307.2.6]	Emergency power required, designed and installed in accordance with the Electrical Code. [CBC 307.2.7]	Emergency power required, designed and installed in accordance with the Electrical Code. [CBC 307.2.7]
23. Emergency Response Equipment Room	No requirement.	No requirement.	No requirement.	No requirement.	An area for spill emergency-response equipment shall be located on each floor ; minimum 50 sq. ft per floor; increases 5 sq. ft per 1,000 sq. ft for floor area in excess 10,000 sq. ft. [CBC Sect. 307.2.12]
24. Sprinkler System	As required by CBC Section 904.2.2 and local Ordinances.	Ordinary Hazard Group 2 with minimum design area of 3,000 square feet. [CBC 904.2.6.1 & CFC 8003.1.6 & 8004.1.10]	Ordinary Hazard Group 2 with minimum design area of 3000 square feet. [CBC 904.2.6.1 & CFC 8003.1.6 & 8004.1.10]	Ordinary Hazard Group 2 with minimum design area of 3,000 square feet. [CBC 904.2.6.1 & CFC 8003.1.6 & 8004.1.10]	Ordinary Hazard Group 2 with minimum design area of 3,000 square feet. [CBC 904.2.6.4]

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			For flammable/ combustible liquid storage rooms, see also CFC 7902.5.11.5.1]		In mixed occupancies, Ordinary Hazard Group I with a minimum design area of 3,000 square ft for portions of buildings not classified as H-8. [CBC 904.2.6.4]
25. Smoke detection	No requirement.	Smoke detection required in liquid & solid oxidizer & organic peroxide storage areas in excess of the exempt amounts. [CFC 1007.2.6.4, 8003.6.1.6 & 8003.7.1.7]	Smoke detection required in liquid & solid oxidizer & organic peroxide storage areas in excess of the exempt amounts. [CFC 1007.2.6.4, 8003.6.1.6 & 8003.7.1.7]	Smoke detection required for storage of highly toxic compressed gases and for use-closed systems of highly toxic and toxic compressed gases in excess of the exempt amounts. [CFC 1007.2.6.4. 8003.3.1.7 & CFC . 8004.2.3.7.7]	Smoke detection required for additions, alterations and repairs of existing H-8 occupancies located above the 10th story. [CBC 307.13.4]
26. Electrical classification for wiring and equipment	Unclassified. (Note: Under some conditions of hazards, it may be necessary to classify a laboratory work area, or part thereof, as a	Class 1, Division 2 where non-exempt amounts of Class 1 Organic peroxides, and pyrophoric gases are stored. [CFC 8003.7.1.6, 8003.8.1.3]	Class 1, Division 2 where non-exempt amounts of Class ll Organic peroxides are stored. [CFC 8003.7.1.6]	Unclassified. (Note: Under some conditions of hazards, it may be necessary to classify a laboratory work area, or part	Unclassified. (Note: Under some conditions of hazards, it may be necessary to classify a laboratory work area, or part

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	B	H-2	H-3	H-7	H-8
	hazardous location for the purpose of designating the electrical installation.[NFPA 45, 3-6.2]) Consult NFPA 70 for additional information.	(Note: Per NFPA 70, Class ll required for areas where presence of combustible dust presents a fire or explosion hazard.) Consult NFPA 70 for additional information.	Consult NFPA 70 for additional information.	thereof, as a hazardous location for the purpose of designating the electrical installation.[NFPA 45, 3-6.2]) Consult NFPA 70 for additional information.	thereof, as a hazardous location for the purpose of designating the electrical installation.[NFPA 45, 3-6.2]) Consult NFPA 70 for additional information
27. Explosion Control (CBC 307.10)	♦ .Indoor spaces where explosive vapor-air mixtures can develop under normal operating conditions. [CFC 7902.1.5]	♦ Indoor spaces where explosive vapor-air mixtures can develop under normal operating conditions. [CFC 7902.1.5, 7903.2.3.4.3] ♦ Indoor storage rooms, areas, and buildings where non-exempt amounts of the	♦ Indoor spaces where explosive vapor-air mixtures can develop under normal operating conditions. [CFC 7902.1.5] ♦ Indoor storage rooms, areas, and buildings where non-exempt amounts of the following hazardous	♦ Indoor spaces where explosive vapor-air mixtures can develop under normal operating conditions. [CFC 7902.1.5] ♦ Indoor storage rooms, areas, and buildings where non-exempt amounts of highly toxic flammable	♦ Indoor spaces where explosive vapor-air mixtures can develop under normal operating conditions. . [CFC 7902.1.5]

Laboratory Code Requirement Matrix

Based on the 2001 California Building Standards Code

(Stanford University Fire Marshal's Office, Environmental Health & Safety Department)

Laboratory Occupancy Classification

	B	H-2	H-3	H-7	H-8
		following hazardous materials are stored 1. Flammable liquid, Class I-A 2. Flammable liquid, Class I-B, I-C when ventilation < 1cfm/ft^2 3. Organic peroxides, Class 1 4. Pyrophoric gases 5. Unstable reactives, Class 3 6. Water reactives, Class 3 [CBC 307.10; CFC 7902.1.5, 8003.1.7] ♦ Use –open or Use-closed systems ✓ Explosion control shall be provided in accordance with Section 8003.1.7	materials are stored: 1. Flammable liquid, Class I-A 2. Flammable liquid, Class I-B, I-C when ventilation < 1cfm/ft^2 3. Water reactives, Class 2 [CBC 307.10; CFC 7902.1.5, 8003.1.7] ♦ Use –open or Use-closed systems ✓ Explosion control shall be provided in accordance with Section 8003.1.7 when an explosive environment can occur. [CFC 8004.2.2.4] ✓ Exception for	gases and toxic flammable gases are stored outside gas cabinets, exhausted enclosures, or gas rooms. Note: Above requirement should never apply because highly toxic gases (in any amount) and non-exempt amounts of toxic gases must be stored in gas cabinets, exhausted enclosures, or gas rooms. [CBC 307.10; 8003.1.7, 8003.3.1.3.1]	

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
		when an explosive environment can occur. [CFC 8004.2.2.4] ✓ Exception for Closed Systems: When process vessels are designed to fully contain the worst-case explosion anticipated within the vessel under process conditions considering the most likely failure. [CFC 8004.2.3.5] ♦ Areas and buildings in which combustible dust is manufactured, used or generated in such a manner that concentrations and conditions create an	Closed Systems: When process vessels are designed to fully contain the worst-case explosion anticipated within the vessel under process conditions considering the most likely failure. [CFC 8004.2.3.5] ♦ Flammable & Combustible Liquids ✓ For closed systems , when an explosive environment can occur as a result of the dispensing, mixing or use process. Exception: When process vessels are designed to fully contain the worst-case explosion		

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
		explosion potential. [CFC 8003.1.7, CBC 307, CFC 7608] ♦ Flammable & Combustible Liquids ✓ For Use-open systems of Class 1 flammable liquids. [CFC 7903.2.3.4.3] ✓ For closed systems , when an explosive environment can occur as a result of the dispensing, mixing or use process. Exception: When process vessels are designed to fully contain the worst-case explosion anticipated within	anticipated within the vessel under process conditions considering the most likely failure. [CFC 7903.2.3.5.3]		

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
		the vessel under process conditions considering the most likely failure. [CFC 7903.2.3.5.3]			
28. Ventilation System	Natural ventilation with openable exterior openings ≥ 5 percent of the total floor area, or mechanical ventilation at 15 cfm of outside air per occupant, minimum, when the building is occupied. Mechanical ventilation at 6 air changes per hour, minimum, where flammable or combustible liquids, Class I, II, III-A, are used. Such exhaust shall be taken from a point at or near the floor. [CBC 1202.2.1, 1202.2.2]	Mechanical ventilation at 1 cfm/ft2, minimum, where hazardous materials are stored or used. Continuous operation unless alternate design is approved. Shall also provide 15 cfm of outside air per occupant, minimum, when the area is occupied. Mechanical exhaust at point of generation of fumes, mists, or vapors where hazardous materials with UFC Standard 79-3 ranking of 3 or 4 are used or dispensed. Exhaust ducts shall run	Mechanical ventilation at 1 cfm/ft2, minimum, where hazardous materials are stored or used. Continuous operation unless alternate design approved. Shall also provide 15 cfm of outside air per occupant, minimum, when the area is occupied. Mechanical exhaust at point of generation of fumes, mists, or vapors where hazardous materials with UFC Standard 79-3 ranking of 3 or 4 are used or dispensed. Exhaust ducts shall run	Mechanical ventilation at 1 cfm/ft2, minimum, where hazardous materials are stored or used. Continuous operation unless alternate design approved. Shall also provide 15 cfm of outside air per occupant, minimum, when the area is occupied. Mechanical exhaust at point of generation of fumes, mists, or vapors where hazardous materials with UFC Standard 79-3 ranking of 3 or 4 are used or dispensed. Exception: ducts	Ventilation rate not addressed in CFC.

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
		be run directly to exterior without going through other spaces when carrying explosive or flammable vapors. Exception: ducts carrying vapor concentration < 25% of the lower flammable limit may pass through other spaces. [CBC 1202.2.1, 1202.2.3; CFC 7903.2.3.4.2, 8003.1.4.2, 8004.1.11, 8004.2.2.2, 8004.2.3.3]	be run directly to exterior without going through other spaces when carrying explosive or flammable vapors. Exception: ducts carrying vapor concentration < 25% of the lower flammable limit may pass through other spaces. [CBC 1202.2.3; CFC 7902.5.11.4, 8003.1.4.2, 8004.1.11, 8004.2.2.2, 8004.2.3.3]	carrying vapor concentration < 25% of the lower flammable limit may pass through other spaces. [CBC 1202.2.3; CFC 8003.1.4.2, 8004.1.11, 8004.2.2.2, 8004.2.3.3]	
29. Smoke and heat venting	No requirement	Required for non-exempt amounts of Oxidizers, Organic peroxides, Unstable reactives, and Water-reactive solids and liquids when space exceeds 15000 sq. ft. in single floor area. [CBC 906, CFC 8003.6.1.5, 8003.7.1.5,	Required for non-exempt amounts of Oxidizers, Organic peroxides, Unstable reactives, and Water-reactive solids and liquids when space exceeds 15000 sq. ft. in single floor area. [CBC 906, CFC 8003.6.1.5, 8003.7.1.5,	No requirement	No requirement

Laboratory Code Requirement Matrix

Based on the 2001 California Building Standards Code

(Stanford University Fire Marshal's Office, Environmental Health & Safety Department)

	Laboratory Occupancy Classification				
	B	H-2	H-3	H-7	H-8
		8003.9.1.4, 8003.10.1.5]	8003.9.1.4, 8003.10.1.5]		
30. Exterior walls and opening protection	Protect walls and openings per Table 5A [CBC]	Protect walls and openings per Table 5A [CBC]	Protect walls and openings per Table 5A [CBC]	Protect walls and openings per Table 5A [CBC]	Protect walls and openings per Table 5A [CBC]

This matrix serves only as a guide to architects/designers engaged in laboratory design on Stanford projects. Nothing in this matrix is intended to authorize any aspect of the work which is not in accordance with applicable codes, local fire department requirements, Stanford University Facility Design Standards, UL listings and/or manufacturers' instructions.