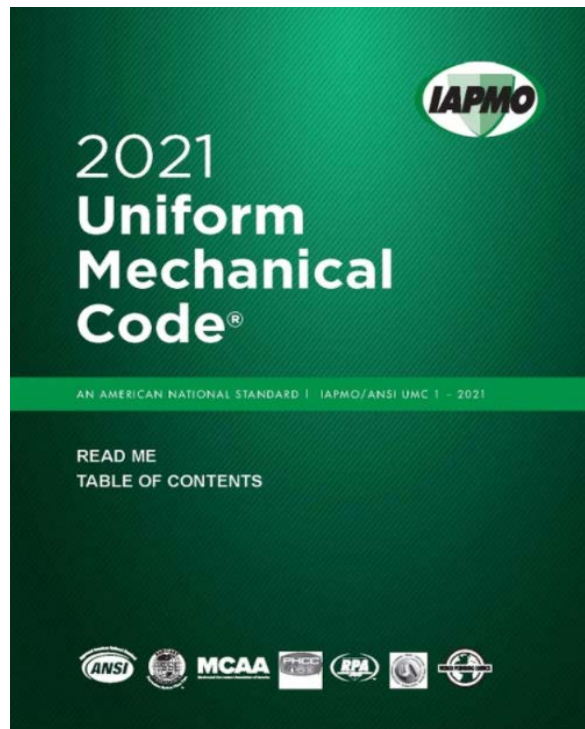




**Development**  
SERVICES DEPARTMENT

*Building a Better and Safer Austin Together*

# 2021 Uniform Mechanical Code



# Meeting Purpose

To present proposed changes to the  
2021 Uniform Mechanical Code

# Reducing Amendments

**GOAL:** To minimize the number of amendments and return to published code.

Amendments were reduced by more than 50% compared to the 2015 adoption process. About 24 sections were amended with 16 of the major changes detailed in the following slides.

## **Reasons for amendments:**

1. Council mandated
2. Business needs (chapter 1)
3. Additional options for the public with exempts from permitting
4. Clarification purposes
5. ISO rating

# Amendment 1

**104.1.1 Special Inspections Program for Timed Inspections 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 for buildings not covered under the Residential Code ~~or a Special Inspections Program~~ 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.

*Note:* Renamed to remove confusion with the special inspection process in the IBC, and made a clarification about buildings not covered under the IRC.

# Amendment 2

## **CHAPTER 2: DEFINITIONS**

**202.1.1 Supplemental Definitions.** The definitions in this subsection apply throughout this code and amend or supplement the definitions in Chapter 2 Section 202 (*General Definitions*) of in the 2021 Uniform Mechanical Code, as published:

**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 blow down, and foundation drain water.

**Bleed-off (Blowdown).** Means 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.** Means A meter that tracks the amount of water discharged from a cooling tower system.

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

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

**Cooling Tower.** Means An open- or closed- loop water recirculation system that uses fans or natural draft to force draw or draw force 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.** Means The ratio of the dissolved solids in recirculating water to the dissolved solids in the make-up 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.

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

**Make-up Meter.** Means A meter that measures the amount of water entering a cooling tower system.

**Overflow Alarm.** Means 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.** Means 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 under city and state permitting requirements contained in Chapters 15 and 16 of the City's Adopted Plumbing Code & Local Amendments (Chapter 25-12, Article 6) and rules of the Texas Commission of Environmental Quality, 30 TAC Chapter 210 Subchapter F.

*Note: Added to maintain consistency with 2007 water conservation regulatory mandates.*

# Amendment 3

**303.8.4 Roof Drainage and Rails.** Equipment shall must 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 (3048 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 (1067 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, fan, or component. If a parapet or other building structure is used in lieu of a guard, it must be at least 42 inches (1067 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.

*Note:* Revisions made to match the requirement of the IBC, and new exception added.

# Amendment 4

**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 will still be required.

*Note:* Added to provide options for installation of equipment in areas like a lobby where the existing code language would affect the design.

# Amendment 5

**310.1.2 Sling-Style Equipment.** Sling-style AC equipment that reintroduces condensation back into the atmosphere is prohibited.

*Note:* Sling style equipment was designed for parts of the country with lower humidity levels.

# Amendment 6

**310.8 Standards for Air Conditioner Condensate Recovery Systems for New Development.** Commercial and multi-family facilities constructed after December 31, 2016, with an air conditioning system with a combined cooling capacity equal to or greater than 200 tons must 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 includes using condensate wastewater to process water; to make up cooling tower water; to flush indoor toilets; to irrigate landscape; or other approved non-potable water uses. Except as provided in the Mechanical Code, condensate wastewater generated by an air condition system described in this section may not be discharged. Potable water may be used for cooling tower makeup water if the condensate wastewater generated is insufficient to meet the cooling tower's make-up water needs. 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.

*Note:* Modified to maintain consistency with 2007 water conservation regulatory mandates.

# Amendment 6

## 310.8

**Exception.** ~~Condensate wastewater may be discharged, consistent with the requirements in Section 310.1, if the amount of condensate wastewater exceeds existing irrigation, cooling tower make-up, or other non-potable water needs at the facility.~~

The requirements of 310.8 for the collection and use of condensate shall not apply under the following conditions:  
Municipal treated effluent (reclaimed water) and/or alternate water sources other than condensate will be used to meet all non-potable water demands;

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 AC condensate for the facility;

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;

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 AC condensate of all units due to the need of the addition of pumps and storage systems or AC condensate lines are feed into multiple collection points;

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”

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.

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.

*Note: Modified to maintain consistency with 2007 water conservation regulatory mandates.*

# Amendment 7

**402.3.1 Intake Opening Location.** An air intake opening shall comply with Table 402.3.1 and shall be located at least 10 feet from lot lines or buildings on the same lot; in addition,

1. Except as provided below or in Table 402.3.1, a mechanical or gravity outdoor air intake shall be located at least 10 feet, measured horizontally, from any hazardous or noxious contaminant source, including vents, streets, alleys, parking lots and loading docks;
2. An outdoor air intake opening shall be located within 10 feet (3048 mm), measured horizontally, from streets, alleys, parking lots, and loading docks if the openings are located at least 25 feet (7620 mm) vertically above those locations;
3. 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 (3048 mm) of the opening;
4. An intake opening on a structure located within a flood hazard area shall be at or above elevation required by section 1612 of the *International Building Code* for utilities and attendant equipment; and
5. An intake opening shall be located a minimum of 10 feet horizontally from the center line of an alley.

~~When measuring distance, an opening that fronts a street or public right of way is measured from the closest edge of the street or public right of way.~~

*Note:* Modified for clarification purposes.

# Amendment 8

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

| Table 402.3.1 Air Intake Minimum Separation Distance (2016 ASHRAE 62.1: table 5.5.1)   |                  |
|--|------------------|
| 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 <a href="#">Appendix J contains sources of additional information</a> on separation criteria. <del>for industrial environments must comply with the</del> <a href="#">These include the ACGIH Industrial Ventilation Manual</a> and the <a href="#">ASHRAE Handbook-HVAC Applications</a> , <a href="#">ASHRAE Laboratory Design Guide</a> , and <a href="#">NSF/ANSI 49</a> .                           |                  |
| Note 3: <del>Shorter separation distance is permitted for fuel gas burning appliances and equipment when based on ANSI Z 223.1/NFPA 54; for oil burning appliances and equipment when based on NFPA 31; and other combustion appliances and equipment when based on NFPA 211.</del> <a href="#">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.</a> |                  |
| Note 4: Distance is measured to the closest place that a vehicle exhaust will likely be located.   |                  |
| Note 5: <del>Shorter separation distance is permitted when</del> <a href="#">The minimum separation distance shall not apply where outdoor surfaces below the air intake</a> are sloped more than 45 degrees from horizontal or are less than one inch wide.   |                  |

Note: An existing ASHRAE table updated to the 2016 version.

# Amendment 9

~~504.1.2 walkway unless three sides are open for dilution air movement. If adequate dilution air cannot be provided, an exhaust serving a domestic range or bathroom exhaust fan must be extended to the outer edge of the covered walkway. An environmental air duct may terminate over a private use balcony if the balcony serves as the same space for the duct and required clearances from openings are maintained. A duct under positive or negative pressure may be routed through a plenum when a longitudinal and traverse joint is sealed with materials designed for that use and is sealed consistent with acceptable methods. A hazardous fume may not be run through a plenum under positive pressure unless the plenum is sealed and encased in another tight enclosure, chase, or metal sleeve complete to connection and to point of discharge.~~

**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.

1. An exhaust duct serving a domestic range or bathroom exhaust fan shall ~~may 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.

2. 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.

Note: Modified for clarification purposes.

# Amendment 10

**504.4 Clothes Dryers Installation.** Clothes dryers shall be exhausted in accordance with the manufacturer's instructions. Dryer exhaust systems shall be independent of all other systems and shall convey the moisture and any products of combustion to the outside of the building.

•**Alternate Engineered Systems.** If the dryer duct system is designed by a professional engineer, the system must comply with ANSI Z21.5.I/CSA 7.1. The design professional must provide calculations and design criteria on plans submitted under Section 104.0 of the Mechanical Code; and must demonstrate dryer vent equivalent to the Mechanical Code.

•**Duct Supports.** Ducts shall be supported in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible.

*Note:* New section replacing UMC clothes dryer requirements with more prescriptive IMC requirements.

# Amendment 11

**519.7 Hazardous Materials – General Requirement.** 2021 International Mechanical Code sections 502.8 through 502.8.5, associated tables and referenced sections shall apply and with the deletion of the specific section of 502.8.4 and replaced with 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 in 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.

*Note:* Pointer to IMC due to UMC not containing specific requirements needed.

# Amendment 12

**519.8 Hazardous Materials – Requirements for Specific Materials. 2021 International Mechanical Code section 502.9, subsections, associated tables and referenced sections shall apply.**

**519.9 Hazardous Production Materials (HPM). 2021 International Mechanical Code section 502.10, subsections, associated tables and referenced sections shall apply.**

*Note:* Pointer to IMC due to the specific requirements of these code sections related to IFD and IBC.

# Amendment 13

**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 (6096 mm) in horizontal sections of duct.

*Note:* New section added to the 2021 published code.

# Amendment 14

## 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.

*Note: Added for clarification purposes.*

# Amendment 15

## CHAPTER 11: REFRIGERATION

### **1126.0 Standards for Cooling Towers.**

A cooling tower shall:

- ~~1. achieve a minimum of five cycles of concentration if the cooling tower utilizes potable water as its primary source of make-up water;~~
- ~~2. be fitted with overflow sensors and alarms, make-up water and blowdown meters to manage water consumption, and conductivity controllers;~~
- ~~3. if the cooling tower is 100 tons or more, the make-up and blowdown meters and over flow alarm must be connected to the buildings central energy management system or utility monitoring dashboard; and~~
- ~~4. be equipped with drift eliminators with a drift rate that does not exceed 0.005 percent of the circulated water flow rate when operated consistent with the equipment manufactures instructions and be used with the cooling tower, evaporative condensers, and fluid coolers; and~~
- ~~5. be registered with Austin Water Utilities Water Conservation Division; and~~
- ~~6. beginning January 1, 2017, include the installation of a water storage tank, pluand treatment to utilize blowdown water for landscape or other authorized beneficial purposes or offset a minimum of 10 percent of the make-up water with reclaimed or onsite water reuse if the capacity of the cooling tower is 100 tons or more and installed for new commercial or multi-family development.~~

1. Achieve a minimum of five cycles of concentration if the cooling tower utilizes potable water as its primary source of makeup water;
2. Be fitted with overflow sensors and alarms, makeup water and blowdown meters to manage water consumption, and conductivity controllers;
3. If the cooling tower is 100 tons or more, the makeup and blowdown meters and overflow alarm shall be connected to the buildings central energy management system or utility monitoring dashboard; and
4. 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.

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.

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 makeup water offset with reclaimed or onsite water reuse.

*Note: Modified to maintain consistency with 2007 water conservation regulatory mandates.*

# Questions/Comments

