

**PROPOSED UMC 2024 CODE V1, DRAFT SUBJECT TO
ADDITIONAL CHANGES**

AN ORDINANCE REPEALING AND REPLACING ARTICLE 5 OF CITY CODE CHAPTER 25-12 (TECHNICAL CODES) RELATING TO THE UNIFORM MECHANICAL CODE AND LOCAL AMENDMENTS; AND CREATING AN OFFENSE.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

PART 1. City Code Chapter 25-12 (Technical Codes) is amended to repeal and replace Article 5 (Mechanical Code) to read:

ARTICLE 5. MECHANICAL CODE

§25-12-131 UNIFORM MECHANICAL CODE.

(A) The Uniform Mechanical Code, 2024 Edition, published by the International Association of Plumbing and Mechanical Officials ("2024 Uniform Mechanical Code") and all appendices are adopted and incorporated by reference into this section with the deletions in Subsection (B) and the amendments in Section 25-12- 133 (local Amendments to the Uniform Mechanical Code).

(B) The following provisions of the 2024 Uniform Mechanical Code are deleted.

Section 104.2	Section 303.8.4 & subsections Section 104.3.3	Section 1126.0 Section 104.4.3
Section 104.3.3-4.4	Section 403.10 Section 104.5	Chapter 13 Table 104.5
Section 104.4.3-303.8.4	Section 303.8.4.1-105.4.1	Table 104.5 Section 305.3.1
Section 504.4 Section 104.4.4	Section 504.4.2 & Subsection Section 504.4.1	Table 104.5 Section 504.4.2
Section 504.4.2.1	Section 504.4.2.2	Section 504.4.2.3
Section 504.4.3	Section 504.4.3.1	Section 504.4.4

Section 104.5 & Subsections Section 504.4.6	Section 609.0 & subsections 1126.0	Section 1402
Section 107.0 Section 1403	Section 939.0 Chapter 13	

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Each provision in this section is a substitute for the identically numbered provision deleted in Section 25-12-131(B) (*Uniform Mechanical Code*) or is an addition to the 2024 Uniform Mechanical Code.

Chapter 1 Administration

104.1.1 Commercial Mechanical Change-Out Program. For buildings not covered under the Residential Code, the building official may establish, by rule, an inspection program for commercial mechanical components identified in this section or a change-out program authorized in other technical or building codes. The buildings must be located within the zoning jurisdiction of the City, outside of the zoning jurisdiction under agreement with a municipal utility district, or where the City provides electrical service. ~~The program applies to replacing roof-top equipment, refrigeration equipment, and heating, ventilation, and air conditioning (HVAC) equipment.~~

Commented [ML3]: insert: "...or as determined by the Building Official..." or remove sentence. Reason: Limitation on what can be included in the program

104.2 Exempt Work. A mechanical permit is not required for the work described in this provision. Work exempt from a permit must still comply with this code and all other applicable laws and City Code requirements.

1. A portable heating appliance, portable ventilating equipment, a portable cooling unit, or a portable evaporative cooler.
2. Replacing a component part that does not alter the original approval and complies with other applicable requirements of this code.
3. Refrigerating equipment that is part of equipment subject to a permit issued under this code.
4. Replacement or relocation of controls and thermostats (less than 24 volts).
5. Installing self-contained refrigerators or freezers.
6. Servicing and repairing ice machines.
7. Relocation of return and supply grilles within range of existing duct lengths if they remain within the same space.
8. Other work as determined by the building official.

104.3.3 Time Limits. Article 13 (*Administration of Technical Codes*) of Chapter 25-12 (*Technical Codes*) establishes permit application time limits and requirements applicable to permit expiration and reactivation, including a review fee for expired permits.

104.5 Fees. Fees applicable to this code are set by a separate ordinance.

104.6 Registration of Air Conditioning and Refrigeration Contractors. An air conditioning and refrigeration contractor must register with the City before performing work regulated by this code. A contractor must provide his or her name and State of Texas license number. A contractor must pay a registration fee, established by separate ordinance, for an initial registration, registration after a license suspension, and registration after the license expires. A new registration fee is not required to renew a license that is not suspended or expired.

107.0 Appeals. A person aggrieved by an order, decision, or determination of the building official related to an application or interpretation of this code may appeal the order, decision, or determination consistent with the procedures set forth in Chapter 25-1, Article 7, Division 1 (*Appeals*). The Mechanical and Plumbing Board, established in Section 2-1-161 (*Mechanical and Plumbing Board*), hears appeals authorized by this section.

Chapter 2 Definitions.

202.1.1 Amended and Supplemented Definitions. The definitions in this subsection apply throughout this code and amend or supplement the definitions in Chapter 2.

~~**Alternate Water Source.** Non-potable source of water that includes but is not limited to recycled manufacturing process water, air conditioner condensate, rainwater, storm water, gray water, black water, cooling tower blowdown, and foundation drain water.~~

Bleed-off (Blowdown). The circulating water in a cooling tower which is discharged to help keep the dissolved solids in the water below a maximum allowable concentration limit.

Blow-Down Meter. A meter that tracks the amount of water discharged from a cooling tower system.

Concentration. Recirculated water in a cooling tower that has elevated levels of total dissolved solids as compared to the original make-up water.

Conductivity Controller. A device used to measure the conductivity of total dissolved solids in the water of a cooling system to control the discharge of water in order to maintain efficiency.

Cooling Tower. An open- or closed-loop water recirculation system that uses fans or natural draft to force or draw air to contact and cool water through the evaporative process that removes heat from water-cooled A/C systems and from industrial processes.

Cycle of Concentration. The ratio of the dissolved solids in recirculating water to the dissolved solids in the makeup water.

Drift Eliminator. A device that captures large water droplets caught in the cooling tower air stream to prevent the water droplets and mist from escaping the cooling tower.

Insanitary Location. An area, space, public/private balcony, or room where the air is unfit or undesirable for circulation to occupiable parts of a building.

Makeup. The amount of water required to replace normal losses caused by bleed-off (blowdown), drift, and evaporation.

Makeup Meter. A meter that measures the amount of water entering a cooling tower system.

Overflow Alarm. A system that includes a level switch and an electronic signaling device that sends an audible signal or provides an alert via the energy management control system to the tower operator in case of sump overflow.

~~**Treatment System.** A method, device or process for the treatment of the water quality of cooling tower blowdown, air conditioning condensate, or other onsite alternative water necessary for the authorized end uses provided it complies with Chapters 15 and 16 of the Plumbing Code and 30 TAC Chapter 210 Subchapter F.~~

Chapter 3 General Regulations.

303.8.4 Roof Drainage and Rails. Equipment shall be installed on a well-drained surface of the roof. Guards must be provided where an appliance, equipment, fan, solar system, or other components require service and are located within 10 feet (3,048 mm) of a roof edge or open side of a walking surface and the edge or walking surface is located 30 inches above the grade below. Rigid fixed rails or guards at least 42 inches (1,067 mm) in height must be provided on the exposed side. The guard must be constructed to prevent a 21-inch-diameter (533 mm) sphere from passing through and must extend at least 30 inches (762 mm) beyond each end of the appliance, equipment,

Commented [ML4]: Robert Stefani will work on definitions

Commented [HT5R4]: Tony,

I am unexpectedly going to be out most of next week. I was intending to go to the UMC meeting on Monday but have reviewed the definitions section and have some deletions to offer.

We can delete the definitions associated with both "alternate water source" and "treatment system" as they are no longer referenced in the amendments.

All others will remain.

fan, or component. If a parapet or other building structure is used in lieu of a guard, it must be at least 42 inches (1,067 mm) in height.

Exception: Guards shall not be required where a permanent fall arrest anchorage connector system in accordance with ASSE Z359.1 is installed.

304.3.1.2.1 Ladders. Permanent ladders to access equipment located on a roof shall be provided at parapet walls that exceed 30 inches in height.

304.4.5 Concealed Space Designed for Appliances. An opening as large as the largest component of appliance is not required, provided the largest appliance can be removed by other means; fire protection components, any part of the electrical installation, or structural load resisting systems and plumbing are not being affected; and plan for removal of the appliance is clearly documented on the approved plans. An unobstructed access panel with a minimum of 22 inches by 30 inches at each point of maintenance and repair access shall be required.

305.3.1 Gas and Oil Fired Furnaces. A float operated automatic control valve shall be installed in the fuel supply line for a heating system that uses a gas or oil fired furnace. The automatic control valve shall shut off fuel supply when floodwaters reach an elevation equal to the floor level of the spaces where the furnace equipment is installed. A manually operated gas valve that can be operated from a location above the regulatory flood datum (RFD) shall be provided in the fuel supply line to act as a supplementary safety provision for fuel cutoff.

310.1.2 Sling-Style Equipment. Sling-style A/C equipment that reintroduces condensation back into the atmosphere is prohibited.

318 cooling systems. Interior spaces intended for human occupancy shall be provided with active or passive cooling systems capable of maintaining an indoor temperature of not more than 80°F (27°C) at a point 3 feet (914 mm) above floor on the design cooling day. The installation of portable cooling systems shall not be used to achieve compliance with this section.

Exceptions:

1. Interior spaces where the primary purpose is not associated with human comfort.
2. Group F, H, S and U occupancies.

310.8 Standards for Air Conditioner Condensate Recovery Systems for New Development. Commercial and multi-family facilities constructed after September 5, 2017, with an evaporative cooling tower system with a combined cooling capacity equal to or greater than 200 tons shall use a single and independent condensate wastewater line to collect and use the condensate wastewater for authorized beneficial purposes. For purposes of this section, authorized beneficial purposes include using condensate wastewater for process water; to make up cooling tower water; to flush indoor toilets; to irrigate landscapes; or other approved non-potable water uses.

Exceptions:

1. The requirements of Section 310.8 for the collection and use of condensate shall not apply under the following conditions:
 - a. Municipal treated effluent (reclaimed water) and/or alternate water sources other than condensate will be used to meet all non-potable water demands;
 - b. Based on a water balance and calculations submitted by the building permit applicant and approved by Austin Water, there is less than 50,000 gallons annually in non-potable water demands for A/C condensate for the facility;
 - c. Separated occupancy designation, or use designation, where no individual building has a cooling capacity less than 100 tons and is part of a multi-complex facility;

Commented [ML6]: Check with Robert Stefani

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d. For large, single-story buildings, where multiple air handling units are not co-located, and a manifold condensation collection system is not feasible to combine the A/C condensate of all units due to the need of the addition of pumps and storage systems or A/C condensate lines are fed into multiple collection points;

e. It is not physically possible to maintain the 1/8 inch per foot minimum slope of condensate lines and/or combine the condensate drain lines from multiple condensate sources due to distance or obstacles from the building layout; or

f. The project includes lease spaces in a multi-tenant retail center where it is not feasible to manifold the condensate lines together because each adjacent individual space would otherwise be required to tie into adjacent tenant condensate lines. In such case, each space shall be required to design condensate lines as if the space were a standalone structure to comply with applicable city codes.

2. If an exception under this section applies, the condensate shall be discharged to the sanitary drain for potential reuse in the City's reclaimed water program or other authorized location.

318.0 Protection of Openings. A duct opening, such as an exhaust or outdoor air intake, which terminates outdoors, shall be protected with corrosion-resistant screens, louvers, or grilles. Duct openings located in exterior walls shall comply with the Building Code's fire resistance rating requirements for an exterior wall opening.

Commented [ML8]: duplicate language with model code

Chapter 4 Ventilation Air

402.3.1 Intake Opening Location. An air intake opening shall comply with Table 402.3.1 and

1. Shall be located at least 10 feet (3,048 mm) from lot lines or buildings on the same lot;

2. Except as provided below or in Table 402.3.1, a mechanical or gravity outdoor air intake shall be located at least 10 feet (3,048 mm), measured horizontally, from any hazardous or noxious contaminant source, including vents, streets, alleys, parking lots and loading docks;

3. An outdoor air intake opening shall be located within 10 feet (3,048 mm), measured horizontally, from streets, alleys, parking lots, and loading docks if the openings are located at least 25 feet (7,620 mm) vertically above those locations;

4. An intake opening shall be located at least three feet (914 mm) below contaminant sources or as set forth in Table 402.3.1 when the sources are located within 10 feet (3,048 mm) of the opening;

5. An intake opening on a structure located within a flood hazard area shall be at or above elevation required by Section 1612 of the Building Code for utilities and attendant equipment; and

6. An intake opening shall be located a minimum of 10 feet horizontally from the centerline of an alley.

Table 402.3.1 Air Intake Minimum Separation Distance (2016 ASHRAE 62.1: Table 5.5.1)

Commented [HT9]: This table is now in the UMC with section number change to 402.4

Object	Minimum Distance
Class 2 air exhaust/relief outlet (note 1): air with moderate contamination concentrations, mild sensory irritation, or mildly offensive odors; and includes air that is inappropriate for transfer or recirculation to spaces used for different purposes.	10 Feet
Class 3 air exhaust/relief outlet (note 1): air with significant contamination concentration, significant sensory irritation intensity, or offensive odor.	15 Feet
Class 4 air exhaust/relief outlet (note 2): air with highly objectionable fumes or gases, or with potentially dangerous particles, bio aerosols, or gases, at concentrations high enough to be considered harmful.	30 Feet

Plumbing vents that terminate less than three feet above the level of the outdoor air intake.	10 Feet
Plumbing vents that terminate more than three feet above the level of the outdoor air intake.	3 Feet
Vents, chimneys, and flues from combustion appliances and equipment (note 3).	15 Feet
Garage entry, automobile loading area, or drive-in queue (note 4).	15 Feet
Truck loading area or dock, bus parking/idling area (note 4).	25 Feet
Driveway, street, or parking place (note 4).	10 Feet
Thoroughfare with high traffic volume.	25 Feet
Roof, landscaped grade, or other surface directly below intake (note 5).	1 Feet
Garage storage/pick-up area, dumpsters.	15 Feet
Cooling tower intake or basin.	15 Feet
Cooling tower exhaust.	25 Feet
Note 1: Applies to the distance from the outdoor air intakes for one ventilation system to the exhaust/relief outlets for any other ventilation system.	
Note 2: Does not apply to laboratory fume hood exhaust air outlets. A laboratory fume hood exhaust air outlet shall comply with ANSI/AIHA Z9.5. Informative Appendix J contains sources of additional information on separation criteria. These include the ACGIH Industrial Ventilation Manual and the ASHRAE Handbook HVAC Applications, ASHRAE Laboratory Design Guide, and NSF/ANSI 49.	
Note 3: The minimum distances relative to fuel-fired appliances shall be as required by ANSI Z223.1/NFPA 54 for fuel gas burning appliances and equipment, NFPA 31 for oil burning appliances and equipment, and NFPA 211 for other combustion appliances and equipment.	
Note 4: Distance is measured to the closest place that a vehicle exhaust will likely be located.	
Note 5: The minimum separation distance shall not apply where outdoor surfaces below the air intake are sloped more than 45 degrees from horizontal or are less than one inch wide.	

Commented [HT10]: Model code is 5 feet

Commented [HT11]: 402.4.1.1 exhaust/relief outlets

Commented [HT12]: 402.4.1.4 laboratory exhaust

Commented [HT13]: 402.4.1.2 Fuel-Burning Equipment

Commented [HT14]: Local change doesn't exist in any model code

Commented [HT15]: 402.4.1.3 Roof, Landscaped Grade, or Another Surface Directly Below Intake.

403.7.3 Occupied Spaces Accessory to Public Garages. Connecting offices, waiting rooms, ticket booths, and similar uses accessory to a public garage must be maintained at a positive pressure and must include ventilation consistent with Section 403.0 Ventilation Rates.

405.4.1 Residential Kitchen Exhaust Rate. For intermittent-controlled operations, the exhaust rate shall be not less than 100 ft³/min (47.2 L/s) and 300 ft³/min (142 L/s) for downdraft appliances. For continuous operation the exhaust rate shall be not less than 50 ft³/min (23.6 L/s).

Chapter 5 Exhaust Systems

504.1.2 Environmental Exhaust Duct Termination Over Covered Walkway. An exhaust duct serving a domestic clothes dryer shall not terminate over a covered walkway unless the duct is extended to the outer edge of the covered walkway.

- A. An exhaust duct serving a domestic range or bathroom exhaust fan shall not terminate over a covered walkway unless three sides are open for dilution air movement.

Exception: If adequate dilution air cannot be provided, an exhaust duct serving a domestic range or bathroom exhaust fan shall be extended to the outer edge of the covered walkway.

- B. An exhaust duct shall terminate over a private use balcony if the balcony serves the same space or dwelling unit as the duct serves and required clearances from openings are maintained.

504.4.2 Domestic Clothes Dryers Installation. 2024 International Mechanical Code Section 504, subsections, and associated tables and references and duct support requirements in B apply to a clothes dryer installation. Alternatively, clothes dryer installation may qualify as an alternate engineered system as set forth in subsection A and comply duct support requirements in subsection B.

- A. **Alternate Engineered Systems.** If the dryer duct system is designed by a professional engineer, the system must comply with ANSI Z21.5.1/CSA 7.1. The design professional must provide calculations and design criteria on plans submitted under Section 104.0 of this code and must demonstrate dryer vent system is equivalent to a system that complies with the 2024 International Mechanical Code.
- B. **Duct Supports.** Ducts shall be supported in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

519.7-520.0 Hazardous Materials. 2024 International Mechanical Code Sections 502.8 through 502.8.5., associated tables and referenced sections shall apply except for Section 502.8.4 that is replaced with the following:

Where gases, liquids or solids in amounts exceeding the maximum allowable quantity per control area and having a hazard ranking of 2, 3 or 4 accordance with NFPA 704 are dispensed or used, mechanical exhaust ventilation shall be provided to capture gases, fumes, mists or vapors at the point of generation.

519.8-521.0 Hazardous Materials - Requirements for Specific Materials. Section 502.9, subsections, associated tables, and referenced sections of 2024 International Mechanical Code apply.

519.9-522.0 Hazardous Production Materials (HPM). 2024 International Mechanical Code Section 502.10, subsections, associated tables and referenced sections apply.

523.0 Hazardous Exhaust Systems. 2024 International Mechanical Code Section 509, subsections, and associated tables and referenced sections.

524.0 Manicure and pedicure stations. 2024 International Mechanical Code Section 502.20, subsections, and associated tables and referenced sections.

~~520.1 General. This section shall govern the design and construction of duct systems for hazardous exhaust and shall determine where such systems are required. Hazardous exhaust systems are systems designed to capture and control hazardous emissions generated from product handling or processes, and convey those emissions to the outdoors. Hazardous emissions include flammable vapors, gases, fumes, mists, or dusts, and volatile or airborne materials that pose a health hazard, such as toxic or corrosive materials. For the purposes of this section, the health hazard rating of materials shall be as specified in NFPA 704. For these sections, a laboratory shall be defined as a facility where the use or synthesis of chemicals is related to testing, analyzing, teaching, researching, or other developmental activities on a nonproduction basis, rather than in a manufacturing process.~~

~~520.2 Where Required. A hazardous exhaust system shall be required wherever operations involving the handling or processing of hazardous materials, in the absence of an exhaust system and under normal operating conditions, have the potential to create one of the following conditions:~~

- ~~1. A flammable vapor, gas, fume, mist, or dust is present in concentrations exceeding 25 percent of the lower flammability limit of the substance for the expected room temperature;~~
- ~~2. A vapor, gas, fume, mist, or dust with a health hazard rating of 4 is present in any concentration; or~~
- ~~3. A vapor, gas, fume, mist, or dust with a health hazard rating of 1, 2, or 3 is present in concentrations exceeding 1 percent of the median lethal concentration of the substance for acute inhalation toxicity.~~

~~Exception: Laboratories, as defined in Section 520.1, except where the concentrations listed in Item 1 are exceeded or a vapor, gas, fume, mist, or dust with a health hazard rating of 1, 2, 3, or 4 is present in~~

Commented [HT16]: Recommend deleting 520.1 -520.10 and create a reference to the IMC

Commented [HT17]: Renumbered, Austin trying to catchup with the rest of the world

Many of us go to nail salons to relax and to be pampered. We don't think of these places as potentially hazardous work environments, yet for many manicurists, regular on-the-job exposure to toxic chemicals is a reality. Workers often experience headaches, dizziness, rashes and other acute symptoms. Some chemicals are known to cause cancer and reproductive, developmental, and respiratory harm" (a)

The intent of these suggested modifications is to (1) better clarify the requirements for a source capture exhaust system at manicure and pedicure stations where ambiguity exists, and to (2) better ensure the effectiveness of the exhaust system by specifically requiring makeup air and prohibiting the recirculation of exhausted air so as to provide a healthy, safe environment for nail salon workers and their clients.

1. PROPOSED MODIFICATION TO SECTION 502.20 Manicure and Pedicure Stations

REASON: It is important to clarify that source capture exhaust is to be discharged to the outdoors and not recirculated. This requirement is consistent with other exhaust systems regulated by the IMC. We are proposing a reference to existing Section 501.3 to better clarify this requirement.

2. PROPOSED NEW SUB-SECTIONS: 502.20.1 Makeup Air & 502.20.2 Makeup Air Temperature.

REASON: The suggested addition of a new sub-section 502.20.1 intends to recognize and reinforce the requirement for balancing the exhausted air with makeup air and help provide guidance on intake opening locations and makeup air temperature by referencing existing Sections 401.4 and adding new subsection 502.20.2 respectively.

concentrations exceeding 1 percent of the median lethal concentration of the substance for acute inhalation toxicity.

520.2.1 Lumber Yards and Woodworking Facilities. Equipment or machinery located inside buildings at lumber yards or woodworking facilities that generates or emits combustible dust shall be provided with an approved dust collection and exhaust system installed in accordance with this section and the Fire Code. Equipment and systems that are used to collect, process, or convey combustible dusts shall be provided with an approved explosion control system.

520.2.2 Combustible Fibers. Equipment or machinery within a building that generates or emits combustible fibers shall be provided with an approved dust collection and exhaust system. Such systems shall comply with this code and the Fire Code.

520.3 Design and Operation. The design and operation of the exhaust system shall be such that flammable contaminants are diluted in non-contaminated air to maintain concentrations in the exhaust flow below 25 percent of the contaminant's lower flammability limit.

520.4 Independent System. A hazardous exhaust system must be independent of another type of exhaust system.

520.5 Incompatible Materials and Common Shafts. Incompatible materials, as defined in the Fire Code, shall not be exhausted through the same hazardous exhaust system. Hazardous exhaust systems shall not share common shafts with other duct systems, except where such systems are hazardous exhaust systems originating in the same fire area.

Exception: The provisions of this section shall not apply to laboratory exhaust systems where all of the following conditions apply:

1. All of the hazardous exhaust ductwork and other laboratory exhaust within both the occupied space and the shafts are under negative pressure while in operation.
2. The hazardous exhaust ductwork manifold together within the occupied space must originate within the same fire area.
3. Hazardous exhaust ductwork originating in different fire areas and manifold together in a common shaft shall meet the provisions of Section 717.5.3, Exception 1, Item 1.1 of the Building Code.
4. Each control branch has a flow regulating device.
5. Perchloric acid hoods and connected exhaust shall be prohibited from manifolding.
6. Radioisotope hoods are equipped with filtration, carbon beds or both where required by the registered design professional.
7. Biological safety cabinets are filtered.
8. Each hazardous exhaust duct system shall be served by redundant exhaust fans that comply with the following:
 - a. The fans shall operate simultaneously in parallel and each fan shall be individually capable of providing the required exhaust rate.
 - b. Each of the redundant fans is controlled so as to operate when the other fan has failed or is shut down for servicing.

520.6 Design. Systems for removal of vapors, gases, or smoke shall be designed by the constant velocity or equal friction methods. Systems conveying particulate matter shall be designed employing the constant velocity method.

520.6.1 Balancing. Systems conveying explosive or radioactive materials shall be pre-balanced by duct sizing. Other systems shall be balanced by duct sizing with balancing devices, such as dampers. Dampers provided to balance

Commented [HT18]: 520.4 is a local addition for the purpose of clarification although section 520.5 is more specific and provides some exceptions.

airflow shall have securely fixed minimum-position blocking devices to prevent restricting the flow below the required volume or velocity.

520.6.2 Emission Control. The design of the system shall be such that the emissions are confined to the area in which they are generated by air currents, hoods, or enclosures and shall be exhausted by a duct system to a safe location or treated by removing contaminants.

520.6.3 Hoods Required. Hoods or enclosures shall be used where contaminants originate in a limited area of a space. The design of the hood or enclosure shall be such that air currents created by the exhaust systems will capture the contaminants and transport them directly to the exhaust duct.

520.6.4 Contaminant Capture and Dilution. The velocity and circulation of air in work areas shall be such that contaminants are captured by an airstream at the area where the emissions are generated and conveyed into a product-conveying duct system. Contaminated air from work areas where hazardous contaminants are generated shall be diluted below the thresholds specified in Section 520.2 with air that does not contain other hazardous contaminants.

520.6.5 Makeup Air. Makeup air from all sources shall be provided during operations at a rate approximately equal to the rate that air is exhausted by the hazardous exhaust system. Makeup shall be provided by gravity or mechanical means or both. Mechanical makeup air systems shall be automatically controlled to start and operate simultaneously with the exhaust system. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air intakes shall be located in accordance with Section 402.3.1.

520.6.6 Clearances. The minimum clearance between hoods and combustible construction shall be the clearance required by the duct system.

520.6.7 Ducts. Hazardous exhaust duct system shall extend directly to the exterior of the building and shall not extend into or through ducts or plenums.

520.7 Penetrations. Penetrations of structural elements by a hazardous exhaust system shall conform to Sections 520.7.1 through 520.7.4.

Exception: Duct penetrations within Group H-5 occupancies as allowed by the International Building Code.

520.7.1 Fire and Smoke Dampers. Fire dampers and smoke dampers are prohibited in hazardous exhaust ducts.

520.7.1.1 Shaft Penetrations. Hazardous exhaust ducts that penetrate fire-resistance-rated shafts shall comply with Section 714.4.1 or 714.4.1.2 of the Building Code.

520.7.2 Floors. Hazardous exhaust systems that penetrate a floor/ceiling assembly shall be enclosed in a fire-resistance-rated shaft constructed in accordance with the Building Code.

520.7.3 Wall Assemblies. Hazardous exhaust duct systems that penetrate fire-resistance-rated wall assemblies shall be enclosed in fire-resistance-rated construction from the point of penetration to the outlet terminal, except where the interior of the duct is equipped with an approved automatic fire suppression system. Ducts shall be enclosed in accordance with the Building Code requirements for shaft construction and such enclosure shall have a minimum fire-resistance rating of not less than the highest fire-resistance-rated wall assembly penetrated.

520.7.4 Fire Walls. Ducts shall not penetrate a fire wall.

520.8 Suppression Required. Ducts shall be protected with an approved automatic fire suppression system installed in accordance with the Building Code.

Exceptions:

1. An approved automatic fire suppression system shall not be required in ducts conveying materials, fumes, mists, and vapors that are nonflammable and noncombustible under all conditions and at any concentrations.

2. ~~Automatic fire suppression systems shall not be required in metallic and noncombustible, nonmetallic exhaust ducts in semiconductor fabrication facilities.~~
3. ~~An approved fire automatic fire suppression system shall not be required in ducts where the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).~~
4. ~~For laboratories, as defined in Section 520.1, automatic fire protection systems shall not be required in laboratory hoods or exhaust systems.~~

520.8.1 Duct Cleanout. Ducts conveying combustible dust as part of a dust collection system shall be equipped with cleanouts that are provided with approved access, predesigned to be disassembled for cleaning, or engineered for automatic cleanouts. Where provided, cleanouts shall be located at the base of each vertical duct riser and at intervals not exceeding 20 feet (6,096 mm) in horizontal sections of duct.

520.9 Duct Construction. Ducts used to convey hazardous exhaust shall be constructed of materials approved for installation in such an exhaust system and shall comply with one of the following:

1. ~~Ducts shall be constructed of approved G90 galvanized sheet steel, with a minimal nominal thickness as specified in Table 520.9.~~
2. ~~Ducts used in systems exhausting nonflammable corrosive fumes or vapors shall be constructed of nonmetallic materials that exhibit a flame spread index of 25 or less and a smoke developed index of 50 or less when tested in accordance with ASTM E84 or UL 723 and that are listed and labeled for the application.~~

Where the products being exhausted are detrimental to the duct material, the ducts shall be constructed of alternative materials that are compatible with the exhaust.

Table 520.9 Minimum Duct Thickness

Diameter of Duct or Maximum Side Dimension	Nonabrasive materials	Nonabrasive/Abrasive Materials	Abrasive Materials
0—8 inches	24 gauge	22 gauge	20 gauge
9—18 inches	22 gauge	20 gauge	18 gauge
19—30 inches	20 gauge	18 gauge	16 gauge
Over 30 inches	18 gauge	16 gauge	14 gauge

520.9.1 Duct Joints. Ducts shall be made tight with lap joints having a minimum lap of 1 inch (25 mm). Joints used in construction consistent with ANSI/SMACNA Round Industrial Duct Construction Standards and ANSI/SMACNA Rectangular Industrial Duct Construction Standards are also acceptable.

520.9.2 Clearance to Combustibles. Ducts shall have a clearance to combustibles in accordance with Table 520.9.2. Exhaust gases having temperatures in excess of 600 degrees Fahrenheit (316 degrees Celsius) shall be exhausted to a chimney in accordance with 2021 International Mechanical Code, Section 511.2.

Table 520.9.2 Clearance to Combustibles

Type of Exhaust or Temperature of Exhaust (F)	Clearance to Combustibles (Inches)
Less than 100	1
100—600	12
Flammable Vapors	6

520.9.3 Explosion Relief. Systems exhausting potentially explosive mixtures shall be protected with an approved explosion relief system or by an approved explosion prevention system designed and installed in accordance with

~~NFPA 69. An explosion-relief system shall be designed to minimize the structural and mechanical damage resulting from an explosion or deflagration within the exhaust system. An explosion prevention system shall be designed to prevent an explosion or deflagration from occurring.~~

~~520.10 Supports. Ducts shall be supported at intervals not exceeding 10 feet (3,048 mm). Supports shall be constructed of noncombustible material.~~

Chapter 6 Duct Systems.

603.10.1 Cross Contamination. A non-hazardous duct under positive or negative pressure may be routed through a duct or plenum or occupied space when longitudinal and traverse joints (seal class A per SMACNA) are sealed with materials designed for that use and is sealed consistent with acceptable methods.

609 Smoke Detection Systems Control. 2024 International Mechanical Code Section 606, subsections, and associated tables and referenced sections.

Chapter 9 Installation of Specific Appliances

*939.0 Sauna Heaters. 2024 International Mechanical Code Section 914, subsections, and associated tables and references.

~~606.2.2 IMC 609.1 Common Supply and Return Air Systems. When multiple air handling systems share common supply or return air paths, spaces, ducts, or plenums with a combined design capacity greater than 2,000 cfm (0.9 m³/s), the supply air systems shall be provided with smoke detectors that comply with Section 609.1.~~

Commented [ML19]: Deleting 609 and going to IMC

~~606.2.2 IMC exception) 609.3 Automatic Shutoff for Fan-Powered Terminal Units (FPTUs). An individual smoke detector is not required for a new or relocated fan-powered terminal unit if the unit does not have an individual design capacity greater than 2,000 cfm (0.9m³/s) and will be shut down by activating:~~

- ~~1. The duct smoke detector located in the supply side of the main air handler which serves that system and is interconnected with the FPTUs; or~~
- ~~2. An area smoke detector system authorized by the exceptions in Section 609.1.~~

~~**609.4 Shutdown Control of Fan-Powered Terminal Units by the Fire Alarm System.** When a fire alarm is initiated by a smoke detector that is located in air handling equipment on a floor, or is located in air handling equipment in an independent smoke zone, the air handling equipment on that floor or in that independent smoke zone must be de-energized, including all fan-powered terminal units (FPTUs).~~

Commented [HT20]: charles will follow up / operation of relay or duct detector

~~**609.5** A FPTU must have a fire alarm relay installed within three feet of the FPTU. The fire alarm relay must be controlled solely by the fire alarm system. The control wiring for a new or relocated FPTU must be wired through its associated fire alarm shut down relay so that the FPTU will be de-energized by a signal from the fire alarm system. The FPTU fan must remain off until the FPTU's fire alarm relay is reset through the fire alarm system. To comply with this code, it cannot be possible to override the fire alarm relay or the "off" control of the FPTU's fan through the building automation system or any other control system.~~

~~**609.6** If an existing building or construction does not comply with this section, a FPTU located within the area being constructed or remodeled must be shut down. If construction or remodeling exceeds 50 percent of the aggregate area of the building as defined in the Existing Building Code, any FPTU located within a system being modified must comply with this section. If the permit authorizes a modification to the HVAC system, then a FPTU in that system must comply with this section.~~

~~609.7 Controls Operation. Upon activation, the smoke detectors shall shut down all operational capabilities of the air distribution system in accordance with the listing and labeling of appliances used in the system. Air distribution systems that are part of a smoke control system shall switch to the smoke control mode upon activation of a smoke detector.~~

Chapter 10 Boilers and Pressure Vessels.

Commented [ML21]: No changes

1015.0 Efficiency Standards for Steam Boilers. A steam boiler shall:

1. Be equipped with conductivity controllers that control blowdown and a cold-water makeup meter. If the system is a 50 Boiler Horsepower or greater, the meter must be connected to the building's energy management system or utility monitoring dashboard;
2. Include a steam condensate return system;
3. Be fitted with a blowdown heat exchanger to transfer heat from blowdown to the feed water; and
4. If the boiler exceeds 15 psi and 100 Boiler Horsepower, and the heat recovery can be used to heat boiler makeup water or other purposes, the boiler blowdown must be directed to a heat recovery system that reduces the temperature of the blowdown discharge to below 140 degrees Fahrenheit without using tempering water.

Chapter 11 Refrigeration.

1126.0 Standards for Cooling Towers.

Commented [ML22]: Keep whole section

1. A cooling tower shall:
 - a. Achieve a minimum of five cycles of concentration if the cooling tower utilizes potable water as its primary source of make-up water;
 - b. Be fitted with overflow sensors and alarms, make-up water and blowdown meters to manage water consumption, and conductivity controllers;
 - c. If the cooling tower is 100 tons or more, the make-up and blowdown meters and overflow alarm shall be connected to the building's central energy management system or utility monitoring dashboard; and
 - d. Be equipped with drift eliminators with a drift rate of not more than 0.005% of the circulated water flow rate for crossflow towers and 0.002% for counterflow towers when operated consistent with the equipment manufacturer's instructions and with the cooling tower, evaporative condensers, and fluid coolers.
2. A biocide shall be used to treat the cooling system recirculation to minimize the growth of Legionella and other microorganisms and to increase water use efficiency.
3. Commercial and multifamily facilities constructed after September 5, 2017, with an evaporative cooling tower system with a combined cooling capacity equal to or greater than 100 tons, shall have a minimum of 10 percent of the cooling tower make-up water offset with reclaimed or onsite water reuse.

~~Chapter 18 Fireplaces, Solid Fuel-Burning Equipment, and Other Specific Appliances.~~

~~1803.2 Hearth Extensions. Hearth extensions of approved factory-built fireplaces shall be installed in accordance with the listing of the fireplace. The hearth extension shall be readily distinguishable from the surrounding floor area. Listed and labeled hearth extensions shall comply with UL 1618.~~

~~1803.3 Unvented Gas Log Heaters. An unvented gas log heater shall not be installed in a factory-built fireplace unless the fireplace system has been specifically tested, listed, and labeled for such use in accordance with UL 127.~~

~~1804.1 Pellet Fuel-Burning Appliances. Pellet fuel-burning appliances shall be listed and labeled in accordance with ASTM E1509 and shall be installed in accordance with the terms of the listing.~~

~~1814.1 Location and Protection. Sauna heaters shall be located so as to minimize the possibility of accidental contact by a person in the room.~~

~~1814.1.1 Guards. Sauna heaters shall be protected from accidental contact by an approved guard or barrier of material having a low coefficient of thermal conductivity. The guard shall not substantially affect the transfer of heat from the heater to the room.~~

~~1814.2 Installation. Sauna heaters shall be listed and labeled consistent with UL 875 and shall be installed in accordance with their listing and the manufacturer's instructions.~~

~~1814.3 Access. Panels, grilles, or access doors that are required to be removed for normal servicing operations shall not be attached to the building.~~

~~1814.4 Heat and Time Controls. Sauna heaters shall be equipped with a thermostat that will limit room temperature to 194 degrees Fahrenheit (90 degrees Celsius). If the thermostat is not an integral part of the sauna heater, the heat-sensing element shall be located within 6 inches (152 mm) of the ceiling. If the heat-sensing element is a capillary tube and bulb, the assembly shall be attached to the wall or other support and shall be protected against physical damage.~~

~~1814.4.1 Timers. A timer, if provided to control main burner operation, shall have a maximum operating time of 1 hour. The control for the timer shall be located outside the sauna room.~~

~~1814.5 Sauna Room. A ventilation opening into the sauna room shall be provided. The opening shall be not less than 4 inches by 8 inches (102 mm by 203 mm), located near the top of the door into the sauna room.~~

~~1814.5.1 Warning Notice. The following permanent notice, constructed of approved material, shall be mechanically attached to the sauna room on the outside.~~

~~WARNING: DO NOT EXCEED 30 MINUTES IN SAUNA. EXCESSIVE EXPOSURE CAN BE HARMFUL TO HEALTH. ANY PERSON WITH POOR HEALTH SHOULD CONSULT A PHYSICIAN BEFORE USING SAUNA.~~

~~The words shall contrast with the background and the wording shall be in letters not less than 0.25 inch (6.4 mm) high.~~

~~Exception: This section does not apply to one- and two-family dwellings.~~

~~1818.4 Circulating Air Ducts for Forced Air Warm Air Furnaces. Circulating air for fuel-burning, forced air type, warm air furnaces shall be conducted into the blower housing from outside the furnace enclosure by continuous airtight ducts.~~

~~1822.1 Kerosene and Oil-Fired Stoves. Kerosene and oil-fired stoves shall be listed and labeled and shall be installed in accordance with the conditions of the listing and the manufacturer's instructions. Kerosene and oil-fired stoves shall comply with NFPA 31 and UL 896.~~

Commented [HT23]: SEE NEW UMC SECTION 939.0 SAUNA HEATERS

Commented [HT24]: Section 918 IMC

Commented [HT25R24]: See section 905.6 circulating air UMC

Commented [HT26]: Section 922 IMC / stove 920.3