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Energy Code Technical Support

Residential Codes FAQs:

2015 International Energy Conservation Code (IECC) with MA Amendments & MA Stretch Energy Code

GENERAL – 9th EDITION

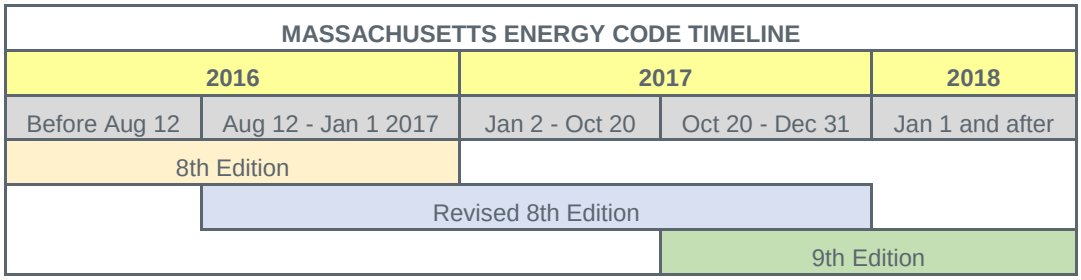
Q: Which version of the energy code is in effect?

A: On July 19, 2016, the Board of Building Regulations and Standards (BBRS) approved the adoption of 2015 IECC and certain Massachusetts-specific amendments as revisions to the 8th Edition of the code. The effective date of the new energy provisions in 780 CMR was August 12, 2016, with a concurrency period that ran through January 1, 2017.

On October 6,2017, the BBRS approved the adoption of the 9th Edition of the code. The effective date was October 20, 2017, with a concurrency period through January 1, 2018, after which time the 9th Edition will be in full effect.

Q: What version of the IECC are open/pending projects from before January 2, 2017 required to meet?

A: Projects that were permitted before August 12, 2016 must comply with the previous Massachusetts codes. Beginning January 2, 2017 only the new code, based on the 2015 IECC, is in effect. Between August 12, 2016 and January 1, 2017, the applicant may have selected either version for compliance. Beginning January 1, 2018, all new work must meet the 9th Edition requirements.



Q: What are the differences between the revised 8th Edition and the 9th Edition?

A: There are very few changes from the recently revised 8th Edition to the 9th Edition. The major change was the adoption of a MA Amendment requiring homes to be PV Ready.

Q: What does the new Solar-Ready Amendment in the 9th Edition require?

A: The new solar-ready provisions of the 9th Edition are found in Appendix RB. This amendment does NOT require the installation of solar photovoltaic or solar thermal systems. Its intent is to ensure the building owner is prepared if they choose to install such systems in the future. The solar-ready provisions apply only to detached one- and two-family dwellings and townhouses with sufficient roof area that faces a suitable direction to benefit from a solar installation.

Plans and construction documents must indicate the solar-ready zone on the roof, which must be kept free from obstructions such as vents and chimneys, and also show a pathway for future wires or pipes between the roof and the electrical service panel or service water system. The electrical service panel must have a space reserved for a future dual pole circuit breaker, and a permanent certificate indicating the solar-ready zone and other requirements must be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional. Finally, the roof design must account for the dead and live loads of a future solar array. There are also exemptions from the requirements for several conditions such as existing shading of the roof and other permanently installed on-site renewable systems.

Q: Do all buildings that need a permit have to satisfy the energy code?

A: Any work done under a permit and not otherwise excluded (see section R402.1 for exceptions) must meet the relevant energy code requirements. This includes additions, alterations, and repairs to existing buildings, as well as new construction projects.

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ENERGY SPECIALISTS / STRETCH CODE

Q: Which code is required in Stretch Code communities?

A: As of January 2, 2017, the Stretch Energy Code is based on the 2015 IECC with Massachusetts amendments. The new Stretch Code specifies that the only allowable compliance path is Section R406 - Energy Rating Index. Be aware that R406 includes all the mandatory provisions of the IECC. Stretch Code communities do not need to re-adopt the Stretch Code; the new requirements automatically take effect.

Q: In Stretch Code communities, what buildings are exempted from the energy code?

A: Because the revised stretch code requirements simply refer to the regular code, all exemptions in the 2015 IECC apply equally in Stretch Code communities. The thermal envelope exemptions for buildings in the energy code as listed in section 402.1 are for buildings with extremely low peak design energy use (less than 1 watt of total energy per square foot) and buildings that do not contain conditioned space.

Also, the Stretch Code no longer pertains to existing buildings, but instead only to new construction. Additions, alterations, or repairs made to existing buildings are treated the same in Stretch Code and non-Stretch Code communities, and are covered in Chapter 5 of the 2015 IECC.

Q: Is a HERS Rater required for all new home construction?

A: No. The Stretch Code allows three different compliance approaches: (1) the home is certified as an ENERGY STAR® home using Version 3.1 of that standard; (2) the home achieves a HERS Index Score no greater than the values found in Table R406.4.1; or (3) the home is certified through the Passive House Institute US using their 2015 standard for North America. Options 1 and 2 must be verified by a certified HERS Rater, while option 3 must be verified by a certified Passive House consultant.

In non-Stretch Code communities, testing and verification for duct leakage and ventilation system performance must be performed by one of the following: HERS Rater, HERS Rating Field Inspector, or an appropriate BPI Certified Professional.

Q: Who is allowed to conduct building infiltration testing? (i.e. a blower door test)

A: Section R402.4.1.2 of the 2015 IECC requires this testing, but does not specify who is qualified to perform the test. The section does note that the code official may, at their discretion, require an “approved third party” to do the test. In practice, infiltration testing is most likely to be performed by a certified HERS Rater or BPI Professional.

Q: What qualifications do duct testers need?

A: As noted in MA amendment R403.3.3, duct testing and verification shall be done by a HERS Rater, HERS Rating Field Inspector, or BPI Certified Professional. This is also true for testing the performance of mechanical ventilation systems, per MA amendment R403.6.2.

ENCLOSURE/INSULATION

Q: Is Kraft facing allowed on fiberglass batts?

A: Yes, Kraft faced batts are allowed. The purpose of facing on batt insulation is to control water vapor, and the facing acts as a Class II vapor retarder. While the energy code does not address vapor retarders, that information can be found in Section R702.7 of the 2015 IRC. Note that Kraft facing is NOT an effective air barrier material.

Q: How is the conditioned floor area calculated for homes with a basement?

A: The 2015 IECC defines conditioned space as “an area, room or space that is enclosed within the building thermal envelope and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.” If the basement is directly or indirectly conditioned, the basement floor area is included in the calculation and the surrounding surfaces must meet all the code requirements associated with conditioned space (e.g. R-15 continuous insulation or R-19 cavity insulation in the basement walls for the prescriptive path).

Q: Is batt insulation allowed to be used in ceiling assemblies that are strapped with furring strips?

A: The Board of Building Regulations and Standards issued an interpretation on this question in September 2016 noting that the 2015 IECC does not prohibit the use of batts in a strapped ceiling assembly provided all requirements of the code are met. This means that fiberglass batts must be split around wires and cut to fit tightly around all obstacles and to fill all voids and cavities. The batts shall be entirely in contact with a sealed air barrier.

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Q: What is the minimum thickness requirement for the vapor barrier?

A: The 2015 International Residential Code (IRC) defines vapor retarder classes by perm rating rather than thickness. Please see 2015 IRC Section R702.7 for guidance on vapor control in building assemblies.

Q: Is polyethylene (poly) acceptable as an air barrier?

A: Polyethylene can be effective as an air barrier if it is installed and sealed properly during construction. Since polyethylene is also a Class I vapor retarder, the guidance for vapor control in assemblies included in section R702.7 of the 2015 IRC should also be followed when using this material.

Q: Can poly be sealed as an air barrier for a shower wall?

A: It is difficult to install poly as a continuous air barrier in this location. Any screw installed through the poly could twist and tear the material, compromising its performance as an air barrier. And since showers are areas of high moisture and temperature, small imperfections in the air barrier are especially critical. Rigid air barriers are preferable. If the poly is visibly sealed and continuous after all work penetrating the poly is complete, it may be effective. Since poly is also a vapor barrier, the guidance for vapor control in assemblies included in section R702.7 of the 2015 IRC should also be followed when using this material.

Q: Can the back of knee wall insulation be covered with poly?

A: No. Although not expressly prohibited by code, polyethylene at the back or exterior side of knee wall insulation (i.e., the cold side in winter) would present a condensation risk due to its properties as a vapor retarder. Instead, a vapor permeable air barrier such as house wrap should be used in this location.

Q: Is an air barrier required behind shower units installed against an exterior wall?

A: Yes. An air barrier must be installed against the insulation at all exterior walls, including behind showers and tub enclosures. A rigid air barrier represents best practice. Wall board may be used, but it would be better to use non-paper faced wall board or another paperless board product (e.g. XPS foam board) as the air barrier to reduce mold potential.

Q: Does the top side of attic insulation need an air barrier?

A: The top side of attic insulation does not need an air barrier in typical attic configurations. (i.e., an unconditioned and uninhabitable vented attic space.) But the ceiling assembly does need an air barrier, normally at the ceiling plane.

Q: What areas of the home should be included in the volume calculation for the air leakage requirement?

A: For the purpose of the blower door metric, only the volume of the conditioned space should be used.

Q: An exception states that R-38 attic insulation is acceptable if uncompressed over the top plate at the eaves at the exterior walls. Is R-38 acceptable just at the perimeter where R-49 will not fit, or can you use R-38 over the entire ceiling?

A: For attics that can accommodate uncompressed R-38 over the top plate at the perimeter, R-38 can be used in the entire attic for the Prescriptive approach as stated in R402.2.1.

HVAC

Q: Why is duct sealing required within conditioned space?

A: Duct sealing ensures that air is delivered to the space as designed. Duct sealing supports the right sizing and proper selection of HVAC systems as well as improved tenant comfort.

Q: What about ducts in insulated cavities? For example, is it okay to put a duct in a floor joist space and not achieve the mandatory floor's insulation requirements?

A: Ducts located in the thermal enclosure typically diminish the insulation in that space. If a project reduced a portion of the floor from R-30 to R-11 to accommodate a duct, then the floor assembly does not meet the Prescriptive requirement for R-value under Table R402.1.2. The project may still meet the thermal enclosure requirements by meeting the total UA alternative (R402.1.5) or through the Performance option. Another option is to "beef up" the insulation in the bay that the duct is running through by using a higher R-value material in that bay.

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Q: If duct elbows are not sealed with mastic can a system still pass the duct leakage test?

A: The 2015 IECC requires that all ducts shall be sealed regardless of their location. If an elbow is not sealed with mastic, it is out of compliance with the mandatory requirement of section R403.3.2.

Q: What is a "remote fan"?

A: A remote fan is a fan which is not immediately adjacent to the space it serves. A remote fan is frequently located in the attic or basement and can serve more than one space through ductwork. These units are also sometimes referred to as "in-line" fans.

Q: Where does make-up air come from when a home uses an exhaust-only ventilation strategy?

A: The make-up air will come into the home through the paths of least resistance, which may include existing leakage pathways such as those found around windows and doors. Homes built to the 2015 IECC are not air tight and a small volume of air will still be drawn into the house by an exhaust-only fan.

Q: What is an ECM?

A: ECM stands for "electronically commutated motor". ECMs are a brushless DC technology that offers higher efficiencies. ECMs are included in the exception to R403.6.1 "Whole-house mechanical ventilation system fan efficacy".

Q: Is mechanical ventilation required in Stretch Code communities?

A: Yes, mechanical ventilation is required in homes in all communities regardless of whether or not they have adopted the Stretch Code. The updated Stretch Code simply refers to the Energy Rating Index compliance path (R406), and this approach requires all the mandatory requirements in the base code, including mechanical ventilation in R403.6.

Q: Is a balanced system like an HRV (heat recovery ventilator) or ERV (energy recovery ventilator) required to meet the mechanical ventilation requirement? What about in Stretch Code communities?

A: Balanced systems are not the only option. Both Stretch Code and non-Stretch Code communities allow for balanced (ERV or HRV), exhaust-only, or supply-only systems to be used to satisfy the mechanical ventilation requirement.

LIGHTING

Q: What are the lighting efficacy requirements?

A: At least 75% of lamps in permanently installed lighting fixtures within a home must be "high efficacy" as defined in in Chapter 2 of the IECC. Efficacy is determined by how much illumination (measured in lumens) the light provides per unit of energy (measured in watts). The higher the lumens-per-watt, the greater the efficacy of the lighting. In practical terms, the high efficacy residential lighting requirement is most often met with LED lighting.

Q: What are the requirements for recessed lighting?

A: Per R402.4.5, recessed luminaires penetrating the building envelope shall be sealed, rated for direct contact with insulation ("IC-rated"), and labeled as having an air leakage rate of not more than 2.0 cfm when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential. The housing of all recessed lights must be sealed to the interior wall or ceiling covering with either a gasket or caulk.

MISCELLANEOUS

Q: Are there any inspection checklists available to aid in compliance with the 2015 IECC and the Stretch Code?

A: If a new house is using the Energy Rating Index compliance path (R406 as amended), then any applicable checklist associated with the qualifying approach must be completed. This will be the case in Stretch Code communities, which must comply using the R406 method.

- For ENERGY STAR® homes, this would include the Rater Design Checklist and the Rater Field Checklist: www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Rater_Checklists.pdf).
- For Passive House certified homes, it would include the PHIUS+ Quality Control Workbook.

Projects in non-Stretch Code communities that use the REScheck compliance path are supported by several documents generated in REScheck including a Compliance Certificate and a detailed Inspection Checklist.

All projects (whether or not in Stretch Code communities) must comply with Air Barrier and Insulation Installation Table R402.4.1.1 in the 2015 IECC.

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Q: Can REScheck be used for the Performance Path?

A: No, REScheck cannot be used for the Simulated Performance Alternative (R405) or for the Energy Rating Index path (R406) of the 2015 IECC. REScheck *can* be used for the Total UA alternative of the Prescriptive path (R402.1.5), which allows for building thermal enclosure tradeoffs only. Also, per the MA amendments, the allowable versions of REScheck are Version 4.6.2 or later and REScheck-Web (www.energycodes.gov/rescheck).

Q: Is a blower door test required in conjunction with REScheck?

A: Yes. Air leakage testing is mandatory for all projects complying with the energy code.

Q: How are fireplaces treated in the code?

A: Section R402.4.2 has requirements intended both to limit uncontrolled air infiltration into the house and also to ensure that wood-burning appliances can operate safely. It states that wood-burning fireplaces must have “tight-fitting” flue dampers or doors, and that outdoor combustion air is brought directly into the firebox. This allows the fireplace to operate while its doors are closed, meaning that air from the house is not drawn into the fireplace.

Q: Are there any financial incentives available for energy efficient construction?

A: Yes. The Mass Save® program, which is sponsored by the gas and electric Program Administrators in the state, offers a variety of energy efficiency incentives for residential buildings. Information is available at: www.masssave.com/en/saving/residential-rebates or 866-527-7283