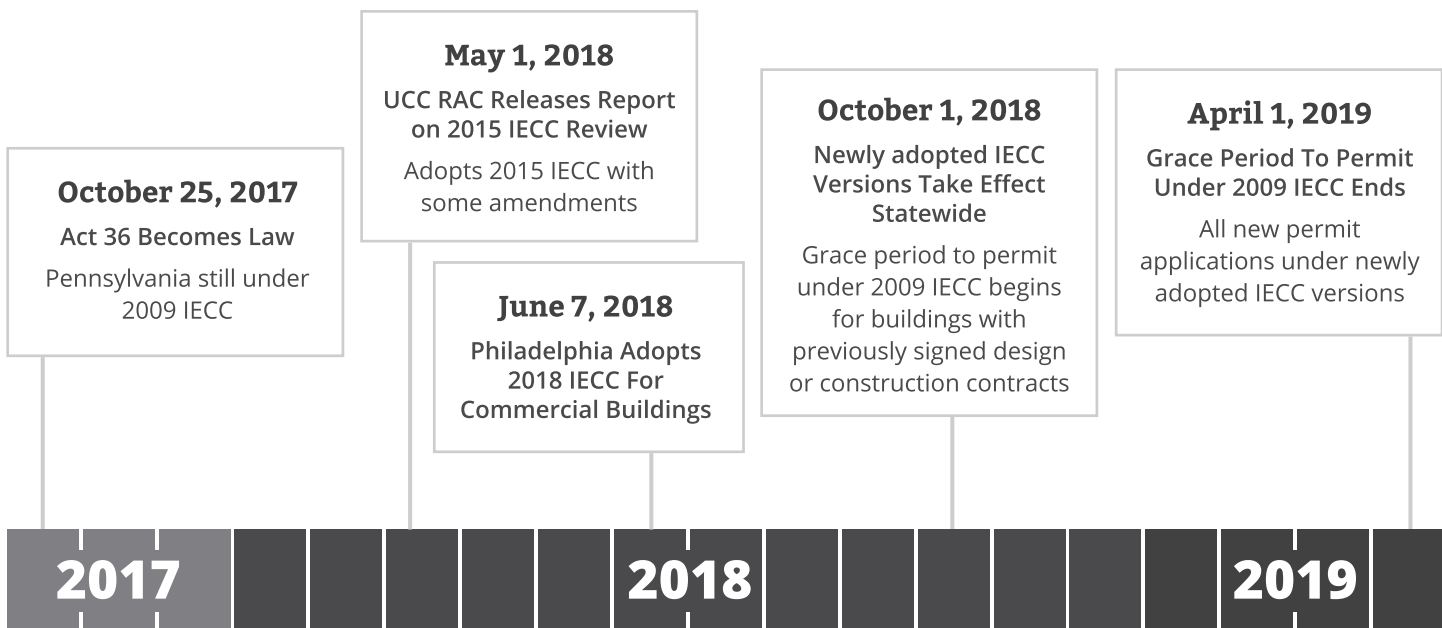




Quick Guide to Pennsylvania and Philadelphia Residential Energy Code Changes (2009 IECC vs 2015 and 2018 IECC)

* For Climate Zone 6 reach out to ReVireo for more information.



Permit Pathways

There are multiple ways to demonstrate compliance with 2015 /2018 IECC at the permit stage. REScheck software can only demonstrate compliance via the Prescriptive/UA Tradeoff permit pathway. In contrast, Home Energy Rating System (HERS) software (i.e., REM/Rate, Ekotrope) can be used to demonstrate compliance via the Performance and HERS Index permit pathways as well as the Prescriptive/UA Tradeoff permit pathway.

| | Prescriptive/UA Tradeoff (2015/2018 IECC R402.1) | Performance (2015/2018 IECC R405) | HERS Index (2015/2018 IECC R406) |
|---------------------------------------|---|--------------------------------------|-------------------------------------|
| Mandatory Requirements Apply | Yes | Yes | Yes |
| Prescriptive Requirements Apply | Yes | No | No |
| Energy Use Metric | Overall UA Value | Energy Cost \$/year | HERS Index |
| Allowable Energy Efficiency Tradeoffs | Insulation, windows & doors only | All except MEP System & Appliances | All |
| HERS Rating Needed | No | Yes | Yes |
| Eligible Software | REScheck, REM/Rate, & Ekotrope | REM/Rate & Ekotrope | REM/Rate & Ekotrope |

* For guidance on the PA Alt. Code, reach out to ReVireo for more information.

Insulation & Windows (Prescriptive)

The table below only includes **Prescriptive** changes from 2009 IECC to 2015 /2018 IECC. All of the 2015 /2018 IECC insulation requirements, including those that did not change from the 2009 IECC, are detailed in 2015 /2018 IECC Table R402.1.2.

| Climate Zone 4 | 2009 | 2015 | 2018 | Climate Zone 5 | 2009 | 2015 | 2018 |
|-------------------|----------------|----------------|-------------|------------------|-------------------------------|-------------------------------|-------------------------------|
| Window U Value | No Requirement | No Requirement | 0.32 | Window U Value | 0.35 | 0.32 | 0.30 |
| Window SHGC | No Requirement | 0.4 | 0.4 | Foundation Walls | Continuous R-10 / Framed R-13 | Continuous R-15 / Framed R-19 | Continuous R-15 / Framed R-19 |
| Above Grade Walls | 13 | 20* or 13+5 | 20* or 13+5 | Ceiling | 38 | 49 | 49 |
| Ceiling | 38 | 49 | 49 | | | | |

*Pennsylvania amended 2015 IECC for all Climate Zones to allow R-18 in place of R-20 provided wall framing factor is 20% for exterior walls with 24" o.c. nominal vertical stud spacing.

Air Handler/Furnace (Mandatory)

The majority of air handlers and furnaces meet the new requirement. More information can be found on the equipment cut sheet. (2015 /2018 IECC R403.3.2.1)

| 2009 | 2015/2018 |
|----------------|--|
| No Requirement | Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193. |

Lighting (Mandatory)

Requirements detailed in 2015 /2018 IECC R404.1. High Efficacy is defined in 2015 /2018 IECC R202.

| 2009 | 2015 | 2018 |
|----------------------------|----------------------------|----------------------------|
| 50% High Efficacy Lighting | 75% High Efficacy Lighting | 90% High Efficacy Lighting |

Duct Leakage (Prescriptive/Mandatory)

Duct Leakage does not have to be tested if all of the ducts are within the thermal envelope, however the ducts must be sealed as per the IRC. (2015/2018 IECC R403.3.4)

Ducts that are tested to have a maximum leakage rate of 1.5 CFM/100 SF to the outside, are insulated with \geq R-8 insulation, and have at least R-19 insulation above and to the sides of the ducts, count as being in conditioned space. (2018 IECC R403.3.6)

| 2009 | 2015/2018 |
|---|---|
| Total Leakage Threshold Options: <ul style="list-style-type: none"> • 4 CFM/100sf CFA (at rough-in w/o air handler installed) • 6 CFM/100sf CFA (at rough in w/ air handler installed) • 12 CFM/100sf CFA (at final) | Total Leakage Threshold Options: <ul style="list-style-type: none"> • 3 CFM/100sf CFA (at rough-in w/o air handler installed) • 4 CFM/100sf CFA (at rough-in w/air handler installed or at final) |
| Leakage to Outside Threshold Options: <ul style="list-style-type: none"> • 8 CFM/100sf CFA (at final) | Leakage to Outside Threshold Options: <ul style="list-style-type: none"> • No Option Available |
| Compliance with either a Total Leakage or Leakage to Outside threshold is Mandatory for all permit pathways. | Compliance with a Total Leakage threshold is Prescriptive and only applies to Prescriptive/UA Tradeoff permit pathway. Performance and ERI permit pathways are exempt from Total Leakage threshold requirements. |

Envelope Leakage (Mandatory)

Pennsylvania and Philadelphia amended 2015 /2018 IECC to increase allowable building infiltration rate from 3 ACH to 5 ACH. (2015/2018 IECC R402.4.1.2)

| 2009 | 2015/2018 |
|---|---|
| 7 ACH @ 50 Pa for all climate zones (Verified via visual inspection or blower door test) | 5 ACH @ 50 Pa for all climate zones (Verified only via blower door test) |

Plumbing Insulation (Prescriptive)

This requirement is Prescriptive and only applies to Prescriptive/UA Tradeoff permit pathway. Performance and ERI permit pathways are exempt from plumbing insulation requirements. (2015/2018 IECC R403.5.3)

| 2009 | 2015/2018 |
|---------------------------------------|--|
| R-2 for Circulating Hot Water Systems | R-3 for Circulating Hot Water Systems Pipes servicing the hot water system must be insulated with at least R-3 if they are: in unconditioned space, greater than or equal to 3/4 inch in diameter, or if the piping is between the water heater and the manifold. |

Other New Requirements

- Construction documents submitted for permitting must include the following: insulation materials and their R-values, fenestration U-factors and solar heat gain coefficients (SHGC), mechanical system design criteria, mechanical and service water-heating system equipment types, sizes and efficiencies, duct layout, insulation and sealing details, and air sealing details. (2015/2018 IECC R103.2 - Mandatory)
- Wall assemblies for the thermal envelope shall have a vapor retarder. (2015/2018 IECC R402.1.1 - Prescriptive)
- Wood burning fireplaces must have tight-fitting flue dampers or doors, and outdoor combustion air intakes. Where using tight-fitting doors on factory built fireplaces, doors must be listed and labeled in accordance with UL.127. (2015/2018 IECC R402.4.2 - Mandatory)

Other New Requirements (continued)

- Hot water boilers that supply heat to the building through one- or two-pipe heating systems shall have an outdoor setback control that lowers the boiler water temperature based on the outdoor temperature. (2015/2018 IECC R403.2)
- R-5 insulation has been added as a requirement in Table R402.1.2 for heated slabs in all climate zones. (2018 IECC R402.1.2)
- Kitchen exhaust systems capable of exhausting more than 400 CFM shall provide makeup air into the same room in which the exhaust system is located or into rooms or duct systems that communicate through one or more permanent openings with the room. (2015 /2018 IRC – M1503.4)

Mechanical Ventilation (Mandatory)

If ventilation is provided using air handler (i.e., “Air Cyclor”), the air handler motor must be an Electronically Commutated Motor (ECM). (2015/2018 IECC R403.6)

| 2009 | 2015/2018 |
|----------------|--|
| No Requirement | Mechanical Ventilation must meet IRC ventilation amount and minimum efficiency requirements. |

Continuous Whole-House Mechanical Ventilation Airflow Rate Requirements - 2015 IRC Table M1507.3.3(1) / 2018 IRC Table M1505.4.3(1)

| Dwelling Unit Floor Area (square feet) | Number of Bedrooms | | | | |
|--|--------------------|-------|-------|-------|-----|
| | 0 - 1 | 2 - 3 | 4 - 5 | 6 - 7 | > 7 |
| | Airflow in CFM | | | | |
| < 1,500 | 30 | 45 | 60 | 75 | 90 |
| 1,501 - 3,000 | 45 | 60 | 75 | 90 | 105 |
| 3,001 - 4,500 | 60 | 75 | 90 | 105 | 120 |
| 4,501 - 6,000 | 75 | 90 | 105 | 120 | 135 |
| 6,001 - 7,500 | 90 | 105 | 120 | 135 | 150 |
| > 7,500 | 105 | 120 | 135 | 150 | 165 |

For SI: 1 square foot = 0.0929 m², 1 cubic foot per minute = 0.0004719 m³/s.

Fan Efficacy Requirements - 2015/2018 IECC Table R403.6.1

| Fan Location | Minimum Airflow Rate (CFM) | Minimum Fan Efficacy (CFM/Watt) | Air Flow Rate Maximum (CFM) |
|------------------------|----------------------------|---------------------------------|-----------------------------|
| Range Hoods | Any | 2.8 CFM/Watt | Any |
| In-Line Fan | Any | 2.8 CFM/Watt | Any |
| Bathroom, Utility Room | 10 | 1.4 CFM/Watt | < 90 |
| Bathroom, Utility Room | 90 | 2.8 CFM/Watt | Any |
| ERV or HRV | Any | 1.2 CFM/Watt | Any |