2021 Uniform Mechanical Code – Code Analysis

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary

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2015 Houston Amendment - Chapter 1 Administration	2021 UMC – Chapter 1 – Administration	2021 Houston UMC Amendments	Code Change Summary
101.1 Title. ~~This document~~ These regulations shall be known as the ~~"Uniform~~ *City of Houston Mechanical Code*,~~" may be cited as such, and will be referred to~~ herein after referred to as "this code~~."~~ and also known as the *Mechanical Code*. The *Construction Code* collectively includes this volume and certain other codes, pamphlets, specifications and documents that are adopted in or by reference through the adopting ordinance, City of Houston Ordinance No. 2021-1037[4].	N/A	**101.1 Title.** ~~This document~~ These regulations shall be known as the ~~"Uniform~~ *City of Houston Mechanical Code*,~~" may be cited as such, and will be referred to~~ hereinafter referred to as "this code~~."~~ and also known as the *Mechanical Code*. The *Construction Code* collectively includes this volume and certain other codes, pamphlets, specifications and documents that are adopted in or by reference through the adopting ordinance, City of Houston Ordinance No. 2021-1037[1].	No change to Houston amendment.
102.1 Conflicts Between Codes. ~~Where the requirements within the jurisdiction of this mechanical code conflict with the requirements of the plumbing code, the plumbing code shall prevail.~~ In instances where this code, applicable standards, or the manufacturer's installation instructions conflict, the more stringent provisions shall prevail. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *City Code* or other volumes of the *Construction Code*, including adopted appendices, other than the *Fire Code* and its adopted appendices and standards, the most restrictive shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *Fire Code*, including its adopted appendices and standards, and the building official and the fire marshal are unable to mutually reconcile the requirements by issuing a written interpretation, then either of them may refer the matter to the General Appeals Board created under the *Building Code*, which shall conduct a review of the matter and issue a written code interpretation based upon the apparent intent of the codes involved. Notwithstanding any other provision, interpretations that are issued by the General Appeals Board shall not be subject to further appeal.	N/A	**102.1 Conflicts Between Codes.** ~~Where the requirements within the jurisdiction of this mechanical code conflict with the requirements of the plumbing code, the plumbing code shall prevail.~~ In instances where this code, applicable standards, or the manufacturer's installation instructions conflict, the more stringent provisions shall prevail. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *City Code* or other volumes of the *Construction Code*, including adopted appendices, other than the *Fire Code* and its adopted appendices and standards, the most restrictive shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *Fire Code*, including its adopted appendices and standards, and the building official and the fire marshal are unable to mutually reconcile the requirements by issuing a written interpretation, then either of them may refer the matter to the General Appeals Board created under the *Building Code*, which shall conduct a review of the matter and issue a written code interpretation based upon the apparent intent of the codes involved. Notwithstanding any other provision, interpretations that are issued by the General Appeals Board shall not be subject to further appeal.	No change to Houston amendment.
	N/A	**102.3 Mechanical Integrity ~~Maintenance~~.** Mechanical systems, materials, and appurtenances, both existing and new, of a premise under the Authority Having Jurisdiction shall be maintained in operating condition. Devices or safeguards required by this code shall be maintained in accordance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for maintenance of mechanical systems. To determine compliance with this subsection, the Authority Having Jurisdiction shall be permitted to cause a mechanical system to be reinspected.	No change to Houston amendment.

[1]. The City Secretary shall insert the number of the adopting ordinance.

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102.8 Appendices. The provisions in the appendices are intended to supplement the requirements of this code and shall not be considered part of this code unless formally adopted as such. Appendix **F** shall be adopted as part of this code.	N/A	**102.8 Appendices.** The provisions in the appendices are intended to supplement the requirements of this code and shall not be considered part of this code unless formally adopted as such. Appendix G shall be adopted as part of this code.	No change to Houston amendment.
102.9 Retroactive Provisions. Notwithstanding any other provision of this section, those provisions of this code that are designated as being "retroactive" shall apply to existing installations and alterations thereof.	N/A	**102.9 Retroactive Provisions.** Notwithstanding any other provision of this section, those provisions of this code that are designated as being "retroactive" shall apply to existing installations and alterations thereof.	No change to Houston amendment.
102.10 Residential Code. Mechanical systems for detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height, each with separate means of egress, and their accessory structures shall comply with the *Residential Code*. Mechanical systems for residential occupancies to which the *Residential Code* does not apply shall be governed by this code.	N/A	**102.10 Residential Code.** Mechanical systems for detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height, each with separate means of egress, and their accessory structures shall comply with the *Residential Code*. Mechanical systems for residential occupancies to which the *Residential Code* does not apply shall be governed by this code.	No change to Houston amendment.
102.11 Energy Conservation. The *Energy Conservation Code* and Chapter 11 of the *Residential Code*, as well as any amendments adopted thereto as authorized by state law, shall be enforced by this jurisdiction in accordance with state law.	N/A	**102.11 Energy Conservation.** The *Energy Conservation Code* and Chapter 11 of the *Residential Code*, as well as any amendments adopted thereto as authorized by state law, shall be enforced by this jurisdiction in accordance with state law.	No change to Houston amendment.

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
103.2 Liability. ~~The Authority Having Jurisdiction charged with the enforcement of this code, acting in good faith and without malice in the discharge of the Authority Having Jurisdiction's duties, shall not thereby be rendered personally liable for damage that accrues to persons or property as a result of an act or by reason of an act or omission in the discharge of such duties. A suit brought against the Authority Having Jurisdiction or employee because of such act or omission performed in the enforcement of provisions of this code shall be defended by legal counsel provided by this jurisdiction until final termination of such proceedings.~~ Except as otherwise provided by law, the building official shall not personally be liable in damages for any act or omission arising out of any official action taken to implement and enforce the provisions of this code. Additionally, except as otherwise provided by law, the building official shall not personally be liable in damages for any act or omission taken in the course and scope of employment. Where and to the extent consistent with the provisions of Chapter 2, Article X, of the *City Code*, this jurisdiction shall provide legal representation and indemnification for any suit or claim brought against the building official or any deputies because of acts or omissions performed in the implementation or enforcement of this code. This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating, or controlling any building, structure or system or other construction for any damages to persons or property caused by defects, nor shall the code enforcement agency, or any member of the board of appeals, or the jurisdiction be held as assuming any such liability by reason of the inspections authorized by this code or any permits or certificates issued under this code.	N/A	**103.2 Liability.** ~~The Authority Having Jurisdiction charged with the enforcement of this code, acting in good faith and without malice in the discharge of the Authority Having Jurisdiction's duties, shall not thereby be rendered personally liable for damage that accrues to persons or property as a result of an act or by reason of an act or omission in the discharge of such duties. A suit brought against the Authority Having Jurisdiction or employee because of such act or omission performed in the enforcement of provisions of this code shall be defended by legal counsel provided by this jurisdiction until final termination of such proceedings.~~ Except as otherwise provided by law, the building official shall not personally be liable in damages for any act or omission arising out of any official action taken to implement and enforce the provisions of this code. Additionally, except as otherwise provided by law, the building official shall not personally be liable in damages for any act or omission taken in the course and scope of employment. Where and to the extent consistent with the provisions of Chapter 2, Article X, of the *City Code*, this jurisdiction shall provide legal representation and indemnification for any suit or claim brought against the building official or any deputies because of acts or omissions performed in the implementation or enforcement of this code. This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating, or controlling any building, structure or system or other construction for any damages to persons or property caused by defects, nor shall the code enforcement agency, or any member of the board of appeals, or the jurisdiction be held as assuming any such liability by reason of the inspections authorized by this code or any permits or certificates issued under this code.	No change to Houston amendment.
103.5.1 Hearing notices. Unless otherwise specifically provided, whenever notice is to be given to any person concerning the right to a hearing, the notice may be given by personal hand delivery, certified mail, or private delivery service, return receipt requested. If there is documented proof that these methods are not successful, the written notice may be sent by email. If the notice is being given to an applicant for a license or to a licensee or to a state license registrant, the notice may be mailed to the address set out in the application for the registration or license unless the applicant or registrant has given the Authority Having Jurisdiction written notice of a change of address, under which circumstances any notice concerning a hearing shall be sent to the most recent address shown on the notice. If any notice mailed to an applicant for a license or to a licensee or registrant is returned without delivery, notice shall be effective if posted where the public may observe it in the Permit Office. If notice is being given to a building owner or to a tenant therein and the Authority Having Jurisdiction is unable to determine the name or address of such person after checking the building records and the applicable records of Houston Public Works, the County Appraisal District, the electrical company, the gas company, and the water utility	N/A	**103.5 Hearing Procedures.** **103.5.1 Hearing notices.** Unless otherwise specifically provided, whenever notice is to be given to any person concerning the right to a hearing, the notice may be given by personal hand delivery, certified mail, or private delivery service, return receipt requested. If there is documented proof that these methods are not successful, the written notice may be sent by email. If the notice is being given to an applicant for a license or to a licensee or to a state license registrant, the notice may be mailed to the address set out in the application for the registration or license unless the applicant or registrant has given the Authority Having Jurisdiction written notice of a change of address, under which circumstances any notice concerning a hearing shall be sent to the most recent address shown on the notice. If any notice mailed to an applicant for a license or to a licensee or registrant is returned without delivery, notice shall be effective if posted where the public may observe it in the Permit Office. If notice is being given to a building owner or to a tenant therein and the Authority Having Jurisdiction is unable to determine the name or address of such person after checking the building records and the applicable records of Houston Public Works, the County Appraisal District, the	No change to Houston amendment.

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provider, notice shall be mailed to the billing addresses of the building as shown on the records of the electrical company and the gas company and shall be posted on or in view of each entrance to the building. Additionally, if any notice is mailed to a building owner or a building tenant and is returned without delivery, notice shall be effective if posted on or in view of each entrance to the building.		electrical company, the gas company, and the water utility provider, notice shall be mailed to the billing addresses of the building as shown on the records of the electrical company and the gas company and shall be posted on or in view of each entrance to the building. Additionally, if any notice is mailed to a building owner or a building tenant and is returned without delivery, notice shall be effective if posted on or in view of each entrance to the building.	
103.5.2 Hearings. Except where otherwise specifically provided, all hearings held pursuant to this code shall be conducted by the jurisdiction's Director of Houston Public Works or a representative, who shall hereinafter be referred to as the "hearing official." The director shall not designate any person to be a hearing official under this code who has taken any part in the investigation of the matter that is the subject of the hearing or any person who directly supervised the investigation. The hearing official shall consider only the evidence presented at the hearing in rendering a decision. The decision of the hearing official shall be set forth in writing and shall be served on each party in the same manner as a notice of right to a hearing.	N/A	**103.5.2 Hearings.** Except where otherwise specifically provided, all hearings held pursuant to this code shall be conducted by the jurisdiction's Director of Houston Public Works or a representative, who shall hereinafter be referred to as the "hearing official." The director shall not designate any person to be a hearing official under this code who has taken any part in the investigation of the matter that is the subject of the hearing or any person who directly supervised the investigation. The hearing official shall consider only the evidence presented at the hearing in rendering a decision. The decision of the hearing official shall be set forth in writing and shall be served on each party in the same manner as a notice of right to a hearing.	No change to Houston amendment.
104.3.2 Plan review fees. Where a plan or other data is required to be submitted in accordance with Section 104.3.1, a plan review fee shall be paid at the time of submitting construction documents for review. The plan review fees for mechanical systems work shall be charged as described in Section 118.1.11 of the *Building Code* and the city fee schedule ~~determined and adopted by this jurisdiction~~. The plan review fees specified in this subsection are separate fees from the permit fees ~~specified in Section 104.5~~. ~~Where plans are incomplete or changed so as to require additional review, a fee shall be charged at the rate shown in Table 104.5.~~ When approved plans are lost or changed so as to require an additional plan review or when a plan review is required and there is no building permit required, a plan review fee shall be charged as described in Section 118.2.8 of the *Building Code* and the city fee schedule.	N/A N/A	**104.3.2 Plan review fees.** Where a plan or other data is required to be submitted in accordance with Section 104.3.1, a plan review fee shall be paid at the time of submitting construction documents for review. The plan review fees for mechanical systems work shall be charged as described in Section 118.1.11 of the *Building Code* and the city fee schedule ~~determined and adopted by this jurisdiction~~. The plan review fees specified in this subsection are separate fees from the permit fees ~~specified in Section 104.5~~. ~~Where plans are incomplete or changed so as to require additional review, a fee shall be charged at the rate shown in Table 104.5.~~ When approved plans are lost or changed so as to require an additional plan review or when a plan review is required and there is no building permit required, a plan review fee shall be charged as described in Section 118.2.8 of the *Building Code* and the city fee schedule.	No change to Houston amendment.
104.3.2.1 Deferred Submittal Plan Review Fees. A plan review fee shall be paid at the time of submitting construction documents for review of deferred submittal plans. The fee for any deferred submittal review shall be charged at the rate shown in the city fee schedule for a minimum permit fee plus applicable administrative fee. The plan review fees specified in this subsection are separate fees from the permit fees.	N/A	**104.3.2.1 Deferred Submittal Plan Review Fees.** A plan review fee shall be paid at the time of submitting construction documents for review of deferred submittal plans. The fee for any deferred submittal review shall be charged at the rate shown in the city fee schedule for a minimum permit fee plus applicable administrative fee. The plan review fees specified in this subsection are separate fees from the permit fees.	No change to Houston amendment.
104.3.3 Time Limitation of Application. An application for which no permit is issued within 180 days following the date of application shall become inactive, and plans and other data submitted for review thereafter shall be returned to the applicant or destroyed by the *Authority Having Jurisdiction*. The *building official* is authorized to grant one or more extensions of time for additional periods not to exceed 180	N/A	**104.3.3 Time Limitation of Application.** An application for which no permit is issued within 180 days following the date of application shall become inactive, and plans and other data submitted for review thereafter shall be returned to the applicant or destroyed by the *Authority Having Jurisdiction*. The *building official* is authorized to grant one or more extensions of time for additional periods not to exceed 180	No change to Houston amendment.

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days each, for a maximum of two years from the date of the original application, upon written request and justifiable cause demonstrated by the applicant. If an application for permit does not result in a permit within two years after the date of original application, the permit application shall expire. In order to renew action on an application after expiration, the applicant shall submit a new permit application and plans and shall pay a new plan review fee. ~~Applications for which no permit is issued within 180 days following the date of application shall expire by limitation, plans and other data submitted for review thereafter, shall be returned to the applicant or destroyed by the Authority Having Jurisdiction. The Authority Having Jurisdiction *building official* shall be permitted to extend the time for action by the applicant for a period not to exceed 180 days upon request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee.~~		days each, for a maximum of two years from the date of the original application, upon written request and justifiable cause demonstrated by the applicant. If an application for permit does not result in a permit within two years after the date of original application, the permit application shall expire. In order to renew action on an application after expiration, the applicant shall submit a new permit application and plans and shall pay a new plan review fee. ~~Applications for which no permit is issued within 180 days following the date of application shall expire by limitation, plans and other data submitted for review thereafter, shall be returned to the applicant or destroyed by the Authority Having Jurisdiction. The Authority Having Jurisdiction shall be permitted to extend the time for action by the applicant for a period not to exceed 180 days upon request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee.~~	
104.4.2 Validity of Permit. The issuance of a permit or approval of ~~construction documents~~ plans and specifications shall not be construed to be a permit for, or an approval of, a violation of the provisions of this code or other ordinance of the jurisdiction. No permit presuming to give authority to violate or cancel the provisions of this code shall be valid. The issuance of a permit based upon ~~plans~~ construction documents, specifications, or other data shall not prevent the Authority Having Jurisdiction from thereafter requiring the correction of errors in ~~said plans~~ the construction documents, specifications, and other data or from preventing building operations being carried on thereunder where in violation of this code or of any other applicable law ~~ordinances of this jurisdiction~~. A permit and all its privileges are issued to the owner of the property for which the permit is issued, regardless of who submits the application or pays the permit fees. Where a Texas license is not required to obtain a mechanical permit or complete the proposed mechanical work, Section 105.4 of the *Building Code* shall apply. Where a Texas license is required to perform specific work, a permit shall be valid only for work performed under the licensed mechanical contractor or licensed HVAC contractor named on the application. A name change on an application or an existing permit must be obtained if the licensed mechanical contractor or licensed HVAC contractor listed on the application or existing permit is no longer responsible for the work performed. Provided that a refund has not been issued, the property owner has not changed, and written authority to amend the permit to designate a different licensed mechanical contractor or licensed HVAC contractor has been provided by the property owner to the building official, the building official shall issue an amended permit. A name change fee and an administrative fee shall be charged as	N/A	**104.4.2 Validity of Permit.** The issuance of a permit or approval of ~~construction documents~~ plans and specifications shall not be construed to be a permit for, or an approval of, a violation of the provisions of this code or other ordinance of the jurisdiction. No permit presuming to give authority to violate or cancel the provisions of this code shall be valid. The issuance of a permit based upon ~~plans~~ construction documents, specifications, or other data shall not prevent the Authority Having Jurisdiction from thereafter requiring the correction of errors in ~~said plans~~ the construction documents, specifications, and other data or from preventing building operations being carried on thereunder where in violation of this code or of any other applicable law ~~ordinances of this jurisdiction~~. Where a Texas license is not required to obtain a mechanical permit or complete the proposed mechanical work, Section 105.4 of the *Building Code* shall apply. Where a Texas license is required to perform specific work, a permit shall be valid only for work performed under the licensed mechanical contractor or licensed HVAC contractor named on the application. A name change on an application or an existing permit must be obtained if the licensed mechanical contractor or licensed HVAC contractor listed on the application or existing permit is no longer responsible for the work performed. Provided that a refund has not been issued, the property owner has not changed, and written authority to amend the permit to designate a different licensed mechanical contractor or licensed HVAC contractor has been provided by the property owner to the building official, the building official shall issue an amended permit. A name change fee and an administrative fee shall be charged as provided in Section 118.1 of the *Building Code* and the city fee schedule.	No change to Houston amendment.

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provided in Section 118.1 of the *Building Code* and the city fee schedule. In the case of the death or dissolution of the original property owner or licensed mechanical contractor or licensed HVAC contractor, pursuant to a timely name change request within 45 calendar days after such death or dissolution, the permit will be transferred to the new property owner or licensed mechanical contractor or licensed HVAC contractor at no fee except for the administrative fee established in Section 118.1.1. of the *Building Code* and the city fee schedule. A property owner, licensed mechanical contractor or licensed HVAC contractor requiring a re-permit who fails to re-permit any applicable work within the time frames established by this code shall be subject to permit fees established in Section 118 of the *Building Code* and the city fee schedule based on the scope of work for all remaining construction and uninspected work.		In the case of the death or dissolution of the original property owner or licensed mechanical contractor or licensed HVAC contractor, pursuant to a timely name change request within 45 calendar days after such death or dissolution, the permit will be transferred to the new property owner or licensed mechanical contractor or licensed HVAC contractor at no fee except for the administrative fee established in Section 118.1.1. of the *Building Code* and the city fee schedule. A property owner, licensed mechanical contractor or licensed HVAC contractor requiring a re-permit who fails to re-permit any applicable work within the time frames established by this code shall be subject to permit fees established in Section 118 of the *Building Code* and the city fee schedule based on the scope of work for all remaining construction and uninspected work.	
104.4.3 Expiration. ~~A~~ Every permit issued by the Authority Having Jurisdiction under the provisions of this code shall become inactive unless ~~expire by limitation and become null and void where~~ the work authorized by such permit ~~is not~~ has commenced and been inspected by a city inspector within 180 days after its issuance, or if ~~from the date of such permit, or where~~ the work authorized by such permit is suspended or abandoned ~~at a time after the work is commenced~~ for a period of 180 days after the time the work was commenced. ~~Before such work is recommenced, a new permit shall first be obtained to do so, and the fee therefore shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded 1 year.~~ If work has not commenced under a permit within two years after the date of issuance or is suspended or abandoned at any time for a period of two years, the permit shall expire and become null and void. To recommence work under an expired permit, the permit holder shall pay the full applicable permit fee and submit plans that comply with this code for the previously uninspected portion of the work. **Exception:** For the purpose of issuing a certificate of occupancy or certificate of compliance, the building official may, upon request, reactivate a permit and perform a final inspection of work.	N/A	**104.4.3 Expiration.** ~~A~~ Every permit issued by the Authority Having Jurisdiction under the provisions of this code shall become inactive unless ~~expire by limitation and become null and void where~~ the work authorized by such permit ~~is not~~ has commenced and been inspected by a city inspector within 180 days after its issuance, or if ~~from the date of such permit, or where~~ the work authorized by such permit is suspended or abandoned ~~at a time after the work is commenced~~ for a period of 180 days after the time the work was commenced. ~~Before such work is recommenced, a new permit shall first be obtained to do so, and the fee therefore shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded 1 year.~~ If work has not commenced under a permit within two years after the date of issuance or is suspended or abandoned at any time for a period of two years, the permit shall expire and become null and void. To recommence work under an expired permit, the permit holder shall pay the full applicable permit fee and submit plans that comply with this code for the previously uninspected portion of the work. **Exception:** For the purpose of issuing a certificate of occupancy or certificate of compliance, the building official may, upon request, reactivate a permit and perform a final inspection of work.	No change to Houston amendment.
104.4.4 Extension. ~~A permittee holding an unexpired permit shall be permitted to apply for an extension of the time within which work shall be permitted to commence under that permit where the permittee is unable to commence work within the time required by this section. The Authority Having Jurisdiction shall be permitted to extend the time for action by the permittee for a period not exceeding 180 days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once. In order to renew action on a permit after expiration, the permittee shall pay~~	N/A	**104.4.4 Extension.** ~~A permittee holding an unexpired permit shall be permitted to apply for an extension of the time within which work shall be permitted to commence under that permit where the permittee is unable to commence work within the time required by this section. The Authority Having Jurisdiction shall be permitted to extend the time for action by the permittee for a period not exceeding 180 days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once. In order to renew action on a permit after expiration, the permittee shall pay~~	No change to Houston amendment.

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~~a new full permit fee.~~ The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The permit holder shall request the extension in writing and demonstrate justifiable cause.		~~a new full permit fee.~~ The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The permit holder shall request the extension in writing and demonstrate justifiable cause.	
104.4.5 Suspension or Revocation. ~~The~~ After notice is provided of a right to a hearing pursuant to Section 103.5, the Authority Having Jurisdiction shall be permitted to, in writing, suspend or revoke a permit issued under the provisions of this code where the permit is issued in error, on the basis of incorrect information supplied, or in violation of other ordinance or regulation of the jurisdiction.	N/A	**104.4.5 Suspension or Revocation.** ~~The~~ After notice is provided of a right to a hearing pursuant to Section 103.5, the Authority Having Jurisdiction shall be permitted to, in writing, suspend or revoke a permit issued under the provisions of this code where the permit is issued in error or on the basis of incorrect information supplied, or in violation of other ordinance or regulation of the jurisdiction.	No change to Houston amendment.
104.5 Fees. Fees shall be assessed in accordance with the provisions of this section and as set forth in the city fee schedule~~, Table 104.5. The fees are to be determined and adopted by this jurisdiction~~.	N/A	**104.5 Fees.** Fees shall be assessed in accordance with the provisions of this section and as set forth in the city fee schedule~~, Table 104.5. The fees are to be determined and adopted by this jurisdiction~~.	No change to Houston amendment.
104.5.2 Investigation Fees. An investigation fee, in addition to the permit fee, shall be collected whether or not a permit is then or subsequently issued. The investigation fee shall be equal to the amount of the permit fee that is required by this code if a permit were to be issued, subject to applicable minimum investigation fees stated in the city fee schedule. The payment of such investigation fee shall not exempt a person from compliance with other provisions of this code, nor from a penalty prescribed by law.	N/A	**104.5.2 Investigation Fees.** An investigation fee, in addition to the permit fee, shall be collected whether or not a permit is then or subsequently issued. The investigation fee shall be equal to the amount of the permit fee that is required by this code if a permit were to be issued, subject to applicable minimum investigation fees stated in the city fee schedule. The payment of such investigation fee shall not exempt a person from compliance with other provisions of this code, nor from a penalty prescribed by law.	No change to Houston amendment.
104.5.3 Fee Refunds. ~~The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee as follows:~~ ~~(1) The amount paid hereunder that was erroneously paid or collected.~~ ~~(2) Refunding of not more than a percentage, as determined by this jurisdiction where no work has been done under a permit issued in accordance with this code.~~ The building official may authorize the refund of any fee paid hereunder that was erroneously paid or collected due to an error by a city employee. This provision shall not be applicable if the error occurred because of incorrect information provided by the applicant. The building official may authorize a refund of not more than 90 percent of the amount in excess of the minimum permit fee paid when no work has been done under a permit issued in accordance with this code. If work has been done under the permit, no refund shall be authorized. The originally paid administrative fee and the plan review portion of the permit fee shall be nonrefundable. The building official ~~Authority Having Jurisdiction~~ shall not authorize a refund~~ing~~ of any fee paid except upon written application filed by the original permit~~tee~~ holder not ~~to exceed~~ later than 180 calendar days after the date of fee payment.	N/A	**104.5.3 Fee Refunds.** ~~The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee as follows:~~ ~~(1) The amount paid hereunder that was erroneously paid or collected.~~ ~~(2) Refunding of not more than a percentage, as determined by this jurisdiction where no work has been done under a permit issued in accordance with this code.~~ The building official may authorize the refund of any fee paid hereunder that was erroneously paid or collected due to an error by a city employee. This provision shall not be applicable if the error occurred because of incorrect information provided by the applicant. The building official may authorize a refund of not more than 90 percent of the amount in excess of the minimum permit fee paid when no work has been done under a permit issued in accordance with this code. If work has been done under the permit, no refund shall be authorized. The originally paid administrative fee and the plan review portion of the permit fee shall be nonrefundable. The building official ~~Authority Having Jurisdiction~~ shall not authorize a refund~~ing~~ of any fee paid except upon written application filed by the original permit~~ee~~ holder not to exceed later than 180 calendar days after the date of fee payment.	No change to Houston amendment.

104.5.4 Annual Fee Increase. Notwithstanding any maximum fee established pursuant to the *Construction Code*, the fees in this volume of the *Construction Code*, as adjusted according to this section, shall be automatically increased on the first day of each subsequent calendar year as provided in Section 1-13 of the *City Code*.	N/A	**104.5.4 Annual Fee Increase.** Notwithstanding any maximum fee established pursuant to the *Construction Code*, the fees in this volume of the *Construction Code*, as adjusted according to this section, shall be automatically increased on the first day of each subsequent calendar year as provided in Section 1-13 of the *City Code*.	No change to Houston amendment.
{**EDITORIAL NOTE:** DELETE TABLE 104.5 IN ITS ENTIRETY.}	N/A	[**EDITORIAL NOTE:** DELETE TABLE 104.5 IN ITS ENTIRETY.]	No change to Houston amendment.
105.2.6 Reinspections. The building official may assess a ~~A~~ reinspection fee ~~shall be permitted to be assessed~~ for each inspection or reinspection when an inspector arrives to perform the inspection and finds the ~~where such~~ portion of work for which inspection is called is not complete or ~~where required~~ when corrections called for in a previous inspection report have not been made. This ~~provision~~ section shall not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply ~~be in accordance~~ with the requirements of this code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection. The building official may assess a reinspection fee ~~Reinspection fees shall be permitted to be assessed where~~ when the inspection record card is not posted or otherwise available on the work site, when the approved plans are not readily available to the inspector, for failure to provide access on the date for which the inspection is requested, or for deviating from plans requiring the approval of the Authority Having Jurisdiction. To obtain reinspection, the applicant shall ~~file an application therefore in writing upon a form furnished for that purpose~~ make a request and pay the reinspection fee in accordance with ~~Table 104.5~~ Section 118 of the *Building Code* and the city fee schedule. In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.	N/A	**105.2.6 Reinspections.** The building official may assess a ~~A~~ reinspection fee ~~shall be permitted to be assessed~~ for each inspection or reinspection when an inspector arrives to perform the inspection and finds the ~~where such~~ portion of work for which inspection is called is not complete or ~~where required~~ when corrections called for in a previous inspection report have not been made. This ~~provision~~ section shall not be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply ~~be in accordance~~ with the requirements of this code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection. The building official may assess a reinspection fee ~~Reinspection fees shall be permitted to be assessed where~~ when the inspection record card is not posted or otherwise available on the work site, when the approved plans are not readily available to the inspector, for failure to provide access on the date for which the inspection is requested, or for deviating from plans requiring the approval of the Authority Having Jurisdiction. To obtain reinspection, the applicant shall ~~file an application therefore in writing upon a form furnished for that purpose~~ make a request and pay the reinspection fee in accordance with ~~Table 104.5~~ Section 118 of the *Building Code* and the city fee schedule. In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.	No change to Houston amendment.
105.4.1 Temporary Operation Inspection. For inspection of a boiler or a heating, ventilation, refrigeration, or air-conditioning system to be used on a temporary basis, a licensed air-conditioning contractor shall request the inspection and pay the fee stated for this provision in the city fee schedule. If the system is not approved for temporary operation on the first inspection, the reinspection fee will be charged for each subsequent inspection for such purpose. No permit for temporary use shall be valid for a period longer than 30 calendar days. The Authority Having Jurisdiction is authorized to reissue a temporary permit upon payment of the fees stated for this provision in the city fee schedule for each successive period of not more than 30 days.	N/A	**105.4.1 Temporary Operation Inspection.** For inspection of a boiler or a heating, ventilation, refrigeration, or air-conditioning system to be used on a temporary basis, a licensed air-conditioning contractor shall request the inspection and pay the fee stated for this provision in the city fee schedule. If the system is not approved for temporary operation on the first inspection, the reinspection fee will be charged for each subsequent inspection for such purpose. No permit for temporary use shall be valid for a period longer than 30 calendar days. The Authority Having Jurisdiction is authorized to reissue a temporary permit upon payment of the fees stated for this provision in the city fee schedule for each successive period of not more than 30 days.	No change to Houston amendment.

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
106.3 Penalties. A person, firm, or corporation violating or failing to comply with a provision of this code shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punishable by the following penalties: where no specific penalty is otherwise provided in this code, a fine~~,~~ of not less than $500.00 and not more than $2,000.00; imprisonment~~,~~; or both set forth by the governing laws of the jurisdiction. Each separate day, or a portion thereof, during which a violation of this code occurs or continues, shall be deemed to constitute a separate offense. Where any conduct in violation of this code also constitutes a violation of state penal law, the offense shall be punishable as provided in the applicable state law. In prosecutions under this code, the various provisions hereof that are designated as an "exception" or "exceptions" shall not be treated as exceptions within the meaning of Section 2.02 of the *Texas Penal Code*, and instead, they shall constitute defenses to prosecution within the meaning of Section 2.03 of the *Texas Penal Code*.	N/A	**106.3 Penalties.** A person, firm, or corporation violating or failing to comply with a provision of this code shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punishable by the following penalties: where no specific penalty is otherwise provided in this code, a fine~~,~~ of not less than $500.00 and not more than $2,000.00; imprisonment~~,~~; or both set forth by the governing laws of the jurisdiction. Each separate day, or a portion thereof, during which a violation of this code occurs or continues, shall be deemed to constitute a separate offense. Where any conduct in violation of this code also constitutes a violation of state penal law, the offense shall be punishable as provided in the applicable state law. In prosecutions under this code, the various provisions hereof that are designated as an "exception" or "exceptions" shall not be treated as exceptions within the meaning of Section 2.02 of the *Texas Penal Code*, and instead, they shall constitute defenses to prosecution within the meaning of Section 2.03 of the *Texas Penal Code*.	No change to Houston amendment.
106.4 Stop Work Orders. Where work is being done contrary to the provisions of this code, the Authority Having Jurisdiction shall be permitted to order the work stopped by notice in writing served on persons engaged in the doing or causing such work to be done, and such persons shall forthwith stop work until authorized by the Authority Having Jurisdiction to proceed with the work. At the time a stop work order is issued, the person performing the work and the permit holder shall be given notice of a right to a hearing on the matter pursuant to Section 103.5. On written request from the permit holder, such a hearing shall be held within three business days from the issuance of the stop work order unless the permit holder or person who was doing the work requests an extension of time. Any stop work order that has been issued shall remain in effect pending any hearing that has been requested unless the stop work order is withdrawn by the Authority Having Jurisdiction.	N/A	**106.4 Stop Work Orders.** Where work is being done contrary to the provisions of this code, the Authority Having Jurisdiction shall be permitted to order the work stopped by notice in writing served on persons engaged in the doing or causing such work to be done, and such persons shall forthwith stop work until authorized by the Authority Having Jurisdiction to proceed with the work. At the time a stop work order is issued, the person performing the work and the permit holder shall be given notice of a right to a hearing on the matter pursuant to Section 103.5. On written request from the permit holder, such a hearing shall be held within three business days from the issuance of the stop work order unless the permit holder or person who was doing the work requests an extension of time. Any stop work order that has been issued shall remain in effect pending any hearing that has been requested unless the stop work order is withdrawn by the Authority Having Jurisdiction.	No change to Houston amendment.
106.5 Authority to Disconnect Utilities in Emergencies. The Authority Having Jurisdiction shall have the authority to disconnect a mechanical system to a building, structure, or equipment regulated by this code in case of emergency where necessary to eliminate an immediate hazard to life or property. The Authority Having Jurisdiction shall, wherever possible, notify the serving utility, the owner, and the occupant of the building, structure, or premises of the decision to disconnect prior to taking such action, and shall notify such serving utility, owner, and occupant of the building, structure, or premises in writing of such disconnection immediately thereafter. The notice shall also inform the owner and the occupant of the building (or the user if the mechanical equipment is not within a building) of a right to a hearing on the matter pursuant to Section 103.5. On request, a hearing shall be conducted within three business days unless the owner or the owners authorized agent requests an extension of time.	N/A	**106.5 Authority to Disconnect Utilities in Emergencies.** The Authority Having Jurisdiction shall have the authority to disconnect a mechanical system to a building, structure, or equipment regulated by this code in case of emergency where necessary to eliminate an immediate hazard to life or property. The Authority Having Jurisdiction shall, wherever possible, notify the serving utility, the owner, and the occupant of the building, structure, or premises of the decision to disconnect prior to taking such action, and shall notify such serving utility, owner, and occupant of the building, structure, or premises in writing of such disconnection immediately thereafter. The notice shall also inform the owner and the occupant of the building (or the user if the mechanical equipment is not within a building) of a right to a hearing on the matter pursuant to Section 103.5. On request, a hearing shall be conducted within three business days unless the owner or the owners authorized agent requests an extension of time.	No change to Houston amendment.

2021 Uniform Mechanical Code – Code Analysis

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
COLOR CODE INDEX: Turquoise = NEW or Modified Text by IAPMO in 2021; Text Underlined = COH Amendment added (NEW); Grey Text = Previous COH Amendment Brought Forward to 2021; ~~Yellow Strikethrough~~ = Text Deleted from the Code by COH; Green Text = NEW or Modified Text by COH in 2021; Magenta = New or Modified Text by IAPMO in 2018			
106.6 Authority to Condemn. Where the Authority Having Jurisdiction ascertains that a mechanical system or portion thereof, regulated by this code, has become hazardous to life, health, or property, or has become insanitary, the Authority Having Jurisdiction shall order in writing that such mechanical system either be removed or placed in a safe or sanitary condition. The order shall specify a reasonable time limit for compliance of not less than three days from the date of the order's issuance and shall inform the owner and the occupant of the right to a hearing on the matter pursuant to Section 103.5. No person shall use or continue using~~maintain~~ a defective mechanical system after receiving such notice. Where such mechanical system is to be disconnected, written notice shall be given to the owner, or the occupant of the building as specified by Section 106.5. In cases of immediate danger to life or property, such disconnection shall be permitted to be made immediately without such notice.	N/A	**106.6 Authority to Condemn.** Where the Authority Having Jurisdiction ascertains that a mechanical system or portion thereof, regulated by this code, has become hazardous to life, health, or property, or has become insanitary, the Authority Having Jurisdiction shall order in writing that such mechanical system either be removed or placed in a safe or sanitary condition. The order shall fix a reasonable time limit for compliance of not less than three days from the date of the order's issuance and shall inform the owner and the occupant of the right to a hearing on the matter pursuant to Section 103.5. No person shall use or continue using ~~maintain~~ a defective mechanical system after receiving such notice. Where such mechanical system is to be disconnected, written notice shall be given to the owner, or the occupant of the building as specified by Section 106.5. In cases of immediate danger to life or property, such disconnection shall be permitted to be made immediately without such notice.	No change to Houston amendment.
107.0 ~~Board of Appeals~~ Boards and Licenses. **107.1 General.** ~~In order to hear and decide appeals of orders, decisions, or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, there shall be and is hereby created a Board of Appeals consisting of members who are qualified by experience and training to pass upon matters pertaining to mechanical system design, construction, and maintenance and the public health aspects of mechanical systems and who are not employees of the jurisdiction. The Authority Having Jurisdiction shall be an ex-officio member and shall act as secretary to said board but shall have no vote upon a matter before the board. The Board of Appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render decisions and findings in writing to the appellant with a duplicate copy to the Authority Having Jurisdiction.~~ The Mechanical Code Review Board and the Boiler Code Review and Licensing Board shall hear and decide appeals of orders, decisions or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, as applicable. (See Sections 110 and 111.)	N/A	**107.0 ~~Board of Appeals~~ Boards and Licenses.** **107.1 General.** ~~In order to hear and decide appeals of orders, decisions, or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, there shall be and is hereby created a Board of Appeals consisting of members who are qualified by experience and training to pass upon matters pertaining to mechanical system design, construction, and maintenance and the public health aspects of mechanical systems and who are not employees of the jurisdiction. The Authority Having Jurisdiction shall be an ex-officio member and shall act as secretary to said board but shall have no vote upon a matter before the board. The Board of Appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render decisions and findings in writing to the appellant with a duplicate copy to the Authority Having Jurisdiction.~~ The Mechanical Code Review Board and the Boiler Code Review and Licensing Board shall hear and decide appeals of orders, decisions or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, as applicable. (See Sections 110 and 111.)	No change to Houston amendment.
107.2 Limitations of Authority. The ~~Board of Appeals~~ aforesaid boards shall have no authority relative to interpretation of the administrative provisions of this code, which shall be the purview of the General Appeals Board (see Section 113 of the *Building Code*), unless otherwise specified, nor shall the aforesaid boards be empowered to waive requirements of this code.	N/A	**107.2 Limitations of Authority.** The ~~Board of Appeals~~ aforesaid boards shall have no authority relative to interpretation of the administrative provisions of this code, which shall be the purview of the General Appeals Board (see Section 113 of the *Building Code*), unless otherwise specified, nor shall the aforesaid boards be empowered to waive requirements of this code.	No change to Houston amendment.

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
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108.0 Emergency Work. **108.1 General.** Notwithstanding any requirement in this code or in the *Construction Code* that requires the issuance of a permit under this code prior to commencing work or that imposes an additional fee for work commenced without a permit being first obtained, a permit or additional fee is not required to commence work if: **(1)** The work involves the emergency repair or replacement of an existing air-conditioning, heating, ventilation or refrigeration system; **(2)** The work needs to be commenced immediately in order to protect property or to preserve the health of persons; **(3)** Notice is given to the Authority Having Jurisdiction by mail, telephone, email, fax or other approved method when the work was commenced; and, **(4)** A permit is then obtained within 48-hours as provided in Subsection 108.2. The Authority Having Jurisdiction shall promulgate regulations and forms as required to administer this section.	N/A	**108.0 Emergency Work.** **108.1 General.** Notwithstanding any requirement in this code or in the *Construction Code* that requires the issuance of a permit under this code prior to commencing work or that imposes an additional fee for work commenced without a permit being first obtained, a permit or additional fee is not required to commence work if: **(1)** The work involves the emergency repair or replacement of an existing air-conditioning, heating, ventilation or refrigeration system; **(2)** The work needs to be commenced immediately in order to protect property or to preserve the health of persons; **(3)** Notice is given to the Authority Having Jurisdiction by mail, telephone, email, fax or other approved method when the work was commenced; and, **(4)** A permit is then obtained within 48-hours as provided in Subsection 108.2. The Authority Having Jurisdiction shall promulgate regulations and forms as required to administer this section.	No change to Houston amendment.
108.2 Time Limit for Obtaining Permit. The licensed contractor, in order to avoid penalties for failure to obtain a permit prior to commencing such emergency work, in addition to complying with Section 108.1, must also apply for a permit for the emergency work within 48 hours after 8:00 a.m. of the first day that the city permit office is opened for business after the date on which the contractor commences such repair or replacement.	N/A	**108.2 Time Limit for Obtaining Permit.** The licensed contractor, in order to avoid penalties for failure to obtain a permit prior to commencing such emergency work, in addition to complying with Section 108.1, must also apply for a permit for the emergency work within 48 hours after 8:00 a.m. of the first day that the city permit office is opened for business after the date on which the contractor commences such repair or replacement.	No change to Houston amendment.
108.3 Operation of System. If the repair or replacement is completed prior to the time that the licensed air-conditioning contractor is required to apply for a permit under these provisions, at the contractor's sole risk and responsibility for any and all injuries and damages that might result therefrom, the contractor may place the system or equipment in operation, provided that the contractor then remains at the job site and checks the operation for a period of at least 15 minutes before leaving the premises. The contractor shall instruct the occupant of the premises or the person in charge of the premises regarding the manner in which the system or equipment may be immediately shut off in case of malfunction in its operation and shall provide the aforesaid occupant or person with a telephone number(s), where the licensed contractor can be reached in case of an emergency resulting from operation of the system or equipment prior to inspection by the jurisdiction.	N/A	**108.3 Operation of System.** If the repair or replacement is completed prior to the time that the licensed air-conditioning contractor is required to apply for a permit under these provisions, at the contractor's sole risk and responsibility for any and all injuries and damages that might result therefrom, the contractor may place the system or equipment in operation, provided that the contractor then remains at the job site and checks the operation for a period of at least 15 minutes before leaving the premises. The contractor shall instruct the occupant of the premises or the person in charge of the premises regarding the manner in which the system or equipment may be immediately shut off in case of malfunction in its operation and shall provide the aforesaid occupant or person with a telephone number(s), where the licensed contractor can be reached in case of an emergency resulting from operation of the system or equipment prior to inspection by the jurisdiction.	No change to Houston amendment.
108.4 Emergency Appeal. In the event of a dispute between the jurisdiction's inspector and the licensed air-conditioning and refrigeration contractor doing the job as to the existence of the emergency requiring the commencing of the job without a permit, the dispute shall be first considered by the Authority Having Jurisdiction. The contractor may appeal the decision of the Authority Having Jurisdiction to the Mechanical Code Review Board or Boiler Code Licensing and Review Board, as applicable, for its consideration and decision. In reviewing the decision of the Authority Having Jurisdiction, the Board shall base its decision on the evidence and testimony presented by both parties.	N/A	**108.4 Emergency Appeal.** In the event of a dispute between the jurisdiction's inspector and the licensed air-conditioning and refrigeration contractor doing the job as to the existence of the emergency requiring the commencing of the job without a permit, the dispute shall be first considered by the Authority Having Jurisdiction. The contractor may appeal the decision of the Authority Having Jurisdiction to the Mechanical Code Review Board or Boiler Code Licensing and Review Board, as applicable, for its consideration and decision. In reviewing the decision of the Authority Having Jurisdiction, the Board shall base its decision on the evidence and testimony presented by both parties.	No change to Houston amendment.

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2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
109.0 Temporary Operation Permit. **109.1 General.** Any heating, ventilating, refrigerating or air-conditioning system being altered or installed by authority of a permit issued under the provisions of this code may be operated for limited periods of time only for testing purposes prior to passing final inspection, on the following conditions: **(1)** The licensed air-conditioning contractor in whose name said permit is issued shall request that the Authority Having Jurisdiction inspect the system. **(2)** If, upon inspection, the system is approved for operation for testing purposes, the Authority Having Jurisdiction shall indicate the length of time that the system may be operated for testing purposes, based upon the size and type of system and the extent of the installation or alteration involved. **(3)** Upon expiration of the temporary operation permit for testing purposes, the system shall be given a final inspection. If the system is not approved, a reinspection fee will be charged on all subsequent inspections until the system is approved as complying with the requirements of the code, or is uninstalled.	N/A	**109.0 Temporary Operation Permit.** **109.1 General.** Any heating, ventilating, refrigerating or air-conditioning system being altered or installed by authority of a permit issued under the provisions of this code may be operated for limited periods of time only for testing purposes prior to passing final inspection, on the following conditions: **(1)** The licensed air-conditioning contractor in whose name said permit is issued shall request that the Authority Having Jurisdiction inspect the system. **(2)** If, upon inspection, the system is approved for operation for testing purposes, the Authority Having Jurisdiction shall indicate the length of time that the system may be operated for testing purposes, based upon the size and type of system and the extent of the installation or alteration involved. **(3)** Upon expiration of the temporary operation permit for testing purposes, the system shall be given a final inspection. If the system is not approved, a reinspection fee will be charged on all subsequent inspections until the system is approved as complying with the requirements of the code, or is uninstalled.	No change to Houston amendment.
109.2 Extension of Time. The time period permitted for operating the system for testing purposes only may be extended by the Authority Having Jurisdiction when necessary to complete the testing of the system to determine that it is operating safely. The extension of such time period shall be noted in writing on the permit, and the system shall still be subject to Section 109.1(3). For the temporary operation permit fee, see the city fee schedule.	N/A	**109.2 Extension of Time.** The time period permitted for operating the system for testing purposes only may be extended by the Authority Having Jurisdiction when necessary to complete the testing of the system to determine that it is operating safely. The extension of such time period shall be noted in writing on the permit, and the system shall still be subject to Section 109.1(3). For the temporary operation permit fee, see the city fee schedule.	No change to Houston amendment.

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110.0 Mechanical Code Review Board. **110.1 Creation of Board.** There is hereby created a Mechanical Code Review Board, hereinafter in this section called the "board," consisting of seven members. Each member of the board except the members in Position Nos. 1 and 2 shall be appointed by the mayor and confirmed by the city council. The mayor shall designate a member to be chairperson. The contractor members filling Position Nos. 5 and 6 shall have been actively engaged in the air-conditioning business in the jurisdiction for at least five years prior to the date of their appointment. The positions on said board shall be filled as follows: **Position No. 1** shall be filled by the Authority Having Jurisdiction. **Position No. 2** shall be filled by the fire marshal of the jurisdiction. **Position No. 3 and 4** shall each be filled by a registered professional engineer licensed by the State of Texas who is actively engage in mechanical engineering. **Position No. 5** shall be filled by a duly licensed Class A air-conditioning and refrigeration contractor licensed under the Texas Air Conditioning and Refrigeration Contractor License Law. **Position No. 6** shall be filled by a duly licensed Class B air-conditioning and refrigeration contractor licensed under the Texas Air Conditioning and Refrigeration Contractor License Law. **Position No. 7** shall be filled by a representative of the public generally.	N/A	**110.0 Mechanical Code Review Board.** **110.1 Creation of Board.** There is hereby created a Mechanical Code Review Board, hereinafter in this section called the "board," consisting of seven members. Each member of the board except the members in Position Nos. 1 and 2 shall be appointed by the mayor and confirmed by the city council. The mayor shall designate a member to be chairperson. The contractor members filling Position Nos. 5 and 6 shall have been actively engaged in the air-conditioning business in the jurisdiction for at least five years prior to the date of their appointment. The positions on said board shall be filled as follows: **Position No. 1** shall be filled by the Authority Having Jurisdiction. **Position No. 2** shall be filled by the fire marshal of the jurisdiction. **Position No. 3 and 4** shall each be filled by a registered professional engineer licensed by the State of Texas who is actively engage in mechanical engineering. **Position No. 5** shall be filled by a duly licensed Class A air-conditioning and refrigeration contractor licensed under the Texas Air Conditioning and Refrigeration Contractor License Law. **Position No. 6** shall be filled by a duly licensed Class B air-conditioning and refrigeration contractor licensed under the Texas Air Conditioning and Refrigeration Contractor License Law. **Position No. 7** shall be filled by a representative of the public generally.	No change to Houston amendment.
The Authority Having Jurisdiction and the fire marshal each, from time to time, may designate in writing a person under their supervision to act in their place as their duly authorized representative. The representative shall enjoy all rights and privileges of the position. A copy of such a designation, specifying the dates any such person shall act as representative of the Authority Having Jurisdiction or of the fire marshal, shall be filed with the minutes of the board. The terms of office for the appointees to Position Nos. 3, 5 and 7 on the board will expire on the second day of January of odd-numbered years. The terms of office for the appointees to Position Nos. 4 and 6 will expire on the second day of January of even-numbered years. However, each member shall continue in office until a successor has been appointed and qualified. Those members of the board in Position Nos. 1 and 2 shall serve ex officio. The amendment of this code section shall not terminate the term of office of any person currently serving on the board. Any person who is currently serving on the board shall continue to serve in the position for which he was appointed and confirmed until a successor is appointed and qualified. In addition to other qualifications hereinabove required, each member of the board shall be a citizen of the United States. All appointed members of the board shall be selected on the basis of their technical and professional qualifications, except that the appointee to Position No. 7 is not required to have the technical		The Authority Having Jurisdiction and the fire marshal each, from time to time, may designate in writing a person under their supervision to act in their place as their duly authorized representative. The representative shall enjoy all rights and privileges of the position. A copy of such a designation, specifying the dates any such person shall act as representative of the Authority Having Jurisdiction or of the fire marshal, shall be filed with the minutes of the board. The terms of office for the appointees to Position Nos. 3, 5 and 7 on the board will expire on the second day of January of odd-numbered years. The terms of office for the appointees to Position Nos. 4 and 6 will expire on the second day of January of even-numbered years. However, each member shall continue in office until a successor has been appointed and qualified. Those members of the board in Position Nos. 1 and 2 shall serve ex officio. The amendment of this code section shall not terminate the term of office of any person currently serving on the board. Any person who is currently serving on the board shall continue to serve in the position for which he was appointed and confirmed until a successor is appointed and qualified. In addition to other qualifications hereinabove required, each member of the board shall be a citizen of the United States. All appointed members of the board shall be selected on the basis of their technical and professional qualifications, except that the appointee to Position No. 7 is not required to have the technical and professional qualifications required for	

and professional qualifications required for other members of the board. Each member of the board shall be subject to removal by the mayor. Four members of the board at any meeting shall constitute a quorum for transaction of all business of the board. A majority vote of the members present at any meeting at which a quorum is present shall prevail. Whenever any position on the board becomes vacant by reason of death, resignation or removal, said vacancy shall be filled for the unexpired term of the member being replaced. Should a vacancy occur on the board, the mayor shall appoint, with the approval of the city council, another qualified person to serve the unexpired term of the vacancy. The board shall hold regular annual meetings in Houston, Texas, the exact time and place to be designated by the chairperson of the board, who is also authorized to call special meetings when deemed necessary. The Authority Having Jurisdiction, or a duly authorized representative, shall act as secretary of the board. Each member of the board shall receive $50.00 for each meeting the member attends (not to exceed three meetings in a calendar month) at which a quorum is present, provided, however, each member of the board who is an employee of the jurisdiction will be paid only for those meetings the member attends that are neither held during nor continue beyond the member's regular working hours. The secretary of the board shall keep the minutes of the board meetings and other business of the board, including correspondence received and sent by the board. The minutes of the board shall be public records available for inspection by the public at all reasonable times.		other members of the board. Each member of the board shall be subject to removal by the mayor. Four members of the board at any meeting shall constitute a quorum for transaction of all business of the board. A majority vote of the members present at any meeting at which a quorum is present shall prevail. Whenever any position on the board becomes vacant by reason of death, resignation or removal, said vacancy shall be filled for the unexpired term of the member being replaced. Should a vacancy occur on the board, the mayor shall appoint, with the approval of the city council, another qualified person to serve the unexpired term of the vacancy. The board shall hold regular annual meetings in Houston, Texas, the exact time and place to be designated by the chairperson of the board, who is also authorized to call special meetings when deemed necessary. The Authority Having Jurisdiction, or a duly authorized representative, shall act as secretary of the board. Each member of the board shall receive $50.00 for each meeting the member attends (not to exceed three meetings in a calendar month) at which a quorum is present, provided, however, each member of the board who is an employee of the jurisdiction will be paid only for those meetings the member attends that are neither held during nor continue beyond the member's regular working hours. The secretary of the board shall keep the minutes of the board meetings and other business of the board, including correspondence received and sent by the board. The minutes of the board shall be public records available for inspection by the public at all reasonable times.	
110.2 Duties. The board shall serve as the Board of Appeals for matters relating to the provisions of this code and shall serve in an advisory capacity to the Authority Having Jurisdiction in technical matters pertaining to provisions of this code. In addition, the board is hereby authorized to perform such other duties as specified in this division and to make recommendations to city council regarding the provisions of this code pertaining to or affecting air-conditioning, ventilation, or refrigeration. **Exception:** As provided by Section 111 of this code, matters within the jurisdiction of the Boiler Code Review and Licensing Board shall be heard by that board.	N/A	**110.2 Duties.** The board shall serve as the Board of Appeals for matters relating to the provisions of this code and shall serve in an advisory capacity to the Authority Having Jurisdiction in technical matters pertaining to provisions of this code. In addition, the board is hereby authorized to perform such other duties as specified in this division and to make recommendations to city council regarding the provisions of this code pertaining to or affecting air-conditioning, ventilation, or refrigeration. **Exception:** As provided by Section 111 of this code, matters within the jurisdiction of the Boiler Code Review and Licensing Board shall be heard by that board.	No change to Houston amendment.
110.3 Restriction on Participation in Certain Matters. No board member shall vote on any matter or participate as a board member in the discussion of any matter in which the member has a personal or financial interest other than as a member of a class or group, of which each member will be affected substantially to the same extent by the board's action or decision in the matter as will the other members of the class or group. (For restrictions on jurisdiction officials, see Chapter 171 of the *Texas Local Government Code*.)	N/A	**110.3 Restriction on Participation in Certain Matters.** No board member shall vote on any matter or participate as a board member in the discussion of any matter in which the member has a personal or financial interest other than as a member of a class or group, of which each member will be affected substantially to the same extent by the board's action or decision in the matter as will the other members of the class or group. (For restrictions on jurisdiction officials, see Chapter 171 of the *Texas Local Government Code*.)	No change to Houston amendment.
110.4 Approval of New Materials. A person, firm, or corporation (hereinafter called "person") desiring approval of any material, device, fixture, method of assemblage, installation, appurtenance, or appliance that is a part of or pertains to heating, air-conditioning, ventilation, refrigeration or heat-producing appliances or systems (hereinafter individually	N/A	**110.4 Approval of New Materials.** A person, firm, or corporation (hereinafter called "person") desiring approval of any material, device, fixture, method of assemblage, installation, appurtenance, or appliance that is a part of or pertains to heating, air-conditioning, ventilation, refrigeration or heat-producing appliances or systems (hereinafter individually	No change to Houston amendment.

and collectively referred to as "item") may submit the item to the Authority Having Jurisdiction for approval along with a written application containing such information as the Authority Having Jurisdiction may require for determination of approval under Section 302.2. If the Authority Having Jurisdiction denies a request for an approval, the person who made the request may appeal that decision by delivering a written notice of appeal to the secretary of the board within 10 days of receipt of the notice of the decision of the Authority Having Jurisdiction. Upon receipt of the notice of appeal, the board shall set the matter for hearing. The board may request any additional tests be conducted that it finds are necessary to determine whether the decision of the Authority Having Jurisdiction should be upheld or overturned. All such tests shall be at the expense of the person requesting the approval. The burden shall be on that person to show that the decision of the Authority Having Jurisdiction should be overturned. The decision of the board upholding or overturning the decision of the Authority Having Jurisdiction shall be set out in the minutes of the board. If the board overturns the decision of the Authority Having Jurisdiction, it shall set forth in its minutes any conditions or limitations to which the approval is made subject.		and collectively referred to as "item") may submit the item to the Authority Having Jurisdiction for approval along with a written application containing such information as the Authority Having Jurisdiction may require for determination of approval under Section 302.2. If the Authority Having Jurisdiction denies a request for an approval, the person who made the request may appeal that decision by delivering a written notice of appeal to the secretary of the board within 10 days of receipt of the notice of the decision of the Authority Having Jurisdiction. Upon receipt of the notice of appeal, the board shall set the matter for hearing. The board may request any additional tests be conducted that it finds are necessary to determine whether the decision of the Authority Having Jurisdiction should be upheld or overturned. All such tests shall be at the expense of the person requesting the approval. The burden shall be on that person to show that the decision of the Authority Having Jurisdiction should be overturned. The decision of the board upholding or overturning the decision of the Authority Having Jurisdiction shall be set out in the minutes of the board. If the board overturns the decision of the Authority Having Jurisdiction, it shall set forth in its minutes any conditions or limitations to which the approval is made subject.	
110.5 Appeals. Any owner, user, license applicant, license holder, or interested person who is affected and aggrieved by a decision of the board may appeal the board's decision to the city council, pursuant to Rule 12 of Section 2-2 of the *City Code*. Upon appeal to the city council from the board's decision, the board's secretary shall file with the city secretary a copy of the minutes of the board setting forth the board's decision and a copy of any minutes of the board reflecting any discussion or motions concerning the matter. Upon receipt of all materials required by the city secretary's Office, the city secretary shall set the matter for consideration. All orders or decisions of the Authority Having Jurisdiction shall be in writing and shall be and remain in full force and effect until reversed, suspended, cancelled or annulled by the board or the city council. The decision of the city council shall be final.	N/A	**110.5 Appeals.** Any owner, user, license applicant, license holder, or interested person who is affected and aggrieved by a decision of the board may appeal the board's decision to the city council, pursuant to Rule 12 of Section 2-2 of the *City Code*. Upon appeal to the city council from the board's decision, the board's secretary shall file with the city secretary a copy of the minutes of the board setting forth the board's decision and a copy of any minutes of the board reflecting any discussion or motions concerning the matter. Upon receipt of all materials required by the city secretary's Office, the city secretary shall set the matter for consideration. All orders or decisions of the Authority Having Jurisdiction shall be in writing and shall be and remain in full force and effect until reversed, suspended, cancelled or annulled by the board or the city council. The decision of the city council shall be final.	No change to Houston amendment.
110.6 License Required. Except as otherwise provided herein, a person who does not hold a current and applicable license as required by the Texas Air Conditioning and Refrigeration Contractor License Law shall not install, alter or repair any heating, ventilating, air-conditioning or refrigeration system, or any part thereof, or obtain any permit to do so. **Note:** The Texas Air Conditioning and Refrigeration Contractor Licensing Law, which is codified as Chapter 1302 of the *Texas Occupations Code*, includes certain exemptions from the requirement of obtaining a state license, which will be honored by this jurisdiction. These exemptions include: work performed by homeowners on their own homes, certain maintenance work by employees of the property owner or management company, certain work performed by employees of regulated electric and gas utility companies, and certain work performed by licensed professional engineers in connection with their business operations.	N/A	**110.6 License Required.** Except as otherwise provided herein, a person who does not hold a current and applicable license as required by the Texas Air Conditioning and Refrigeration Contractor License Law shall not install, alter or repair any heating, ventilating, air-conditioning or refrigeration system, or any part thereof, or obtain any permit to do so. **Note:** The Texas Air Conditioning and Refrigeration Contractor Licensing Law, which is codified as Chapter 1302 of the *Texas Occupations Code*, includes certain exemptions from the requirement of obtaining a state license, which will be honored by this jurisdiction. These exemptions include: work performed by homeowners on their own homes, certain maintenance work by employees of the property owner or management company, certain work performed by employees of regulated electric and gas utility companies, and certain work performed by licensed	No change to Houston amendment.

		professional engineers in connection with their business operations.	
110.7 State License Notification Requirement. Each person licensed under the Texas Air Conditioning and Refrigeration Contractor License Law shall notify and register his notification with the Authority Having Jurisdiction in a form and manner prescribed by the Authority Having Jurisdiction prior to performing any work pertaining to that license within the jurisdiction. The notification shall be registered and maintained on file within the jurisdiction offices of the Mechanical Inspections Section, Code Enforcement Branch, Houston Public Works. ~~The fee for initial notification registration shall be stated for this provision in the city fee schedule. A notification registration maintenance fee stated for this provision in the city fee schedule shall be paid annually thereafter as long as the notification registration is renewed.~~ Each notification registration shall expire on December 31 of each year. Additionally, a notification registration shall expire upon the registrant's failure to provide proof of current insurance coverage or proof of license renewal.	N/A	**110.7 State License Notification Requirement.** Each person licensed under the Texas Air Conditioning and Refrigeration Contractor License Law shall notify and register his notification with the Authority Having Jurisdiction in a form and manner prescribed by the Authority Having Jurisdiction prior to performing any work pertaining to that license within the jurisdiction. The notification shall be registered and maintained on file within the jurisdiction offices of the Mechanical Inspections Section, Code Enforcement Branch, Houston Public Works. Each notification registration shall expire on December 31 of each year. Additionally, a notification registration shall expire upon the registrant's failure to provide proof of current insurance coverage or proof of license renewal.	No change to Houston amendment.
110.8 Liability Insurance. Each person who is required to register shall, upon registration and continuously thereafter for as long as the registration is renewed, maintain proof of current liability insurance coverage in the amount and form specified in applicable state laws and regulations. The proof shall be in the form of a copy of the certificate furnished to the state and evidence that the carrier of the insurance will provide 10 days' notice to the Authority Having Jurisdiction in the event that the policy is reduced or terminated prior to the expiration date specified on the certificate.	N/A	**110.8 Liability Insurance.** Each person who is required to register shall, upon registration and continuously thereafter for as long as the registration is renewed, maintain proof of current liability insurance coverage in the amount and form specified in applicable state laws and regulations. The proof shall be in the form of a copy of the certificate furnished to the state and evidence that the carrier of the insurance will provide 10 days' notice to the Authority Having Jurisdiction in the event that the policy is reduced or terminated prior to the expiration date specified on the certificate.	No change to Houston amendment.
110.9 Violations. It shall be unlawful for any person, partnership, firm or corporation who is not licensed under the Texas Air Conditioning and Refrigeration Contractor License Law to display a sign or advertise in any other manner that such person, partnership, firm or corporation is authorized to engage in business as an air-conditioning and refrigeration contractor. It shall be unlawful for a licensed air-conditioning and refrigeration contactor to: (1) Permit a license to be used in any manner contrary to any of the provisions of this code; (2) Obtain a permit required under this code in another person's name or allow the use of his name by another person for the purpose of obtaining a permit when the licensed air-conditioning and refrigeration contractor does not intend to or does not, in fact, do or supervise the work authorized by the permit; or, (3) Take out permits for air-conditioning work to be done by a person, partnership, firm or corporation other than the person, firm, partnership, or corporation by whom the permittee is employed. Licensed air-conditioning and refrigeration contractors shall not be simultaneously employed by, or work for, more than one business entity for the purpose of obtaining permits under this	N/A	**110.9 Violations.** It shall be unlawful for any person, partnership, firm or corporation who is not licensed under the Texas Air Conditioning and Refrigeration Contractor License Law to display a sign or advertise in any other manner that such person, partnership, firm or corporation is authorized to engage in business as an air-conditioning and refrigeration contractor. It shall be unlawful for a licensed air-conditioning and refrigeration contactor to: (1) Permit a license to be used in any manner contrary to any of the provisions of this code; (2) Obtain a permit required under this code in another person's name or allow the use of his name by another person for the purpose of obtaining a permit when the licensed air-conditioning and refrigeration contractor does not intend to or does not, in fact, do or supervise the work authorized by the permit; or, (3) Take out permits for air-conditioning work to be done by a person, partnership, firm or corporation other than the person, firm, partnership, or corporation by whom the permittee is employed. Licensed air-conditioning and refrigeration contractors shall not be simultaneously employed by, or work for, more than one business entity for the purpose of obtaining permits under this	No change to Houston amendment.

code or for the purpose of doing or supervising work that can be done only by authority of a permit obtained under the provisions of this code.		code or for the purpose of doing or supervising work that can be done only by authority of a permit obtained under the provisions of this code.	
110.10 Identification of Vehicles and Sites. Each vehicle used in conjunction with air-conditioning and refrigeration contracting shall be marked as required by Title 16 *Texas Administration Code* Section 75.71(g). When an unlicensed subcontractor is at a job site not identified by a marked vehicle, the site shall be identified either by a temporary sign on the subcontractor's vehicle or on a sign visible and readable from the nearest public street containing the contractor's license number and company name.	N/A	**110.10 Identification of Vehicles and Sites.** Each vehicle used in conjunction with air-conditioning and refrigeration contracting shall be marked as required by Title 16 *Texas Administration Code* Section 75.71(g). When an unlicensed subcontractor is at a job site not identified by a marked vehicle, the site shall be identified either by a temporary sign on the subcontractor's vehicle or on a sign visible and readable from the nearest public street containing the contractor's license number and company name.	No change to Houston amendment.
110.11 Contractor Records. Each time that a licensed air-conditioning and refrigeration contractor or any employee thereof does any installation, replacement, or repair of any type on any air-conditioning, refrigeration, ventilation or heating system, or combination of such systems, the contractor shall make a record of the work. The contractor shall readily make available the records, upon request, for inspection and copying by the Authority Having Jurisdiction and the contractor must hold the records on file for at least two years. Before leaving the premises where the work is performed, the contractor shall deliver one copy of the record to the owner or the owner's representative. These records shall contain the following information: **(1)** Name and address of licensed contractor. **(2)** License number of licensed contractor. **(3)** Name of owner. **(4)** Date. **(5)** General nature of work performed. **(6)** Any other information required by applicable provisions of the Texas Air Conditioning and Refrigeration Contractor License Law and regulations issued thereunder.	N/A	**110.11 Contractor Records.** Each time that a licensed air-conditioning and refrigeration contractor or any employee thereof does any installation, replacement, or repair of any type on any air-conditioning, refrigeration, ventilation or heating system, or combination of such systems, the contractor shall make a record of the work. The contractor shall readily make available the records, upon request, for inspection and copying by the Authority Having Jurisdiction and the contractor must hold the records on file for at least two years. Before leaving the premises where the work is performed, the contractor shall deliver one copy of the record to the owner or the owner's representative. These records shall contain the following information: **(1)** Name and address of licensed contractor. **(2)** License number of licensed contractor. **(3)** Name of owner. **(4)** Date. **(5)** General nature of work performed. **(6)** Any other information required by applicable provisions of the Texas Air Conditioning and Refrigeration Contractor License Law and regulations issued thereunder.	No change to Houston amendment.

111.0 Boiler Code Review and Licensing Board. **111.1 Creation and Composition.** There is hereby created a Boiler Code Review and Licensing Board consisting of five members, hereinafter in this section called the "board." The members in Position Nos. 1 through 4 of the board shall be appointed by the mayor and confirmed by the city council. The mayor shall designate a member to be chairperson. Each of the five positions shall be filled as follows: **Position No. 1** shall be filled by a registered professional engineer licensed by the State of Texas who is actively engaged in the design of mechanical systems using boilers as a source of heat energy. **Position No. 2** shall be filled by an owner, partner, officer, or manager of a firm that is actively engaged in the manufacture, sale, repair or installation (or combination thereof) of boilers. **Position No. 3** shall be filled by a licensed stationary engineer who has held a first-grade license issued by the jurisdiction for not less than 10 years. **Position No. 4** shall be filled by a person who is an owner, partner, officer, or manager of a firm that is the user of a boiler. **Position No. 5** shall be filled by the Authority Having Jurisdiction. The Authority Having Jurisdiction, from time to time, may designate in writing a member of the jurisdiction's Boiler Inspection Section to act in his place as a duly authorized representative. The representative shall enjoy all rights and privileges of the position. A copy of the designation, specifying the dates such a person shall act as representative of the Authority Having Jurisdiction, shall be filed with the minutes of the board.	N/A	**111.0 Boiler Code Review and Licensing Board.** **111.1 Creation and Composition.** There is hereby created a Boiler Code Review and Licensing Board consisting of five members, hereinafter in this section called the "board." The members in Position Nos. 1 through 4 of the board shall be appointed by the mayor and confirmed by the city council. The mayor shall designate a member to be chairperson. Each of the five positions shall be filled as follows: **Position No. 1** shall be filled by a registered professional engineer licensed by the State of Texas who is actively engaged in the design of mechanical systems using boilers as a source of heat energy. **Position No. 2** shall be filled by an owner, partner, officer, or manager of a firm that is actively engaged in the manufacture, sale, repair or installation (or combination thereof) of boilers. **Position No. 3** shall be filled by a licensed stationary engineer who has held a first-grade license issued by the jurisdiction for not less than 10 years. **Position No. 4** shall be filled by a person who is an owner, partner, officer, or manager of a firm that is the user of a boiler. **Position No. 5** shall be filled by the Authority Having Jurisdiction. The Authority Having Jurisdiction, from time to time, may designate in writing a member of the jurisdiction's Boiler Inspection Section to act in his place as a duly authorized representative. The representative shall enjoy all rights and privileges of the position. A copy of the designation, specifying the dates such a person shall act as representative of the Authority Having Jurisdiction, shall be filed with the minutes of the board.	No change to Houston amendment.
111.2 Appointments, Removals, Etc. The terms of office for the appointees to Position Nos. 1 and 3 shall expire on the second day of January of odd-numbered years, and the terms of the appointees to Position Nos. 2 and 4 shall expire on the second day of January of even-numbered years. However, each member shall continue in office until a successor is appointed and qualified. The amendment of this code section shall not terminate the term of office of any person currently serving in any position of the board. Any appointed member who is currently serving on the board shall continue to serve in the position to which he was appointed and confirmed until a successor is appointed and confirmed by city council under this code. Each appointed member of the board shall be subject to removal at any time by the mayor. Each member of the board shall receive $50.00 for services for each meeting of the board the member attends at which a quorum is present, provided, however, each member of the board who is an employee of the jurisdiction shall be paid only for those meetings that are not held during the board member's regular working hours. Three members of the board present at any meeting shall constitute a quorum for the transaction of all business of the board. A majority vote of board members present at any meeting at which a quorum is present shall prevail. The board shall meet twice each month. The chairperson shall have the power to call a special session of the board when	N/A	**111.2 Appointments, Removals, Etc.** The terms of office for the appointees to Position Nos. 1 and 3 shall expire on the second day of January of odd-numbered years, and the terms of the appointees to Position Nos. 2 and 4 shall expire on the second day of January of even-numbered years. However, each member shall continue in office until a successor is appointed and qualified. The amendment of this code section shall not terminate the term of office of any person currently serving in any position of the board. Any appointed member who is currently serving on the board shall continue to serve in the position to which he was appointed and confirmed until a successor is appointed and confirmed by city council under this code. Each appointed member of the board shall be subject to removal at any time by the mayor. Each member of the board shall receive $50.00 for services for each meeting of the board the member attends at which a quorum is present, provided, however, each member of the board who is an employee of the jurisdiction shall be paid only for those meetings that are not held during the board member's regular working hours. Three members of the board present at any meeting shall constitute a quorum for the transaction of all business of the board. A majority vote of board members present at any meeting at which a quorum is present shall prevail. The board shall meet twice each month. The chairperson shall have the power to call a special session of the board when	No change to Houston amendment.

deemed necessary, but no more than three meetings may be held in any month. In the absence of the chairperson at any meeting, the board members present may, by majority vote, select a temporary chairperson for that meeting.		deemed necessary, but no more than three meetings may be held in any month. In the absence of the chairperson at any meeting, the board members present may, by majority vote, select a temporary chairperson for that meeting.	
111.3 Restriction on Participation in Certain Matters. No board member shall vote on any matter or participate as a board member in the discussion of any matter in which the member has a personal or financial interest other than as a member of a class or group, of which each member will be affected substantially to the same extent by the board's action or decision in the matter as will the other members of the class or group. (For restrictions on jurisdiction officials, see Chapter 171 of the *Texas Local Government Code*.)	N/A	**111.3 Restriction on Participation in Certain Matters.** No board member shall vote on any matter or participate as a board member in the discussion of any matter in which the member has a personal or financial interest other than as a member of a class or group, of which each member will be affected substantially to the same extent by the board's action or decision in the matter as will the other members of the class or group. (For restrictions on jurisdiction officials, see Chapter 171 of the *Texas Local Government Code*.)	No change to Houston amendment.
111.4 Records. The board shall keep or cause to be kept a written record of its meetings. The records shall be open to inspection by the public at all reasonable times.	N/A	**111.4 Records.** The board shall keep or cause to be kept a written record of its meetings. The records shall be open to inspection by the public at all reasonable times.	No change to Houston amendment.
111.5 Authority Having Jurisdiction. The Authority Having Jurisdiction is hereby charged with determining compliance with the provisions of this code. The Authority Having Jurisdiction shall prepare and maintain a record of all persons qualified to install and operate boilers under the provisions of this code. The Authority Having Jurisdiction or duly appointed representative shall act as secretary to the board at all meetings.	N/A	**111.5 Authority Having Jurisdiction.** The Authority Having Jurisdiction is hereby charged with determining compliance with the provisions of this code. The Authority Having Jurisdiction shall prepare and maintain a record of all persons qualified to install and operate boilers under the provisions of this code. The Authority Having Jurisdiction or duly appointed representative shall act as secretary to the board at all meetings.	No change to Houston amendment.
111.6 Examinations. The board shall develop and administer examinations for stationary engineer's licenses. The examinations shall determine the applicant's capacity and ability to understand and safely operate boilers, steam equipment and the various auxiliary machinery, appliances and appurtenances in conjunction with the operation of such boilers and steam equipment. The board shall perform such other duties as may be required of it by the governing body and mayor of the jurisdiction. The board shall adopt rules and regulations which, insofar as they relate to boilers, shall conform to the ASME Code and shall not be inconsistent with the terms and provisions of this code.	N/A	**111.6 Examinations.** The board shall develop and administer examinations for stationary engineer's licenses. The examinations shall determine the applicant's capacity and ability to understand and safely operate boilers, steam equipment and the various auxiliary machinery, appliances and appurtenances in conjunction with the operation of such boilers and steam equipment. The board shall perform such other duties as may be required of it by the governing body and mayor of the jurisdiction. The board shall adopt rules and regulations which, insofar as they relate to boilers, shall conform to the ASME Code and shall not be inconsistent with the terms and provisions of this code.	No change to Houston amendment.
111.7 Review and Action of the Boiler Board. Disputes arising between inspectors and any person or persons concerning the application of the provisions of this code to the installation of boiler facilities serving the property of such person or persons may be submitted to the Authority Having Jurisdiction. An interested party (other than an inspector) who is dissatisfied with the decision of the Authority Having Jurisdiction in the matter may appeal that decision to the board. Upon such an appeal, each party to the dispute shall be entitled to present its side of the matter to the board, and the board shall render its decision on the matter based on the information presented by both sides and the board's interpretation of applicable provisions of this code. The board shall have the power, by a majority vote, to revoke or cancel a stationary engineer's license, operator's license, or operator's permit for dishonesty, incompetency, or misconduct by the license or permit holder while discharging his duties or for neglect of his duties.	N/A	**111.7 Review and Action of the Boiler Board.** Disputes arising between inspectors and any person or persons concerning the application of the provisions of this code to the installation of boiler facilities serving the property of such person or persons may be submitted to the Authority Having Jurisdiction. An interested party (other than an inspector) who is dissatisfied with the decision of the Authority Having Jurisdiction in the matter may appeal that decision to the board. Upon such an appeal, each party to the dispute shall be entitled to present its side of the matter to the board, and the board shall render its decision on the matter based on the information presented by both sides and the board's interpretation of applicable provisions of this code. The board shall have the power, by a majority vote, to revoke or cancel a stationary engineer's license, operator's license, or operator's permit for dishonesty, incompetency, or misconduct by the license or permit holder while discharging his duties or for neglect of his duties.	No change to Houston amendment.

No license or permit shall be permanently revoked or canceled without first giving the license or permit holder an opportunity to be heard by the board. The Authority Having Jurisdiction shall provide notice of a right to a hearing on the matter pursuant to Section 103.5. The Authority Having Jurisdiction shall have the authority to suspend for just cause a stationary engineer's license, operator's license, or operator's permit. The holder of a suspended license or permit shall not engage in activities authorized by the license or permit while such license or permit is suspended but shall be given an opportunity to be heard by the board within five working days after delivering to the Authority Having Jurisdiction a written request for a hearing.		No license or permit shall be permanently revoked or canceled without first giving the license or permit holder an opportunity to be heard by the board. The Authority Having Jurisdiction shall provide notice of a right to a hearing on the matter pursuant to Section 103.5. The Authority Having Jurisdiction shall have the authority to suspend for just cause a stationary engineer's license, operator's license, or operator's permit. The holder of a suspended license or permit shall not engage in activities authorized by the license or permit while such license or permit is suspended but shall be given an opportunity to be heard by the board within five working days after delivering to the Authority Having Jurisdiction a written request for a hearing.	
111.8 Review of New Materials, Methods and Revisions to the Code. Any person whose boiler products are not approved under this code may file a petition in writing for approval thereof. The petition shall be delivered to the Authority Having Jurisdiction, who shall determine whether the material or method should be approved pursuant to Section 302.2 of this code. If the Authority Having Jurisdiction denies approval of the material or method, the person who made the request may appeal that decision by delivering a written notice of appeal to the secretary of the board within 10 days of receipt of the notice of the decision of the Authority Having Jurisdiction. Upon receipt of the notice of appeal, the board shall set the matter for hearing. The board may request any additional tests be conducted that it finds are necessary to determine whether the decision of the Authority Having Jurisdiction should be upheld or overturned. All such tests shall be at the expense of the person requesting the approval. The burden shall be on that person to show that the decision of the Authority Having Jurisdiction should be overturned. The decision of the board upholding or overturning the decision of the Authority Having Jurisdiction shall be set out in the minutes of the board. If the board overturns the decision of the Authority Having Jurisdiction, it shall set forth in its minutes any conditions or limitations to which the approval is made subject. The board shall receive requests for revisions to those provisions of this code that affect matters relating to boilers, and it shall be the duty of the board to recommend to the city council any changes to this code that the board deems necessary. The board shall make a report to the city council annually stating its recommended changes.	N/A	**111.8 Review of New Materials, Methods and Revisions to the Code.** Any person whose boiler products are not approved under this code may file a petition in writing for approval thereof. The petition shall be delivered to the Authority Having Jurisdiction, who shall determine whether the material or method should be approved pursuant to Section 302.2 of this code. If the Authority Having Jurisdiction denies approval of the material or method, the person who made the request may appeal that decision by delivering a written notice of appeal to the secretary of the board within 10 days of receipt of the notice of the decision of the Authority Having Jurisdiction. Upon receipt of the notice of appeal, the board shall set the matter for hearing. The board may request any additional tests be conducted that it finds are necessary to determine whether the decision of the Authority Having Jurisdiction should be upheld or overturned. All such tests shall be at the expense of the person requesting the approval. The burden shall be on that person to show that the decision of the Authority Having Jurisdiction should be overturned. The decision of the board upholding or overturning the decision of the Authority Having Jurisdiction shall be set out in the minutes of the board. If the board overturns the decision of the Authority Having Jurisdiction, it shall set forth in its minutes any conditions or limitations to which the approval is made subject. The board shall receive requests for revisions to those provisions of this code that affect matters relating to boilers, and it shall be the duty of the board to recommend to the city council any changes to this code that the board deems necessary. The board shall make a report to the city council annually stating its recommended changes.	No change to Houston amendment.
111.9 Appeals. Any owner, user, license applicant, license holder, or interested person who is affected and aggrieved by a decision of the board may appeal the board's decision to the city council, pursuant to Rule 12 of Section 2-2 of the *City Code*. Upon appeal to the city council from the board's decision, the board's secretary shall file with the city secretary a copy of the minutes of the board setting forth the board's decision and a copy of any minutes of the board reflecting any discussion or motions concerning the matter. Upon receipt of all materials required by the city secretary's Office, the city secretary shall set the matter for consideration. All orders or decisions of the Authority Having Jurisdiction shall be in writing and shall be and remain in full force and effect	N/A	**111.9 Appeals.** Any owner, user, license applicant, license holder, or interested person who is affected and aggrieved by a decision of the board may appeal the board's decision to the city council, pursuant to Rule 12 of Section 2-2 of the *City Code*. Upon appeal to the city council from the board's decision, the board's secretary shall file with the city secretary a copy of the minutes of the board setting forth the board's decision and a copy of any minutes of the board reflecting any discussion or motions concerning the matter. Upon receipt of all materials required by the city secretary's Office, the city secretary shall set the matter for consideration. All orders or decisions of the Authority Having Jurisdiction shall be in writing and shall be and remain in full force and effect	No change to Houston amendment.

until reversed by the board or the city council or suspended, cancelled or annulled. The decision of the city council shall be final.		until reversed by the board or the city council or suspended, cancelled or annulled. The decision of the city council shall be final.	
112.0 Stationary Engineer's License. **112.1 License.** Persons who desire to secure a stationary engineer's license shall apply to the board and pay to the Authority Having Jurisdiction the applicable fee stated in the city fee schedule. Licenses shall be granted in three grades: **(1)** A first-grade stationary engineer's license authorizes the licensee to have direct charge of, operate or supervise any power boiler of any size. **(2)** A second-grade stationary engineer's license authorizes the licensee to have direct charge of, operate, and supervise any power boiler having an aggregate amount of heat output not to exceed 8,380,000 Btu per hour and to act as assistant or watch engineer under the charge and supervision of the holder of a first-grade stationary engineer's license of any power boiler. **(3)** A third-grade stationary engineer's license authorizes the licensee to have direct charge of, operate, or supervise any power boiler having an aggregate amount of heat output not to exceed 3,352,000 Btu per hour and to act as assistant or watch engineer under the charge and supervision of the holder of a first- or second-grade stationary engineer's license of any power boiler having an aggregate amount of heat output not to exceed 8,380,000 Btu per hour.	N/A	**112.0 Stationary Engineer's License.** **112.1 License.** Persons who desire to secure a stationary engineer's license shall apply to the board and pay to the Authority Having Jurisdiction the applicable fee stated in the city fee schedule. Licenses shall be granted in three grades: **(1)** A first-grade stationary engineer's license authorizes the licensee to have direct charge of, operate or supervise any power boiler of any size. **(2)** A second-grade stationary engineer's license authorizes the licensee to have direct charge of, operate, and supervise any power boiler having an aggregate amount of heat output not to exceed 8,380,000 Btu per hour and to act as assistant or watch engineer under the charge and supervision of the holder of a first-grade stationary engineer's license of any power boiler. **(3)** A third-grade stationary engineer's license authorizes the licensee to have direct charge of, operate, or supervise any power boiler having an aggregate amount of heat output not to exceed 3,352,000 Btu per hour and to act as assistant or watch engineer under the charge and supervision of the holder of a first- or second-grade stationary engineer's license of any power boiler having an aggregate amount of heat output not to exceed 8,380,000 Btu per hour.	No change to Houston amendment.
112.2 Stationary Engineer Examination Application. An applicant for a first-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least four years of hands-on boiler operating experience on boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; (ii) a graduation certificate from an accredited engineering school and at least two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (iii) a United States Department of Labor diploma showing the applicant finished a full three-year course as an apprentice stationary engineer and two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat. An applicant for a second-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least three years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (ii) a graduation certificate from an accredited engineering school and at least one year of hands-on boiler operating experience on boilers used to heat water or liquid for	N/A	**112.2 Stationary Engineer Examination Application.** An applicant for a first-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least four years of hands-on boiler operating experience on boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; (ii) a graduation certificate from an accredited engineering school and at least two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (iii) a United States Department of Labor diploma showing the applicant finished a full three-year course as an apprentice stationary engineer and two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat. An applicant for a second-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least three years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (ii) a graduation certificate from an accredited engineering school and at least one year of hands-on boiler operating experience on boilers used to heat water or liquid for	No change to Houston amendment.

COLOR CODE INDEX: **Turquoise** = NEW or Modified Text by IAPMO in 2021 | **Text Underlined** = COH Amendment added (NEW) | **Grey Text** = Previous COH Amendment Brought Forward to 2021
~~**Yellow Strikethrough**~~ = Text Deleted from the Code by COH | **Green Text** = NEW or Modified Text by COH in 2021 | **Magenta** = New or Modified Text by IAPMO in 2018

environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat. An applicant for a third-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (ii) a graduation certificate from an accredited engineering school and at least six months of hands-on boiler operating experience on boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat. No person may take an examination for a stationary engineer's license unless he has submitted the service letters, certificates, and/or diplomas to the board as required by this section and the submitted documents have been accepted by the board. Applicants will be required to correctly answer at least 70 percent of the questions comprising the examination to qualify for a stationary engineer's license of any grade. All questions and answers will be written in the English language. An applicant for a stationary engineer's license who fails to satisfactorily pass an examination shall not be entitled to a refund of the examination fee paid to the jurisdiction and shall not be reexamined for the grade in which the applicant failed, or examined for a higher grade, within a period of less than 30 days. Each applicant shall pay the examination fee stated for this provision in the city fee schedule for each examination for which the applicant applies. The fee is to be paid to the Authority Having Jurisdiction at the time the application is filed. Service letters shall be filed with the application. An applicant shall be eligible for examination on the date of the next regularly scheduled examination that is held at least *seven* days after the date of application. Applicants who have successfully passed the examination shall pay the license fee stated for this provision in the city fee schedule to the Authority Having Jurisdiction prior to the issuance of the license. The license shall expire on December 31 of the year of issuance, unless suspended or *revoked.* Thereafter, the license may be renewed annually pursuant to the provisions set forth below. The receipt for payment of a license renewal fee shall be displayed with the license. Failure to do so shall constitute grounds for the suspension or *revocation* of the license.		environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat. An applicant for a third-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (ii) a graduation certificate from an accredited engineering school and at least six months of hands-on boiler operating experience on boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat. No person may take an examination for a stationary engineer's license unless he has submitted the service letters, certificates, and/or diplomas to the board as required by this section and the submitted documents have been accepted by the board. Applicants will be required to correctly answer at least 70 percent of the questions comprising the examination to qualify for a stationary engineer's license of any grade. All questions and answers will be written in the English language. An applicant for a stationary engineer's license who fails to satisfactorily pass an examination shall not be entitled to a refund of the examination fee paid to the jurisdiction and shall not be reexamined for the grade in which the applicant failed, or examined for a higher grade, within a period of less than 30 days. Each applicant shall pay the examination fee stated for this provision in the city fee schedule for each examination for which the applicant applies. The fee is to be paid to the Authority Having Jurisdiction at the time the application is filed. Service letters shall be filed with the application. An applicant shall be eligible for examination on the date of the next regularly scheduled examination that is held at least *seven* days after the date of application. Applicants who have successfully passed the examination shall pay the license fee stated for this provision in the city fee schedule to the Authority Having Jurisdiction prior to the issuance of the license. The license shall expire on December 31 of the year of issuance, unless suspended or *revoked.* Thereafter, the license may be renewed annually pursuant to the provisions set forth below. The receipt for payment of a license renewal fee shall be displayed with the license. Failure to do so shall constitute grounds for the suspension or *revocation* of the license.	
112.3 License Renewals. License renewals shall be granted without reexamination upon payment of the fee stated for this provision in the city fee schedule, provided such fee is paid within 30 days after the expiration date of the license and not thereafter. When a renewal application is filed more than 30 days after the expiration of the license, the fee for renewal shall be as stated for this provision in the city fee schedule. When the annual license renewal fee has not been paid for a period of *five consecutive* years, the license shall not be renewed until the applicant has successfully passed a reexamination.	N/A	**112.3 License Renewals.** License renewals shall be granted without reexamination upon payment of the fee stated for this provision in the city fee schedule, provided such fee is paid within 30 days after the expiration date of the license and not thereafter. When a renewal application is filed more than 30 days after the expiration of the license, the fee for renewal shall be as stated for this provision in the city fee schedule. When the annual license renewal fee has not been paid for a period of *five consecutive* years, the license shall not be renewed until the applicant has successfully passed a reexamination.	No change to Houston amendment.

Each certificate or license issued under the terms and provisions of this section shall be signed by the person to whom it was issued as required by the board.		Each certificate or license issued under the terms and provisions of this section shall be signed by the person to whom it was issued as required by the board.	
112.4 Validity, Replacement of License. When the holder of a license is examined by the board and granted a license in a higher grade, the higher-grade license shall not be issued until the license of the lower grade is surrendered and all required fees are paid to the Authority Having Jurisdiction. When a license becomes lost or destroyed, the board shall grant a new license in the same grade, provided proof of such loss or destruction is presented to the satisfaction of the board. The fee for a replacement license shall be stated for this provision in the city fee schedule. If the proof of such loss or destruction is not satisfactory to the board, reexamination in the same grade shall be required, and the fee for the reexamination shall be as provided in Section 112.2.	N/A	**112.4 Validity, Replacement of License.** When the holder of a license is examined by the board and granted a license in a higher grade, the higher-grade license shall not be issued until the license of the lower grade is surrendered and all required fees are paid to the Authority Having Jurisdiction. When a license becomes lost or destroyed, the board shall grant a new license in the same grade, provided proof of such loss or destruction is presented to the satisfaction of the board. The fee for a replacement license shall be stated for this provision in the city fee schedule. If the proof of such loss or destruction is not satisfactory to the board, reexamination in the same grade shall be required, and the fee for the reexamination shall be as provided in Section 112.2.	No change to Houston amendment.
112.5 Reciprocity. A person who holds a current and valid marine engineer's license issued by the United States Coast Guard shall be qualified for examination by the board for a stationary engineer's license of equal or lower grade, provided the license fee set forth in Section 112.2 has been paid. A person who holds a current and valid stationary engineer's or a steam engineer's license issued by a state, municipality, or government agency shall be qualified for examination by the board in the grade of the equivalent license in this jurisdiction, as determined by the board, provided the holder of the license presents proof to the satisfaction of the board that the license was granted as a result of boiler operating experience and a passing grade on a written examination on the operation, maintenance and repair of boilers and boiler accessories and safety rules for the boilers. No license issued by a foreign government, graduation certificate from a foreign school, college, or university, or any service letter from an employer in a foreign country shall qualify the holder thereof to be examined by the board for a stationary engineer's license of any grade unless the submitted document and the information contained therein are determined valid by the board and equivalent to the standards prescribed above. Upon examination of the information presented, the board shall designate the grade in which the applicant may be examined, if such evidence is found by the board to be valid.	N/A	**112.5 Reciprocity.** A person who holds a current and valid marine engineer's license issued by the United States Coast Guard shall be qualified for examination by the board for a stationary engineer's license of equal or lower grade, provided the license fee set forth in Section 112.2 has been paid. A person who holds a current and valid stationary engineer's or a steam engineer's license issued by a state, municipality, or government agency shall be qualified for examination by the board in the grade of the equivalent license in this jurisdiction, as determined by the board, provided the holder of the license presents proof to the satisfaction of the board that the license was granted as a result of boiler operating experience and a passing grade on a written examination on the operation, maintenance and repair of boilers and boiler accessories and safety rules for the boilers. No license issued by a foreign government, graduation certificate from a foreign school, college, or university, or any service letter from an employer in a foreign country shall qualify the holder thereof to be examined by the board for a stationary engineer's license of any grade unless the submitted document and the information contained therein are determined valid by the board and equivalent to the standards prescribed above. Upon examination of the information presented, the board shall designate the grade in which the applicant may be examined, if such evidence is found by the board to be valid.	No change to Houston amendment.
112.6 Expiration of License. Each license issued for stationary engineers that was in effect the day prior to the adoption of this code by city council shall expire on the 31st day of December of the year in which this code is adopted. Any such license may be renewed as though it had been originally issued pursuant to this code.	N/A	**112.6 Expiration of License.** Each license issued for stationary engineers that was in effect the day prior to the adoption of this code by city council shall expire on the 31st day of December of the year in which this code is adopted. Any such license may be renewed as though it had been originally issued pursuant to this code.	No change to Houston amendment.
112.7 Limitations of Operator. Except as provided in Section 113.1, no person shall: **(1)** Have direct charge, control, or supervision of any power boiler; or, **(2)** Act as or perform the duties of a stationary engineer or assistant watch engineer on any power boiler. Nor shall any owner, user or person operate or use, or cause or permit any boiler to be operated or used unless the persons	N/A	**112.7 Limitations of Operator.** Except as provided in Section 113.1, no person shall: **(1)** Have direct charge, control, or supervision of any power boiler; or, **(2)** Act as or perform the duties of a stationary engineer or assistant watch engineer on any power boiler. Nor shall any owner, user or person operate or use, or cause or permit any boiler to be operated or used unless the persons responsible for the operation of the boiler have current	No change to Houston amendment.

responsible for the operation of the boiler have current and valid licenses for the applicable classes as required in Section 112.1.		and valid licenses for the applicable classes as required in Section 112.1.	
112.8 Duties of the Certificate Holder. Each holder of a certificate of stationary engineer's license shall file with the board the name of the employer, the plant location, and the amount of Btu-per-hour heat output of the boiler that the holder is operating. Each holder of a stationary engineer's license shall enclose his license certificate under glass in a dustproof frame and shall display it in a conspicuous place in the plant where the holder is employed. The operator's permit issued under Section 113.1 designating the person in charge of the boiler shall be enclosed under glass in a dustproof frame and prominently displayed as near as possible to the boiler to which the operator's permit applies.	N/A	**112.8 Duties of the Certificate Holder.** Each holder of a certificate of stationary engineer's license shall file with the board the name of the employer, the plant location, and the amount of Btu-per-hour heat output of the boiler that the holder is operating. Each holder of a stationary engineer's license shall enclose his license certificate under glass in a dustproof frame and shall display it in a conspicuous place in the plant where the holder is employed. The operator's permit issued under Section 113.1 designating the person in charge of the boiler shall be enclosed under glass in a dustproof frame and prominently displayed as near as possible to the boiler to which the operator's permit applies.	No change to Houston amendment.
112.9 Responsibility of the Boiler Owner or User. Every owner or user of a power boiler that has heat output that exceeds 2,100,000 Btu per hour shall establish a method of operation utilizing one or more licensed stationary engineers of the herein required license grade. The operating method shall include direct physical examination of the boiler by the licensed stationary engineer at reasonable time intervals to ensure its safe operation. The owner or user shall establish the operation method based on accepted boiler industry practices commensurate with load characteristics, use, and configuration of the boiler.	N/A	**112.9 Responsibility of the Boiler Owner or User.** Every owner or user of a power boiler that has heat output that exceeds 2,100,000 Btu per hour shall establish a method of operation utilizing one or more licensed stationary engineers of the herein required license grade. The operating method shall include direct physical examination of the boiler by the licensed stationary engineer at reasonable time intervals to ensure its safe operation. The owner or user shall establish the operation method based on accepted boiler industry practices commensurate with load characteristics, use, and configuration of the boiler.	No change to Houston amendment.
113.0 Boiler Operator's Permit. **113.1 Application, Issuance, Fee and Expiration.** An owner or user of any hot-water-heating boiler, low-pressure hot-water-heating boiler, or steam-heating boiler at pressure of 15 pounds per square inch or less used to heat water or liquid for environmental heating or commercial processing purposes or a power boiler having an heat output that does not exceed 2,100,000 Btu per hour, may apply to the Authority Having Jurisdiction for a permit to allow the boiler to be operated by the owner or user or by a person knowledgeable in the operation of the boiler, instead of by a licensed stationary engineer. The person who is to operate the boiler shall be the owner of the boiler or his bona fide employee and shall demonstrate competency to do so in a manner determined by the board. The board shall establish the method of testing and the minimum knowledge, ability, and qualifications such person must demonstrate to show competency to operate the distinctive types of boilers. If a person demonstrates competency in the operation of the type of boiler for which the permit is sought, the permit shall be granted upon the payment of the permit fee stated in the city fee schedule. The permit shall expire on December 31st of each year, unless suspended or *revoked* before the expiration date.	N/A	**113.0 Boiler Operator's Permit.** **113.1 Application, Issuance, Fee and Expiration.** An owner or user of any hot-water-heating boiler, low-pressure hot-water-heating boiler, or steam-heating boiler at pressure of 15 pounds per square inch or less used to heat water or liquid for environmental heating or commercial processing purposes or a power boiler having an heat output that does not exceed 2,100,000 Btu per hour, may apply to the Authority Having Jurisdiction for a permit to allow the boiler to be operated by the owner or user or by a person knowledgeable in the operation of the boiler, instead of by a licensed stationary engineer. The person who is to operate the boiler shall be the owner of the boiler or his bona fide employee and shall demonstrate competency to do so in a manner determined by the board. The board shall establish the method of testing and the minimum knowledge, ability, and qualifications such person must demonstrate to show competency to operate the distinctive types of boilers. If a person demonstrates competency in the operation of the type of boiler for which the permit is sought, the permit shall be granted upon the payment of the permit fee stated in the city fee schedule. The permit shall expire on December 31st of each year, unless suspended or *revoked* before the expiration date.	No change to Houston amendment.
113.2 Renewal Application and Fee. Renewal of such permits shall be granted upon the payment of the renewal fee stated for this provision in the city fee schedule if the renewal is applied for within 30 days after the expiration of such permit. If	N/A	**113.2 Renewal Application and Fee.** Renewal of such permits shall be granted upon the payment of the renewal fee stated for this provision in the city fee schedule if the renewal is applied for within 30 days after the expiration of such permit. If the	No change to Houston amendment.

the renewal is not applied for within 30 days after the expiration of such permit, the applicant may renew the permit upon payment of the regular fee stated for this provision in the city fee schedule.		renewal is not applied for within 30 days after the expiration of such permit, the applicant may renew the permit upon payment of the regular fee stated for this provision in the city fee schedule.	
113.3 Permit Specific to Location and Boilers at the Location. A permit shall be valid only for the specific location and for the boilers at the location named on the permit. Separate permits may be issued for a person to operate boilers at two or more locations owned by the employer of the boiler operator listed on the permit. When a permit is issued for boiler operation at two or more locations, the applicant must file for a separate boiler operator permit for each location and pay the fee for each boiler operator permit received.	N/A	**113.3 Permit Specific to Location and Boilers at the Location.** A permit shall be valid only for the specific location and for the boilers at the location named on the permit. Separate permits may be issued for a person to operate boilers at two or more locations owned by the employer of the boiler operator listed on the permit. When a permit is issued for boiler operation at two or more locations, the applicant must file for a separate boiler operator permit for each location and pay the fee for each boiler operator permit received.	No change to Houston amendment.
113.4 Replacement of Lost or Destroyed Permit. When an operator's permit becomes lost or destroyed, the Authority Having Jurisdiction may grant a replacement permit in the same manner as set forth for a stationary engineer's license in Section 112.4.	N/A	**113.4 Replacement of Lost or Destroyed Permit.** When an operator's permit becomes lost or destroyed, the Authority Having Jurisdiction may grant a replacement permit in the same manner as set forth for a stationary engineer's license in Section 112.4.	No change to Houston amendment.
113.5 Expiration After Adoption of Code. All permits issued for the operation of boilers that were in effect the day prior to the adoption of this code by city council shall expire on the 31st day of December of the year in which this code is adopted. Any such permit may be renewed as though it had been originally issued pursuant to this code.	N/A	**113.5 Expiration After Adoption of Code.** All permits issued for the operation of boilers that were in effect the day prior to the adoption of this code by city council shall expire on the 31st day of December of the year in which this code is adopted. Any such permit may be renewed as though it had been originally issued pursuant to this code.	No change to Houston amendment.
114.0 Boiler Related Inspections and Liabilities. The Authority Having Jurisdiction shall periodically inspect each location where a boiler is installed to determine if the boiler is being operated by an authorized person in accordance with all applicable laws. Such inspections shall be made annually or at such other intervals as the Authority Having Jurisdiction determines is necessary to ensure compliance with applicable laws. **Exception:** Boilers used solely for the production of domestic water are exempted from 114.0. If there is a conflict between this code and the State of Texas Boiler Law in Chapter 755 of the *Texas Health and Safety Code* and any amendments thereto, then state law will apply. The provisions of this code shall not be construed to relieve from responsibility or lessen the responsibility of any person, firm, corporation, master plumber, appliance dealer, or installer owning, operating, or installing any boiler or other equipment described in this section for damages to persons or property caused by any defect therein, nor shall the jurisdiction be held responsible for any such liability as a result of an inspection authorized or an approval issued by this code.	N/A	**114.0 Boiler Related Inspections and Liabilities.** The Authority Having Jurisdiction shall periodically inspect each location where a boiler is installed to determine if the boiler is being operated by an authorized person in accordance with all applicable laws. Such inspections shall be made annually or at such other intervals as the Authority Having Jurisdiction determines is necessary to ensure compliance with applicable laws. **Exception:** Boilers used solely for the production of domestic water are exempted from 114.0. If there is a conflict between this code and the State of Texas Boiler Law in Chapter 755 of the *Texas Health and Safety Code* and any amendments thereto, then state law will apply. The provisions of this code shall not be construed to relieve from responsibility or lessen the responsibility of any person, firm, corporation, master plumber, appliance dealer, or installer owning, operating, or installing any boiler or other equipment described in this section for damages to persons or property caused by any defect therein, nor shall the jurisdiction be held responsible for any such liability as a result of an inspection authorized or an approval issued by this code.	No change to Houston amendment.

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2015 Houston Amendment - Chapter 2 Definitions	2021 UMC – Chapter 2 – Definitions	2021 Houston UMC Amendments	Code Change Summary
201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.	N/A	**201.2 Interchangeability.** Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.	No change to Houston amendment.
201.3 Specific Construction and Terms Defined in Other Codes. Where specific rules of construction or terms are not addressed or defined in this code and are addressed or defined in the *City Code* or another volume of the *Construction Code*, such terms or specific constructions herein shall have the meanings ascribed to them in those other volumes, as applicable to the construction and proposed scope of work hereunder.	N/A	**201.3 Specific Construction and Terms Defined in Other Codes.** Where specific rules of construction or terms are not addressed or defined in this code and are addressed or defined in the *City Code* or another volume of the *Construction Code*, such terms or specific constructions herein shall have the meanings ascribed to them in those other volumes, as applicable to the construction and proposed scope of work hereunder.	No change to Houston amendment.
203.0 – A – **Alteration.** Any change in an original design or configuration. **Authority Having Jurisdiction.** The Director of Public Works, who is appointed to administer and enforce the provisions of this code. ~~organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures. The Authority Having Jurisdiction shall be a federal, state, local, or other regional department or an individual such as a plumbing official, mechanical official, labor department official, health department official, building official, or others having statutory authority. In the absence of a statutory authority, the Authority Having Jurisdiction may be some other responsible party.~~ This definition shall include the Authority Having Jurisdiction's duly authorized representatives.	**Air Dispersion Systems:** Materials intended for use in air handling systems in exposed locations operating under positive pressure. **Appliance.** A device that utilizes an energy source to produce light, heat, power, refrigeration, ~~or~~ air conditioning, or compressed fuel gas. This definition also shall include a vented decorative appliance **Appliance Categorized Vent Diameter/Area.** The minimum vent area/diameter/area permissible for Category I appliances to maintain a nonpositive vent static pressure where tested in accordance with nationally recognized standards. [NFPA 54:~~3.3.7~~ 3.3.6]	**203.0 – A –** **Alteration.** Any change in an original design or configuration. **Authority Having Jurisdiction.** The City of Houston, Texas. The definition shall also mean the Director of Houston Public Works, who is appointed to administer and enforce the provisions of this code. ~~organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures. The Authority Having Jurisdiction shall be a federal, state, local, or other regional department or an individual such as a plumbing official, mechanical official, labor department official, health department official, building official, or others having statutory authority. In the absence of a statutory authority, the Authority Having Jurisdiction may be some other responsible party.~~ This definition shall include the Authority Having Jurisdiction's duly authorized representatives.	New base code definition for air dispersion systems. No change to Houston amendment.
204.0 – B – **Building Code.** The ~~building code~~ *City of Houston Building Code*, as ~~that is~~ adopted and amended by this jurisdiction. **Building Official.** The director of Houston Public Works or the duly authorized representative designated by the director to act as the chief construction code enforcement official of the jurisdiction; also known as chief building official. The term also includes the Houston Airport Systems building official who may be designated by the building official to perform *Construction Code* permitting and enforcement activities on Houston Airport Systems premises. *Building Thermal Envelope – Deleted from UMC. (See Houston Energy Code)*	**Boiler, High-Pressure.** A boiler ~~furnishing~~ for generating steam at gauge pressures in excess of 15 ~~pounds-force per square inch (~~psi~~)~~ (103 kPa), or for heating water to a temperature in excess of 250°F (121°C) or at a gauge pressure in excess of 160 psi (gauge pressure of 1103 kPa). [NFPA 211:~~3.3.13.2~~ 3.3.14.2]	**204.0 – B –** **Building Code.** The ~~building code~~ *City of Houston Building Code*, as ~~that is~~ adopted and amended by this jurisdiction. **Building Official.** The director of Houston Public Works or the duly authorized representative designated by the director to act as the chief construction code enforcement official of the jurisdiction; also known as chief building official. The term also includes the Houston Airport Systems building official who may be designated by the building official to perform *Construction Code* permitting and enforcement activities on Houston Airport Systems premises.	Minor wordsmithing changes to base code boiler definition. No change to Houston amendment.

2021 Uniform Mechanical Code – Code Analysis

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary

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205.0 – C – **Certificate of Compliance.** A certificate stating that materials and products meet specified standards or that the scope of work under a specific permit was done in compliance with approved construction documents. Any reference in the *Construction Code* to a "CC", certificate of completion, or a certificate of inspection issued by this jurisdiction, is a reference to a certificate of compliance as defined herein. **City Code.** The *Code of Ordinances, City of Houston, Texas*. **City Fee Schedule.** The schedule of fees charged by the city for various permits, licenses, authorizations and services, which is maintained on the city's website. **Code Official.** The Houston Fire Department and Building Code Enforcement employees, including but not limited to, plan analysts, field inspectors, and other technical staff charged with the administration and enforcement of this code as specifically delegated by the Authority Having Jurisdiction. The code official is authorized to approve designs, construction, equipment, materials, installations, processes, procedures, practices, and other duties necessary to verify and document compliance with the *Construction Code*, ordinances, and other laws and policies as specifically delegated by the chief building official, fire chief, and the Authority Having Jurisdiction. **Construction Code.** Has the meaning ascribed in Section 1-2 of the *City Code*.	**Ceiling Radiation Damper.** A listed device installed in a ceiling membrane of a fire-resistance-rated floor-ceiling or roof-ceiling assembly to automatically limit the radiative heat transfer through an air inlet/outlet opening. [NFPA 5000:~~3.3.142.1~~ 3.3.139.1] **Chimney Connector**. The pipe that connects a fuel-burning appliance to a chimney. [NFPA 211: ~~3.3.47.1~~ 3.3.48.1] **Combination Fire and Smoke Damper.** A device that meets both the fire damper and smoke damper requirements. [NFPA 5000:~~3.3.142.2~~ 3.3.139.2] **Combustible Material.** ~~As pertaining to materials adjacent to or in contact with heat-producing appliances, vent connectors, gas vents, chimneys, steam and hot water pipes, and warm air ducts, materials made of or surfaced with wood, compressed paper, plant fibers, or other materials that are capable of being ignited and burned. Such material shall be considered combustible even though flame-proofed, fire-retardant treated, or plastered.~~ A material that, in the form in which it is used and under the conditions anticipated, will ignite and burn; a material that does not meet the definition of noncombustible. [NFPA 54:~~3.3.67.1~~ 3.3.64.1] **Compensating Hood.** A hood for commercial food heat-processing equipment that has an outside-air supply with air delivered below or within the hood. Where makeup air is diffused directly into the exhaust within the hood cavity, it becomes a short-circuit hood.	**205.0 – C –** **Certificate of Compliance.** A certificate stating that materials and products meet specified standards or that the scope of work under a specific permit was done in compliance with approved construction documents. Any reference in the *Construction Code* to a "CC", certificate of completion, or a certificate of inspection issued by this jurisdiction, is a reference to a certificate of compliance as defined herein. **City Code.** The *Code of Ordinances, City of Houston, Texas*. **City Fee Schedule.** The schedule of fees charged by the city for various permits, licenses, authorizations and services, which is maintained on the city's website. **Code Official.** The Houston Fire Department and Building Code Enforcement employees, including but not limited to, plan analysts, field inspectors, and other technical staff charged with the administration and enforcement of this code as specifically delegated by the Authority Having Jurisdiction. The code official is authorized to approve designs, construction, equipment, materials, installations, processes, procedures, practices, and other duties necessary to verify and document compliance with the *Construction Code*, ordinances, and other laws and policies as specifically delegated by the chief building official, fire chief, and the Authority Having Jurisdiction. **Construction Code.** Has the meaning ascribed in Section 1-2 of the *City Code*.	Minor changes to base code definitions. No change to Houston amendment.
206.0 – D – **Design Flood Elevation.** See Chapter 19 of the *City Code* for provisions regarding the flood plain. ~~The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the design flood elevation is the elevation of the highest existing grade of the building's perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number is taken as being equal to 2 feet (610 mm).~~ **Detached Boiler.** Any class of boiler that remains in its original installed location and is permanently disconnected from its energy source (i.e. natural gas, electricity, etc.).	**Damper.** A valve or plate for controlling draft or the flow of gases, including air. [NFPA 211:~~3.3.51~~ 3.3.52] **Direct Gas-Fired Non-recirculating Industrial Air Heater.** A non-recirculating industrial air heater in which all the products of combustion generated by the appliance are released into the outdoor airstream being heated. [NFPA 54:~~3.3.57.1~~ 3.3.56.1] **Direct Gas-Fired Recirculating Industrial Air Heater.** An air recirculating heater in which all of the products of combustion generated by the appliance are released into the airstream being heated. [NFPA 54:~~3.3.57.2~~ 3.3.56.2] **Direct-Vent Appliances.** Appliances that are constructed and installed so that all air for combustion is derived directly from the outdoors and all flue gases are discharged to the outdoors. [NFPA 54:~~3.3.6.3~~ 3.3.5.3] **Draft Hood.** A nonadjustable device built into an appliance, or made a part of the vent connector from an appliance, that is designed to: (1) Provide for the ready escape of the flue gases from the appliance in the event of no draft, backdraft, or stoppage beyond the draft hood. (2) Prevent a backdraft from entering the appliance.	**206.0 – D –** **Design Flood Elevation.** See Chapter 19 of the *City Code* for provisions regarding the flood plain. ~~The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the design flood elevation is the elevation of the highest existing grade of the building's perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number is taken as being equal to 2 feet (610 mm).~~	Minor changes to base code definitions. Removed definition of detached boiler from Houston amendment as it's no longer needed.

	(3) Neutralize the effect of stack action of the chimney or gas vent upon the operation of the appliance. [NFPA 54:~~3.3.33~~ 3.3.31] **Duct Furnace.** A furnace normally installed in distribution ducts of air-conditioning systems to supply warm air for heating. This definition applies only to an appliance that, for air circulation, depends on a blower not furnished as part of the furnace. [NFPA 54:~~3.3.47.3~~ 3.3.45.3]		
207.0 – E – **Electrical Code.** ~~The *National Electrical Code* promulgated by the National Fire Protection Association, as adopted by this jurisdiction~~ The *City of Houston Electrical Code*, as adopted and amended by this jurisdiction. **Energy Conservation Code.** The *City of Houston Residential Energy Conservation Code* or the *City of Houston Commercial Energy Conservation Code*, both as adopted and amended by this jurisdiction.	N/A	**207.0 – E –** **Electrical Code.** ~~The *National Electrical Code* promulgated by the National Fire Protection Association, as adopted by this jurisdiction~~ The *City of Houston Electrical Code*, as adopted and amended by this jurisdiction. **Energy Conservation Code.** The *City of Houston Residential Energy Conservation Code* or the *City of Houston Commercial Energy Conservation Code*, both as adopted and amended by this jurisdiction.	No change to Houston amendment.
208.0 – F – **Family.** An individual or two or more persons related by blood or marriage or a group of not more than 10 persons (excluding live in personnel hired to assist the family) who need not be related by blood or marriage living together in a dwelling unit. **Fire Code.** ~~The fire code~~ The *City of Houston Fire Code*, as adopted by this jurisdiction. **Fire Code Official.** The jurisdiction's fire marshal, who is charged with the administration and enforcement of the *Fire Code*, or an authorized representative. **Flood Hazard Area.** See Chapter 19 of the *City* Code for provisions regarding the flood plain. ~~The greater of the following two areas:~~ ~~**(1)** The area within a floodplain subject to a 1 percent or greater chance of flooding in any given year.~~ ~~**(2)** The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.~~ *Flood Hazard Area Subject to High Velocity Wave Action – Relocated in the UMC 2015 to the definition of "Coastal High Hazard Areas."*	N/A	**208.0 – F –** **Fire Code.** ~~The fire code~~ The *City of Houston Fire Code*, as adopted by this jurisdiction. **Fire Code Official.** The jurisdiction's fire marshal, who is charged with the administration and enforcement of the *Fire Code*, or an authorized representative. **Flood Hazard Area.** See Chapter 19 of the *City* Code for provisions regarding the flood plain. ~~The greater of the following two areas:~~ ~~(1) The area within a floodplain subject to a 1 percent or greater chance of flooding in any given year.~~ ~~(2) The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.~~	No change to Houston amendment.
212.0 – J – **Jurisdiction.** The governmental unit that has adopted this code under due legislative authority.		**212.0 – J –** **Jurisdiction.** The governmental unit that has adopted this code under due legislative authority.	No change to Houston amendment.
	Low-Probability Pump. A pump that (a) is permanently sealed to prevent atmospheric release of the pumped fluid, (b) incorporates a static seal to prevent atmospheric release of the pumped fluid, or (c) incorporates not less than two sequential dynamic shaft seals and automatically shuts down upon failure of any seal to prevent atmospheric release of the pumped fluid. [ASHRAE 15:3]		New base code definition for low-probability pump.

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215.0 – M – **Mechanical Integrity.** The physical installation of products, systems, or equipment in accordance with their intended purpose and according to the manufacturer's specifications and manufacturer's installation instructions.	N/A	**215.0 – M –** **Mechanical Integrity.** The physical installation of products, systems, or equipment in accordance with their intended purpose and according to the manufacturer's specifications and manufacturer's installation instructions.	No change to Houston amendment.
216.0 – N – **National Board Inspection Code.** The manual for boiler and pressure vessel inspectors published by the *National Board of Boiler and Pressure Vessel Inspectors*. **Non-standard Boiler.** A boiler that does not qualify as a standard boiler.	N/A	**216.0 – N –** **National Board Inspection Code.** The manual for boiler and pressure vessel inspectors published by the *National Board of Boiler and Pressure Vessel Inspectors*.	No change to Houston amendment.
218.0 – P – **Plumbing Code.** The ~~Uniform Plumbing Code promulgated by the International Association of Plumbing and Mechanical Officials,~~ *City of Houston Plumbing Code*, as adopted by this jurisdiction. **Portable Boiler.** A boiler primarily designed and intended for temporary use by anyone at any location.	N/A	**218.0 – P –** **Plumbing Code.** The ~~Uniform Plumbing Code promulgated by the International Association of Plumbing and Mechanical Officials,~~ *City of Houston Plumbing Code*, as adopted by this jurisdiction. **Portable Boiler.** A boiler primarily designed and intended for temporary use by anyone at any location.	No change to Houston amendment.
220.0 – R – **Repair (Boilers).** The work necessary to restore a boiler or a pressure vessel to a good and sound operating condition, provided there is no deviation from the original design. **Residential Code.** The *City of Houston Residential Code*, as adopted and amended by this jurisdiction.	N/A	**220.0 – R –** **Repair (Boilers).** The work necessary to restore a boiler or a pressure vessel to a good and sound operating condition, provided there is no deviation from the original design. **Residential Code.** The *City of Houston Residential Code*, as adopted and amended by this jurisdiction.	No change to Houston amendment.
221.0 – S – **Safety Appliances.** Safety devices such as safety valves or safety relief valves (within the jurisdictional limits as prescribed by the Authority Having Jurisdiction) provided for the purposes of diminishing the danger of accidents. **Secondhand Boiler.** A boiler for which both the location and ownership have changed. **Standard Boiler.** A boiler that bears the Texas stamp, the ASME stamp, or the stamp of any jurisdiction that has adopted a standard of construction equivalent to that required by the State of Texas.	N/A	**221.0 – S –** **Safety Appliances.** Safety devices such as safety valves or safety relief valves provided for the purposes of diminishing the danger of accidents. **Secondhand Boiler.** A boiler for which both the location and ownership have changed.	No change to Houston amendment.
{EDITORIAL NOTE: ALL OTHER PORTIONS OF CHAPTER 2 REMAIN AS SET FORTH IN THE 2015 UMC.}	N/A	[**EDITORIAL NOTE:** ALL OTHER PORTIONS OF CHAPTER 2 REMAIN AS SET FORTH IN THE 2021 UMC.]	No change to Houston amendment.

2015 Houston Amendment - Chapter 3 General Regulations	2021 UMC – Chapter 3 – General Regulations	2021 Houston UMC Amendments	Code Change Summary
303.8 Equipment and Appliances on Roofs. Equipment and appliances on roofs shall be designed or enclosed so as to withstand climatic conditions in the area in which they are installed. Where enclosures are provided, each enclosure shall permit easy entry and movement~~, shall be of reasonable height,~~ and shall have not less than a 30 inch (762 mm) clearance	N/A	**303.8 Equipment and Appliances on Roofs.** Equipment and a~~A~~ppliances on roofs shall be designed or enclosed so as to withstand climatic conditions in the area in which they are installed. Where enclosures are provided, each enclosure shall permit easy entry and movement~~, shall be of reasonable height,~~ and shall have ~~at least~~ not less than a 30 inch (762 mm) clearance between the entire service access panel(s) of	No change to Houston amendment.

between the entire service access panel(s) of the equipment and appliance, and the wall of the enclosure. [NFPA 54:9.4.1.1]		the equipment and appliance and the wall of the enclosure. [NFPA 54:9.4.1.1]	
303.8.4 Clearance. Equipment and appliances shall be installed on a well-drained surface of the roof. Not less than ~~6~~ 10 feet (~~1829~~ 3048 mm) of clearance shall be between a part of the equipment and appliance and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures not less than 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]	**303.8.4 Edge of Roof Clearance.** Appliances shall be installed on a well-drained surface of the roof. At least 6 feet (1829 mm) of clearance shall be available between any part of the appliance and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures at least 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]	**303.8.4 Edge of Roof Clearance.** Appliances shall be installed on a well-drained surface of the roof. Not less~~At least~~ than ~~6~~ 10 feet (~~1829~~ 3048 mm) of clearance shall be between any part of the appliance and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures at least 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]	Update title to be in line with base code, no major change to Houston amendment.
	303.8.4.1 Guards and Rails. Guards or rails shall be required where the following exist: (1) The clearance between the appliance and a roof edge or open end of an equipment platform is less than 6 feet (3048 mm) (2) The open end of the equipment platform is located more than 30 inches (762 mm) above the roof, floor, or grade below. Where guards or rails are installed, they shall be constructed so as to prevent the passage of a 21inch (533 mm) diameter ball, resist the imposed loading conditions, and shall extend not less than 30 inches (7625 mm) beyond each side of the equipment or appliance. **Exception:** Guards shall not be required where a permanent fall arrest anchorage connector system in accordance with ASSE Z359.1 is installed.		New base code provisions for guards and rails and when they're required.
303.10.1 Clearance Reduction. Reduced clearances to combustible construction for listed equipment and appliances shall comply with the listing and Table 303.10.1. Where permitted by the manufacturer, and not provided in this code, reduced clearances to combustible construction for unlisted equipment and appliances shall comply with Table 303.10.1. Unlisted equipment and appliances shall comply with Table 303.10.1.			Houston amendment removed to return to base code provisions.
304.1 General. Appliances shall be located with respect to building construction and other equipment so as to permit access to the appliance. ~~Sufficient c~~Clearance shall be maintained to permit cleaning of heating surfaces; the replacement of filters, blowers, motors, burners, controls, and vent connections; the lubrication of moving parts where necessary; the adjustment and cleaning of burners and pilots; and the proper functioning of explosion vents, where provided. For attic installation, the passageway and servicing area adjacent to the appliance shall be floored. [NFPA 54:9.2.1] Unless otherwise specified, not less than 30 inches (762 mm) in depth, width, and height of working space shall be provided. **Exception:** A platform shall not be required for unit heaters or room heaters.	N/A		Houston amendment removed to return to base code provisions.

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
304.3 Access to Equipment and Appliances on Roofs. Equipment and appliances located on roofs or other elevated locations shall be accessible. [NFPA 54:9.4.3.1]	N/A	**304.3 Access to Equipment and Appliances on Roofs.** Equipment and aAppliances located on roofs or other elevated locations shall be accessible. [NFPA 54:9.4.3.1]	No change to Houston amendment.
304.3.1 Access. Buildings exceeding 15 feet (4572 mm) in height shall have ~~an inside~~ means of access to the roof in accordance with this section, unless other means acceptable to the Authority Having Jurisdiction are used. [NFPA 54:9.4.3.2]	N/A	**304.3.1 Access.** Buildings of more than 15 feet (4572 mm) in height shall have ~~an inside~~ means of access to the roof in accordance with this section, unless other means acceptable to the Authority Having Jurisdiction are used. [NFPA 54:9.4.3.2]	No change to Houston amendment.
304.3.1.1 Access Type. The inside means of access shall be a permanent, or foldaway inside stairway, or ladder, terminating in an enclosure, scuttle, or trap door. Such scuttles or trap doors shall be not less than 22 inches by 24 inches (559 mm by 610 mm) in size, shall open easily and safely under all conditions, especially snow; and shall be constructed so as to permit access from the roof side unless deliberately locked on the inside. Not less than ~~6~~ 10 feet (~~1829~~ 3048 mm) of clearance shall be between the access opening and the edge of the roof or similar hazard, or rigidly fixed rails or guards not less than 42 inches (1067 mm) in height shall be provided on the exposed side. Where parapets or other building structures are utilized in lieu of guards or rails, they shall be not less than 42 inches (1067 mm) in height. [NFPA 54:9.4.3.3]	N/A	**304.3.1.1 Access Type.** The inside means of access shall be a permanent or foldaway inside stairway, or ladder, terminating in an enclosure, scuttle, or trap door. Such scuttles or trap doors shall be not less than 22 inches by 24 inches (559 mm by 610 mm) in size, shall open easily and safely under all conditions, especially snow, and shall be constructed so as to permit access from the roof side unless deliberately locked on the inside. Not less than 6 10 feet (~~1829~~ 3048 mm) of clearance shall be between the access opening and the edge of the roof or similar hazard, or rigidly fixed rails or guards not less than 42 inches (1067 mm) in height shall be provided on the exposed side. Where parapets or other building structures are utilized in lieu of guards or rails, they shall be not less than 42 inches (1067 mm) in height. [NFPA 54:9.4.3.3]	No change to Houston amendment.
304.4 Appliances in Attics and Under-Floor Spaces. An attic or under-floor space in which an appliance is installed shall be accessible through an opening and passageway not less than the largest component of the appliance, ~~and~~ or not less than 22 inches by 30 inches (559 mm by 762 mm) whichever is more restrictive. Where an appliance is located within the attic a pull down stair shall be provided that is not less than 22 inches (559 mm) in width at its narrowest point with a load capacity of not less than 350 pounds.	N/A	**304.4 Appliances in Attics and Under-Floor Spaces.** An attic or under-floor space in which an appliance is installed shall be accessible through an opening and passageway not less than the largest component of the appliance, ~~and~~ or not less than 22 inches by 30 inches (559 mm by 762 mm) whichever is more restrictive. Where an appliance is located within the attic a pull down stair shall be provided that is not less than 22 inches (559 mm) in width at its narrowest point with a load capacity of not less than 350 pounds.	No change to Houston amendment.
305.2 Flood Hazard Areas. See Chapter 19 of the *City Code*. ~~For buildings located in flood hazard areas, heating, ventilating, air-conditioning, refrigeration, miscellaneous heat-producing, and energy-utilizing equipment and appliances shall be elevated at or above the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~ ~~**Exception:** Equipment and appliances shall be permitted to be located below the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher, provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such elevation.~~	N/A	**305.3 Flood Hazard Areas.** See Chapter 19 of the *City Code*. ~~For buildings located in flood hazard areas, heating, ventilating, air-conditioning, refrigeration, miscellaneous heat-producing, and energy-utilizing equipment and appliances shall be elevated at or above the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~ ~~**Exception:** Equipment and appliances shall be permitted to be located below the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher, provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such elevation.~~	Update section number, no major change to Houston amendment.
~~**305.2.1 Coastal High Hazard Areas.** Mechanical systems in buildings located in coastal high hazard areas shall be in accordance with the requirements of Section 305.2, and mechanical systems, pipes, and appurtenances shall not be mounted on or penetrate through walls that are intended~~	N/A	~~**305.3.1 Coastal High Hazard Areas.** Mechanical systems in buildings located in coastal high hazard areas shall be in accordance with the requirements of Section 305.3, and mechanical systems, pipes, and appurtenances shall not be mounted on or penetrate through walls that are intended~~	Update section number, no change to Houston amendment.

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~~to breakaway under flood loads in accordance with the building code.~~		~~to breakaway under flood loads in accordance with the building code.~~	
~~**305.2.2 Air Exhaust and Intake Openings.** Outside air exhaust openings and air intake openings shall be located at or above the elevation required by the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~	N/A	~~**305.3.2 Air Exhaust and Intake Openings.** Outside air exhaust openings and air intake openings shall be located at or above the elevation required by the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~	Update section number, no change to Houston amendment.
310.2 Condensate Control. Where an equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, ~~other than damage to replaceable lay-in ceiling tiles,~~ a secondary drain line shall be provided and shall be drained to a readily observed location in accordance with Section 310.1. An additional protection method for condensate overflow shall be provided in accordance with one of the following: **(1)** A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked. **(2)** An additional watertight pan of corrosion-resistant material, with a separate drain line, installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain. **(3)** An additional drain line at a level that is higher than the primary drain line connection of the drain pan. **(4)** An additional watertight pan of corrosion-resistant material with a water level detection device installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain and to shut off the equipment. The additional pan or the additional drain line collection shall be provided with a drain pipe of not less than ¾ of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed. **{EDITORIAL NOTE:** THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2015 UMC.}	**310.2 Condensate Control.** Where any equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, a drain line shall be provided and shall be drained in accordance with Section 310.1. An additional protection method for condensate overflow shall be provided in accordance with one of the following: (1) A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked. (2) An additional watertight pan of corrosion-resistant material, with a separate drain line, installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain. (3) An additional drain line at a level that is higher than the primary drain line connection of the drain pan. (4) An additional watertight pan of corrosion-resistant material with a water level detection device installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain and to shut off the equipment. The additional pan or the additional drain line connection shall be provided with a drain pipe of not less than 3⁄4 of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed.	**310.2 Condensate Control.** Where any equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, a secondary drain line shall be provided and shall be drained to a readily observed location in accordance with Section 310.1. When a secondary drain line cannot be installed, aAn additional protection method for condensate overflow shall be provided in accordance with one of the following: **[EDITORIAL NOTE:** THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2021 UMC.]	No change to Houston amendment.
310.3.2 Insulation. Primary drain piping inside buildings shall be insulated for the first 15 feet (4572 mm) horizontally from the drain pan. The insulation shall be a minimum of ½ inch (12.7 mm) in thickness.	N/A	**310.3.2 Insulation.** Primary drain piping inside buildings shall be insulated for the first 15 feet (4572 mm) horizontally from the drain pan. The insulation shall be a minimum of ½ inch (12.7 mm) in thickness.	No change to Houston amendment.

2015 Houston Amendment - Chapter 4 Ventilation Air	2021 UMC – Chapter 4 – Ventilation Air	2021 Houston UMC Amendments	Code Change Summary
	401.0 General. **401.1 Applicability.** This chapter contains requirements for ventilation air supply, exhaust, and makeup air requirements for occupiable spaces within a building. Spaces within buildings, except those within a dwelling unit in residential occupancies		New base code provisions for ventilation air in certain spaces within buildings.

	where occupants are nontransient, shall comply with Section 402.0 through Section 404.0. ~~**402.1.2 Dwelling.** Requirements for ventilation air rate for single family dwellings units in residential occupancies, where to occupants are nontransient, shall be in accordance with this chapter or ASHRAE 62.2 Section 405.0.~~		

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TABLE402.1
MINIMUM VENTILATION RATES IN BREATHING ZONE [1, 2]
~~[ASHRAE 62.1: TABLE 6-1]~~

OCCUPANCY CATEGORY [4]	PEOPLE OUTDOOR Air Rate R_P (cfm/person)	AREA OUTDOOR Air Rate R_A (cfm/ft [2])	DEFAU OCCUPA Density (people/1 ft [2])
RRECTIONAL ILITIES			
king/waiting	7.5	0.06	50
	5	0.12	25
room	5	0.06	30
rd stations	5	0.06	15
CLEANERS / NDRIES			
-operated dry ner	15	–	20
-operated laundries	7.5	–	20
mercial dry cleaner	30	0.06	30
mercial laundry	25	–	10
age, pick up	7.5	0.12	30
CATIONAL ILITIES			
classroom	10	0.18	20
srooms (ages 5-8)	10	0.12	25
srooms (age 9 plus)	10	0.12	35
puter lab	10	0.12	25
care (through age	10	0.18	25
care sickroom	10	0.18	25
ure classroom	7.5	0.06	65
ure hall (fixed seats)	7.5	0.06	150
ia center [a]	10	0.12	25
ic/theater/dance	10	0.06	35
i-use assembly	7.5	0.06	100
nce laboratories [e]	10	0.18	25
ersity/college ratories	10	0.18	25
od/metal shop	10	0.18	20
D AND ERAGE SERVICE			
, cocktail lounges	7.5	0.18	100
teria/fast food ng	7.5	0.18	100

TABLE 402.1
MINIMUM VENTILATION RATES IN BREATHING ZONE[1, 2]
[ASHRAE 62.1: TABLE 6.2.2.1]

OCCUPANCY CATEGORY[4]	PEOPLE OUTDOOR Air Rate R_P (CFM/person)	AREA OUTDOOR Air Rate R_a (CFM/ft²)	DEFAULT OCCUPANT DENSITY[3] (people/1000 ft²)	AIR CLASS
CORRECTIONAL FACILITIES				
Booking/waiting	7.5	0.06	50	2
Cell	5	0.12	25	2
Day room	5	0.06	30	1
Guard stations	5	0.06	15	1
EDUCATIONAL FACILITIES				
Art classroom	10	0.18	20	2
Classrooms (ages 5-8)	10	0.12	25	1
Classrooms (age 9 plus)	10	0.12	35	1
Computer lab	10	0.12	25	1
Daycare (through age 4)	10	0.18	25	2
Daycare sickroom	10	0.18	25	3
Lecture classroom[h]	7.5	0.06	65	1
Lecture hall (fixed seats)[h]	7.5	0.06	150	1
Media center[a]	10	0.12	25	1
Multi-use assembly[h]	7.5	0.06	100	1
Music/theater/dance[h]	10	0.06	35	1
Science laboratories[g]	10	0.18	25	2
University/college laboratories	10	0.18	25	2
Wood/metal shop	10	0.18	20	2
FOOD AND BEVERAGE SERVICE				
Bars, cocktail lounges	7.5	0.18	100	2
Cafeteria/fast food dining	7.5	0.18	100	2
Kitchen (cooking)[i]	7.5	0.12	20	2
Restaurant dining rooms	7.5	0.18	70	2
GENERAL				
Break rooms[h]	5	0.06	25	1
Coffee stations[h]	5	0.06	20	1
Conference/meeting[h]	5	0.06	50	1
Corridors[h]	–	0.06	–	1
Occupiable storage rooms for liquids or gels[b]	5	0.12	2	2
HOTELS, MOTELS, RESORTS, DORMITORIES				
Barracks sleeping areas[h]	5	0.06	20	1
Bedroom/living room[h]	5	0.06	10	1
Laundry rooms, central	5	0.12	10	2
Laundry rooms within dwelling units	5	0.12	10	1
Lobbies/pre-function[h]	7.5	0.06	30	1
Multipurpose assembly[h]	5	0.06	120	1
OFFICE BUILDINGS				
Break Rooms	5	0.12	50	1
Main entry lobbies[h]	5	0.06	10	1
Occupiable storage rooms for dry materials	5	0.06	2	1
Office space[h]	5	0.06	5	1
Reception areas[h]	5	0.06	30	1
Telephone/data entry[h]	5	0.06	60	1
MISCELLANEOUS SPACES				
Bank or bank lobbies[h]	7.5	0.06	15	1
Bank vaults/safe deposit[h]	5	0.06	5	2
Computer (not printing)[h]	5	0.06	4	1
Freezer and refrigerated spaces (<50°F)[e]	10	–	–	2
General manufacturing (excludes heavy industrial and processes using chemicals)	10	0.18	7	3
Pharmacy (prep. area)	5	0.18	10	2
Photo studios	5	0.12	10	1

TABLE 402.1
MINIMUM VENTILATION RATES IN BREATHING ZONE[1, 2, 4]
[ASHRAE 62.1: TABLE 6.2.2.1]

OCCUPANCY CATEGORY[4]	PEOPLE OUTDOOR Air Rate R_P (cfm/person)	AREA OUTDOOR Air Rate R_A (cfm/ft²)	DEFAULT OCCUPANT Density[3] (people/1000 ft²)	AIR CLASS
CORRECTIONAL FACILITIES				
Booking/waiting	7.5	0.06	50	2
Cell	5	0.12	25	2
Day room	5	0.06	30	1
Guard stations	5	0.06	15	1
DRY CLEANERS / LAUNDRIES				
Coin-operated dry cleaner	15	–	20	
Coin-operated laundries	7.5	0.12	20	2
Commercial dry cleaner	30	0.06	30	
Commercial laundry	25	–	10	
Storage, pick up	7.5	0.12	30	
EDUCATIONAL FACILITIES				
Art classroom	10	0.18	20	2
Classrooms (ages 5-8)	10	0.12	25	1
Classrooms (age 9 plus)	10	0.12	35	1
Computer lab	10	0.12	25	1
Daycare (through age 4)	10	0.18	25	2
Daycare sickroom	10	0.18	25	3
Lecture classroom[h]	7.5	0.06	65	1
Lecture hall (fixed seats)[h]	7.5	0.06	150	1
Media center[a]	10	0.12	25	1
Multi-use assembly[h]	7.5	0.06	100	1
Music/theater/dance[h]	10	0.06	35	1
Science laboratories[g]	10	0.18	25	2
University/college laboratories	10	0.18	25	2
Wood/metal shop	10	0.18	20	2
FOOD AND BEVERAGE SERVICE				
Bars, cocktail lounges	7.5	0.18	100	2
Cafeteria/fast food dining	7.5	0.18	100	2
Kitchen (cooking)[i]	7.5	0.12	20	2
Restaurant dining rooms	7.5	0.18	70	2
GENERAL				
Break rooms[h]	5	0.06	25	1
Coffee stations[h]	5	0.06	20	1
Conference/meeting[h]	5	0.06	50	1
Corridors[h]	–	0.06	–	1
Occupiable storage rooms for liquids or gels[b]	5	0.12	2	2
HOSPITALS, NURSING AND CONVALESCENT HOMES				

No change to Houston amendment.

COLOR CODE INDEX: **Turquoise** = NEW or Modified Text by IAPMO in 2021 | **Text Underlined** = COH Amendment added (NEW) | **Grey Text** = Previous COH Amendment Brought Forward to 2021

~~**Yellow Strikethrough**~~ = Text Deleted from the Code by COH | **Green Text** = NEW or Modified Text by COH in 2021 | **Magenta** = New or Modified Text by IAPMO in 2018

Kitchen (cooking) i	7.5	0.12	20
Restaurant dining rooms	7.5	0.18	70
GENERAL			
Break rooms	5	0.06	25
Coffee stations	5	0.06	20
Conference/meeting	5	0.06	50
Corridors	–	0.06	–
Occupiable storage rooms for liquids or gels **b**	5	0.12	2
HOSPITALS, NURSING AND CONVALESCENT HOMES			
Autopsy rooms	–	–	0.5
Medical Procedure rooms	15	20	–
Operating rooms	30	20	–
Patient rooms	25	10	–
Physical therapy	15	20	–
Recovery and ICU	15	20	–
HOTELS, MOTELS, RESORTS, DORMITORIES			
Bedroom/living room	5	0.06	10
Barracks sleeping areas	5	0.06	20
Dormitory sleeping areas	5	0.06	–
Gambling casinos	7.5	0.16	–
Laundry rooms, central	5	0.12	10
Laundry rooms within dwelling units	5	0.12	10
Lobbies/pre-function	7.5	0.06	30
Multipurpose assembly	5	0.06	120
OFFICE BUILDINGS			
Breakrooms	5	0.12	50
Occupiable storage rooms for dry materials	5	0.06	2
Office space	5	0.06	5
Main entry lobbies	5	0.06	10
Reception areas	5	0.06	30
Telephone/data entry	5	0.06	60
MISCELLANEOUS SPACES			
Bank or bank lobbies	7.5	0.06	15
Bank vaults/safe deposit	5	0.06	5
Computer (not printing)	5	0.06	4
General manufacturing	10	0.18	7

TABLE 402.1 (continued)
MINIMUM VENTILATION RATES IN BREATHING ZONE[1, 2]
[ASHRAE 62.1: TABLE 6.2.2.1]

OCCUPANCY CATEGORY[4]	PEOPLE OUTDOOR Air Rate R_p (CFM/person)	AREA OUTDOOR Air Rate R_a (CFM/ft²)	DEFAULT OCCUPANT DENSITY[3] (people/1000 ft²)	AIR CLASS
Shipping/receiving[b]	10	0.12	2	2
Sorting, packing, light assembly	7.5	0.12	7	2
Telephone closets	–	–	–	1
Transportation waiting[h]	7.5	0.06	100	1
Warehouses[b]	10	0.06	–	2
PUBLIC ASSEMBLY SPACES				
Auditorium seating area[h]	5	0.06	150	1
Courtrooms[h]	5	0.06	70	1
Legislative chambers[h]	5	0.06	50	1
Libraries	5	0.12	10	1
Lobbies[h]	5	0.06	150	1
Museums (children's)	7.5	0.12	40	1
Museums/galleries[h]	7.5	0.06	40	1
Places of religious worship[h]	5	0.06	120	1
RESIDENTIAL				
Common corridors[h]	–	0.06	–	1
Dwelling unit[c, g, h]	5	0.06	See footnote[f]	1
RETAIL				
Sales (except as below)	7.5	0.12	15	2
Barber shop[h]	7.5	0.06	25	2
Beauty and nail salons	20	0.12	25	2
Coin-operated laundries	7.5	0.12	20	2
Mall common areas[h]	7.5	0.06	40	1
Pet shops (animal areas)	7.5	0.18	10	2
Supermarket[h]	7.5	0.06	8	1
SPORTS AND ENTERTAINMENT				
Bowling alley (seating)	10	0.12	40	1
Disco/dance floors[h]	20	0.06	100	2
Gambling casinos	7.5	0.18	120	1
Game arcades	7.5	0.18	20	1
Gym, sports arena (play area)[e]	20	0.18	7	2
Health club/aerobics room	20	0.06	40	2
Health club/weight rooms	20	0.06	10	2
Spectator areas[h]	7.5	0.06	150	1
Stages, studios[d, h]	10	0.06	70	1
Swimming (pool & deck)[e]	–	0.48	–	2

For SI units: 1 cubic foot per minute = 0.0283 m³/min, 1 square foot = 0.0929 m²

Notes:

1 This table applies to no-smoking areas. Rates for smoking-permitted spaces shall be determined using other methods.

2 Volumetric airflow rates are based on ~~an~~ dry air density of 0.075 pounds of dry air per cubic foot (lbda/ft³) (1.201 kgda/m³). ~~, which corresponds to dry air~~ at a barometric pressure of 1 atm (101 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density ~~but such adjustment is not required for compliance with this chapter~~.

3 The default occupant density shall be used where actual occupant density is not known.

4 Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 402.1

a For high school and college libraries, ~~use~~ the values shown for "Public Assembly Spaces – Libraries" shall be used.

b Rate ~~is capable of~~ may not ~~being~~ be sufficient where stored materials include those having potentially harmful emissions.

c Rate does not allow for humidity control. ~~Additional ventilation or dehumidification shall be permitted to remove moisture.~~ "Deck area" refers to the area surrounding the pool that ~~would be expected to be~~ is capable of being wetted during ~~normal~~ pool use ~~i.e., where~~ or when the pool is occupied. Deck area that is not expected to be wetted shall be designated as a ~~space type (for example, "spectator area")~~ an occupancy category.

d Rate does not include special exhaust for stage effects ~~(e.g., such as~~ dry ice vapors, and smoke.

e Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.

f Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.

g Air from one residential dwelling shall not be recirculated or transferred to other spaces outside of that dwelling.

h Ventilation air for this occupancy category shall be permitted to be reduced to zero where the space is in occupied-standby mode.

Autopsy rooms	–	0.5	20	
Medical procedure rooms	15	–	20	
Operating rooms	30	–	20	
Patient rooms	25	–	10	
Physical therapy	15	–	20	
Recovery and ICU	15	–	20	
HOTELS, MOTELS, RESORTS, DORMITORIES				
Barracks sleeping areas[h]	5	0.06	20	1
Bedroom/living room[h]	5	0.06	10	1
Dormitory sleeping areas	5	0.06	–	
Gambling casinos	7.5	0.16	–	
Laundry rooms, central	5	0.12	10	2
Laundry rooms within dwelling units	5	0.12	10	1
Lobbies/pre-function[h]	7.5	0.06	30	1
Multipurpose assembly[h]	5	0.06	120	1
OFFICE BUILDINGS				
Breakrooms	5	0.12	50	1
Main entry lobbies[h]	5	0.06	10	1
Occupiable storage rooms for dry materials	5	0.06	2	1
Office space[h]	5	0.06	5	1
Reception areas[h]	5	0.06	30	1
Telephone/data entry[h]	5	0.06	60	1
MISCELLANEOUS SPACES				
Bank or bank lobbies[h]	7.5	0.06	15	1
Bank vaults/safe deposit[h]	5	0.06	5	2
Computer (not printing)[h]	5	0.06	4	1
Freezer and refrigerated spaces (<50ºF)[e]	10	–	–	2
General manufacturing (excludes heavy industrial and processes using chemicals)	10	0.18	7	3
Pharmacy (prep. area)	5	0.18	10	2
Photo studios	5	0.12	10	1
Shipping/receiving[b]	10	0.12	2	2
Sorting, packing, light assembly	7.5	0.12	7	2
Telephone closets	–	–	–	1
Transportation waiting[h]	7.5	0.06	100	1
Warehouses[b]	10	0.06	–	2
PUBLIC ASSEMBLY SPACES				
Auditorium seating area[h]	5	0.06	150	1
Courtrooms[h]	5	0.06	70	1
Legislative chambers[h]	5	0.06	50	1
Libraries	5	0.12	10	1
Lobbies[h]	5	0.06	150	1
Museums (children's)	7.5	0.12	40	1
Museums/galleries[h]	7.5	0.06	40	1

(excludes heavy industrial and processes using chemicals)				
Pharmacy (prep. area)	5	0.18	10	
Photo studios	5	0.12	10	
Shipping/receiving **b**	10	0.12	2	
Sorting, packing, light assembly	7.5	0.12	7	
Telephone closets	–	0.00	–	
Transportation waiting	7.5	0.06	100	
Warehouses **b**	10	0.06	–	
PUBLIC ASSEMBLY SPACES				
Auditorium seating area	5	0.06	150	
Courtrooms	5	0.06	70	
Legislative chambers	5	0.06	50	
Libraries	5	0.12	10	
Lobbies	5	0.06	150	
Museums (children's)	7.5	0.12	40	
Museums/galleries	7.5	0.06	40	
Places of religious worship	5	0.06	120	
RESIDENTIAL				
Common corridors	–	0.06	–	
Dwelling unit **f, g**	5	0.06	See footnote **f**	
RETAIL				
Sales (except as below)	7.5	0. 12	15	
Barber shop	7.5	0.06	25	
Beauty and nail salons **h**	~~20~~ 25	~~0.12~~ 0.25	25	
Coin-operated laundries	7.5	0.12	20	
Mall common areas	7.5	0.06	40	
Pet shops (animal areas)	7.5	0.18	10	
Supermarket	7.5	0.06	8	
SPORTS AND ENTERTAINMENT				
Bowling alley (seating)	10	0.12	40	
Disco/dance floors	20	0.06	100	
Gambling casinos	7.5	0.18	120	
Game arcades	7.5	0.18	20	
Gym, stadium (play	–	0.30	30	

Places of religious worship[h]	5	0.06	120	1
RESIDENTIAL				
Common corridors[h]	–	0.06	–	1
Dwelling unit[f, g, h]	5	0.06	See footnote[f]	1
RETAIL				
Sales (except as below)	7.5	0. 12	15	2
Barber shop[h]	7.5	0.06	25	2
Beauty and nail salons	~~20~~ 25	~~0.12~~ 0.25	25	2
Coin-operated laundries	7.5	0.12	20	2
Mall common areas[h]	7.5	0.06	40	1
Pet shops (animal areas)	7.5	0.18	10	2
Supermarket[h]	7.5	0.06	8	1
SPORTS AND ENTERTAINMENT				
Bowling alley (seating)	10	0.12	40	1
Disco/dance floors[h]	20	0.06	100	2
Gambling casinos	7.5	0.18	120	1
Game arcades	7.5	0.18	20	1
Gym, sports arena (play area)[e]	20	0.18	7	2
Health club/aerobics room	20	0.06	40	2
Health club/weight rooms	20	0.06	10	2
Spectator areas[h]	7.5	0.06	150	1
Stages, studios[d, h]	10	0.06	70	1
Swimming (pool & deck)[c]	–	0.48	–	2

For SI units: 1 cubic foot per minute = 0.0283 m^3/min, 1 square foot = 0.0929 m^2

Notes:

1 This table applies to no-smoking areas. Rates for smoking-permitted spaces shall be determined using other methods.

2 Volumetric airflow rates are based on an air density of 0.075 pounds of dry air per cubic foot (lbda/ft^3) (1.201 kgda/m^3) at a barometric pressure of 1 atm (101 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density.

3 The default occupant density shall be used where actual occupant density is not known.

4 Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 402.1

a For high school and college libraries, use values shown for "Public Assembly Spaces – Libraries" shall be used.

b Rate may not be sufficient where stored materials include those having potentially harmful emissions.

c Rate does not allow for humidity control. "Deck area" refers to the area surrounding the pool that is capable of being wetted during normal pool use or when the pool is occupied. Deck area that is not expected to be wetted shall be designated as an occupancy category.

d Rate does not include special exhaust for stage effects such as dry ice vapors and smoke.

e Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.

f Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.

g Air from one residential dwelling shall not be recirculated or transferred to other space outside of that dwelling.

h Ventilation air for this occupancy category shall be permitted to be reduced to zero where the space is in occupied-standby mode.

i Provide minimum 80% outdoor makeup air to air conditioning system through fixed openings.

j Where the hood is eliminated for enclosed single batch low temperature chemical dishwashers, the ventilation shall be designed by a licensed design professional to accommodate the latent and sensible heat load emitted from such appliances.

area)				
Health club/aerobics room	20	0.06	40	
Health club/weight rooms	20	0.06	10	
Sports arena (play area)	–	0.30	–	
Spectator areas	7.5	0.06	150	
Stages, studios **d**	10	0.06	50	
Swimming (pool & deck) **c**	–	0.48	–	

For SI units: 1 cubic foot per minute = 0.0283 m^3/min, 1 square foot = 0.0929 m^2

Notes:

1. This table applies to no-smoking areas. Rates for smoking-permitted spaces must be determined using other methods.
2. Volumetric airflow rates are based on an air density of 0.075 pounds of dry air per cubic foot (lb_{da}/ft^3) (1.201 kg_{da}/m^3), which corresponds to dry air at a barometric pressure of 1 atm (101 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density but such adjustment is not required for compliance with this chapter.
3. The default occupant density shall be used where actual occupant density is not known.
4. Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 402.1

a For high school and college libraries, use values shown for Public Spaces- Library.
b Rate is capable of not being sufficient where stored materials include those having potentially harmful emissions.
c Rate does not allow for humidity control. Additional ventilation or dehumidification shall be permitted to be required to remove moisture.
d Rate does not include special exhaust for stage effects, (e.g., dry ice vapors, smoke).
e No class of air has been established for this occupancy category.
f Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.
g Air from one residential dwelling shall not be recirculated or transferred to other space outside of that dwelling.
h Provide minimum 80% outdoor makeup air to A/C System through fixed openings.

I Where the hood is eliminated for enclosed single batch low temperature chemical dishwashers , the ventilation shall be designed by a licensed design professional to accommodate the latent and sensible heat load emitted from such appliances

2021 Uniform Mechanical Code – Code Analysis

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary

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TABLE 403.7
MINIMUM EXHAUST RATES
[ASHRAE 62.1: TABLE 6.5]

ANCY CATEGORY [4]	EXHAUST RATE (cfm/unit)	EXHAUST RATE (cfm/ft²)	AIR
	–	0.50	1
ooms	–	0.70	2
ir rooms [1]	–	1.50	2
ops	–	0.50	2
nd nail salons	–	0.60	2
toilet	–	1.00	2
nting rooms	–	0.50	2
s	–	1.00	2
al science laboratories	–	1.00	2
closets, trash rooms,	–	1.00	3
– commercial	–	0.70	2
tes	–	0.30	2
oms	–	0.50	2
essing rooms	–	0.25	2
ay booths	–	–	4
arages [3]	–	0.75	2
s (animal areas)	–	0.90	2
ting machinery rooms [6]	–	–	3
al – kitchens [7]	2550/100	–	2
undry storage rooms	–	1.00	3
ooms, chemical	–	1.50	4
private [5, 9]	2025/50	–	2
public [4, 9]	50/70	–	2
k shop/classrooms	–	0.50	2

For SI units: 1 cubic foot per minute = 0.0283 m^3/min, 1 square foot = 0.0929 m^2

Notes:

1. Stands where engines are run shall have exhaust systems that directly connect to the engine exhaust and prevent escape of fumes.
2. Where combustion equipment is intended to be used on the playing surface, additional dilution ventilation, source control, or both shall be provided.
3. Exhaust rate is not required for open parking garages as defined in accordance with the building code.
4. Rate is per water closet, urinal, or both. Provide the higher rate where periods of heavy use are expected to occur, e.g., toilets in theatres, schools, and sports facilities. Otherwise the lower rate shall be permitted to be used.
5. Rate is for a toilet room intended to be occupied by one person at a time. For continuous system operation during normal hours of

N/A

TABLE 403.7
MINIMUM EXHAUST RATES
[ASHRAE 62.1: TABLE 6.5]

OCCUPANCY CATEGORY[4]	EXHAUST RATE (cfm/unit)	EXHAUST RATE (cfm/ft²)	AIR CLASS
Arenas[2]	–	0.50	1
Art classrooms	–	0.70	2
Auto repair rooms[1]	–	1.50	2
Barber shops	–	0.50	2
Beauty and nail salons	–	0.60	2
Cells with toilet	–	1.00	2
Copy, printing rooms	–	0.50	2
Darkrooms	–	1.00	2
Educational science laboratories	–	1.00	2
Janitor closets, trash rooms, recycling	–	1.00	3
Kitchens – commercial	–	0.70	2
Kitchenettes	–	0.30	2
Locker rooms for athletic, industrial and health care facilities	–	0.50	2
Other Locker rooms	–	0.25	2
Shower rooms[7, 10]	20/50	-	2
Paint spray booths	–	–	4
Parking garages[3]	–	0.75	2
Pet shops (animal areas)	–	0.90	2
Refrigerating machinery rooms[6]	–	–	3
Residential – kitchens[7]	2550/100	–	2
Soiled laundry storage rooms	–	1.00	3
Storage rooms, chemical	–	1.50	4
Toilets – private[5, 9]	2025/50	–	2
Toilets – public[4, 9]	50/70	–	2
Woodwork shop/classrooms	–	0.50	2

For SI units: 1 cubic foot per minute = 0.0283 m^3/min, 1 square foot = 0.0929 m^2

Notes:

1 Stands where engines are run shall have exhaust systems that directly connect to the engine exhaust and prevent escape of fumes.
2 Where combustion equipment is intended to be used on the playing surface, additional dilution ventilation, source control, or both shall be provided.
3 Exhaust shall not be required where two or more sides comprise walls that are at least 50 percent open to the outside.
4 Rate is per water closet, urinal, or both. Provide the higher rate where periods of heavy use are expected to occur. The lower rate shall be permitted to be used otherwise.
5 Rate is for a toilet room intended to be occupied by one person at a time. For continuous system operation during normal hours of use, the lower rate shall be permitted to be used. Otherwise the higher rate shall be used.
6 For refrigeration machinery rooms, the exhaust rate shall comply with Chapter 11.
7 For continuous system operation, the lower rates shall be permitted. Otherwise the higher rate shall be used.
8 For unlisted occupancies for a proposed space not listed in the table, the requirements for the listed occupancy that is most similar in terms of occupant density and occupancy type shall be used.
9 Exhaust air that has been cleaned in accordance with the criteria of Class 1 shall be permitted to be recirculated.

No change to Houston amendment.

use, the lower rate shall be permitted to be used. Otherwise the lower rate shall be permitted to be used. **6** For refrigeration machinery rooms, the exhaust rate shall comply with Chapter 11. **7** For continuous system operation, the lower rates shall be permitted. Otherwise the higher rate shall be used. **8** For unlisted occupancies for a proposed space not listed in the table, the requirements for the listed occupancy that is most similar in terms of occupant density and occupancy type shall be used. **9** Exhaust air that has been cleaned in accordance with the criteria of Class 1 shall be permitted to be recirculated.		10 Rate is per shower head.	
	403.7.2 Enclosed Parking Garages. Mechanical ventilation systems for enclosed parking garages shall operate continuously. **Exceptions:** (1) Mechanical ventilation systems shall be permitted to operate intermittently where the system is designed to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices. (2) Approved automatic carbon monoxide sensing devices, and nitrogen dioxide detectors shall be permitted ~~to be employed~~ to modulate the ventilation system to not exceed a maximum average ~~concentration of carbon monoxide~~ of 50 parts per million of carbon monoxide, or 1 part per million nitrogen dioxide during an eight-hour period, with a concentration of not more than 200 parts per million for carbon monoxide, or 5 parts per million nitrogen dioxide, for a period not exceeding ~~one hour~~ 15 minutes. Automatic ~~carbon monoxide~~ sensing devices installed ~~to~~ in modulated parking garage ventilation systems shall be approved in accordance with Section 301.2.		Minor changes to base code provisions for mechanical ventilation in enclosed parking garages.
405.0 Smoke Control Systems. **405.1 Scope and Purpose.** This section applies to mechanical and passive smoke control systems that are required by the *Building Code* or the *Fire Code*. The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems regulated by this section serve a different purpose than the smoke- and heat-venting provisions in Section 910 of the *Building Code* or the *Fire Code*.	**405.0 Indoor Air Quality for Residential Occupancies.** **405.1 General.** Rooms or occupied spaces within residential occupancies, where the occupants are nontransient, shall be designed to have mechanical ventilation and exhaust air in accordance with Section 405.2 through 405.5.		New base code provisions for residential indoor air quality. Previous Houston amendment relocated to Section 406.0.
	405.1.1 Natural Ventilation. Where approved by the Authority Having Jurisdiction, natural ventilation shall be permitted for Climate Zone 1, Climate Zone 2; or for thermally conditioned buildings for less than 876 hours per year.		New base code provisions for natural ventilation in certain climate zones.
405.2 General Design Requirements. Buildings, structures, or parts thereof required by the *Building Code* or the *Fire Code* to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909 of the *Building Code* and the	**405.2 Ventilation Air Rate.** The required mechanical ventilation outdoor air rate (Q_{tot}) shall be as calculated in accordance with Equation 405.2. **Exception:** For existing buildings and where permitted by the Authority Having Jurisdiction, the total mechanical		New base code provisions for ventilation air rates. Previous Houston amendment removed, refer to Section 406.0.

generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.	ventilation (Q_{tot}) is not required where Q_{tot} is calculated to be less than 15 ft^3/min (0.007 m^3/s). Q_{tot} = 0.03Afloor + 7.5(Nbr+1) **Equation 405.2** Where: Q_{tot} = Total required ventilation outdoor air rate, CFM A_{floor} = Floor area, ft^2 N_{br} = Number of bedrooms more than 1 For SI units 1 cubic foot per minute = 0.00047 m^3/s		
	405.2.1 Reduced Ventilation Air Rate. Where permitted by the Authority Having Jurisdiction, the mechanical ventilation air rate required in Section 405.2 shall be permitted to be reduced where an infiltration rate is determined in accordance with ASTM E779.		New base code provisions for reducing ventilation air rates.
405.3 Special Inspection and Test Requirements. In addition to the ordinary inspection and test requirements that buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 of the *Building Code* shall undergo special inspections and acceptance testing by a Houston registered special inspector, sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the construction documents shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved. The special inspections and tests required by this section shall be conducted under the same terms as found in Section 1704 of the *Building Code*.	**405.3 Bathroom Exhaust.** A mechanical exhaust directly to the outdoors shall be provided in each room containing a bathtub, shower, or tub/shower combination. The fan shall run intermittently (on demand) or continuously. A readily accessible manual control designed to be operated as needed or an automatic control shall be provided for intermittent operations.		New base code provisions for bathroom exhaust. Previous Houston amendment removed, refer to Section 406.0.
	405.3.1 Exhaust Rate. The exhaust rate shall be not less than 50 ft3/min (0.02 m3/s) for intermittent operation and 20 ft3/min (0.009 m3/s) for continuous operation.		Removed Houston amendment.
405.4 Analysis. A rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the systems supporting them and the methods of construction to be utilized shall accompany the submitted construction documents and shall include, but not be limited to, the items indicated in Sections 405.4.1 through 405.4.7.	**405.4 Kitchen Exhaust.** A mechanical exhaust directly to the outdoors shall be provided in each kitchen. The fan shall run intermittently (on demand) or continuously. A readily accessible manual control designed to be operated as needed or an automatic control shall be provided for intermittent operations.		New base code provisions for ktichen exhaust. Previous Houston amendment removed, refer to Section 406.0.
405.4.1 Stack Effect. The system shall be designed such that the maximum probable normal or reverse stack effects will not adversely interfere with the system's capabilities. In determining the maximum probable stack effect, altitude, elevation, weather history and interior temperatures shall be used.	**405.4.1 Exhaust Rate.** For intermittent-controlled operations, the exhaust rate shall be not less than 100 ft3/min (0.047 m3/s) for range hoods or 300 ft3/min (0.141 m3/s) for mechanical exhaust fans including downdraft appliances. For continuous operated ventilation, the exhaust rate shall be not less than 5 air changes per hour based on kitchen volume for enclosed kitchens.		New base code provisions for exhaust rates. Previous Houston amendment removed, refer to Section 406.0.
405.4.2 Temperature Effect of Fire. Buoyancy and expansion caused by the design fire in accordance with Section 405.9 shall be analyzed. The system shall be designed such that these effects do not adversely interfere with the system's capabilities.	N/A		Previous Houston amendment removed, refer to Section 406.0.

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405.4.3 Wind Effect. The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions of the *Building Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.4.4 HVAC Systems. The design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis shall include all permutations of systems' status. The design shall consider the effects of fire on the HVAC systems.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.4.5 Climate. The design shall consider the effects of low temperatures on systems, property and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.4.6 Duration of Operation. All portions of active or engineered smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is greater.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.4.7 Smoke Control System Interaction. The design shall consider the interaction effects of the operation of multiple smoke control systems for all design scenarios.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.5 Smoke Barrier Construction. Smoke barriers required for passive smoke control and a smoke control system using the pressurization method shall comply with the *Building Code*. Smoke barriers shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios: **(1)** Walls: $A/A_w =$ 0.00100 **(2)** Interior exit stairways and ramps and exit passageways: $A/A_w =$ 0.00035 **(3)** Enclosed exit access stairways and ramps and all other shafts: $A/A_w =$ 0.00150 **(4)** Floors and roofs: $A/A_F =$ 0.00050 **Where:** $A =$ Total leakage area, square feet (m^2). $A_F =$ Unit floor or roof area of barrier, square feet (m^2). $A_w =$ Unit wall area of barrier, square feet (m^2). The leakage area ratios shown do not include openings created by gaps around doors and operable windows. The total leakage area of the smoke barrier shall be determined in accordance with Section 405.5.1 and tested in accordance with Section 405.5.2.	**405.5 Ventilation Openings.** Occupiable spaces shall be provided with a readily accessible ventilation opening openable to the outdoors. The opening shall be not less than 5 square feet (0.464 m2) or 4 percent of the occupied floor area. The openable area shall be based on free, unobstructed area through the opening.		New base code provisions for ventilation openings. Previous Houston amendment removed, refer to Section 406.0.

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405.5.1 Total Leakage Area. Total leakage area of the barrier is the product of the smoke barrier gross area times the allowable leakage area ratio, plus the area of other openings such as gaps around doors and operable windows.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.5.2 Testing of Leakage Area. Compliance with the maximum total leakage area shall be determined by achieving the minimum air pressure difference across the barrier with the system in the smoke control mode for mechanical smoke control systems utilizing the pressurization method. Compliance with the maximum total leakage area of passive smoke control systems shall be verified through methods such as door fan testing or other methods, as approved by the fire code official.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.5.3 Opening Protection. Openings in smoke barriers shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by door assemblies complying with the requirements of the *Building Code* for doors in smoke barriers. **Exceptions:** **(1)** Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors listed for releasing service installed in accordance with the *Building Code*. **(2)** Fixed openings between smoke zones that are protected utilizing the airflow method. **(3)** In Group I-1 Condition 2, Group I-2 and ambulatory care facilities, where a pair of opposite-swinging doors are installed across a corridor in accordance with Section 405.5.3.1, the doors shall not be required to be protected in accordance with Section 716 of the *Building Code*. The doors shall be close-fitting within operational tolerances and shall not have a center mullion or undercuts in excess of ¾ inch (19.1 mm), louvers or grilles. The doors shall have head and jamb stops and astragals or rabbets at meeting edges and, where permitted by the door manufacturer's listing, positive-latching devices are not required. **(4)** In Group I-2 and ambulatory care facilities, where such doors are special-purpose horizontal sliding, accordion or folding door assemblies installed in accordance with Section 1010.1.4.3 of the *Building Code* and are automatic closing by smoke detection in accordance with Section 716.5.9.3 of the *Building Code*. **(5)** Group I-3. **(6)** Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank down capacity of greater than 20 minutes as determined by the design fire size.	N/A		Previous Houston amendment removed, refer to Section 406.0.

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405.5.3.1 Group I-1 Condition 2; Group I-2 and Ambulatory Care Facilities. In Group I-1 Condition 2; Group I-2 and ambulatory care facilities, where doors are installed across a corridor, the doors shall be automatic closing by smoke detection in accordance with Section 716.5.9.3 of the *Building Code* and shall have a vision panel with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.5.3.2 Ducts and Air Transfer Openings. Ducts and air transfer openings are required to be protected with a minimum Class II, 250°F (121°C) smoke damper complying with the *Building Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.6 Pressurization Method. The primary mechanical means of controlling smoke shall be by pressure differences across smoke barriers. Maintenance of a tenable environment is not required in the smoke control zone of fire origin.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.6.1 Minimum Pressure Difference. The minimum pressure difference across a smoke barrier shall be 0.05-inch water gage (12.4 Pa) in fully sprinklered buildings. In building permitted to be other than fully sprinklered, the smoke control system shall be designed to achieve pressure differences not less than two times the maximum calculated pressure difference produced by the design fire.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.6.2 Maximum Pressure Difference. The maximum air pressure difference across a smoke barrier shall be determined by required door-opening or closing forces. The actual force required to open exit doors when the system is in the smoke control mode shall be in accordance with the *Building Code*. Opening and closing forces for other doors shall be determined by standard engineering methods for the resolution of forces and reactions. The calculated force to set a side-hinged, swinging door in motion shall be determined by: $F = F_{dc} + K(WA\Delta P)/2(W-d)$ **Where:** A = Door area, square feet (m^2). d = Distance from door handle to latch edge of door, feet (m). F = Total door opening force, pounds (N). F_{dc} = Force required to overcome closing device, pounds (N). K = Coefficient 5.2 (1.0). W = Door width, feet (m). ΔP = Design pressure difference, inches of water gage (Pa).	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.6.3 Pressurized Stairways and Elevator Hoistways. Where stairways or elevator hoistways are pressurized, such pressurization systems shall comply with Section 405 as smoke control systems, in addition to the requirements of Section 909.20 of the *Building Code* and 909.21 of the *Fire Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.

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405.7 Airflow Design Method. Where approved by the code official, smoke migration through openings fixed in a permanently open position, which are located between smoke control zones by the use of the airflow method, shall be permitted. The design airflow shall be in accordance with this section. Airflow shall be directed to limit smoke migration from the fire zone. The geometry of openings shall be considered to prevent flow reversal from turbulent effects. Smoke control systems using the airflow method shall be designed in accordance with NFPA 92.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.7.1 Prohibited Conditions. This airflow design method shall not be employed where either the quantity of air or the velocity of the airflow will adversely affect other portions of the smoke control system, unduly intensify the fire, disrupt plume dynamics or interfere with building occupants exiting. Airflow toward the design fire shall not exceed 200 feet per minute (1.02 m/s). Where the calculated airflow exceeds this limit, the airflow method shall not be used.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.8 Exhaust Method. Where approved by the building official, mechanical smoke control for large enclosed volumes, such as in atriums or malls, shall be permitted to utilize the exhaust method. Smoke control systems using the exhaust method shall be designed in accordance with NFPA 92.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.8.1 Exhaust Rate. The height of the lowest horizontal surface of the accumulating smoke layer shall be maintained not less than 6 feet (1829 mm) above any walking surface that forms a portion of a required egress system within the smoke zone.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.9 Design Fire. The design fire shall be based on a rational analysis performed by the registered design professional and approved by the code official. The design fire shall be based on the analysis in accordance with Section 405.4 and this section.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.9.1 Factors Considered. The engineering analysis shall include the characteristics of the fuel, fuel load, effects included by the fire and whether the fire is likely to be steady or unsteady.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.9.2 Design Fire Fuel. Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.9.3 Heat-Release Assumptions. The analysis shall make use of the best available data from approved sources and shall not be based on excessively stringent limitations of combustible material.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.9.4 Sprinkler Effectiveness Assumptions. A documented engineering analysis shall be provided for conditions that assume fire growth is halted at the time of sprinkler activation.	N/A		Previous Houston amendment removed, refer to Section 406.0.

405.10 Equipment. Equipment, such as, but not limited to, fans, ducts, automatic dampers and balance dampers, shall be suitable for its intended use, suitable for the probable exposure temperatures that the rational analysis indicates and as approved by the code official.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.10.1 Exhaust Fans. Components of exhaust fans shall be rated and certified by the manufacturer for the probable temperature rise to which the components will be exposed. This temperature rise shall be computed by: $T_S = (Q_c/mc) + (T_a)$ **Where:** c = Specific heat of smoke at smoke-layer temperature, BTU/lb°F (kJ/kg ● K). m = Exhaust rate, pounds per second (kg/s). Q_C = Convective heat output of fire, Btu/s (kW). T_a = Ambient temperature, °F (K). T_S = Smoke temperature, °F (K). **Exception:** Reduced T_S as calculated based on the assurance of adequate dilution air.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.10.2 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 405.10.1. Ducts shall be constructed and supported in accordance with Chapter 6. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports. **Exception:** Flexible connections, for the purpose of vibration isolation, that are constructed of approved fire-resistance-rated materials are exempt from 405.10.2.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.10.3 Equipment, Inlets and Outlets. Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outdoor air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be so located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.10.4 Automatic Dampers. Automatic dampers, regardless of the purpose for which they are installed within the smoke control system, shall be listed and conform to the requirements of approved, recognized standards.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.10.5 Fans. In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty, with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the	N/A		Previous Houston amendment removed, refer to Section 406.0.

documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the structural design requirements of the *Building Code*. Motors driving fans shall operate within the limits specified on their nameplate horsepower (kilowatts), as determined from measurement of actual current draw. Motors driving fans shall have a minimum service factor of 1.15.			
405.11 Standby Power. The smoke control system shall be supplied with standby power in accordance with Section 2702 of the *Building Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.11.1 Equipment Room. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gears and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire-resistance-rated fire barriers constructed in accordance with Section 707 of the *Building Code* or horizontal assemblies constructed in accordance with Section 711 of the *Building Code*, or both. Power distribution from the two sources shall be by independent routes.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.11.2 Power Sources and Power Surges. Elements of the smoke control system relying on volatile memories or the like shall be supplied with uninterruptible power sources of sufficient duration to span 15-minute primary power interruption. Elements of the smoke control system susceptible to power surges shall be suitable protected by conditioners, suppressors or other approved means.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.12 Detection and Control Systems. Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907 of the *Building Code*. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.12.1 Verification. Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override and the presence of power downstream of all disconnects. A preprogrammed weekly test sequence shall report abnormal conditions audibly, visually and by printed report. The preprogrammed weekly test shall operate all devices, equipment and components used for smoke control. **Exception:** Where verification of individual components tested through the preprogrammed weekly testing sequence will interfere with, and produce unwanted effects to, normal building operation, such individual components are permitted to be bypassed from the preprogrammed weekly testing, where approved by the building official and in accordance with both of the following: **(1)** Where the operation of components is bypassed from the preprogrammed weekly test, a listed control unit shall verify weekly the	N/A		Previous Houston amendment removed, refer to Section 406.0.

presence of power downstream of all disconnects. **(2)** Testing of all components bypassed from the preprogrammed weekly test shall be in accordance with Section 909.20.6 of the *Fire Code*.			
405.12.2 Wiring. In addition to meeting the requirements of the *Electrical Code*, mechanical smoke control, wiring, regardless of voltage, shall be fully enclosed within continuous raceways. The requirement of this section shall apply only to wiring extending from the fire alarm system control unit that activates any required smoke-control system component such as relays, fans, dampers, or stair pressurization systems.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.12.3 Activation. Smoke control systems shall be activated in accordance with the *Building Code* or the *Fire Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.12.4 Automatic Control. Where complete automatic control is required or used, the automatic control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1 of the *Fire Code*, from manual controls that are readily accessible to the fire department, and any smoke detectors required by engineering analysis.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.13 Control-Air Tubing. Control-air tubing shall be of sufficient size to meet the required response times specified by the design professional or *Fire Code*, whichever is more restrictive. Tubing shall be flushed clean and dry prior to final connections. Tubing shall be adequately supported and protected from damage. Tubing passing through concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.13.1 Materials. Control-air tubing shall be hard-drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be wrought copper or brass, solder type in accordance with ASME B 16.18 or ASME B 16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP-5 brazing alloy with solidus above 1,100°F (593°C) and liquids below 1,500°F (816°C). Brazing flux shall be used on copper-to-brass joints only. **Exception:** Nonmetallic tubing used within control panels and at the final connection to devices are exempted from 405.13.1, provided all of the following conditions are met: **(1)** Tubing shall comply with the requirements of Section 602.2.3. **(2)** Tubing and connected devices shall be completely enclosed within a galvanized or paint-grade steel enclosure having a minimum thickness of 0.0296 inch (0.7534 mm) (No. 22 gage). Entry to the enclosure shall be by	N/A		Previous Houston amendment removed, refer to Section 406.0.

copper tubing with a protective grommet of Neoprene or Teflon or by suitable brass compression to male barbed adapter. **(3)** Tubing shall be identified by appropriately documented coding. **(4)** Tubing shall be neatly tied and supported within the enclosure. Tubing bridging cabinets and doors or moveable devices shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.			
405.13.2 Isolation from Other Functions. Control tubing serving other than smoke control functions shall be isolated by automatic isolation valves or shall be an independent system.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.13.3 Testing. Control-air tubing shall be tested at three times the operating pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior to final connection to devices.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.14 Marking and Identification. The detection and control systems shall be clearly marked at all junctions, accesses and terminations.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.15 Control Diagrams. Identical control diagrams shall be provided and maintained as required by the *Fire Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.16 Fire Fighter's Smoke Control Panel. A fire fighter's smoke control panel for fire department emergency response purposes only shall be provided in accordance with the *Fire Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.17 System Response Time. Smoke control system activation shall comply with the *Fire Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.18 Acceptance Testing. Devices, equipment, components and sequences shall be tested in accordance with Section 405.3 of this code and the *Fire Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.
405.19 System Acceptance. Authority Having Jurisdiction acceptance of the smoke control system shall be based on special inspections documenting compliance with the provisions of this code and the *Fire Code*.	N/A		Previous Houston amendment removed, refer to Section 406.0.

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	N/A	**406.0 Smoke Control Systems.** Smoke control systems shall be designed, installed, and tested based on the requirements of Section 909 of the *Fire Code*.	Previous Houston amendment for smoke control has been condensed into one section, referring to IFC provisions for smoke control.
2015 Houston Amendment - Chapter 5 Exhaust Systems	**2021 UMC – Chapter 5 – Exhaust Systems**	**2021 Houston UMC Amendments**	**Code Change Summary**
	504.4 Clothes Dryers. A clothes dryer exhaust duct shall not be connected to a vent connector, gas vent, chimney, and shall not terminate into a crawl space, attic, or other concealed space. Exhaust ducts shall not be assembled with screws or other fastening means that extend into the duct and that are capable of catching lint, and that reduce the efficiency of the exhaust system. Exhaust ducts shall be constructed of rigid metallic material. Transition ducts used to connect the dryer to the exhaust duct shall be listed and labeled in accordance with UL 2158A, or installed in accordance with the clothes dryer manufacturer's installation instructions. Clothes dryer exhaust ducts shall terminate to the outside of the building in accordance with Section 502.2.1 and shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination. Devices, such as fire or smoke dampers that will obstruct the flow of the exhaust shall not be used. Where joining of ducts, the male end shall be inserted in the direction of airflow.		Minor change to base code provisions to reference new UL 2158A standard.
504.4.2.1 Length Limitation. Unless otherwise permitted or required by the dryer manufacturer's instructions and approved by the Authority Having Jurisdiction, domestic dryer moisture exhaust ducts shall not exceed a total combined horizontal and vertical length of ~~14~~ 35 feet (~~4267~~ 10668 mm), including two 90 degree (1.57 rad) elbows. A length of 2 feet (610 mm) shall be deducted for each 90 degree (1.57 rad) elbow in excess of two. Where the exhaust duct is concealed within the building construction and exceeds the length limitation of this section, a permanent label or tag shall be located within 6 feet (1829 mm)of the exhaust duct connection identifying the length of the exhaust duct.	**504.4.2.1 Length Limitation.** Unless otherwise permitted or required by the dryer manufacturer's instructions and approved by the Authority Having Jurisdiction, domestic dryer moisture exhaust ducts shall not exceed a total combined horizontal and vertical length of 14 feet (4267 mm), including two 90 degree (1.57 rad) elbows. A length of 2 feet (610 mm) shall be deducted for each 90 degree (1.57 rad) elbow in excess of two. **Exception:** Where an exhaust duct power ventilator, in accordance with Section 504.4.2.3, is used, the maximum length of the dryer exhaust duct shall be permitted to be in accordance with the dryer exhaust duct power ventilator manufacturer's installation instructions.	**504.4.2.1 Length Limitation.** Unless otherwise permitted or required by the dryer manufacturer's instructions and approved by the Authority Having Jurisdiction, domestic dryer moisture exhaust ducts shall not exceed a total combined horizontal and vertical length of ~~14~~ 35 feet (~~4267~~ 10,668 mm), including two 90 degree (1.57 rad) elbows. A length of 2 feet (610 mm) shall be deducted for each 90 degree (1.57 rad) elbow in excess of two. Where the exhaust duct is concealed within the building construction and exceeds the length limitation of this section, a permanent label or tag shall be located within 6 feet (1,829 mm) of the exhaust duct connection identifying the length of the exhaust duct. **Exception:** Where an exhaust duct power ventilator, in accordance with Section 504.4.2.3, is used, the maximum length of the dryer exhaust duct shall be permitted to be in accordance with the dryer exhaust duct power ventilator manufacturer's installation instructions.	New base code exception for duct length limitations. No change to Houston amendment.
504.6 Gypsum Wallboard Ducts. Bathroom and laundry room exhaust ducts, and other environmental air ducts shall not ~~be permitted to~~ be constructed of gypsum wallboard ~~subject to the limitations of Section 602.5~~.	**N/A**	**504.6 Gypsum Wallboard Ducts.** Bathroom and laundry room exhaust ducts, and other environmental air ducts shall not be permitted to be constructed of gypsum wallboard ~~subject to the limitations of Section 602.4.2~~.	No change to Houston amendment.

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	507.4.4.2 Single Wall. Listed single wall factory-built grease ducts shall be permitted to be enclosed with field-applied grease duct enclosure material where the material and the assembly of duct and material are listed for that application and installed in accordance with the grease duct manufacturer's listing and their installation instructions. [NFPA 96:4.3.3.2]		New base code section for single wall factory-built grease ducts.
508.1 Where Required. Type 1 hoods shall be installed at or above commercial-type deep-fat fryers, broilers, grills, hot-top ranges, ovens, barbecues, rotisseries, and similar equipment that emits comparable amounts of smoke or grease in a food-processing establishment. For the purpose of this section, a food-processing establishment shall include a building or portion thereof used for the processing of food, but shall not include a dwelling unit. Type 2 hoods shall be installed above equipment and dishwashers that generate steam, heat, and products of combustion, and where grease or smoke is not present. **Exceptions:** **(1)** Cooking appliance that is in accordance with UL 710B for reduced emissions where the grease discharge does not exceed 2.9 E-09 ounces per cubic inch (oz/in^3) (5.0 E-06 kg/m^3) where operated with a total airflow of 500 cubic feet per minute (cfm) (0.236 m^3/s). **(2)** Recirculating systems listed in accordance with UL 710B and installed in accordance with Section 516.0. **(3)** Dishwashing machines connected to a Type II duct system and exhausted directly to the outdoors. **(4)** Dishwashing machines with a self-contained condensing system listed in accordance with UL 921 and installed in a space where the HVAC system has been engineered to accommodate the latent and sensible heat load emitted from such appliances as approved by the Authority Having Jurisdiction. Such equipment shall be provided with an interlocking device to prevent opening of the appliance prior to completion of its cycle. **(5)** Residential cooking equipment located in daycare facilities, churches, employee lunchrooms, or similar locations that are no more hazardous than kitchen facilities in an individual dwelling unit. **(6)** Listed convection ovens.	**508.0 Type I Hoods.** **508.1 Where Required.** Type I hoods shall be installed at or above commercial-type deep-fat fryers, broilers, grills, hot-top ranges, ovens, barbecues, rotisseries, and similar equipment that emits comparable amounts of smoke or grease in a food-processing establishment. For the purpose of this section, a food-processing establishment shall include a building or portion thereof used for the processing of food, but shall not include a dwelling unit. **Exceptions:** (1) Cooking appliance that is in accordance with UL 710B for reduced emissions where the grease discharge does not exceed 2.9 E-09 ounces per cubic inch (oz/in3) (5.0 E-06 kg/m3) where operated with a total airflow of 500 cubic feet per minute (CFM) (0.236 m3/s). (2) Recirculating systems listed in accordance with UL 710B and installed in accordance with Section 516.0.	**508.1 Where Required.** Type I hoods shall be installed at or above commercial-type deep-fat fryers, broilers, grills, hot-top ranges, ovens, barbecues, rotisseries, and similar equipment that emits comparable amounts of smoke or grease in a food-processing establishment. For the purpose of this section, a food-processing establishment shall include a building or portion thereof used for the processing of food, but shall not include a dwelling unit. **Exceptions:** **(1)** Cooking appliance that is in accordance with UL 710B for reduced emissions where the grease discharge does not exceed 2.9 E-09 ounces per cubic inch (oz/in^3) (5.0 E-06 kg/m^3) where operated with a total airflow of 500 cubic feet per minute (CFM) (0.236 m^3/s). **(2)** Recirculating systems listed in accordance with UL 710B and installed in accordance with Section 516.0. **(3)** Residential cooking equipment located in daycare facilities, churches, employee lunchrooms, or similar locations that are no more hazardous than kitchen facilities in an individual dwelling unit. **(4)** Listed convection ovens.	Base code updates remove additional exceptions. No change to Houston amendment.
	508.2.2 Listed Ventilated Ceiling Technology. Listed ventilated ceiling technology shall be installed and maintained in accordance with the terms of its listing and the manufacturer's instructions. [NFPA 96:5.6]		New base code provisions for listed ventilation ceiling technology.
510.1.7 Type II Exhaust Duct Systems. Ducts and plenums serving Type II hoods shall be constructed of rigid metallic materials in accordance with Chapter 6. Duct bracing and supports shall comply with Chapter 6. Ducts	**510.1.7 Type I Exhaust Duct Systems.** Listed grease ducts shall be installed in accordance with the terms of their listing and the manufacturer's ~~installation~~ instructions. [NFPA 96:7.1.7]		Houston amendment for Section 510.1.7 has been relocated to Section 519.4.

subject to positive pressure and ducts conveying moisture-laden or waste-heat-laden air shall be adequately sealed.			
510.9.1 Rooftop Terminations. Rooftop terminations shall be arranged with or provided with the following: **(1)** Not less than 10 feet (3048 mm) of horizontal clearance from the outlet to adjacent buildings, property lines, and air intakes. **Exception:** Exhaust outlets for grease ducts serving commercial food heat-processing equipment may terminate not less than 5 feet (1524 mm) from an adjacent building, adjacent property line or air intake opening into a building if the air from the exhaust outlet is discharged away from such locations. {**EDITORIAL NOTE:** THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2015 UMC.}	N/A	**510.9.1 Rooftop Terminations.** Rooftop terminations shall be arranged with or provided with the following: **(1)** A minimum of 10 feet (3,048 mm) of horizontal clearance from the outlet to adjacent buildings, property lines, and air intakes. **Exception:** Exhaust outlets for grease ducts serving commercial food heat-processing equipment may terminate not less than 5 feet (1,524 mm) from an adjacent building, adjacent property line or air intake opening into a building if the air from the exhaust outlet is discharged away from such locations. [**EDITORIAL NOTE:** THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2021 UMC.]	No change to Houston amendment.
	~~**510.9.1.1 Listed Flexible Connectors.** Listed flexible connectors shall be permitted to be used on exterior roof locations where required for proper equipment vibration isolation.~~		Base code provisions removed.
	511.1.3.1 At the Rooftop. Fans installed at the rooftop termination point shall be in accordance with the following: (1) Section 510.9.1 and Section 510.9.1.2. (2) Flexible connectors shall be ~~permitted~~ prohibited.		Minor wordsmithing to base code provisions.
513.1 General. Fire-extinguishing equipment for the protection of grease removal devices, hood exhaust plenums, and exhaust duct systems shall be provided in accordance with this section or the *Fire Code*, whichever is most restrictive. [NFPA 96:10.1.1]	N/A	**513.1 General.** Fire-extinguishing equipment for the protection of grease removal devices, hood exhaust plenums, and exhaust duct systems shall be provided in accordance with this section or the *Fire Code*, whichever is most restrictive. [NFPA 96:10.1.1]	No change to Houston amendment.
	513.3.1 Hoods. Hoods installed end to end, back to back, or both, or sharing a common ductwork, not exceeding 75 feet (22 860 mm) in distance from the farthest hood, and having a grease producing appliance(s) located under one or more of the hoods, shall be considered a single hazard area requiring simultaneous automatic fire protection in all hoods and ducts. [NFPA 96:10.3.1.1]		New base code provisions for hood installations.
	513.3.1.1 Common Ductwork. In hoods that are installed end to end, back to back, or both, and that share a common ductwork, the ductwork beyond 75 feet (22 860 mm) from the farthest hood shall be protected by an independent fire-extinguishing system with its own detection system or by a fire-extinguishing system that activates simultaneously with the fire-extinguishing system(s) protecting the hoods. [NFPA 96:10.3.1.1.1]		New base code provisions for ductwork related to hoods.

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	513.3.2 Independent Systems. Hoods installed end to end, back to back, or both that do not share a common exhaust duct and are separated by a wall(s) or other means to ensure that grease-laden vapors exhausted under one hood cannot propagate to the other hoods, the hoods' fire-extinguishing system(s) shall be independent and shall not be required to simultaneously discharge. [NFPA 96:10.3.1.2]		New base code provisions for independent fire extinguishing systems for hoods.
	513.3.3 Exempt Equipment. Fume incinerators, thermal recovery units, air pollution control devices, or other devices installed in the exhaust duct shall not be required to comply with Section 513.3.1. [NFPA 96:10.3.1.3]		New base code provisions for exempt equipment.
		519.1 Where Required. Type II hoods shall be installed above equipment and dishwashers that generate steam, heat, or products of combustion, and where grease or smoke is not present. **Exceptions:** (1) Dishwashing machines connected to a Type II duct system and exhausted directly to the outdoors. (2) Dishwashing machines with a self-contained condensing system listed in accordance with UL 921 and installed in a space where the HVAC system has been engineered to accommodate the latent and sensible heat load emitted from such appliances as approved by the Authority Having Jurisdiction. Such equipment shall be provided with an interlocking device to prevent opening of the appliance prior to completion of its cycle. (3) Residential cooking equipment located in daycare facilities, churches, employee lunchrooms, or similar locations that are no more hazardous than kitchen facilities in an individual dwelling unit. (4) Listed convection ovens.	New Houston amendment for Type II hoods to mirror existing Houston amendments for Type I hoods in Section 508.1.
		519.4 Type II Exhaust Duct Systems. Ducts and plenums serving Type II hoods shall be constructed of rigid metallic materials in accordance with Chapter 6. Duct bracing and supports shall comply with Chapter 6. Ducts subject to positive pressure and ducts conveying moisture-laden or waste-heat-laden air shall be adequately sealed.	No change to Houston amendment, relocated from Section 510.1.7.
	519.5 Termination of Type II Hood Exhaust System. The exhaust system shall terminate as follows: (1) Rooftop terminations shall terminate not less than 10 feet (3048 mm) from a property line, and the exhaust flow shall be directed away from the roof surface of the roof, not less than 40 inches (1016 mm). (2) Horizontal terminations shall terminate not less than 10 feet (3048 mm) from adjacent buildings, property lines, operable openings, and from grade level. (3) The ~~termination~~ discharge outlet shall not be directed onto a public ~~way~~ walkway.		Minor wordsmithing to base code provisions.

2015 Houston Amendment - Chapter 6 Duct Systems	2021 UMC – Chapter 6 – Duct Systems	2021 Houston UMC Amendments	Code Change Summary
	602.2 Combustibles Within Ducts or Plenums. Materials exposed within ducts or plenums shall be noncombustible or shall have a flame spread index not to exceed 25 and a smoke-developed index not to exceed 50, where tested as a composite product in accordance with ASTM E84 or UL 723. Plastic piping installed in plenums shall be tested in accordance with all requirements of ASTM E84 or UL 723. Mounting methods, supports and sample sizes of materials for testing that are not specified in ASTM E84 or UL 723 shall be prohibited. **Exceptions:** (1) Return-air and outside-air ducts, plenums, or concealed spaces that serve a dwelling unit. (2) Air filters in accordance with the requirements of Section 311.2. (3) Water evaporation media in an evaporative cooler. (4) Charcoal filters where protected with an approved fire suppression system. (5) Products listed and labeled for installation within plenums in accordance with Section 602.2.1 through Section 602.2.3. (6) Smoke detectors. (7) Duct insulation, coverings, and linings and other supplementary materials installed in accordance with Section ~~604.0~~ 605.0. (8) Materials in a hazardous fabrication area including the areas above and below the fabrication area sharing a common air recirculation path with the fabrication area.		New base code language added for plastic piping requirements in plenum spaces.
	602.3 Metallic. Ducts, plenums, or fittings of metal shall comply with SMACNA HVAC Duct Construction Standards – Metal and Flexible. Flexible metallic ducts shall comply with UL 181.		New base code provisions for flexible metallic ducts
	602.4 Nonmetallic Ducts. Nonmetallic ducts shall comply with Section 602.4.1, Section 602.4.2, Section 602.4.3 or Section 602.4.4.		New base code provisions for nonmetallic ducts.
	~~602.4~~ **602.4.1 Phenolic.** Phenolic duct, plenum, or fitting material shall comply with UL 181. Ducts, plenums, or fittings of phenolic shall be constructed in accordance with SMACNA Phenolic Duct Construction Standards or the conditions of its listing.		Minor wordsmithing to base code provisions for phenolic ducts to comply with UL 181.
	~~602.5~~ **602.4.2 Gypsum.** Where gypsum products are exposed in ducts or plenums, the air temperature shall be restricted to a range from 50°F (10°C) to 125°F (52°C), and moisture content shall be controlled so that the material is not adversely affected. All gypsum products shall have a mold or mildew resistant surface. For the purpose of this	**602.4.2 Gypsum.** Where gypsum products are exposed in return air ducts or plenums, the air temperature shall be restricted to a range from 50˚F (10˚C) to 125˚F (52˚C), and moisture content shall be controlled so that the material is not adversely affected. All gypsum products shall have a mold or mildew resistant surface. For the purpose of this section, gypsum products shall not be	Base code section relocated. No change to Houston amendment.

	section, gypsum products shall not be exposed in supply ducts.	exposed in supply ducts, and exhaust systems complying with the requirements of Chapter 5.	
	~~603.13~~ 602.4.3 **Air Dispersion Systems.** ~~Where installed, air dispersion systems shall be completely in exposed locations in duct systems under positive pressure, and not pass through or penetrate fire resistant-rated construction.~~ Air dispersion systems shall be listed and labeled in accordance with UL 2518.		Minor changes to base code.
602.5 Gypsum. Where gypsum products are exposed in return air ducts or plenums, the air temperature shall be restricted to a range from 50˚F (10˚C) to 125˚F (52˚C), and moisture content shall be controlled so that the material is not adversely affected. For the purpose of this section, gypsum products shall not be exposed in ducts serving as supply from evaporative coolers, and in other air-handling systems regulated by this chapter where the temperature of the gypsum product will be below the dew point temperature, and exhaust systems complying with the requirements of Chapter 5. **Moved to 602.4.2**			Houston amendment relocated to Section 602.4.2, no change.
	~~**602.6 Factory-Made Air Ducts.** Factory-made air ducts shall be approved for the use intended or shall be in accordance with the requirements of UL 181. Each portion of a factory-made air duct system shall be identified by the manufacturer with a label or other identification indicating compliance with its class designation.~~		Base code provisions removed.
	603.1 General. Air ducts shall be installed in accordance with this Chapter and the installation instructions.		New base code updates for air ducts.
	603.1.1 Pressure Classification. The pressure classification of ducts shall be not less than the design operating pressure of the air distribution in which the duct is utilized.		Minor base code changes.
	603.1.2 Air Temperature. The temperature of the air to be conveyed in a duct shall not exceed 250°F (121°C).		New base code provisions for temperature limits conveyed through ducts.
	603.1.3 Protection. Air ducts, other than plastic ducts, shall be installed with not less than 4 inches (102 mm) of separation from earth, except where installed as a liner inside of concrete, tile, or metal pipe and shall be protected from physical damage.		New base code provisions for air duct protection.
	603.1.4 Vertical Risers. Ducts listed and labeled to UL 181 shall not be used for vertical risers in air-duct systems serving more than two stories.		New base code provisions for vertical risers.

	603.1.5 Penetrations. Ducts listed and labeled to UL 181 shall not penetrate a fire-resistance-rated assembly or construction.		New base code provisions for duct penetrations.
	603.3 Metal Ducts. Ducts shall be supported at each change of direction and in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible. Riser ducts shall be held in place by means of metal straps or angles and channels to secure the riser to the structure. ~~Metal ducts shall be installed with not less than 4 inches (102 mm) separation from earth.~~ Ducts shall be installed in a building with clearances that will retain the full thickness of fireproofing on structural members.		Base code removes metal ducts provisions.
	~~**603.4 Factory-Made Air Ducts.** Factory-made air ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the terms of their listing, the manufacturer's installation instructions, and SMACNA HVAC Duct Construction Standards – Metal and Flexible.~~ ~~Factory-made air ducts shall not be used for vertical risers in air-duct systems serving more than two stories and shall not penetrate a fire-resistance-rated assembly or construction.~~ ~~Factory-made air ducts shall be installed with not less than 4 inches (102 mm) of separation from earth, except where installed as a liner inside of concrete, tile, or metal pipe and shall be protected from physical damage. The temperature of the air to be conveyed in a duct shall not exceed 250°F (121°C).~~ ~~Flexible air connectors shall not be permitted.~~		Base code removes provisions for factory made air ducts.
	603.4.1 Length Limitation. ~~Factory-made~~ flexible air ducts ~~and connectors~~ shall be not more than 5 feet (1524 mm) in length and shall not be used in lieu of rigid elbows or fittings. Flexible air ducts shall be permitted to be used as an elbow at a terminal device. Exception: Residential occupancies.		Minor wordsmithing to base code provisions.
	~~**603.11**~~ **603.10 Cross Contamination.** Exhaust ducts ~~and venting systems~~ that convey Class 4 air shall be negatively pressurized relative to ducts, plenums, or occupiable spaces through which the ducts pass. Exhaust ducts under positive pressure that convey Class 2 or Class 3 air shall not extend into or pass through ducts, ~~or~~ plenums, or occupiable spaces other than the space from which the exhaust air is drawn. **Exception:** Exhaust ducts conveying Class 2 air and exhaust ducts conveying air from residential kitchen hoods that are sealed in accordance with SMACNA Seal Class A. [ASHRAE 62.1:5.2.1, 5.2.2].		Base code updates to cross contamination provisions.
603.11 Cross Contamination. Hazardous or product-conveying exhaust ~~Exhaust~~ ducts and venting systems under positive pressure shall not extend into or pass through ducts or plenums.	**603.11 Underground Installation.** Ducts installed underground shall be approved for the installation and shall have a slope of not less than 1⁄8 inch per foot (10.4 mm/m) back to the main riser. Ducts, plenums, and fittings shall be permitted to be constructed of concrete, clay, or ceramics where installed in the ground or in a concrete slab, provided the joints are sealed and duct is secured in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible. Metal ducts where installed in or under a concrete slab shall be encased in not less than 2 inches (51 mm) of concrete, secured in	**603.11 Underground Installation.** Ducts installed underground shall be approved for the installation and shall have a slope of not less than $^{1}/_{8}$ inch per foot (10.4 mm/m) back to the main riser. Ducts, plenums, and fittings shall be permitted to be constructed of concrete, clay, or ceramics where installed in the ground or in a concrete slab, provided the joints are sealed and duct is secured in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible. Metal ducts where installed in or under a concrete slab shall be stainless steel or galvanized and encased in not less than 2 inches (51	Houston amendment for "cross contamination" has been removed as it's no longer necessary. 2021 Houston amendment for "underground installations" has been relocated from 603.12, no changes to Houston amendment.

	accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible.	mm) of concrete, secured in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible.	
603.12 Underground Installation. Ducts installed underground shall be approved for the installation and shall have a slope of not less than $^1/_8$ inch per foot (10.4 mm/m). Ducts, plenums, and fittings shall be permitted to be constructed of concrete, clay, or ceramics where installed in the ground or in a concrete slab, provided the joints are tightly sealed. Metal ducts where installed in or under a concrete slab shall be stainless steel or galvanized and encased in not less than 2 inches (51 mm) of concrete.			Houston amendment has been relocated to 603.11, no changes.
604.1 General. Air ducts conveying air at temperatures exceeding 140˚F (60˚C) shall be insulated to maintain an insulation surface temperature of not more than 140˚F (60˚C). Factory-made air ducts and insulations intended for installation on the exterior of ducts shall be legibly printed with the name of the manufacturer, the thermal resistance (R) value at installed thickness, flame-spread index and smoke developed index of the composite material. Internal duct liners and insulation shall be installed in accordance with the *Energy Conservation Code* ~~SMACNA HVAC Duct Construction Standards—Metal and Flexible~~. **Exceptions:** **(1)** Factory-installed plenums, casings, or ductwork furnished as a part of HVAC equipment tested and rated in accordance with approved energy efficiency standards. **(2)** Ducts or plenums located in conditioned spaces where heat gain or heat loss will not increase energy use. **(3)** For runouts less than 10 feet (3048 mm) in length to air terminals or air outlets, the rated R value of insulation need not exceed R-3.5. **(4)** The rated R value of required insulation on the b~~B~~acks of air outlets and outlet plenums exposed to unconditioned or indirectly conditioned spaces with face areas exceeding 1~~5~~ square feet (0.0929~~5~~ m^2) need not exceed R-2; those 1~~5~~ square feet (0.0929~~5~~ m^2) or smaller need not be insulated. **(5)** Ducts and plenums used exclusively for evaporative cooling systems.	N/A		Previous Houston amendment relocated to Section 605.1.
		605.1 General. Air ducts conveying air at temperatures exceeding 140˚F (60˚C) shall be insulated to maintain an insulation surface temperature of not more than 140˚F (60˚C). Installation material on the exterior of ducts shall be legibly printed with the name of the manufacturer, the thermal resistance (R) value at installed thickness, flame-spread index, and smoke developed index of the composite material. Internal duct liners and insulation shall be installed in accordance with the *Energy Conservation Code* ~~SMACNA HVAC Duct Construction Standards—Metal and Flexible~~. **Exceptions:**	Houston amendment relocated from Section 604.1, no change to amendment.

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		(1) Factory-installed plenums, casings, or ductwork furnished as a part of HVAC equipment tested and rated in accordance with approved energy efficiency standards. **(2)** Ducts or plenums located in conditioned spaces where heat gain or heat loss will not increase energy use. **(3)** For runouts less than 10 feet (3,048 mm) in length to air terminals or air outlets, the rated R value of insulation need not exceed R-3.5. **(4)** The rated R value of required insulation on the b~~B~~acks of air outlets and outlet plenums exposed to unconditioned or indirectly conditioned spaces with face areas exceeding 1~~5~~ square feet (0.0929~~5~~ m^2) need not exceed R-2; those 1~~5~~ square feet (0.09295 m^2) or smaller need not be insulated. Ducts and plenums used exclusively for evaporative cooling systems.	
	~~**604.1.1**~~ **605.1.1 Within Ducts or Plenums.** Materials installed within ducts and plenums for insulating, sound deadening, or other purposes shall have a mold, humidity, and erosion-resistant surface where tested in accordance with UL 181. Duct liners in systems operating with air velocities exceeding 2000 feet per minute (10.16 m/s) shall be fastened with both adhesive and mechanical fasteners, and exposed edges shall have approved treatment to withstand the operating velocity. Where the internal insulation is capable of being in contact with condensates or other liquids, the material shall be water-resistant. Pipe and duct insulation shall not be used to reduce the maximum flame and smoke requirements in Section 602.2 unless tested in accordance with ASTM E84 or UL 723 as a composite assembly of the duct or pipe and its associated insulation, coatings and adhesives.		No Houston amendment.
605.5 Access and Identification. Fire and smoke dampers shall be provided with an approved means of access large enough to allow inspection and maintenance of the damper and its operating parts. The access shall not affect the integrity of the fire resistance-rated assembly. The access openings shall not reduce the fire resistance rating of the assembly. Access shall not require the use of tools. Access doors in ducts shall be tight fitting and approved for the required duct construction. Access points shall be permanently identified visibly on the exterior of the duct and at the ceiling level by a label with letters not less than ½ of an inch (12.7 mm) in height reading as one of the following: **(1)** Smoke Damper **(2)** Fire Damper **(3)** Fire/Smoke Damper Access doors shall be not more than 2 inches (51 mm) less than the size of the duct up to 24 inches (610 mm), and 24 inch by 24 inch (610 mm by 610 mm) in ducts of 28 inches (711 mm) dimension or larger.	N/A		Houston amendment relocated to Section 606.5.

		606.5 Access and Identification. Fire and smoke dampers shall be provided with an approved means of access large enough to allow inspection and maintenance of the damper and its operating parts. The access shall not affect the integrity of the fire resistance-rated assembly. The access openings shall not reduce the fire resistance rating of the assembly. Access shall not require the use of tools. Access doors in ducts shall be tight fitting and approved for the required duct construction. Access points shall be permanently identified visibly on the exterior of the duct and at the ceiling level by a label with letters not less than ½ of an inch (12.7 mm) in height reading as one of the following: **(1)** Smoke Damper **(2)** Fire Damper **(3)** Fire/Smoke Damper Access doors shall be not more than 2 inches (51 mm) less than the size of the duct up to 24 inches (610 mm), and 24 inch by 24 inch (610 mm by 610 mm) in ducts of 28 inches (711 mm) dimension or larger.	No change to Houston amendment, relocated from Section 605.5.
608.1 Air-Moving Systems and Smoke Detectors. Air-moving systems supplying air in excess of ~~2000~~ 2200 cubic feet per minute (ft^3/min) (~~0.9439~~ 1.0382 m^3/s) to enclosed spaces within buildings shall be equipped with an automatic shutoff. Automatic shutoff shall be accomplished by interrupting the power source of the air-moving equipment upon detection of smoke in the main supply-air duct or return-air duct served by such equipment. Duct smoke detectors shall comply with UL 268A and shall be installed in accordance with the manufacturer's installation instructions. Such devices shall be compatible with the operating velocities, pressures, temperatures, and humidity's of the system. Where fire-detection or alarm systems are provided for the building, the smoke detectors shall be supervised by such systems in an approved manner. **Exceptions:** **(1)** Where the space supplied by the air-moving equipment is served by a total coverage smoke-detection system in accordance with the fire code, interconnection to such system shall be permitted to be used to accomplish the required shutoff. **(2)** Automatic shutoff is not required where occupied rooms served by the air-handling equipment have direct exit to the exterior and the travel distance does not exceed 100 feet (30,480 mm). For the purpose of this exception, occupied rooms shall not include rooms that have less than 300 square feet (27.8709 square meters) and are ancillary to the function of the space served by the air-handling system, such as restrooms, storerooms, or cashier or manager offices. **(3)** Automatic shutoff is not required for Group R, Division 3 and Group U occupancies.	N/A	(1)	Houston amendment relocated to Section 609.1., no changes.

(4) Automatic shutoff is not required for approved smoke-control systems or where analysis demonstrates shutoff would create a greater hazard, such as shall be permitted to be encountered in air-moving equipment supplying specialized portions of Group H Occupancies. Such equipment shall be required to have smoke detection with remote indication and manual shutoff capability at an approved location. **(5)** Smoke detectors that are factory installed in listed air-moving equipment shall be permitted to be used in lieu of smoke detectors installed in the main supply-air duct served by such equipment.			
		609.1 Air-Moving Systems and Smoke Detectors. Air-moving systems supplying air in excess of ~~2000~~ 2,200 cubic feet per minute (ft^3/min) (~~0.9439~~ 1.0382 m^3/s) to enclosed spaces within buildings shall be equipped with an automatic shutoff. Automatic shutoff shall be accomplished by interrupting the power source of the air-moving equipment upon detection of smoke in the main supply-air duct or return-air duct served by such equipment. Duct smoke detectors shall comply with UL 268A and shall be installed in accordance with the manufacturer's installation instructions. Such devices shall be compatible with the operating velocities, pressures, temperatures, and humidities of the system. Where fire-detection or alarm systems are provided for the building, the smoke detectors shall be supervised by such systems in an approved manner. **Exceptions:** (1) Where the space supplied by the air-moving equipment is served by a total coverage smoke-detection system in accordance with the fire code, interconnection to such system shall be permitted to be used to accomplish the required shutoff. (2) Automatic shutoff is not required where occupied rooms served by the air-handling equipment have direct exit to the exterior and the travel distance does not exceed 100 feet (30,480 mm). For the purpose of this exception, occupied rooms shall not include rooms that have less than 300 square feet (27.8709 square meters) and are ancillary to the function of the space served by the air-handling system, such as restrooms, storerooms, or cashier or manager offices. (3) Automatic shutoff is not required for Group R, Division 3 and Group U occupancies. (4) Automatic shutoff is not required for approved smoke-control systems or where analysis demonstrates shutoff would create a greater hazard, such as shall be permitted to be encountered in air-moving equipment supplying specialized portions of Group H Occupancies. Such equipment shall be required to have smoke	No change to Houston amendment, relocated from Section 608.1.

		detection with remote indication and manual shutoff capability at an approved location. (5) Smoke detectors that are factory installed in listed air-moving equipment shall be permitted to be used in lieu of smoke detectors installed in the main supply-air duct served by such equipment.	
2015 Houston Amendment – Chapter 8 Chimneys and Vents	**2021 UMC – Chapter 8 – Chimneys and Vents**	**2021 Houston UMC Amendments**	**Code Change Summary**
	Table 802.4 (Table 802.4) **TABLE 802.4** **TYPE OF VENTING SYSTEM TO BE USED** **[NFPA 54: TABLE 12.5.1]**		Base code table has been updated for certain listed appliances.

APPLIANCES	TYPE OF VENTING SYSTEM	LOCATION OF REQUIREMENT
~~Listed Category I appliances~~	~~Type B gas vent~~	~~Section 802.6~~
~~Listed appliances equipped with draft hood~~	~~Chimney~~	~~Section 802.5~~
~~Appliances listed for use with Type B gas vent~~	~~Single-wall metal pipe~~ ~~Listed chimney lining system for gas venting~~ ~~Special gas vent listed for these appliances~~	~~Section 802.7~~ ~~Section 802.5.3~~ ~~Section 802.4.3~~
Listed Category I appliances Listed appliances equipped with draft hood Appliances listed for use with Type B gas vent	Type B gas vent	Section 802.6
	Chimney	Section 802.5
	Single-wall metal pipe	Section 802.7
	Listed chimney lining system for gas venting	Section 802.5.3
	Special gas vent listed for these appliances	Section 802.4.3
Listed vented wall furnaces	Type B-W gas vent	Section 802.6, Section 907.
Category II ~~appliances~~, Category III ~~appliances~~, and Category IV appliances	As specified or furnished by manufacturers of listed appliances	Section 802.4.1 ~~and~~, Section 80
~~Incinerators~~	~~Single-wall metal pipe~~	~~NFPA 82~~
Incinerators	In accordance with NFPA 82	
Appliances that can be converted to use of solid fuel Unlisted combination gas- and oil-burning appliances Combination gas- and solid-fuel-burning appliances Appliances listed for use with chimneys only Unlisted appliances	Chimney	Section 802.5
~~Listed combination gas- and oil-burning appliances~~	~~Type L vent~~	~~Section 802.6~~ ~~Section 802.5~~
Listed combination gas- and oil-burning appliances	Type L vent	Section 802.6
	Chimney	Section 802.5
Decorative appliances in vented fireplace	Chimney	Section 911.2
Gas-fired toilets	Single-wall metal pipe	Section 802.7, Section 929
Direct vent appliances	—	Section 802.2.6
Appliances with integral vents	—	Section 802.2.7

	802.8.2 Direct-Vent Appliance. The ~~vent terminal of a~~ clearances for through-the-wall direct ~~vent appliance with an input of 10 000 Btu/h (3 kW) or less~~ vent terminals shall be ~~located at least 6 inches (152 mm) from any air opening into a building, an appliance with an input over 10 000 Btu/h (3 kW) but not over 50 000 Btu/h (14.7 kW) shall be installed with a 9 inch (229 mm) vent termination clearance, and an appliance with an input exceeding 50 000 Btu/h (14.7 kW) shall have at least a 12 inch (305 mm) vent termination clearance~~ in accordance with Table 802.8.2. The bottom of the vent terminal and the air intake shall be located ~~at least~~ not less than 12 inches (305 mm) above finished ground level. [NFPA 54:12.9.3]		Base code provisions for direct-vent appliances have been updated.

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	TABLE 802.8.2 **THROUGH-THE-WALL DIRECT VENT TERMINATION CLEARANCES** **[NFPA 54: TABLE 12.9.3]** See table below		New base code table for through-the-wall vent terminations, provides clearance requirements.

DIRECT VENT APPLIANCE INPUT RATING	THROUGH THE WALL VENT TERMINAL CLEARANCE FROM A AIR OPENING INTO A BUILDIN (inches)
10 000 Btu/h and less	6
Greater than 10 000 Btu/h and not exceeding 50 000 Btu/h	9
Greater than 50 000 Btu/h and not exceeding 150 000 Btu/h	12
> 150 000 Btu/h	In accordance with the appliar manufacturer's instructions and no case less than the clearanc specified in Section 802.8.1

For SI Units: 1 inch = 25.4 mm, 1000 British thermal units per hour = 0 kW

2015 Houston Amendment - Chapter 9 Installation of Specific Appliances	2021 UMC – Chapter 9 – Installation of Specific Appliances	2021 Houston UMC Amendments	Code Change Summary
	902.0 General. **902.1 Nonindustrial Appliance.** This chapter is applicable primarily to nonindustrial-type appliances and installations and, unless specifically indicated, does not apply to industrial-type appliances and installations. Listed appliances shall be installed in accordance with their listing and the manufacturer's installation instructions or, as elsewhere specified in this chapter, as applicable to the appliance. Unlisted appliances shall be installed as specified in this part as applicable to the appliances. ~~For additional information concerning particular appliances and accessories, including industrial types, reference can be made to the standards listed in Chapter 17.~~		Base code removes reference to Ch. 17 for information on appliances
904.4 Temperature- or Pressure-Limiting Devices. See Chapter 10 of this code. ~~Steam and hot water boilers, respectively, shall be provided with approved automatic limiting devices for shutting down the burner(s) to prevent boiler steam pressure or boiler water temperature from exceeding the maximum allowable working pressure or temperature. Safety limit controls shall not be used as operating controls. [NFPA 54:10.3.4]~~	N/A		Houston amendment removed, returning to base code provisions.

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904.5 Low-Water Cutoff. See Chapter 10 of this code. ~~Water boilers and steam boilers shall be provided with an automatic means to shut off the fuel supply to the burner(s) where the boiler water level drops to the lowest safe water line. In lieu of the low-water cutoff, water tube or coil-type boilers that require forced circulation to prevent overheating and failure shall have an approved flow-sensing device arranged to shut down the boiler where the flow rate is not capable of protecting the boiler against overheating. [NFPA 54:10.3.5]~~	N/A		Houston amendment removed, returning to base code provisions.
904.6 Steam Safety and Pressure-Relief Valves. See Chapter 10 of this code. ~~Steam and hot water boilers shall be equipped, respectively, with listed or approved steam safety of pressure-relief valves of discharge capacity and shall comply with ASME requirements. A shutoff valve shall not be placed between the relief valve and the boiler or on discharge pipes between such valves and the atmosphere. [NFPA 54:10.3.6]~~	N/A		Houston amendment removed, returning to base code provisions.
913.1.1 Gasketed Fireplace Doors. A gasketed fireplace door shall not be installed on a factory-built fireplace, except where the fireplace system has been tested in accordance with UL 127 and the *Energy Conservation Code*.	N/A	**913.1.1 Gasketed Fireplace Doors.** A gasketed fireplace door shall not be installed on a factory-built fireplace, except where the fireplace system has been tested in accordance with UL 127 and the *Energy Conservation Code*. [**EDITORIAL NOTE:** THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.]	No change to Houston amendment.
916.2.1.1 Unvented Room Heaters. Unvented room heaters shall be prohibited in accordance with Section 2445.1 of the *Residential Code* ~~not be installed in bathrooms or bedrooms~~. {**EDITORIAL NOTE:** THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2015 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.}	N/A		Houston amendment removed, returning to base code provisions.
	920.4.2 Vertical Clearance. Built-in top (or surface) cooking appliances shall have a vertical clearance above the cooking top of not less than 30 inches (762 mm) to combustible material or metal cabinets. A clearance of not less than 24 inches (610 mm) is permitted where one of the following is installed: (1) The underside of the combustible material or metal cabinet above the cooking top is protected with not less than 1⁄4 of an inch (6.4 mm) insulating millboard covered with sheet metal not less than 0.0122 of an inch (0.3099 mm) thick. (2) A metal ventilating hood of sheet metal not less than 0.0122 of an inch (0.3099 mm) thick is installed above the cooking top with a clearance of not less than 1⁄4 of an inch (6.4 mm) between the hood and the underside of the combustible material or metal cabinet, and the hood not less than the width of the appliance and is centered over the appliance. (3) A listed cooking appliance or microwave oven installed over a listed cooking appliance shall be in accordance with the terms of the upper appliance listing and the manufacturer's installation instructions. Microwave ovens shall comply with UL 923.		New base code provisions for microwave ovens to comply with UL 923.

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary

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		927.0 Pool Heaters. Pool heaters shall comply with Appendix L of the *Plumbing Code*. [**EDITORIAL NOTE:** THE REMAINDER OF SECTION 927 REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.]	No change to Houston amendment, relocated from Section 928.0.
928.0 Pool Heaters. Pool heaters shall comply with Appendix L of the *Plumbing Code*. **{EDITORIAL NOTE: THE REMAINDER OF SECTION 928 REMAINS AS SET FORTH IN THE 2015 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.}** **Moved to 927.0**	N/A		Previous Houston amendment relocated to Section 927.0, no change.
	934.0 Refrigeration Appliances. **934.1 Self-Contained Refrigerators and Freezers.** Factory-built commercial refrigerators and freezers shall comply with UL 471 or UL 60335-2-89 and shall be installed in accordance with the manufacturer's installation instructions.		Base code updates to reference UL 60335-2-89 standard.

2015 Houston Amendment - Chapter 10 Boilers and Pressure Vessels	2021 UMC – Chapter 10 – Boilers and Pressure Vessels	2021 Houston UMC Amendments	Code Change Summary
1001.1 Applicability. The requirements of this chapter shall apply to the construction, installation, operation, repair, and alteration of boilers and pressure vessels. Low-pressure boilers shall comply with this chapter and Section 904.0. The installation or repair of gas and potable water piping and/or accessories shall be subject to the provisions of the *Plumbing Code*. **Exceptions:** **(1)** Listed and approved potable water heaters with a nominal capacity not exceeding 120 gallons (454 L) and having a heat input not exceeding 200,000 British thermal units per hour (Btu/h) (58.6 kW) used for hot water supply at a pressure not exceeding 160 pounds force per square inch (psi) (1103 kPa) and at temperatures not exceeding 210°F (99°C), in accordance with the plumbing code. **(2)** Pressure vessels used for unheated water supply, including those containing air that serves as a cushion and is compressed by the introduction of water and tanks connected to sprinkler systems. **(3)** Portable unfired pressure vessels and Interstate Commerce Commission (I.C.C.) containers. **(4)** Containers for liquefied petroleum gases, bulk oxygen, and medical gas that are regulated by the fire code. **(5)** Unfired pressure vessels in business, factory, hazardous, mercantile, residential, storage, and utility occupancies having a volume not exceeding 5 cubic feet (0.14 m^3) and operating at pressures not exceeding 250 psi (1,724 kPa). **(6)** Pressure vessels used in refrigeration systems shall comply with Chapter 11.		**1001.1 Applicability.** The requirements of this chapter shall apply to the construction, installation, operation, repair, and alteration of boilers and pressure vessels. Low-pressure boilers shall comply with this chapter and Section 904.0. The installation or repair of gas and potable water piping and/or accessories shall be subject to the provisions of the *Plumbing Code*. **Exceptions:** (1) Listed and approved potable water heaters with a nominal capacity not exceeding 120 gallons (454 L) and having a heat input not exceeding 200 000 British thermal units per hour (Btu/h) (58.6 kW) used for hot water supply at a pressure not exceeding 160 pounds-force per square inch (psi) (1103 kPa) and at temperatures not exceeding 210°F (99°C), in accordance with the plumbing code. (2) Pressure vessels used for unheated water supply, including those containing air that serves as a cushion and is compressed by the introduction of water and tanks connected to sprinkler systems. (3) Portable unfired pressure vessels and Interstate Commerce Commission (I.C.C.) containers. (4) Containers for liquefied petroleum gases, bulk oxygen, and medical gas that are regulated by the fire code. (5) Unfired pressure vessels in business, factory, hazardous, mercantile, residential, storage, and utility occupancies having a volume not exceeding 5 cubic feet (0.14 m^3) and operating at pressures not exceeding 250 psi (1,724 kPa). 6) Pressure vessels used in refrigeration systems shall comply with Chapter 11.	No change to Houston amendment.

(7) Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables, and other similar humidity control systems. **(8)** A boiler or pressure vessel subject to regular inspection by federal inspectors or licensed by federal authorities. ~~**(9) DELETED**~~		(7) Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables, and other similar humidity control systems. (8) A boiler or pressure vessel subject to regular inspection by federal inspectors or licensed by federal authorities.	
		1001.1.1 Potable Water Boilers. Permits and inspections pertaining to boilers used exclusively for the production of potable hot water shall be administered by the Plumbing Inspection Section staff of the Authority Having Jurisdiction.	Previous Houston amendment relocated from Section 1003.6, no changes.
		1001.1.2 Permit Required. Except for work exempted by Section 104.2 of this code, a permit shall be obtained from the Authority Having Jurisdiction prior to installation, reinstallation, alteration, repair or replacement of boilers and pressure vessels related to steam and hot water boiler systems. Alteration of safety control systems on automatic boilers or replacement, repair, or alteration of breeching, vent connector, vent pipe or chimney, and the conversion of solid fuel-fired boilers as permitted by Section 1010.0 shall also require a permit. See Chapter 1 for requirements for obtaining permits.	Previous Houston amendment relocated from Section 1003.7, no changes.
		1001.1.3 Boiler Nameplate. A boiler nameplate shall be attached to each boiler. Lost or destroyed nameplates shall be replaced in accordance with the *National Board Inspection Code*.	Previous Houston amendment relocated from Section 1003.8, no changes.
1001.7 Makeup water connection to steam boilers. Approved backflow preventers shall be installed in accordance with the *Plumbing Code*.	N/A	**1001.7 Makeup water connection to steam boilers.** Approved backflow preventers shall be installed in accordance with the *Plumbing Code*.	No change to Houston amendment.
1003.6 Potable Water Boilers. Permits and inspections pertaining to boilers used exclusively for the production of potable hot water shall be administered by the Plumbing Inspection Section staff of the Authority Having Jurisdiction. ~~Reference Section 1001.1, Exception 1. Permits and inspections pertaining to boilers used for other than the production of potable hot water shall be administered by the Mechanical Inspection Section staff of the Authority Having Jurisdiction.~~ **Moved to 1001.1.1**	N/A		Previous Houston amendment relocated to Section 1001.1.1.
1003.7 Permit Required. Except for work exempted by Section 104.2 of this code, a permit shall be obtained from the *Authority Having Jurisdiction* prior to installation, reinstallation, alteration, repair or replacement of boilers and pressure vessels related to steam and hot water boiler systems. Alteration of safety control systems on automatic boilers or replacement, repair, or alteration of breeching, vent connector, vent pipe or chimney, and the conversion of solid fuel-fired	N/A		Previous Houston amendment relocated to Section 1001.1.2.

boilers as permitted by Section 1010.0 shall also require a permit. See Chapter 1 for requirements for obtaining permits. **Moved to 1001.1.2**			
1003.8 Boiler Nameplate. A boiler nameplate shall be attached to each boiler. Lost or destroyed nameplates shall be replaced in accordance with the *National Board Inspection Code*. **Moved to 1001.1.3**	N/A		Previous Houston amendment relocated to Section 1001.1.3.
1005.6 Authority to Set and Seal Safety Appliances. All safety and safety relief valves for ASME Section I, Section IV, and Section VIII Division 1 boilers must be repaired, tested, set, and sealed by one of the following, provided the scope of the issued certificate of authorization covers the work to be performed: **(1)** An organization holding a valid V, HV, or UV certification or authorization, as appropriate, issued by the American Society of Mechanical Engineers (ASME); **(2)** An organization holding a valid VR certificate of authorization issued by the National Board of Boiler and Pressure Vessel Inspectors; or **(3)** An organization holding a valid owner/operate certificate of authorization issued by the Texas Department of Licensing and Regulation.	N/A	**1005.6 Authority to Set and Seal Safety Appliances.** All safety and safety relief valves for ASME Section I, Section IV, and Section VIII Division 1 boilers must be repaired, tested, set, and sealed by one of the following, provided the scope of the issued certificate of authorization covers the work to be performed: **(1)** An organization holding a valid V, HV, or UV certification or authorization, as appropriate, issued by the American Society of Mechanical Engineers (ASME); **(2)** An organization holding a valid VR certificate of authorization issued by the National Board of Boiler and Pressure Vessel Inspectors; or **(3)** An organization holding a valid owner/operate certificate of authorization issued by the Texas Department of Licensing and Regulation.	No change to Houston amendment.
1006.0 Gas Shutoff Valves. **1006.1 General.** An approved manual shutoff valve ~~with handle~~ shall be installed within 3 feet (914 mm) of the boiler gas train, upstream of all control devices on the main burner of a gas-fired boiler. The takeoff point for the gas supply to the pilot shall be upstream of the gas shutoff valve of the main burner and shall be valved separately. A union or other approved means of disconnect shall be provided immediately down-stream of these shutoff valves.		**1006.0 Gas Shutoff Valves.** **1006.1 General.** An approved manual shutoff valve shall be installed within 3 feet (914 mm) of the boiler gas train, upstream of all control devices on the main burner of a gas-fired boiler. The takeoff point for the gas supply to the pilot shall be upstream of the gas shutoff valve of the main burner and shall be valved separately. A union or other approved means of disconnect shall be provided immediately down-stream of these shutoff valves.	No change to Houston amendment.
1008.2 Low-Water Fuel Cutoff and Feed Water Pump Control Combined in a Single Device. Where a low-water fuel cutoff and feed water pump control combined in a single device is used, an additional separate low-water fuel cutoff with manual reset shall be installed, or be in accordance with the manufacturer's specifications of a listed device. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.	N/A	**1008.2 Low-Water Fuel Cutoff and Feed Water Pump Control Combined in a Single Device.** Where a low-water fuel cutoff and feed water pump control combined in a single device is used, an additional separate low-water fuel cutoff with manual reset shall be installed, or be in accordance with the manufacturer's specifications of a listed device. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.	No change to Houston amendment.
1008.3 Low-Water Fuel Cutoff Housed in Either the Water Column or Separate Chamber. The installation shall be provided with a blow down pipe and valve not less than ¾ inch pipe size. The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water fuel cutoff device.	N/A	**1008.3 Low-Water Fuel Cutoff Housed in Either the Water Column or Separate Chamber.** The installation shall be provided with a blow down pipe and valve not less than ¾ inch pipe size. The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water fuel cutoff device.	No change to Houston amendment.

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1013.1 General. An installation for which a permit is required shall not be put into service until it has been inspected and approved by the Authority Having Jurisdiction. It shall be the duty of the owner or his authorized representative to notify the Authority Having Jurisdiction that the installation is ready for inspection and test. It also shall be the duty of the owner or his authorized representative to post in a conspicuous position on the installation a notice in substantially the following form: "Warning! This installation has not been inspected and approved by the Authority Having Jurisdiction and shall not be covered or concealed until so inspected and approved," and it shall be unlawful for anyone other than the Authority Having Jurisdiction to remove such notice. The Authority Having Jurisdiction shall require such tests as it deems necessary to determine that the installation is in accordance with the provisions of this section. Such tests shall be made by the owner or his authorized representative in the presence of the Authority Having Jurisdiction. All boiler installations shall be hydrostatically tested by the owner or owner's authorized representative in the presence of the Authority Having Jurisdiction and in accordance with the *National Board Inspection Code*. **Exception:** On installation designed and supervised by a registered design professional, the Authority Having Jurisdiction shall have the authority to permit inspection and testing by such registered design professional. Where the owner or his authorized representative requests inspection of a boiler prior to its installation, the Authority Having Jurisdiction shall make such inspection.	N/A	**1013.1 General.** An installation for which a permit is required shall not be put into service until it has been inspected and approved by the Authority Having Jurisdiction. It shall be the duty of the owner or his authorized representative to notify the Authority Having Jurisdiction that the installation is ready for inspection and test. It also shall be the duty of the owner or his authorized representative to post in a conspicuous position on the installation a notice in substantially the following form: "Warning! This installation has not been inspected and approved by the Authority Having Jurisdiction and shall not be covered or concealed until so inspected and approved," and it shall be unlawful for anyone other than the Authority Having Jurisdiction to remove such notice. The Authority Having Jurisdiction shall require such tests as it deems necessary to determine that the installation is in accordance with the provisions of this section. Such tests shall be made by the owner or his authorized representative in the presence of the Authority Having Jurisdiction. All boiler installations shall be hydrostatically tested by the owner or owner's authorized representative in the presence of the Authority Having Jurisdiction and in accordance with the *National Board Inspection Code*. **Exception:** On installation designed and supervised by a registered design professional, the Authority Having Jurisdiction shall have the authority to permit inspection and testing by such registered design professional. Where the owner or his authorized representative requests inspection of a boiler prior to its installation, the Authority Having Jurisdiction shall make such inspection.	No change to Houston amendment.
1013.2 Temporary Operating Permit. ~~It shall be unlawful to operate a boiler or pressure vessel without first obtaining a valid operating permit to do so from the Authority Having Jurisdiction. Such permit shall be displayed in a conspicuous place adjacent to the boiler or vessel. The operating permit shall not be issued until the equipment has been inspected and approved by the Authority Having Jurisdiction.~~ ~~**Exception:** The operation of steam-heating boilers, low-pressure hot-water-heating boilers, hot water supply boilers, and pressure vessels in residential occupancies of less than six dwelling units and in utility occupancies.~~ An installer of a boiler installed by authority of a permit issued under the provisions of this code may operate a temporary boiler and its appurtenances for a limited time for the purpose of cleaning, testing and adjusting, prior to passing final inspection, upon the following conditions: **(1)** The installer in whose name the permit is issued shall request the Authority Having Jurisdiction to inspect the system for approval of such operation. **(2)** If upon inspection the system is approved for operation as described in this section, the Authority Having Jurisdiction shall indicate in writing on said permit that a temporary operation is approved for the purpose of	N/A		Previous Houston removed to maintain base code provision for "operating permit". Houston language for "temporary operating permit" have been relocated to Section 1013.2.1.

cleaning, testing, and adjusting for a period of 30 working days from date of inspection. **(3)** On or before the expiration date of the temporary operating permit, the system shall be given a final inspection and if the system fails to be approved, a reinspection fee will be charged for each subsequent inspection until the system is finally approved as complying with the requirements of this code. **(4)** Should the cleaning, testing, and adjusting of a boiler system not be completed within the time stipulated on the temporary operating permit, the Authority Having Jurisdiction may extend the time for just cause.			
		1013.2.1 Temporary Permit. An installer of a boiler installed by authority of a permit issued under the provisions of this code may operate a temporary boiler and its appurtenances for a limited time for the purpose of cleaning, testing and adjusting, prior to passing final inspection, upon the following conditions: (1) The installer in whose name the permit is issued shall request the Authority Having Jurisdiction to inspect the system for approval of such operation. (2) If upon inspection the system is approved for operation as described in this section, the Authority Having Jurisdiction shall indicate in writing on said permit that a temporary operation is approved for the purpose of cleaning, testing, and adjusting for a period of 30 working days from date of inspection. (3) On or before the expiration date of the temporary operating permit, the system shall be given a final inspection and if the system fails to be approved, a reinspection fee will be charged for each subsequent inspection until the system is finally approved as complying with the requirements of this code. Should the cleaning, testing, and adjusting of a boiler system not be completed within the time stipulated on the temporary operating permit, the Authority Having Jurisdiction may extend the time for just cause.	No changes to Houston amendment, relocated from Section 1013.2.

2015 Houston Amendment - Chapter 11 Refrigeration	2021 UMC – Chapter 11 – Refrigeration	2021 Houston UMC Amendments	Code Change Summary
1101.1 Applicability. Part I governs the design, installation, and construction of refrigeration systems, equipment, refrigerant piping, pressure vessels, and safety devices for new buildings~~, replacement of parts, alterations, and substitution of different refrigerants~~. Replacement of existing refrigeration systems, conversion to a different refrigerant or installation of a new refrigeration system into an existing building shall conform to the requirements of this chapter. Part II governs the installation and construction of cooling towers.	N/A	**1101.1 Applicability.** Part I governs the design, installation, and construction of refrigeration systems, equipment, refrigerant piping, pressure vessels, and safety devices for new buildings~~, replacement of parts, alterations, and substitution of different refrigerants~~. Replacement of existing refrigeration systems, conversion to a different refrigerant or installation of a new refrigeration system into an existing building shall conform to the requirements of this chapter. Part II governs the installation and construction of cooling towers.	No change to Houston amendment.
1101.1.1 Existing Systems. The requirements of this section shall apply to existing refrigerant systems, equipment or devices where a substitution of a different	N/A	**1101.1.1 Existing Systems in Machinery Rooms.** The requirements of this section shall apply to existing refrigerant systems, equipment or devices where a	No change to Houston amendment.

<table>
<tr>
<td>refrigerant or replacement or addition of a refrigeration system or equipment occurs, and:
(1) The quantity of refrigerant in the largest system in the room exceeds the allowable quantities per Table 1102.2; or
(2) The replaced, converted or altered system contains Group A1 refrigerant and has an aggregate horsepower of 100 or more for a single refrigerant system; or
(3) The system contains other than Group A1 refrigerant
Exception: Absorption systems, see Section 1104.9, are exempted from 1101.2.</td>
<td></td>
<td>substitution of a different refrigerant or replacement or addition of a refrigeration system or equipment occurs, and:
(1) The quantity of refrigerant in the largest system in the room exceeds the allowable quantities per Table 1102.3; or
(2) The replaced, converted or altered system contains Group A1 refrigerant and has an aggregate horsepower of 100 or more for a single refrigerant system; or
(3) The system contains other than Group A1 refrigerant.</td>
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<td>1103.1.1 Safety Group. Table 1102.3 classifies refrigerants by toxicity and flammability, and assigns safety groups using combinations of toxicity class and flammability class. For the purposes of this chapter, the refrigerant Groups A1, A2L, A2, A3, B1, B2L, B2, and B3 shall be considered to be individual and distinct safety groups, as shown in Table 1103.1.1. Each refrigerant is assigned into not more than one group.</td>
<td>New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC.

Refer to Technical Memo #09 for more information on A2L refrigerant update.</td>
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<tr>
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<td>TABLE 1103.1.1
REFRIGERANT SAFETY GROUP CLASSIFICATIONS
<table>
<tr><td>Higher Flammability</td><td>A3</td><td>B3</td></tr>
<tr><td>Flammable</td><td>A2</td><td>B2</td></tr>
<tr><td>Lower Flammability</td><td>A2L</td><td>B2L</td></tr>
<tr><td>No Flame Propagation</td><td>A1</td><td>B1</td></tr>
<tr><td></td><td>Lower Toxicity</td><td>Higher Toxicity</td></tr>
</table></td>
<td>New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC.

Refer to Technical Memo #09 for more information on A2L refrigerant update.</td>
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<tr>
<td></td>
<td>1103.3 Higher Flammability Refrigerants. Group A3 and B3 refrigerants shall not be used except where approved by the Authority Having Jurisdiction.
Exceptions:
(1) Laboratories with more than 100 square feet (9.29 m^2) of space per person.
(2) Industrial occupancies.
(3) Listed ~~portable unit~~ self-contained systems containing not more than 0.331 pounds (0.150 kg) of Group A3 refrigerant, provided that the equipment is installed in accordance with the listing and the manufacturer’s installation instructions. [ASHRAE 15:7.5.3]</td>
<td></td>
<td>Minor wordsmithing to base code provisions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1104.2 Refrigerant Concentration Limit. The concentration of refrigerant in a complete discharge of an independent circuit of high-probability systems shall not exceed the amounts shown in Table 1102.3, except as provided in Section 1104.3, ~~and~~ Section 1104.4, and Section 1104.6. The volume of occupied space shall be determined in accordance with Section 1104.2.1 through Section 1104.2.3.
Exceptions:</td>
<td>New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC.

Refer to Technical Memo #09 for more information on A2L refrigerant update.</td>
</tr>
</table>

		(1) Listed equipment in locations other than public corridors and lobbies containing not more than 6.6 pounds (2.99 kg) of refrigerant, regardless of the refrigerant safety classification, provided the equipment is installed in accordance with the listing and with the manufacturer's installation instructions. (2) Listed equipment for use in laboratories with more than 100 square feet (9.29 m^2) of space per person, regardless of the refrigerant safety classification, provided that the equipment is installed in accordance with the listing and the manufacturer's installation instructions. [ASHRAE 15:7.2]	
	1104.4 Industrial Occupancies and Refrigerated Rooms. Section 1104.2 shall not apply in industrial occupancies and refrigerated rooms where in accordance with the following: (1) The space(s) containing the machinery is (are) separated from other occupancies by tight construction with tight-fitting doors. (2) Access is restricted to authorized personnel. ~~(3) The floor area per occupant is not less than 100 square feet (9.29 m2).~~ ~~**Exception:** The minimum floor area shall not apply where the space is provided with egress directly to the outdoors or into approved building exits.~~ (43)Refrigerant detectors are installed with the sensing location and alarm level as required in refrigeration machinery rooms in accordance with Section 1106.2.2.2. (54)Open flames and surfaces exceeding 800°F (427°C) shall not be permitted where a Group A2, B2, A3, or B3 refrigerant, is used. (65)Electrical equipment that is in accordance with Class 1, Division 2, of NFPA 70 where the quantity of a Group A2, B2, A3, or B3 refrigerant in an independent circuit is capable of exceeding 25 percent of the lower flammability limit (LFL) upon release to the space based on the volume determined in accordance with Section 1104.2.1 through Section 1104.2.3. (~~7~~6)Refrigerant containing parts in systems exceeding 100 horsepower (74.6 kW) compressor drive power, except evaporators used for refrigeration or dehumidification, condensers used for heating, control and pressure-relief valves for either, low-probability pumps, and connecting piping, are located in a machinery room or outdoors. [ASHRAE 15:7.2.2]		Minor wordsmithing to base code provisions.
		1104.5 Flammable Refrigerants. The total of Group A2, B2, A3, and B3 refrigerants, other than Group A2L and B2L refrigerants shall not exceed 1100 pounds (498.9 kg) without approval by the Authority Having Jurisdiction. Institutional Occupancies shall comply with Section 1104.3. Machinery rooms required in accordance with Section 1106.0 based on flammability shall be constructed and maintained in accordance with Section 1106.2.1 through 1106.2.6 and Section 1106.11 for Group A2L and B2L refrigerants.	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6 Group A2L Refrigerants for Human Comfort.** High-probability systems using Group A2L refrigerants for human	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC.

		comfort applications shall comply with this section. [ASHRAE 15:7.6]	Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.1 Refrigerant Concentration Limit.** Occupied spaces shall comply with the releaseable charge limitations of the equipment listing and ASHRAE 15. Unoccupied spaces with refrigerant containing equipment, not including continuous piping or tubing, shall comply with the releaseable charge limitations of the equipment listing or Section 1104.6.4. [ASHRAE 15:7.6.1-7.6.1.2]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.2 Listing and Installation Requirements.** Refrigeration systems shall be listed and shall be installed in accordance with listing, the manufacturer's instructions, and any markings on the equipment restricting the installation. [ASHRAE 15:7.6.2]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.2.1 Nameplate.** The nameplate required by Section 1115.5 shall include a symbol indicating that a flammable refrigerant is used, as specified by the product listing. [ASHRAE 15:7.6.2.1]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.2.2 Labeling.** A label indicating a flammable refrigerant is used shall be placed adjacent to service ports and other locations where service involving components containing refrigerant is performed, as specified by the product listing. [ASHRAE 15:7.6.2.2]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.2.3 Refrigerant Detection Systems.** Refrigerant detection systems shall be in accordance with the listing and ASHRAE 15.	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.2.4 Refrigerant Concentration Above Limit.** When the refrigerant detection system senses a refrigerant exceeding its setpoint, the following actions shall be taken: (1) The supply air fan of the equipment shall activate with a minimum airflow rate specified by the manufacturer. (2) Turn off the compressor and all other electrical devices, excluding the control power transformers, control systems, and the supply air fan. The supply air fan shall continue to operate for at least five minutes after the refrigerant detection system has sensed a drop in the refrigerant concentration below the refrigerant detection system set point. **Exception:** The compressor operation shall not be turned off when the compressor operation reduces the leak rate or the total amount of released refrigerant to the indoor	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.

		space. (3) Any device that controls airflow located within the product or in ductwork that supplies air to the occupied space shall be fully open. Any device that controls airflow shall be listed. (4) Mitigation action required by the equipment listing shall be initiated. [ASHRAE 15:7.6.2.4]	
	N/A	**1104.6.3 Ignition Sources Located in Ductwork.** Open-flame-producing devices shall not be permanently installed in the ductwork that serves the space. Unclassified electrical devices shall not be located within the ductwork that serves the space. Devices containing hot surfaces exceeding 1290°F (700°C) shall not be located in the ductwork that serves the space unless there is a minimum airflow of 200 ft/min (1.0 m/s) across the heating device(s) and there is proof of airflow before the heating device(s) is energized. [ASHRAE 15:7.6.3-7.6.3.3]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.4 Mechanical Ventilation.** When the releaseable charge of the refrigeration system exceeds the refrigerant concentration limit specified in Section 1104.6.1, the refrigerant charge and ventilation air flow shall be in accordance with the equipment listing and ASHRAE 15.	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.5 Compressors and Pressure Vessels Located Indoors.** For refrigeration compressors and pressure vessels located in an indoor space that is accessible only during service and maintenance, the refrigerant charge shall be in accordance with the equipment listing and ASHRAE 15.	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.6.6 Refrigerant Sensors.** Refrigerant sensors required by Section 1104.6.2 shall meet the following requirements: (1) Refrigerant sensors shall be evaluated by the testing laboratory as part of the equipment listing. (2) Refrigerant sensors shall be located such that refrigerant will be detected if the refrigerating system is operating or not operating. a) For refrigerating systems that are connected to the occupied space through ductwork, refrigerant sensors shall be located within the listed equipment. b) For refrigerating systems that are directly connected to the occupied space without ductwork, the refrigerant sensor shall be located in the equipment in accordance with the equipment listing. Additional remote refrigerant sensors shall be permitted within the occupied space when included as part of the equipment	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.

		mitigation system according to manufacturer's instructions. [ASHRAE 15:7.6.5]	
	N/A	**1104.~~7~~6 Applications for Human Comfort and for Nonindustrial Occupancies.** In nonindustrial occupancies, Group A2, ~~A2L,~~ A3, B1, B2L, B2, and B3 refrigerants shall not be used in high-probability systems for human comfort. Use of Group A2L refrigerants used in high-probability systems for human comfort shall be in accordance with Section 1104.6.	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.8~~7~~ Refrigerant Type and Purity.** Refrigerants shall be of a type specified by the equipment manufacturer. Unless otherwise specified by the equipment manufacturer, refrigerants used in new equipment shall be of purity in accordance with AHRI 700.	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.8~~7~~.1 Recovered Refrigerants.** Recovered refrigerants shall not be reused except in the system from which they were removed or as provided in Section 1104.8~~7~~.2 or Section 1104.8~~7~~.3. When contamination is evident by discoloration, odor, acid test results, or system history, recovered refrigerants shall be reclaimed in accordance with Section 1104.8~~7~~.3 before reuse. [ASHRAE 15:7.5.1.4]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.8~~7~~.2 Recycled Refrigerants.** Recycled refrigerants shall not be reused except in systems using the same refrigerant and lubricant designation and belonging to the same owner as the systems from which they were removed. Where contamination is evident by discoloration, odor, acid test results, or system history, recycled refrigerants shall be reclaimed in accordance with Section 1104.8~~7~~.3. **Exception:** Drying shall not be required in order to use recycled refrigerants where water is the refrigerant, is used as an absorbent or is a deliberate additive. [ASHRAE 15:7.5.1.5]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.8~~7~~.3 Reclaimed Refrigerants.** Used refrigerants shall not be reused in a different owner's equipment unless tested and found to be in accordance with the requirements of AHRI 700. Contaminated refrigerants shall not be used unless reclaimed and is in accordance with AHRI 700. [ASHRAE 15:7.5.1.6]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
	N/A	**1104.8~~7~~.4 Mixing.** Refrigerants with different refrigerant designations shall only be mixed in a system in accordance with the following: (1) The addition of a second refrigerant is allowed by the equipment manufacturer and is in accordance with the manufacturer's instructions. (2) The resulting mixture does not change the refrigerant safety group. [ASHRAE 15:7.5.1.7]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
		~~Refrigerants, including refrigerant blends, with different designations as in accordance with Table 1102.3 shall not be mixed in a system.~~ ~~**Exception:** Addition of a second refrigerant shall be permitted where specified by the equipment manufacturer to improve oil return at low temperatures. The refrigerant and amount added shall be in accordance with the manufacturer's instructions. [ASHRAE 15.7.5.1.7]~~	
1104.9 Absorption Refrigeration.	N/A	**1104.98 Changing Refrigerants.** Changes of refrigerant in an existing system to a refrigerant with a different refrigerant designation shall only be allowed where in accordance with Section 1104.9.1 through Section 1104.9.4. ~~A change in the type of refrigerant in a system shall not be made without notifying the Authority Having Jurisdiction, the user, and due observance of safety requirements. The refrigerant being considered shall be evaluated for suitability.~~ [ASHRAE 15:5.3]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update. Previous Houston amendment for absorption refrigeration has been removed.
1104.9.1 Lithium Bromide Absorption Refrigeration. Lithium bromide absorption refrigeration equipment using water as the refrigerant and steam or hot water as the energy source is exempt from refrigeration machinery room requirements and may be located in the same room with refrigeration equipment requiring a machinery room.	N/A	**1104.9.1 Approval.** The change of refrigerant shall be approved by the owner. [ASHRAE 15:5.3.1]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update. Previous Houston amendment for absorption refrigeration has been removed.
1104.9.2 Direct Fired Absorption Refrigeration. Direct fired absorption refrigeration equipment shall be installed in a room constructed as required for a boiler of similar Btu input. This equipment shall not be installed in a refrigeration machinery room.	N/A	**1104.9.2 Procedures.** The changes of refrigerant shall be in accordance with one of the following: (1) Written instructions of the original equipment manufacturer. (2) An evaluation of the system by a registered design professional or by an approved nationally recognized testing laboratory that validates safety and suitability of the replacement refrigerant. (3) Approval of the Authority Having Jurisdiction. [ASHRAE 15:5.3.2]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update. Previous Houston amendment for absorption refrigeration has been removed.
1104.9.3 Ammonia Absorption Refrigeration. Ammonia absorption refrigeration equipment larger than 5 tons shall be installed in a refrigeration machinery room with the relief piped in accordance with the *Fire Code*.	N/A	**1104.9.3 Replacement Refrigerant of Same Classification.** Where the replacement refrigerant is classified into the same safety group, requirements that were applicable to the existing system shall continue to apply. [ASHRAE 15:5.3.3]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update. Previous Houston amendment for absorption refrigeration has been removed.
		1104.9.4 Replacement Refrigerant of Different Classification. Where the replacement refrigerant is classified into a different safety group, the system shall comply with the requirements of this chapter for a new installation, and the change of refrigerant shall require Authority Having Jurisdiction approval. [ASHRAE 15:5.3.4]	New Houston amendment approved during Public Comment. Provides updated provisions for refrigerants based on the 2024 UMC. Refer to Technical Memo #09 for more information on A2L refrigerant update.
1105.6 Prohibited Locations. Refrigeration systems or portions thereof shall not be located within a required exit enclosure. Refrigeration compressors exceeding 5 horsepower (3.7 kW) rating shall be located not less than 10 feet (3048 mm) from an exit ~~opening in a Group A; Group B; Group E; Group F;~~	N/A		Previous Houston amendment removed, returning to base code provisions.

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~~Group I; Group R; Division 1; or Group S Occupancy,~~ unless separated by a one-hour fire-resistive ~~occupancy separation~~ fire barrier. **Exception:** Refrigeration compressors containing A1 refrigerant located 10 feet (3048 mm) or less from an exit opening.			
		1106.1 Where Required. Refrigeration systems shall be provided with a refrigeration machinery room where any of the conditions as outlined in Section 1106.1.1 through Section 1106.1.4 exist. **Exception:** Refrigeration equipment shall be permitted to be located outdoors in accordance with ASHRAE 15.	New Houston amendment.

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1106.9 Boilers in Existing Machinery Rooms. **1106.9.1 Isolation.** Boilers and other heat-producing appliances shall be isolated from the machinery room by walls or partitions that create a reasonably distinct and separate atmosphere from the refrigeration machinery room. Combustion air shall be taken from other than refrigeration machinery rooms in accordance with Chapter 7 of this code. Partitions, doors and other components of the structure shall be made of materials as required for not less than a one-hour occupancy separation. **Exceptions:** **(1)** Where it is physically impractical to comply with the above requirement, an evaluation report by a registered engineer or registered architect licensed to practice in the State of Texas shall be presented to the Authority Having Jurisdiction for approval. The walls, partitions and doors need not comply with the requirements set forth for a fire barrier, but may consist of one-hour material designed and constructed to isolate the machinery room from the boilers to create a reasonably distinct and separate atmosphere within the respective rooms. **(2)** Where it is found to be physically impractical to construct a separation of boilers and refrigeration machinery containing Group A1 or Group B1 refrigerant, a registered professional engineer licensed to practice in the State of Texas shall evaluate the effect that ventilation, both emergency and continuous, will have on the operation of boilers within the refrigeration machinery room. A report, including a statement clearly indicating that a boiler will operate safely shall be submitted to the Authority Having Jurisdiction for review and approval prior to placing the boilers and ventilation into operation simultaneously. If the registered professional engineer determines that the required continuous ventilation will not have a detrimental effect on the operation of boilers but that emergency ventilation will have a detrimental effect on boiler operation, an electrical interlock designed to shut off the fuel supply to boilers when emergency ventilation is energized may be used in lieu of isolation of the boilers from the machinery room.	N/A		Previous Houston amendment relocated to Section 1106.13.
1106.9.2 Engines in Existing Refrigeration Machinery Rooms. Engines are permitted in refrigeration machinery rooms, provided: **(1)** The refrigerant classification is Group A1 and Group B1 only; **(2)** Combustion air is taken from outside the building and to the engine in substantially sealed ducts or pipes; **(3)** Insulation is provided for all hot surfaces subject to a temperature of 800°F or higher;	N/A		Previous Houston amendment relocated to Section 1106.13.

(4) Ventilation is provided to dissipate the radiant heat from the engines to keep the room below 120°F (48.89°C); and **(5)** There is no open flame or spark. **Moved to 1106.13.2**			
1106.9.3 Switchgear and Related Equipment in Machinery Rooms. Switchgear and related equipment may remain in an existing machinery room, provided: **(1)** The refrigerant classification is Group A1 or Group B1 only; and **(2)** The switchgear or related equipment possesses no clearance or work hazard in regard to the refrigeration machinery or the electrical switchgear. **Moved to 1106.13.3**	N/A		Previous Houston amendment relocated to Section 1106.13.
1106.9.4 Emergency Control. Emergency control in accordance with Section 1107.6 shall be provided for the refrigeration equipment and existing air-handling equipment except machinery room ventilation fans.	N/A		Previous Houston amendment relocated to Section 1106.13.
		1106.13 Existing Machinery Rooms. **1106.13.1 Isolation.** Where the requirements of 1106.5 cannot be met for existing installations, open flame appliances or other heat producing appliances shall be isolated from the machinery room according to the requirements of Table 509 for Houston Building Code. Where sprinklers are used to prevent installing a one hour barrier, a physical barrier must still be installed to separate the open flame or heat producing appliance from the machinery room. Boilers and other heat-producing appliances shall be isolated from the machinery room by walls or partitions that create a reasonably distinct and separate atmosphere from the refrigeration machinery room. Combustion air shall be taken from other than refrigeration machinery rooms in accordance with Chapter 7 of this code. Partitions, doors and other components of the structure shall be made of materials as required for not less than a one-hour occupancy separation.	No changes to Houston amendment, relocated from Section 1106.9.
		1106.13.2 Engines in Existing Refrigeration Machinery Rooms. Engines are permitted in refrigeration machinery rooms, provided: **(1)** The refrigerant classification is Group A1 and Group B1 only; **(2)** Combustion air is taken from outside the building and to the engine in substantially sealed ducts or pipes; **(3)** Insulation is provided for all hot surfaces subject to a temperature of 800°F or higher; **(4)** Ventilation is provided to dissipate the radiant heat from the engines to keep the room below 120°F (48.89°C); and **(5)** There is no open flame or spark.	No changes to Houston amendment, relocated from Section 1106.9.

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary
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		1106.13.3 Switchgear and Related Equipment in Machinery Rooms. Switchgear and related equipment may remain in an existing machinery room, provided: **(1)** The refrigerant classification is Group A1 or Group B1 only; and **(2)** The switchgear or related equipment possesses no clearance or work hazard in regard to the refrigeration machinery or the electrical switchgear.	No changes to Houston amendment, relocated from Section 1106.9.
1107.4 Distribution of Ventilation. Exhaust inlets or permanent openings shall be located to provide ventilation throughout the entire refrigeration machinery room. Emergency exhaust intakes shall be located within 12 inches (305 mm) of the floor unless the refrigerant is lighter than air.	N/A		Houston amendment has been removed.
1109.1.4 Piping Insulation. For minimum pipe insulation see the *Energy Code*.	N/A		Houston amendment relocated to Section 1109.1.5.
		1109.1.5 Piping Insulation. For minimum pipe insulation see the *Energy Code*.	No change to Houston amendment, relocated from Section 1109.1.4.
2015 Houston Amendment - Chapter 12 Hydronics	**2021 UMC – Chapter 12 – Hydronics**	**2021 Houston UMC Amendments**	**Code Change Summary**
~~**1207.4 Solar Heat Collector Systems.** Solar water heating systems used in hydronic panel radiant heating systems shall be installed in accordance with the *Uniform Solar Energy Code* and *Hydronics Code* (USEHC).~~	N/A	~~**1207.4 Solar Heat Collector Systems.** Solar water heating systems used in hydronic panel radiant heating systems shall be installed in accordance with the *Uniform Solar Energy Code* and *Hydronics Code* (USEHC).~~	No change to Houston amendment.
	1214.4 Automatic Makeup Fluid. Where an automatic makeup fluid supply fill device is used to maintain the ~~water~~ fluid content of the heat-source unit, or any closed loop in the system, the makeup supply shall be located at the expansion tank connection or other approved location. A pressure-reducing valve shall be installed on a makeup ~~water~~ feed line. The pressure of the feed line shall be set in accordance with the design of the system, and connections to potable water shall be in accordance with Section 1202.0 to prevent contamination due to backflow.		Minor changes to base code provisions.
	1217.5.3 Types of Tube Fasteners. Tubing that is embedded within concrete shall be fastened according to manufacturer's instructions. Unless prohibited by the manufacturer, tube fasteners include the following: (1) Ties made of wire, typically fastened to anchors such as rebar or wire mesh. (2) Plastic tube/cable ties, typically nylon, fastened to anchors such as rebar or wire mesh. (3) Staples made of metal or plastic or combination thereof, without sharp edges that would harm tube, fastened to insulation or subfloor. (4) Plastic rails with integrated tube holders intended for the specific type of tube. (5) Insulation sheets with integrated knobs for holding the specific type of tube and intended for this application.		New base code requirements for tube fasteners.

	(6) Other fasteners recommended by the manufacturer.		
	1217.5.4 Spacing of Tube Fasteners. The maximum spacing between tube fasteners within a concrete floor shall not exceed the spacing specified by the manufacturer or, in the absence of manufacturer's specifications, 2.5 feet (762 mm).		New base code provisions for tube fastener spacing.
	~~1217.5.3~~ 1217.6 Joist Systems and Subfloors.		Update to base code section number.
	1217.6.1 Tubing Fasteners. Tubing that is installed within joist spaces and subfloor panel systems shall be fastened according to manufacturer's instructions. Unless prohibited by the manufacturer, tubing fasteners shall include the following: (1) Heat transfer panel systems made of wood, aluminum or other thermally conductive materials intended for this application and the specific type of tube. (2) Staples made of metal or plastic or combination thereof, without sharp edges that would harm tube. intended for this application and the specific type of tube fastened to subfloor. (3) Plastic rails with integrated tube holders intended for the specific type of tube. (4) Other fasteners recommended by the manufacturer.		New base code provisions for tubing fasteners.
	~~1217.5.4~~ 1217.7 Wall and Ceiling Panels.		Update to base code section number.
	1220.0 ~~Auxiliary~~ Snow and Ice Melt Systems.		Update to base code section title.
	1220.2 Types of Tube Fasteners. Tubing that is embedded within concrete shall be fastened according to manufacturer's instructions. Unless prohibited by the manufacturer, tube fasteners include the following: (1) Ties made of wire, typically fastened to anchors such as rebar or wire mesh. (2) Plastic tube/cable ties, typically nylon, fastened to anchors such as rebar or wire mesh. (3) Staples made of metal or plastic or combination thereof, without sharp edges that would harm tube, fastened to insulation or subfloor. (4) Plastic rails with integrated tube holders intended for the specific type of tube.		New base code provisions for tubing fasteners.

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	(5) Insulation sheets with integrated knobs for holding the specific type of tube and intended for this application. (6) Other fasteners recommended by the manufacturer.		
	1220.3 Spacing of Tube Fasteners. The maximum spacing between tube fasteners within a concrete area shall not exceed the spacing specified by the manufacturer or, in the absence of manufacturer's specifications, 2.5 feet (762 mm).		New base code provisions for tube fastener spacing.
2015 Houston Amendment - Chapter 13 Fuel Gas Piping	**2021 UMC – Chapter 13 – Fuel Gas Piping**	**2021 Houston UMC Amendments**	**Code Change Summary**
1301.0 Scope of Gas Piping. For provisions pertaining to fuel gas piping see Chapter 12 of the *Plumbing Code*. **{EDITORIAL NOTE: THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2015 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.}**	**1301.0 Scope of Gas Piping.** **1301.1 Applicability.** The regulations of this chapter shall govern the installation of fuel gas piping in or in connection with a building, structure or within the property lines of premises up to 5 pounds-force per square inch (psi) (34 kPa) for natural gas and 10 psi (69 kPa) for undiluted propane, other than service pipe. Fuel oil piping systems shall be installed in accordance with NFPA 31.	**1301.0 Scope of Gas Piping.** For provisions pertaining to fuel gas piping see Chapter 12 of the *Plumbing Code*. **[EDITORIAL NOTE:** THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.]	Base code updated to provide requirements for natural gas and propane limits. No change to Houston amendment.
	1310.3.11310.4.1 Connections. Where gas piping is to be concealed, connections shall be of the following type: (1) Pipe fittings, such as elbows, tees, couplings, and right/left nipple/couplings. (2) Joining tubing by brazing (see Section 1308.5.8.21308.5.7.1). (3) Press-connect fittings listed to CSA LC 4 ~~for use in concealed spaces or that have been demonstrated to sustain, without leakage, forces due to temperature expansion or contraction, vibration, or fatigue based on their geographic location, application, or operation.~~ (4) CSST fittings listed to CSA LC 1. (45) Where necessary to insert fittings in gas pipe that has been installed in a concealed location, the pipe shall be reconnected by welding, flanges, or the use of a right/left nipple/coupling.		Minor changes to base code provisions.
	1312.6 Appliance Shutoff Valves and Connections. Each appliance connected to a piping system shall have an accessible, approved manual shutoff valve with a nondisplaceable valve member, or a listed gas convenience outlet. Appliance shutoff valves and convenience outlets shall serve a single appliance only. [NFPA 54:9.6.5] The shutoff valve shall be located within 6 feet (1829 mm) of the appliance it serves. [NFPA 54:9.6.5.1] Where a connector is used, the valve shall be installed upstream of the connector. A union or flanged connection shall be provided downstream from the valve to permit removal of appliance controls. [NFPA 54:9.6.5.1(A)] ~~Shutoff valves serving decorative appliances shall be permitted to be installed in fireplaces if listed for such use.~~ **Exceptions:**		Minor changes to base code to provide references to NFPA standard 54.

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	(1) Shutoff valves serving decorative appliances in a fire-place shall not ~~be permitted to be accessibly~~ located ~~inside or under an appliance~~ within the fireplace firebox except where ~~such appliance is removed without removal of~~ the ~~shutoff~~ the valve is listed for such use. [NFPA 54:9.6.5.1(B)] (2) Shutoff valves shall be permitted to be accessibly located inside wall heaters and wall furnaces listed for recessed installation where necessary maintenance is performed without removal of the shutoff valve.		
2015 Houston Amendment - Chapter 14 Process Piping	**2015-2021 UMC Changes**	**2021 Houston Amendment - Chapter 14 Process Piping**	**Comment**
{EDITORIAL NOTE: THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2015 UMC AND IS NOT ADOPTED BY THIS JURISDICTION. PROCESS PIPING SHALL COMPLY WITH SECTION 2907 AND OTHER APPLICABLE PROVISIONS OF THE *FIRE CODE* AS DEFINED HEREIN.}	N/A	[**EDITORIAL NOTE:** THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION. PROCESS PIPING SHALL COMPLY WITH SECTION 2907 AND OTHER APPLICABLE PROVISIONS OF THE *FIRE CODE* AS DEFINED HEREIN.]	No change to Houston amendment.
2015 Houston Amendment - Chapter 15 Solar Energy Systems	**2015-2021 UMC Changes**	**2021 Houston Amendment - Chapter 15 Solar Energy Systems**	**Comment**
{EDITORIAL NOTE: THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2015 UMC AND IS NOT ADOPTED BY THIS JURISDICTION. THE INSTALLATION OF SOLAR ENERGY SYSTEMS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE *CONSTRUCTION CODE*, AS DEFINED HEREIN.}	N/A	[**EDITORIAL NOTE:** THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION. THE INSTALLATION OF SOLAR ENERGY SYSTEMS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE *CONSTRUCTION CODE*, AS DEFINED HEREIN.]	No change to Houston amendment.
2015 Houston Amendment - Chapter 17 Referenced Standards	**2015-2021 UMC Changes**	**2021 Houston Amendment - Chapter 17 Referenced Standards**	**Comment**

TABLE 1701.1
REFERENCED STANDARDS

Standard Title	Application	Referenced Sectior
Specification for Seamless Copper Tube, Bright Annealed (Metric)	Miscellaneous	405.13.1
National Electrical Code	Miscellaneous	301.4, 511.1.6, 516.2.7, 516.2.9(4 905.10.2, 1104.4(6) 1311.14.5(2), 13 503.5(11)(c)
Standard for Smoke Control Systems	Smoke Control	405.7, 405.8
Standards for Control Units and Accessories for Fire Alarm Systems	Miscellaneous	405.12

N/A

TABLE 1701.1
REFERENCED STANDARDS

Standard Number	Standard Title	Application	Referenced Sections
ASHRAE 15-~~2016~~ 2022	Safety Standard for Refrigeration Systems	Refrigeration Systems	1102.1, 1104.6.1, 1104.6.2.3, 1104.6.4, 1104.6.5, 1106.1, Table 1113.5
ASHRAE 34-~~2016~~ 2022	Designation and Safety Classification of Refrigerants	Refrigeration Classifications	1102.3, Table 1102.3, 1103.1, Table 1106.2.5.2
ASTM B 68-2011	Specification for Seamless Copper Tube, Bright Annealed (Metric)	Miscellaneous	405.13.1
NFPA 70-2023~~20~~*	National Electrical Code	Miscellaneous	301.4, 511.1.6, 512.2.5, 516.2.7, 516.2.9(4), 602.2.1, 905.10.2, 1104.4(6), 1217.7.1, 1311.14.5(2), 1312.6, E 503.5(11)(c)
NFPA 92-2015	Standard for Smoke Control Systems	Smoke Control	405.7, 405.8
UL 864-2003	Standards for Control Units and Accessories for Fire Alarm Systems	Miscellaneous	405.12

Previous Houston amendment for ASTM B68, NFPA 92, and UL 864 remain unchanged.

New updates to ASHRAE 15 and 34 to provide most recent standard edition, 2022, and UL 60335-2-89 and 60335-2-40 to the 2022 edition.

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		UL 60335-2-40-~~2017~~2022	Household and Similar Electrical Appliances — Safety — Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	Appliances	903.1, 904.13	
		UL 60335-2-89-~~2017~~2021	Household and Similar Electrical Appliances – Safety – Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor	Appliances	934.1, 934.2, 934.3	