



# International Energy Conservation Code 2015

*With Massachusetts Amendments*

- Effective for all homes permitted after 1/1/2017
- All homes must meet Mandatory requirements
- Homes in non-stretch towns can choose between Prescriptive and Performance requirements
- Homes in stretch code towns must meet the Performance requirements (and do not need to meet the Prescriptive requirements)

## **Mandatory Requirements**

### **Air Tightness**

- Building envelope shall be tested and verified as having an air leakage rate not exceeding 3.0 Air Changes per Hour at 50 Pascals
- A continuous air barrier shall be installed in the building envelope and breaks or seams in the air barrier shall be sealed.
- Attic access panels and doors shall be sealed
- The junction of the foundation and sill plate shall be sealed
- The junction of the top plate and exterior sheathing shall be sealed
- Window/door rough openings shall be sealed
- Rim joists shall be sealed
- Exposed edges of floor insulation (such as at cantilevered floors) shall be sealed
- Exposed earth in unvented crawlspaces shall be covered with Class I vapor retarder with taped seams
- Duct shafts, utility penetrations, and flue shafts shall be sealed
- Air sealing shall be provided between house and garage
- Recessed light fixtures shall be sealed to the drywall
- Air barrier between tubs/showers and exterior walls
- Exterior electrical and phone boxes shall be sealed
- HVAC boots that penetrate the building envelope shall be sealed to the subfloor or drywall
- Fireplaces must have either tight-fitting flue dampers or doors
- Windows, skylights, and sliding glass doors must have 0.3 cfm per square foot leakage or less (per NFRC label)
- Swinging doors must have 0.5 cfm per square foot leakage or less
- Recessed lights penetrating the building envelope shall be IC-rated and have 2.0 CFM leakage or less (air-tight cans)

### **Insulation**

- Air-permeable insulation shall not be used as a sealing material
- Insulation shall be installed in contact with the air barrier
- Cavities within corners and headers shall be insulated
- Rim joists shall be insulated



- Floor insulation shall either be installed in contact with subfloor or in contact with sheathing on the underside of floor joists
- Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that readily conforms to the available space shall be used
- Exterior walls behind showers and tubs shall be insulated

#### **HVAC Controls**

- Programmable thermostats required
- Heat pumps with supplemental heat must have programmable thermostats that ensure supplemental heat only operates when heat pump capacity cannot satisfy load
- Outdoor reset controls required for all boilers to modulate water temperature based on outdoor temperature

#### **Ductwork**

- Ducts, air handlers, and filter boxes shall be sealed
- R-8 insulation on supplies and returns in attic
- R-6 insulation on all other ducts in unconditioned spaces
- Building framing cavities shall not be used as ducts or plenums

#### **Mechanical System Piping**

- Mechanical system piping carrying fluids above 105 degrees or below 55 degrees must be insulated to at least R-3
- Pipe insulation exposed to the weather must be protected

#### **Ventilation**

- The building shall be provided with an exhaust-only or balanced continuous ventilation system
- Minimum airflow must meet either ASHRAE 62.2-2010 or ASHRAE 62.2-2013 as tested by HERS rater or BPI professional
- Ventilation inlets or outlets within 7' of grade require a sign to keep clear
- Ventilation inlets must have a screen
- Ventilation system must be 1.0 sone or less unless remotely mounted
- Minimum efficacy:
  - Range hoods 2.8 cfm/watt
  - In-line fans 2.8 cfm/watt
  - Bathroom fan (10-89 cfm) 1.4 cfm/watt
  - Bathroom fan (90+ cfm) 2.8 cfm/watt

#### **Equipment sizing**

- Heating and cooling equipment shall be sized according to Manual S based on loads calculated according to Manual J

#### **Lighting equipment**

- A minimum of 75% of lamps or fixtures shall be high efficacy lighting.
  - Exception: Low voltage lighting



## **Prescriptive Requirements**

### **Insulation and Fenestration**

- Walls: R-20 (cavity) or R-13 (cavity) + R-5 (continuous)
- Above Grade Mass Walls: R-17 (cavity) or R-13 (continuous)
- Windows: U-factor 0.30
- Skylights: U-factor 0.55
- Flat or Vaulted Ceiling: R-49\*
- Framed Floors: R-30 (cavity)\*\*
- Slab: R-10 edge extending 2' down or in (R-15 if radiant slab)
- Basement Walls: R-value  $\geq$  15 (continuous)  
or  $\geq$  19 (cavity)
- Crawlspace Walls: R-value  $\geq$  15 (continuous)  
or  $\geq$  19 (cavity)

\* = R-38 acceptable if it extends over the exterior wall top plate. Also, up to 500 sqft can be R-30 as long as this is less than 20% of the total ceiling area.

\*\* = R-19 acceptable if floor joists are too shallow for R-30

REScheck can be used as an alternative to above insulation and window requirements, but U-value of windows can never exceed U-0.48

### **Duct Leakage**

- Ducts shall be tested to verify duct tightness:
  - 4 cfm per 100 square feet of conditioned area
  - 3 cfm per 100 square feet of conditioned area if air handler not installed
  - Not required for ducts and air handler inside the thermal envelope

### **Domestic Hot Water Piping**

- Domestic hot water pipes shall be insulated to R-3 in the following situations:
  - Pipes  $\frac{3}{4}$  inch or larger diameter
  - Pipes serving more than one dwelling unit
  - Pipes outside conditioned space
  - Pipes from water heater to manifold
  - Pipes under slab or buried
  - Pipes in recirculating systems



## Performance Requirements

### There are three options for complying with the Performance Requirements:

1. **Passive House:** PHIUS+ 2015 Passive Building Standard - North America, or another approved software by PHIUS, where Specific Space Heat Demand, as modeled by a Certified Passive House Consultant, is less than or equal to 10 kBtu/ft<sup>2</sup>/year.
2. **ENERGY STAR v3.1:** New buildings shall be certified as ENERGY STAR Certified Homes, Version 3.1, including meeting the ENERGY STAR HERS index target and meeting requirements of HVAC Design Checklist, HVAC Commissioning Checklist, Rater Field Checklist, and Water Management System Builder Checklist.
3. **HERS Rating:** Energy rating index must be 55 or less, prior to credit for on-site renewable electricity generation. The RESNET Home Energy Rating System (HERS) Index is the approved ERI approach in Massachusetts.

For the HERS rating approach, the threshold for energy rating can be offset for the following features:

Feature	Offset
Photovoltaic system 2.5 kW or greater	5 points
Renewable energy primary heating system, including Clean Biomass Heating System, solar thermal array, or ground source heat pump	5 points
Solar thermal array for domestic hot water or Clean Biomass Stove	2 points

Note: Offsets cannot be claimed for both the Clean Biomass Heating System and the Clean Biomass Stove on the same house. However, offsets can be combined in any other combination.

For the HERS rating approach, there is no longer a requirement for meeting the Thermal Bypass Checklist or Thermal Enclosure Checklist but all mandatory IECC 2015 requirements (including air sealing and 3.0 ACH50) still apply.

**CLEAN BIOMASS STOVE.** Wood- or pellet-fired stoves that are EPA certified; and have a particulate matter emissions rating of no more than 3.5 g/hr for non-catalytic wood and pellet stoves; or 2.0 g/hr for catalytic wood and pellet stoves.

**CLEAN BIOMASS HEATING SYSTEMS.** Wood-pellet fired central boilers and furnaces where the equipment has a thermal efficiency rating of 80% (higher heating value) or greater; and a particulate matter emissions rating of no more than 0.15 lb/MMBtu PM heat output.