Summary of Significant Changes to the 2018 Edition of the International Mechanical Code

Description of Change	Change Summary	Change Significance
403.3.2.4 System controls. Where provided within a dwelling unit, controls for outdoor air ventilation systems shall include text or a symbol indicating the system's function.	Adds new requirement for labeling of controls for whole-house (dwelling) ventilation systems	Section 401.2 will require dwelling units to be mechanically ventilated where their infiltration rate is tested and known to be less than 5 ACH50. Section 403.3.2 addresses dwelling units in low-rise construction and prescribes the design and operation of the dwelling ventilation system. The newly added text requires the control(s) for such ventilation system to be labeled as such. This is important because the occupants of the dwelling are typically not aware of the ventilation system or how it operates. Often, the system relies on local exhaust fans in the bathroom and kitchen to run continuously to provide the required ventilation. Regardless of the type of system, supply air, exhaust air, or combination of such, the control may be a simple wall switch. This wall switch might not be distinguishable from any other wall switch in the dwelling and the ventilation system will be inadvertently shut off, thereby allowing indoor pollutant levels to increase. Such switches should obviously be labeled "Ventilation System" or facsimile thereof to allow informed use of the control switch
403.3.2.5 Ventilating Equipment. Exhaust equipment serving single dwelling units shall be listed and labeled to provide the minimum required air flow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.	Adds a new requirement for the testing of exhaust fans for dwelling units.	Exhaust fans used in dwellings will not necessarily have the exhaust flow rate that they were advertised to have. Requiring such fans to be tested, listed and labeled in accordance with a standard will ensure that the fans will deliver the performance expected. Even though the fan has been verified to perform as tested by the manufacturer, the fan must be installed properly to achieve that flow rate. Fans are often installed with undersized ducts and excessive duct lengths such that they cannot develop their rated flow, despite of the fan testing and labeling.

Description of Change	Change Summary	Change Significance
404.1 Enclosed parking garages. ~~Where m~~Mechanical ventilation systems for enclosed parking garages shall operate ~~intermittently~~ continuously or shall be automatically operated ~~such operation shall be automatic~~ by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Such detectors shall be listed in accordance with UL 2075 and installed in accordance with their listing and the manufacturers' ~~recommendations~~ instructions. Automatic operation shall cycle the ventilation system between the following two modes of operation: 1. Full-on at an airflow rate of not less than 0.75 cfm per square foot of the floor area served. 2. Standby at an airflow rate of not less than 0.05 cfm per square foot of the floor area served.	The code text was rewritten to clarify the intent with regard to "intermittent" operation.	This code section has been misinterpreted regarding intermittent operation. No technical changes were made, rather the text was rewritten to make it clear that the garage exhaust system can never shut off completely. The exhaust is either full-on all of the time, or it is allowed to be cycled between full-on and minimum-on by CO and NO2 detectors. "Intermittent" operation implied that the system could shut off completely which was never the intent. The detectors determine when the exhaust system goes from standby (minimum rate) to the full-on rate. If the system is operated in a continuous mode without detectors, then it would operate at the full-on rate continuously
504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or chimney. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums. Clothes dryer exhaust ducts shall be sealed in accordance with Section 603.9.	The code is modified to cover the sealing of clothes dryer exhaust ducts.	Section 501.5 states that exhaust ducts must comply with Chapter 6 where not otherwise specified in Chapter 5. This would include Section 603.9 for duct sealing. Because clothes dryer exhaust duct construction is specified in Chapter 5, (Section 504), the link to Section 603.9 is not apparent. Adding the requirement for duct sealing makes sure that this important requirement is not overlooked.

Description of Change	Change Summary	Change Significance
504.4.1 Exhaust termination outlet and passageway size. The passageway of dryer exhaust duct terminals shall be undiminished in size and shall provide an open area of not less than 12.5 square inches (8065 mm^2).	The code now addresses the required size of dryer exhaust ducts terminals.	The allowed length of a clothes dryer exhaust duct is based on the assumption that the exhaust terminal poses little flow resistance. Nothing in the code requires a reduction in the allowable length of the duct based on the resistance of the exhaust terminal, therefore, it was determined to be necessary to specify a minimum size terminal opening to account for the flow resistance offered by the terminal. Dryer manufacturer's instructions will specify the minimum opening depth for outlet hoods and this new code text further specifies a minimum terminal opening area. The minimum opening area of 12.5 square inches is equivalent to the area of a 4-inch round duct.
504.8.2 Duct installation. Exhaust ducts shall be supported at 4-foot (1219 mm) intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Ducts shall not be joined with screws or similar fasteners that protrude more than 1/8 inch (3.2 mm) into the inside of the duct. Where dryer exhaust ducts are enclosed in wall or ceiling cavities, such cavities shall allow the installation of the duct without deformation.	The code now addresses the installation of clothes dryer exhaust ducts in wall and ceiling cavities.	The new text will require a space larger than a 2 x 4 wall stud cavity to accommodate 4-inch exhaust ducts. The intent is prevent ducts from being deformed by forcing them into interstitial spaces smaller than 4 inches in the least dimension. Deformed ducts impede flow, stress duct joints, seams and fittings and interfere with duct cleaning.

Description of Change	Change Summary	Change Significance
506.5.2 Pollution-control units. The installation of pollution- control units shall be in accordance with the manufacturer's installation instructions and all of the following: 1. Pollution-control units shall be listed and labeled in accordance with UL 1978. 2. Fans serving pollution-control units shall be listed and labeled in accordance with UL 762. 3. Pollution control units shall be mounted and secured in accordance with the manufacturer's installation instructions and the International Building Code. 4. Pollution-control units located indoors shall be listed and labeled for such use. Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be located in a room or space having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions. 5. A clearance of not less than 18 inches (457 mm) shall be maintained between the pollution-control unit and combustible material. 6. Roof-mounted pollution-control units shall be listed for outdoor installation and shall be mounted not less than 18 inches (457 mm) above the roof.	The code added coverage and a definition for pollution control units which are installed in the grease exhaust system to extract smoke, grease particles and odors from the exhaust flow.	Pollution-control units (PCU's) are relatively new technology and are now commonly installed. The code lacked coverage for them until now. In urban areas, commercial kitchen exhaust effluent can be quite objectionable and a public nuisance, especially in cases where the exhaust outlet is at a lower elevation. A common application for a PCU would be where a mercantile or business tenant space on the first floor of an eight-story apartment building is converted into a restaurant and there is no way to get the kitchen exhaust through the roof. A PCU can be specified in this case to clean up the exhaust before it is discharged through a sidewall in the first story. Exhaust odors can certainly affect the enjoyment of life for urban dwellers and pedestrians. Since this text was added to the 2018 IMC, UL has developed an outline of investigation for PCU's.

7. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13. 8. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution-control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur. 9. Pollution-control units shall be provided with a factory- installed fire suppression system. 10. Service space shall be provided in accordance with the manufacturer's instructions for the pollution-control unit and the requirements of Section 306. 11. Wash-down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains, shall be sealed with a trap or other approved means to prevent air bypass. Where a trap is utilized it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings. 12. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing. 13. Duct connections to pollution-control units shall be in accordance with Section 506.3.2.3. Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Ducts shall transition to the full size of the unit's inlet and outlet openings.		

14. Extra-heavy-duty appliance exhaust systems shall not be connected to pollution-control units except where such units are specifically designed and listed for use with solid fuels. 15. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.		
202 GENERAL DEFINITIONS **POLLUTION-CONTROL UNIT (PCU).** Manufactured equipment that is installed in a grease exhaust duct system for the purpose of extracting smoke, grease particles and odors from the exhaust flow by means of a series of filters.		

Description of Change	Change Summary	Change Significance
602.2.1.8 Pipe and duct insulation within plenums. Pipe and duct insulation contained within plenums, including insulation adhesives, shall have a flame spread index of not more than 25 and a smoke developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature which they are exposed in service. The test temperature shall not fall below 250ºF (121ºC). Pipe and duct insulation shall be listed and labeled.	A new section specifically addresses duct and pipe insulation in plenums.	Although materials were covered in general in Section 602.2.1, there was no subsection to specifically address duct and pipe insulation installed on the exterior of ducts and pipes located within plenums. It must be verified with the manufacturer of the insulation product whether the insulation complies with the flame spread and smoke development limits of the code.
603.5.2 Phenolic ducts. Nonmetallic phenolic ducts shall be constructed and installed in accordance with the SMACNA Phenolic Duct Construction Standards.	The code added coverage for a newer type of non-metallic duct, phenolic duct.	The code now references the SMACNA standard for phenolic duct construction. Phenolic ducts are made of a closed cell rigid foam board that is covered on both sides by a scrim-reinforced aluminum foil membrane. Such ducts are self-insulated, because the phenolic foam board has insulating properties, and the duct material can comply with UL 181 as a Class I duct. Class I ducts have a flame spread index not exceeding 25 and a smoke-developed index not exceeding 50 when tested to ASTM E 84 or UL 723. Section 603.5 addresses non-metallic ducts, as are phenolic ducts.
603.8.2 Sealing. Ducts shall be sealed, ~~and~~ secured and tested prior to ~~pouring the~~ concrete encasement or direct burial. Ducts shall be leak tested as required by Section C403 of the *International Energy Conservation Code*.	The code now addresses the testing of underground ducts.	Underground ducts are required to be sealed, secured in place to prevent movement or floating and tested, all prior to burial or pouring concrete. The IECC requires that high-pressure classification ducts be leak tested in accordance with the SMACNA air duct leakage test manual. Obviously, repairing defective seals is not possible after the ducts are buried or encased in concrete. Underground ducts are subject to air leakage, water intrusion and the corrosive effects of soil and moisture. Non- metallic ducts are commonly used because they can be made air and liquid tight and are not subject to corrosion.

Description of Change	Change Summary	Change Significance
603.9 Joints, seams and connections. ~~All l~~Longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards—Metal and Flexible and NAIMA Fibrous Glass Duct Construction Standards*. ~~All j~~Joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Tapes and mastics used to seal fibrous glass ductwork shall be listed and labeled in accordance with UL 181A and shall be marked "181 A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Tapes and mastics used to seal metallic and flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181 B-FX" for pressure-sensitive tape or "181 B-M" for mastic. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181 B-C." Closure systems used to seal all ductwork shall be installed in accordance with the manufacturer's instructions. **Exception:** For ducts having a static pressure classification of less than 2 inches of water column (500 Pa), additional closure systems shall not be required for continuously welded joints and seams and locking-type joints and seams~~. of other than the~~ This exception shall not apply to snap-lock and button-lock type~~s~~ joints and seams located outside of conditioned spaces.	The code is less restrictive for Snap- and Button-lock duct joints that are located within the thermal envelope.	Previous code did recognize Snap- and Button-lock joints under the exception for welded and locking-type joints and seams. Snap- and Button-lock joints were considered to have greater leakage rates than other locking-type joints and seams and therefore were always required to be sealed. The new text relaxes this requirement by allowing such joints and seams that are located inside of the conditioned space to be considered as adequate without additional sealing. The relatively small amount of leakage from such joints into the conditioned space being served by the ducts was considered as negligible. Such joints outside of the thermal envelope would have to have additional sealing means applied.

Description of Change	Change Summary	Change Significance
607.3.1 Damper testing. Dampers shall be listed and labeled in accordance with the standards in this section. Fire dampers shall comply with the requirements of UL 555. Only fire dampers ~~and ceiling radiation dampers~~ labeled for use in dynamic systems shall be installed in heating, ventilating and air-conditioning systems designed to operate with fans on during a fire. Smoke dampers shall comply with the requirements of UL 555S. Combination fire/smoke dampers shall comply with the requirements of both UL 555 and UL 555S. Ceiling radiation dampers shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E 119 or UL 263. Only ceiling radiation dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. Corridor dampers shall comply with requirements of both UL 555 and UL 555S. Corridor dampers shall demonstrate acceptable closure performance when subjected to 150 feet per minute (0.76 mps) velocity across the face of the damper using the UL 555 fire exposure test.	The code mandates dynamic type ceiling radiation dampers where subject to continuous air flow from HVAC fans.	The code now recognizes the ceiling radiation damper need to be compatible with the HVAC system operation. Fire dampers are required to be the dynamic rated type where they are expected to close against air flow, and the same is now true for ceiling radiation dampers (CRD). If the fans (air handlers) do not shut down during a fire event, the air flow in any direction can interfere with damper closing, especially in cases where the air flow tends to push dampers blades toward the open position.

Description of Change	Change Summary	Change Significance
SECTION 929 **HIGH-VOLUME LARGE-DIAMETER FANS** **929.1 General.** Where provided, high-volume large-diameter fans shall be tested and labeled in accordance with AMCA 230, listed and labeled in accordance with UL 507, and installed in accordance with the manufacturer's instructions. **SECTION 202 GENERAL DEFINITIONS** **HIGH-VOLUME, LARGE-DIAMETER FAN.** A low-speed ceiling fan that circulates large volumes of air and that is greater than 7 feet (2134 mm) in diameter.	Adds coverage for high-volume large-diameter fans.	High volume large diameter fans (HVLD) are being used more and more and the code did not specifically address them previously. These fans are also referred to as high volume low speed (HVLS) fans. These fans resemble the ubiquitous ceiling paddle fans in our homes and restaurants, but are very large diameter, measured across the plane of the blades, and the RPM speed is very low. Some fans are 24 feet in diameter. The fans move large volumes of air by slow rotation of long blades and can be extremely quiet compared to higher speed fans. They are used in large open spaces with high ceilings such as warehouses, fleet garages, arenas, assembly areas, gymnasiums, barns, hangars, livestock containment areas, etc. Air currents are created than can turn over the air in a space creating a cooling and ventilation effect without noise and objectionable air movement and can also reduce stratification of air in the heating season. The primary benefits of these fans are providing human and animal comfort, helping to control condensation and stratification problems and saving energy used for conditioning the air in spaces.
1107.2 Piping location. Refrigerant piping that crosses an open space that affords passageway in any building shall be not less than 7 feet 3 inches (2210 mm) above the floor unless the piping is located against the ceiling of such space. Refrigerant piping shall not be placed in any of the following ~~elevator, dumbwaiter or other shaft containing a moving object or in any shaft that has openings to living quarters or to means of egress. Refrigerant piping shall not be installed in an enclosed public stairway, stairway landing or means of egress.~~ 1. A fire-resistance-rated exit access corridor. 2. An interior exit stairway. 3. An interior exit ramp. 4. An exit passageway. 5. An elevator, dumbwaiter or other shaft containing a moving object. 6. A shaft that has one or more openings into a fire-resistance-rated exit access corridor, interior exit stairway or ramp or exit passageway.	This code section was rewritten to clearly state the intent regarding the prohibited locations for refrigerant piping.	Previous editions of the code prohibited refrigerant piping in enclosed public stairways, stairway landings and means of egress. This wording was very ambiguous, especially the reference to "means of egress" and the terminology was inconsistent with the IBC. Means of egress is defined as a continuous and unobstructed path of horizontal and vertical egress travel from any occupied portion of a building, thus refrigerant piping would be prohibited almost everywhere in a building. The actual intent was logically assumed to be to prohibit refrigerant piping in exit stairways, exit ramps, exit passageways and fire-resistance-rated exit access corridors. A refrigerant leak in such spaces could jeopardize egress from the building.

Description of Change	Change Summary	Change Significance
CHAPTER 14 SOLAR SYSTEMS **SECTION 1401 GENERAL** **1401.1 Scope.** This chapter shall govern the design, construction, installation, alteration and repair of solar thermal systems, equipment and appliances intended to utilize solar energy for space heating or cooling, domestic hot water heating, swimming pool heating or process heating. **1401.4 Solar ~~energy~~ thermal equipment and appliances.** Solar ~~energy~~ thermal equipment and appliances shall conform to the requirements of this chapter and SRCC 300. Solar thermal systems shall be listed and labeled in accordance with SRCC 300 and shall be installed in accordance with the manufacturer's instructions and SRCC 300. **1401.4.1 Collectors and panels.** Solar thermal collectors and panels shall be listed and labeled in accordance with SRCC 100 or SRCC 600, as applicable. **SECTION 1402** **DESIGN AND INSTALLATION** **1402.1 General.** The design and installation of solar thermal systems shall comply with Sections 1402.1 through 1402.8. Solar thermal systems shall be listed and labeled in accordance with SRCC 300 and shall be installed in accordance with the manufacturer's instructions and SRCC 300. **~~1402.1~~ 1402.2 Access.** Access shall be provided to solar ~~energy~~ thermal equipment and appliances for maintenance. Solar thermal systems and	Modifies coverage for solar thermal systems.	Chapter 14 was significantly increased in content and it was clarified that the chapter applies only to thermal solar (as opposed to solar photovoltaic) systems. The new text relies on three newly referenced solar product standards developed and maintained by the Solar Rating and Certification Corporation. The text addresses the various types of thermal solar system designs, including direct and indirect systems and drain-back systems. Much new text was added addressing: system design and installation, protection from freezing and excess pressure and temperature, protection of potable water and building structure, piping installation and insulation, heat exchanger application, heat transfer fluids, access for roof-mounted equipment and system labeling and signage.

appurtenances shall not obstruct or interfere with the operation of any doors, windows or other building components requiring operation or access. Roof-mounted solar thermal equipment shall not obstruct or interfere with the operation of roof-mounted equipment, appliances, chimneys, roof hatches, smoke vents, skylights and other roof penetrations and openings. (Portions of Chapter 14 are not shown for brevity and clarity. Refer to the 2018 IMC for the complete text.)		