EXPRESS TERMS
FOR
PROPOSED BUILDING STANDARDS
OF THE
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

REGARDING PROPOSED CHANGES TO
2007 CALIFORNIA MECHANICAL CODE
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 4

LEGEND FOR EXPRESS TERMS
1. Existing California amendments or code language being modified: All such language appears in *italics*, modified language is underlined.
2. New California amendments: All such language appears *underlined and in italics*.
3. Repealed text: All such language appears in ~~strikeout~~.

EXPRESS TERMS

CHAPTER 2 – DEFINITIONS

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204.0
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BUILDING OFFICIAL – See **Authority Having Jurisdiction.** ***[For OSHPD 1, 2, 3 & 4]*** ~~*For the State of California,*~~ *"Building Official" shall be the "Enforcing Agency" as specified in California Chapter 1, Section* ~~*108.0*~~ *110.*

217.0

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OCCUPANCY CLASSIFICATION – For the purpose of this code, certain occupancies are defined as follows: ***[OSHPD 1, 2, 3 & 4]*** *Occupancy Classification* ~~*S*~~ *shall be those as shown in the California Building Code*~~*,*~~*. f*~~*F*~~*or the purpose of this code, certain occupancies are defined as follows:*

Group I Occupancies

Division 1.1. Nurseries for the full-time care of children under the age of six (each accommodating more than five children).

Hospitals, sanitariums, nursing homes ~~***[For OSHPD 1, 2 &3]*** *and homes for the aged*~~ with nonambulatory patients, protective social-care facilities or homes with nonambulatory guests, and similar buildings (each accommodating more than five (5) patients).

Notation
Authority: Health & Safety Code §1226, 1275,129790 & 129850 and Government Code §11152.5
Reference: Health & Safety Code §1226, 1275, 129790 & 129850

CHAPTER 3 – GENERAL REQUIREMENTS

304.2 Room Large in Comparison to Size of Equipment. Central-heating furnaces not listed for closet or alcove installation shall be installed in a room or space having a volume at least twelve (12) times the total volume of the furnace; central-heating boilers not listed for closet or alcove installation shall be installed in a room or space having a volume sixteen (16) times the volume of the boiler. ***[For OSHPD 1, 2, 3 & 4]*** *The total volume of the boilers shall be based on the total number of central-heating boilers that can operate at the same time.*

> **Exceptions:**
> (1) The installation clearances …
>
> *(2)* ***[For OSHPD 1, 2, 3 & 4]*** *A 25 percent reduction in the boiler room ~~sizing up to 25 percent~~ volume ~~will be acceptable~~ is allowed with forced-draft ~~combustible blowers~~ boilers and approved ventilation of the boiler room. In no case shall boiler room volume or clearances be reduced below those required by the conditions of the boiler listing. The boiler and the boiler room ventilation system, including fans, controls and damper motors shall be on emergency power when required by Section 316. The ventilation system shall either operate continuously, or, if interlocked with the boiler(s), it shall not interfere with the proper boiler operation*.

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314.0 Steam and Hot-Water Systems

314.1 Requirements for Hospitals and Optional Services Provided in Correctional Treatment Centers. [For OSHPD 1 & 4]

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314.1.3 *Boiler systems providing space heating shall be designed to maintain a minimum temperature of 60°F (15.6°C) in general patient areas and the temperatures specified in Table 315 for sensitive areas during periods of breakdown or maintenance of any one boiler. Winter design temperature shall be based on the Median of Extremes shown by the 1982 ASHRAE ~~Climactic~~ Climatic Data for Region X.*

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315.0 Air Conditioning and Heating Systems

315.1 Requirements for Hospitals and Optional Services Provided in Correctional Treatment Centers. [For OSHPD 1 & 4]

315.1.1 *The systems shall be designed to provide the temperatures and ~~humidities~~ humidity for sensitive areas or rooms shown in Table 315.*

> ***Exception:*** *Calculations substantiating that the humidity will not be outside the range shown in Table 315 more than 0.5% of the time on an annual basis may be submitted to OSHPD as an alternate method of compliance. Humidifiers are not required if OSHPD approves the alternate method of compliance. Calculations shall be performed by a California licensed mechanical engineer and shall be based on the 1982 ASHRAE Climatic Data for Region X or other nationally recognized weather data.*

315.1.2 *Individual temperature and humidity controls shall be provided for each designated sensitive area or room shown in Table 315.*

Exceptions:

~~315.1.3~~ *(1) Dew-point control with individual overriding room humidistat will be acceptable as a substitute when justification is provided.*

~~315.1.4~~ *(2) Rooms ~~controlled by the same thermostat~~ with similar exposure, function and humidity requirements may have humidity control with zone humidifier where designs are specifically approved by the enforcing agency.*

(3) Humidifier is not required pursuant to Section 315.1.1.

[Relocated from Section 315.1.6] 315.1.3 *For ~~all other~~ occupied areas not shown in Table 315, heating systems shall be ~~designated~~ designed to provide 70°F to 75°F (21.1°C to 23.9°C) ~~temperatures under winter design conditions~~ based on the Median of Extremes shown by the 1982 ASHRAE Climatic Data for Region X. The systems shall be thermostatically controlled with appropriate zoning to achieve the above conditions.*

[Relocated from Section 315.1.7] 315.1.4 *~~In all patient-occupied areas~~ For occupied areas not shown in Table 315, cooling systems shall be designed to provide 75°F (23.9°C) maximum based on the 0.5 percent summer design dry bulb temperatures shown by the 1982, ASHRAE Climate Data for Region X. The ~~heating and cooling~~ systems ~~should~~ shall be thermostatically controlled with appropriate zoning to achieve the above conditions.*

~~***315.1.5*** *Heating systems shall have the heating capacity to provide the minimum temperatures and humidities in Table 315.*~~

[Relocated to Section 315.1.3] ~~***315.1.6*** *For all other occupied areas, heating systems shall be designated designed to provide 70°F to 75°F (21.1°C to 23.9°C) temperatures under winter design conditions. The systems shall be thermostatically controlled with appropriate zoning to achieve the above conditions.*~~

[Relocated to Section 315.1.4] ~~***315.1.7*** *In all patient-occupied areas cooling systems shall be designed to provide 75°F (23.9°C) maximum based on the 0.5 percent summer design dry bulb temperatures shown by the 1982, ASHRAE Climate Data for Region X. The heating and cooling system should be thermostatically controlled with appropriate zoning to achieve the above conditions.*~~

315.2 Requirements for Skilled Nursing, Intermediate Care Facilities and Basic Services Provided in Correctional Treatment Centers. [For OSHPD 2 & 4]

315.2.1 *Systems shall accommodate the provisions of Section ~~315.1.6 through 315.1.7.~~ 315.1.3 and 315.1.4.*

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Table 315 – Heating, ~~and~~ Cooling, and Humidity Requirements for Sensitive Areas or Rooms

Area or Rooms Designation	*Temperature Range[1, 2]*	*Relative Humidity[1, 3]*
	ºF	*Percent*
Operating room	*68-73*	*30-60*
Cystoscopy	*68-73*	*30-60*
Cardiac ~~cath~~ catheterization lab	*70-75*	*30-60*
Delivery room	*68-73*	*30-60*
Recovery room	*70*	*30-60*
Newborn nursery	*75*	*30-60*
Intensive-care newborn nursery	*75-80*	*30-60*
Intensive care	*70-75*	*30-60*

[1]Thermostats and humidistat shall be either locally resetable and of the non-locking type or remotely resetable and of the locking type.
[2]Where temperature ranges are indicated, the system shall be capable of maintaining the rooms at any point within the range. A single figure indicates a heating or cooling capacity of at least the indicated temperature. Temperatures different than those shown will be allowed when approved by the authority having jurisdiction.
[3]The ranges listed are the minimum and maximum limits where control is specifically needed.

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316.0 Essential Mechanical Provisions [For OSHPD 1, 2, 3(Surgical Clinics only) & 4] *During periods of power outages emergency electrical power shall be provided for the following equipment:*
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316.6 *Alarms for airborne infection isolation rooms and protective environment rooms.*

Notation
Authority: Health & Safety Code §1226, 1275,129790 & 129850 and Government Code §11152.5
Reference: Health & Safety Code §1226, 1275, 129790 & 129850

CHAPTER 4 – VENTILATION AIR SUPPLY

403.0 Ventilation Rates. *[Not permitted for OSHPD 1, 2, 3 & 4]*

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~~Part 1 – Ventilation for Health Care Facilities [For OSHPD 1, 2, 3 & 4]~~
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407.2 Outdoor Air Intakes and Exhaust Outlets.

407.2.1 Outdoor Air Intakes. *Outdoor air intakes shall be located at least 25 feet (7.62 m) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, cooling towers, plumbing vents, and areas that may collect vehicular exhaust or other noxious fumes. The bottom of outdoor air intakes shall be located as high as practicable, but not less than 10 feet (3048 mm) above ground level. If installed through the roof, they shall be located 18 inches (457 mm) above roof level or 3 feet (914 mm) above a flat roof where heavy snowfall is anticipated.*

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407.3 Air Balance.

407.3.1 *The ventilation systems shall be designed and balanced to provide the general air balance relationship to adjacent areas, shown in Table 4-A. The ventilation systems shall be balanced in accordance with the latest edition of standards published by the Associated Air ~~Balanced~~ Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB).*

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407.4 Air Circulation.

407.4.1 *Air shall be introduced at the cleanest areas and removed at the dirtiest areas in order to reduce chances of airborne cross infection as follows:*

407.4.1.1 *Air supplied to operating rooms, cesarean operating rooms, cardiac ~~catherization~~ catheterization labs, cystoscopy rooms, delivery rooms and nurseries, shall be delivered at or near the ceiling of the area served, and all air removed from the area shall be removed near floor level. Exhaust or recirculation inlets shall be located not less than 3 inches (76 mm) nor more than 8 inches(203 mm) above the finished floor. At least two exhaust or recirculation air inlets shall be used in all cardiac catheterization labs, cystoscopy rooms, operating rooms, and delivery rooms and shall be located not less than 3 inches (76 mm) nor more than 8 inches (203 mm) above the finished floor.*

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407.4.1.4 *No space above a ceiling may be utilized as an outside-air, relief-air, supply-air, exhaust-air or return-air plenum.*

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408.2 Filters for Hospitals.

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408.2.4 *Noncentral recirculating air handling systems, ~~i.e~~ for example, through-the-wall units, fan coil units, and heat pumps may be utilized for single patient rooms of one or more beds. ...*

TABLE 4-A --PRESSURE RELATIONSHIP AND VENTILATION REQUIREMENTS FOR GENERAL ACUTE CARE HOSPITALS, SKILLED NURSING FACILITIES, INTERMEDIATE CARE FACILITIES, CORRECTIONAL TREATMENT CENTERS, OUTPATIENT FACILITIES AND LICENSED CLINICS

A	B	C	D	E	F
			CONDITIONED AIR NOT 100% O.S.A.		
AREA DESIGNATION	AIRBALANCE RELATIONSHIP TO ADJACENT AREAS [8]	MINIMUM AIR CHANGES IF 100% O.S.A.	Minimum Air Changes of Outdoor Air per Hour	Minimum Total Air Changes per Hour	ALL AIR EXHAUSTED DIRECTLY TO OUTDOORS
Operating room, cardiac catheterization lab and cystoscopy	P[7]	12	5	20	
Patient holding preparation[1]	~~E~~ NR	6	2	6	
Delivery room, cesarean operating room	P	12	5	20	
Newborn/ well baby nursery	P	6	2	6	
Post anesthesia care unit	~~E~~ NR	6	2	6	Yes

intensive care service spaces, ~~A~~acute respiratory- care service spaces, ~~B~~burn service spaces, ~~C~~coronary-care service ~~S~~ spaces, ~~P~~pediatric intensive-care service spaces[9]	*P*	*6*	*2*	*6*	
Newborn intensive care	*P*	*6*	*2*	*6*	
Emergency department:					
Waiting area	*N*	*12*	*2*	*12*	*Yes*[2]
Operating room	*P*	*12*	*5*	*20*	
Treatment room	*~~E~~ NR*	*6*	*2*	*6*	
Trauma room[3]	*P*	*12*	*5*	*20*	
Triage	*N*	*12*	*2*	*12*	
Patient room	*~~E~~ NR*	*2*	*2*	*6*	
IV Prep. room	*P*	*6*	*2*	*6*	
Blood draw/phlebotomy	*NR*	*6*	*2*	*6*	
Infusion room	*P*	*6*	*2*	*6*	
Blood bank/ tissue storage	*NR*	*6*	*2*	*6*	
Administrative	*NR*	*4*	*2*	*4*	
Patient area corridor	*~~E~~ NR*	*2*	*2*	*4*	
Labor/delivery/recovery room, Labor/delivery/recovery/ postpartum room	*~~E~~ NR*	*2*	*2*	*6*	
Airborne infection isolation room	*N*[4]	*12*	*2*	*12*	*Yes*
Airborne infection isolation anteroom	*P*[4]	*10*	*2*	*10*	*Yes*
Protective environment room	*P*[5]	*15*	*2*	*15*	
Protective environment anteroom	*N*[6]	*15*	*2*	*15*	
Treatment and examination rooms, Bloodborne infection isolation room	*~~E~~ NR*	*6*	*2*	*6*	
Bronchoscopy and endoscopy	*N*	*12*	*2*	*12*	*Yes*
Special purpose room (SNF & ICF only)	*~~E~~ NR*	*6*	*2*	*6*	*Yes*
Radiological / Imaging:					
Angiography ~~R~~room	*P*	*12*	*5*	*15*	
X-ray (diagnostic and treatment)	*~~E~~ NR*	*6*	*2*	*6*	
CT Scan	*~~E~~ NR*	*6*	*2*	*6*	
MRI room	*~~E~~ NR*	*6*	*2*	*6*	
Fluoroscopy ~~R~~room	*N*	*6*	*2*	*6*	*Yes*
Dark ~~R~~room	*N*	*12*	*2*	*12*	*Yes*
Negative-pressure x-ray room	*N*	*12*	*2*	*12*	*Yes*
Ultra sound room	*~~E~~ NR*	*6*	*2*	*6*	
Gamma camera	*~~E~~ NR*	*6*	*2*	*6*	
Waiting area	*N*	*12*	*2*	*12*	*Yes*
Nuclear medicine	*N*	*6*	*2*	*6*	*Yes*
Bedpan room	*N*			*10*	*Yes*
Bathroom	*N*			*10*	*Yes*
Janitors' closet, ~~H~~housekeeping room	*N*			*10*	*Yes*
Sterilizer equipment room	*N*			*10*	*Yes*

Sub sterile room	~~*E*~~ *NR*	*10*	*2*	*10*	*Yes*
Linen and trash chute rooms	*N*			*10*	*Yes*
Food preparation centers	~~*E*~~ *NR*	*10*	*2*	*10*	*Yes*
Dining room	~~*E*~~ *NR*	*10*	*2*	*10*	
Dishwashing room	*N*			*10*	*Yes*
Dietary day storage	~~*E*~~ *NR*			*2*	
Laundry, general (clean and dirty)	~~*E*~~ *NR*	*10*	*2*	*10*	*Yes*
Soiled linen sorting and storage	*N*			*10*	*Yes*
Clean linen storage	*P*	*2*	*2*	*2*	
Anesthesia storage	~~*E*~~ *NR*	*8*		*8*	*Yes*
Central medical and surgical supply:					
Soiled or decontamination room	*N*	*4*	*2*	*4*	*Yes*
Clean workroom	*P*	*4*	*2*	*4*	
Unsterile supply	~~*E*~~ *NR*	*2*	*2*	*2*	
Pharmacy/medicine room	*P*	*2*	*2*	*4*	
Laboratory					
General	*N*	*6*	*2*	*6*	
Biochemistry	*P*	*6*	*2*	*6*	
Cytology	*N*	*6*	*2*	*6*	*Yes*
Glass washing	*N*	*10*	*2*	*10*	*Yes*
Histology	*N*	*6*	*2*	*6*	*Yes*
Microbiology	*N*	*6*	*2*	*6*	*Yes*
~~*Nuclear medicine*~~	~~*N*~~	~~*6*~~	~~*2*~~	~~*6*~~	~~*Yes*~~
Pathology	*N*	*6*	*2*	*6*	*Yes*
Serology	*P*	*6*	*2*	*6*	
Sterilizing	*N*	*10*	*2*	*10*	*Yes*
Media transfer	*P*	*4*	*2*	*4*	
Infectious disease and virus	*N*	*6*	*2*	*6*	*Yes*
Bacteriology	*N*	*6*	*2*	*6*	*Yes*
Negative-pressure treatment/exam room	*N*	*12*	*2*	*12*	*Yes*
Physical therapy and hydrotherapy	*N*	*6*	*2*	*6*	
Soiled workroom (utility room)	*N*	*4*	*2*	*10*	*Yes*
Clean workroom	*P*	*4*	*2*	*6*	
Autopsy	*N*	*12*	*2*	*12*	*Yes*
Toilet room	*N*			*10*	*Yes*
Shower room	*N*				*Yes*
Waiting area primary care clinic	*N*	*10*	*2*	*10*	*Yes*[2]

P = Positive ~~*E Equal*~~ *NR = No requirement for continuous directional control* *N=Negative*

[1]*The pressure relationship of the entire emergency department shall be negative to other adjacent areas.*

[2]*Air may be recirculated if a high-efficiency particulate air (HEPA) filter with a minimum efficiency of 99.97 percent or a minimum efficiency reporting value (MERV) of 17 is installed in the return air duct which serves the waiting area.*

[3]*The term "trauma room" as used here is the operating room space in the emergency department or other trauma reception area that is used for emergency surgery. The first aid room and/or "emergency room" used for initial treatment of accident victims may be ventilated as noted for the "treatment rooms."*

[4]*The anteroom shall have positive air pressure in relation to the airborne infection isolation room. A door louver, transfer grille, or other acceptable means shall be provided to allow for airflow from the anteroom to the airborne infection isolation room. The airborne infection isolation room shall have negative pressure in relation to the anteroom, and the adjoining toilet room shall have negative pressure in relation to the airborne infection isolation room. Negative pressure shall be achieved by balancing the exhaust cfm to no less than 75 cfm (35.4 L/s) greater than the supply cfm for each airborne infection isolation room the anteroom serves. The overall area consisting of the anteroom, airborne infection isolation room, and adjoining toilet room shall have an equal air*

balance in relation to the corridor.

EXCEPTION: For correctional treatment centers, the location and design of the air transfer device shall not compromise the safety, security and protection of staff, inmates, and property.

[5]Positive-pressure shall be achieved by balancing the supply cfm to not less than 75 cfm (35.4 L/s) greater than the exhaust and return cfm for each protective environment room the anteroom serves.

[6]The anteroom shall have negative air pressure in relation to the protective environment room. A door louver, transfer grille, or other acceptable means shall be provided to allow for airflow from the protective environment room to the anteroom. The protective environment room shall have positive-pressure in relation to the anteroom and adjoining toilet room. Positive pressure shall be achieved by balancing the supply cfm to not less than 75 cfm (35.4 L/s) greater than the exhaust and return cfm. The overall area consisting of the anteroom, protective environment room, and adjoining toilet room shall have an equal air balance in relation to the corridor.

EXCEPTION: For correctional treatment centers, the location and design of the air transfer device shall not compromise the safety, security, and protection of staff, inmates, and property.

[7]Cystoscopy may have ~~equal air balance relationship to adjacent areas~~ no requirement for continuous directional control when approved by authority having jurisdiction.

[8]For operating rooms, cardiac catheterization labs, angiography rooms, cystoscopy rooms, delivery rooms, cesarean operating rooms, newborn intensive care, intensive care units, and nurseries provide approximately 15% excess supply air to the room or a sufficient quantity of excess supply air to maintain an appropriate positive air balance based on the room tightness and number of doors. For all rooms not listed in this footnote or not listed in Table 315 requiring either a positive or negative air balance, provide approximately 10% differential CFM between supply and return/exhaust airflow but not less than 25 CFM differential shall be provided regardless of room size. Room function, size, and tightness may be considered when determining the differential airflow required.

[9] Intensive care patient rooms~~, which~~ that contain a modular toilet/sink combination unit within the room~~,~~shall be provided with a minimum of 75 CFM of exhaust directly over the modular toilet/sink combination unit.

Table 4-B - Filter Efficiencies for Central Ventilation and Air- Conditioning Systems in General Acute Care Hospitals, Acute Psychiatric Hospitals, Outpatient Facilities and Licensed Clinics.[1]

AREA DESIGNATION	MINIMUM NUMBER OF FILTER BANKS	FILTER EFFICIENCY % FILTER BANK (Minimum efficiency reporting value MERV)[5]		
		No. 1[1]	No. 2[1]	No. 3[2]
Orthopedic operating room, bone marrow transplant operating room, organ transplant operating room	3	30% (8)	90% (14)	99.97%[3] (17)
Protective environment rooms	3	30% (8)	90% (14)	99.97%[4] (17)
Angiography; cardiac catheterization labs; operating rooms; delivery rooms; nurseries; patient care, treatment, cystoscopy, cesarean operating room, diagnostic and related areas; airborne infection isolation rooms; areas providing direct patient service or clean supplies such as sterile and clean processes	2	30% (8)	90% (14)	
Laboratories	2	30%	80%	

		(8)	*(13)*	
Administrative, med staff support areas, bulk storage, soiled holding areas, food preparation areas, public cafeterias and laundries	*1*	*30%* *(8)*		

Notation
Authority: Health & Safety Code §1226, 1275,129790 & 129850 and Government Code §11152.5
Reference: Health & Safety Code §1226, 1275, 129790 & 129850

CHAPTER 11 – REFRIGERATION

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Table 11-1
Refrigerant Groups[1], Properties[2] and Allowable Quantities[3] *13*

(Data reprinted with permission from The American Society of Heating, Refrigerating, and Air-Conditioning Engineers)

Refrigerant	Chemical Formula	Chemical Name[4] (Composition for Blends)	Safety Group[1]	PEL[5] (ppm)	IDLH[6] (ppm)	Pounds per 1000 cf of Space[7]
R-11	CCl_3F	Trichlorofluoromethane	A1	C100[8]	4,000[10]	1.60
R-12	CCl_2F_2	Dichlorodifluoromethane	A1	1000	40,000	12.00
R-13	CCF_3	Chlorotrifluoromethane	A1	1000	67,000	18.00
R-13B1	$CBrF_3$	Bromotrifluoromethane	A1	1000	57,000	22.00
R-14	CF_4	Tetrafluoromethane (carbon tetrafluoride)	A1	1000	67,000	15.00
R-22	$CHClF_2$	Chlorodifluoromethane	A1	1000[10]	42,000[11]	9.4
R-23	CHF4	Trifluoromethane	A1	-	-	-
R-113	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1000	4500	1.90
R-114	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoethane	A1	1000	50,000	9.40
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1,-trifluoroethane	B1	10[10]	4000[11]	1.60
R-124	$CHClFCF_3$	1,2-dichloro-1,1,1,-tetrafluoethane	A1	-	-	-
R-134a	CF_3CH_2F	1,1,1,2-tetrafluoroethane	A1	1000[10]	50,000[11]	16.00
R-170	CH_3CH_3	Ethane	A3	1000	6,400	0.50
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	-	-	-
R-245fa	$CF_3CH_2CHF_2$	1,1,1,3,3-pentafluoropropane	A3	-	-	-
R-290	$CH_3CH_2CH_3$	Propane	A3	1000	4,400	0.50
R-400	Azeotrope	R-12/114	A1	-	-	-
R-401A	Azeotrope	R-22/152a/124 (53/13/34)	A1	-	-	-

R-401B	Azeotrope	R-22/152a/124 (61/11/28)	A1	-	-	-
R-401C	Azeotrope	R-22/152a/124 (33/15/52)	A1	-	-	-
R-402A	Azeotrope	R-125/290/22 (60/2/38)	A1	-	-	-
R-402B	Azeotrope	R-125/290/22 (38/2/60)	A1	-	-	-
R-404A	Azetrope	R-125/143a/34a (44/52/4)	A1	-	-	-
R-407A	Azeotrope	R-32/125/134a (20/40/40)	A1	-	-	-
R-407B	Azeotrope	R-32/125/134a (10/70/20)	A1	-	-	-
R-407C	Azeotrope	R-32/125/134a (23/25/52)	A1	-	-	-
R-407D	Azeotrope	R-32/125/134a (15/15/70)	A1	-	-	-
R-407E	Azeotrope	R-32/125/134a (25/15/60)	A1	-	-	-
R-408A	Azeotrope	R-125/143a/22 (7/46/47)	A1	-	-	-
R-409A	Azeotrope	R-22/124/142b (60/25/15)	A1	-	-	-
R-410A	Azeotrope	R-32/125 (50/50)	A1	-	-	-
R-416A	Azeotrope	R-134a/124/600 (59/39.5/1.5)	A1	-	-	-
R-500 73.8% 26.2%	Azetrope CCl_2F_2 CCIF2CHF3	R-12/125a (73.8/26.2) Dichlorodifluoromethane 1,1-difuoroethane	A1	1000[10]	47,000[10]	12.00
R-502 48% 51.2%	Azeotrope CHCIF2 CCIF2CF3	R-23/13 (48.8/51.2) Chlorodifluoroethane 1-chloro-1,1,2,2,2-pentafluoroethane	A1	1000	67,000	15.00
R-503	Azeotrope	R-23/13 (48.8/51.2)	A1	1000	67,000	15.00
R-507A	Azeotrope	R-125/143a (50/50)	A1	-	-	-
R-508A	Azeotrope	R-23/116 (39/61)	A1	-	-	-
R-508B	Azeotrope	R-23/116 (46/54)	A1	-	-	-
R-509A	Azeotrope	R-22/218 (44/560)	A1	-	-	-
R-600	$CH_3CH_2CH_2CH_3$	Butane	A3	800	3,400	0.51
R-600a	$CH(CH_2)_2CH_3$	Isobutane (2-methyl propane)	A3	800	3,400	0.51
R-717	NH_3	Ammonia	B2	50[12]	500	0.022
R-718	H_2O	Water	A1	-	-	-
R-744	CO_2	Carbon Dioxide	A1	5000	50,000	5.70
R-1150	$CH_2=CH_2$	Ethene (ethylene)	A3	1000	5,200	0.38
R-1270	$CH_3CH=CH_2$	Propane 9propylene)	B3	1000	3,400	0.37

For SI: 1 pound = 0.454kg, 1 cubic foot = 0.0283m^3.
1 Refrigerant safety group designation is in accordance with Section 1102.0.
2 Refrigerant properties are those needed for this chapter.
3 Allowable quantities are for high-probability systems under Section 1103.0 only.
4 Chemical name shown is the preferred name.
5 PEL is that designated in 29 CFR 1910.1000 unless otherwise indicated.
6 IDLH is that designated by NIOSH unless otherwise designated.
7 Pounds of refrigerant in a high-probability system per 1000 cubic feet (28.3kg/m^3) of occupied space. See Section 1104.0. This column does not apply to refrigerant machinery rooms or areas covered by Section 1106.0.
8 The PEL value shown is the TLV-C recommended by ACGIH.

9 The IDLH value shown is reduced from that designated by NIOSH in light of cardiac sensitization potential.
10 A PEL has not yet been established; the value given was determined in a consistent manner.
11 An IDLH has not yet been established; the value given was determined in a consistent manner.
12 OSHA PEL is 50ppm; ACGIH TLV-WA is 25ppm.
*13 **[For OSHPD 1, 2, 3(Surgical Clinics) & 4]** The quantity of refrigerant in each system is limited to 50% of the amount listed. Exception: kitchens, laboratories, and mortuaries.*

Notation
Authority: Health & Safety Code §1226, 1275,129790 & 129850 and Government Code §11152.5
Reference: Health & Safety Code §1226, 1275, 129790 & 129850

CHAPTER 12 – HYDRONICS

Part 1 – Steam and Water Piping

…

Section 1201.2.6 Hangers and Supports. All piping and equipment shall be adequately supported to the satisfaction of the Authority Having Jurisdiction. Hot-water and steam piping shall be supported, anchored, and provided with swing joints, expansion loops or joints, or other means to avoid excessive strain on piping, equipment, or the building structure to the satisfaction of the Authority Having Jurisdiction. ***[For OSHPD 1, 2 and 4]*** *Pipe connections less than 2-1/2" to heating coils, cooling coils, humidifiers, and similar equipment shall have flexible connectors or three (3) 90-degree offsets in close proximity of the connection.*

…

Notation
Authority: Health & Safety Code §1226, 1275,129790 & 129850 and Government Code §11152.5
Reference: Health & Safety Code §1226, 1275, 129790 & 129850

CHAPTER 12
HYDRONICS

Proposed Adoption		**OSHPD**				**Comments**
		1	2	3	4	
Adopt entire chapter without amendments		~~X~~	~~X~~	X	~~X~~	
Adopt entire chapter with amendments listed below		X	X		X	
Adopt only sections listed below						
Chapter/Section	Codes					
1201.2.6	CA	X	X		X	

CHAPTER 11
REFRIGERATION

Proposed Adoption		**OSHPD**				**Comments**
		1	2	3	4	
Adopt entire chapter without amendments						
Adopt entire chapter with amendments listed below		X	X	X	X	
Adopt only sections listed below						
Chapter/Section	Codes					
1131.1	CA	X	X	X	X	
Table 11-1	CA	X	X	X	X	
Table 11-2	CA	X	X	X	X	