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DEPARTMENT OF  
DEVELOPMENT REVIEW AND PERMITTING

## Worcester County

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### Worcester County 2021 International Residential Energy Code

By adoption of the Maryland Building Performance Standards and specifically the International Energy Code 2021 Edition (IECC 2021) and Residential Code (IRC2021), Worcester County and State of Maryland Building Code requires all new construction and additions to residential dwellings to meet IECC 2021/IRC 2021. Maryland allows alternates to 2021 building envelope requirements with the selection of alternate measures of 6% overall improvement if using the 2018 IECC building envelope insulation levels (see attached selection list option 2). Applicants for building permits are required to review requirements, select envelope options (1,2,or 3), review report/inspection requirements and sign on page 4.

#### Mandatory IECC 2021 Requirements:

1. Certificate of Compliance – R401.3 – Builder or Design Professional must post all energy compliance cert. on elect. Panel.
2. Thermal Envelope – R402 – Insulation, Fenestration, required prescriptive or performance – Exceptions below for alterations.
3. Air Leakage – R402.4 – Building Envelope must limit air exchanges 3 per hour (at 50 Pascals) by Certified Tightness Test. <sup>1</sup>
4. HVAC Controls – R403.1 – Programmable t-stat for furnaces and supplemental heat controls for heat pumps.
5. Duct Insulation – R 403.3.1 – Outside thermal envelope (TE) required. R8 ducts >3 inches dia., R6 ducts <3 inches dia.
6. Duct Sealing – R 403.3.6 – HVAC ducts tests – Max leakage 4 CFM/100 SF outside, 8 CFM/100 inside TE. Report required.
7. Building Cavities – R 403.3.7 – Cavities shall not be used as ducts or plenums.
8. Mechanical System Pipe Insulation – R403.4 – R-3 minimum if fluid above 105 degrees F or less than 55 F.
9. Circulating Hot Water Systems – R403.5.1 – Controls and insulation required.
10. Mechanical Ventilation – R403.6 – Whole house ventilation is required per M1505. Testing and certification is required. <sup>1</sup>
11. Additional Efficiency (R408) – Thermal Env. Improvement fenestration , HVAC 16 SEER, Water heating 2.0 EF, Ducts in Envelope, Ventilation with HRV or ERV.
12. Equipment Sizing – R403.7 – HVAC equipment sized per Air Conditioning Contractors of America (ACCA) Standards.
13. Snow Melt System Controls – R403.9- Special controls required if system installed.
14. Pools and Spas – R403.10 – Controls to minimize energy usage required. Covers required on heated pools and spas.
- 15 – Lighting Equipment – R404 – All installed lighting shall utilize high efficacy lamps (> 65 lumens/watt). Interior controls including dimmers and occupancy sensors required except bathroom, hallways, exterior and safety. Exterior lights controls include daylight control auto off.

#### Notes:

1. Attention must be given to sealing the entire building envelope during construction to attain certified passing results. Consult your Certified Building Envelope Test Contractor (RESNET, BPI). A passing test report for both building tightness and ventilation by a certified contractor/inspector must be provided to Worcester County to obtain final building Certificate of Occupancy.
2. Construction Documentation is required per R103.2 including Insulation, Fenestration and Mechanical Systems (sizes and efficiencies).



#### Building Envelope Exceptions - Alterations (only applies if building energy use is not increased by the repairs/renovations):

1. Storm Window installed over existing windows.
2. Existing ceiling, wall or floor cavities exposed provided these cavities are filled with insulation.
3. Construction where existing roof, wall or floor cavity is not exposed.
4. Roof re-cover.
5. Surface applied window film installed on existing single pane fenestration assemblies to reduce the solar heat gain performance provided the glazing is not replaced.
6. Repairs/Renovations will not increase the building energy use (e.g., NO HVAC, NO Lights, NO hot water) – NON- Conversion Agreement Required.

Note : If repairs/renovations are limited to items 1-6 above, then there is no building envelope specific requirements.

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Circle one option 1, 2 or 3. Complete table 1 or 2 additional features for options 1 or 2. Option 3 requires additional submittals.

NO

EXEMPT

YES

To options 2 & 3

Option 1

IRC 2021 Prescriptive Rmin and/or Umax value (Table R402.1.2 & R402.1.3)

Climate Zone 4

Fenestration U	Skylight U	Glazed Fenestration SHGC max	Ceiling R	Wood Frame Wall R	Mass Wall R	Floor R	Basement Wall R	Slab R-val,depth	Crawl Space Wall R
0.3	0.55	0.4	60 or R49(raised heel) or assembly U=0.024	30 or 20+5ci, or 13+10ci, or 0+20ci, or assembly U=0.045	8/13 or assembly U=0.098	19 or assembly U=0.047	10ci or R13	10ci, 4 ft	10ci or 13 or assembly U=0.065

Select One additional energy savings feature from TABLE 1 (Circle Selection Below)

Table 1 – 2021 IRC Select one additional efficiency option – IRC 2021 R408

Circle one Option

1	R408.2.1 - Enhanced Envelope performance. 5% improvement.
2A	R408.2.2 More efficient HVAC equipment performance. Greater than or equal to 95 AFUE natural gas furnace and 16 SEER air conditioner.
2B	R408.2.2 Greater than 10 HSPF/16 SEER air source heat pump
2C	R408.2.2 Greater than 3.5 COOP ground source heat pump.
3A	R408.2.3 Reduced energy use in water heating. Greater than or equal to 0.82 EF fossil fuel system.
3B	R408.2.3 Reduced energy use in water heating. Greater than or equal to 2.0 EF electric heating system.
3C	R408.2.3 Reduced energy use in water heating. Greater than or equal to 0.4 solar fraction solar heating system.
4A	R408.2.4 More efficient duct distribution system. All ducts and air handlers completely within the building envelope. Systems must meet leakage requirements.
4B	R408.2.4 More efficient duct distribution system. 100% of ductless or hydronic thermal distribution systems in the thermal envelope.
4C	R408.2.4 More efficient duct distribution system. 100% of duct systems located in conditioned space (see R403.2.2 – insulation and air barrier detail)
5	R408.2.5 Improved air sealing and efficient ventilation system. ACH50 less than or equal to 3.0 with ERV or HRV installed.

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Option 2



### Maryland Prescriptive R-Value Alternate (Table R402.1.3.1)

#### Climate Zone 4

Fenestration U	Skylight U	Glazed Fenestration SHGC max	Ceiling R	Wood Frame Wall R	Mass Wall R	Floor R	Basement Wall R	Slab R-val, depth	Crawl Space Wall R
0.3	0.55	0.4	49 or R38 with raised heel	20 or 15+3ci	8/13	19	10ci or 13 or assembly U=0.059	10ci, 4 ft	10ci or 13

Select Additional Energy savings features equal to or greater than 6% total from TABLE 2 (Circle selection(s))



Table 2 – MD Alternative Additional Packages – Must select one or more to equal or exceed 6% additional efficiency (Circle Selection(s))

Provide Manufacturers Data showing compliance with the selected items.		
1	Greater than or equal to 2.5% reduction in total UA	1%
2	Greater than or equal to 5% reduction in total UA	2%
3	Greater than or equal to 7.5% reduction in total UA	2%
4	0.22 U factor windows	3%
5	High performance cooling system (greater than or equal to 18 SEER and 14 EER air conditioner)	3%
6	High performance cooling system (greater than or equal to 16 SEER and 12 EER air conditioner)	3%
7	High performance gas furnace (greater than or equal to 96 AFUE furnace)	5%
8	High performance gas furnace (greater than or equal to 96 AFUE furnace)	4%
9	High performance heat pump (greater than or equal to 10 HSPF/18 SEER air source heat pump)	6%
10	High performance heat pump (greater than or equal to 9 HSPF/16 SEER air source heat pump)	5%
11	Ground source heat pump (greater than or equal to 3.5 COP)	6%
12	Fossil fuel source water heating system greater than or equal to 82 EF	3%
13	High performance heat pump water heating system with efficiency greater than or equal to 2.9 UEF	8%
14	High performance heat pump water heating system with efficiency greater than or equal to 3.2 UEF	8%
15	Solar Hot water heating system (greater than or equal to 0.4 solar fraction)	6%
16	More efficient HVAC distribution system (100% thermal distribution system in thermal envelope)	10%
17	100 % of ducts in conditioned space. Insulation and air barriers and ducts installed per IRC 2021 R403.3.2.	12%
18	Reduced total duct leakage when located outside conditioned space. Measured per IRC 2021 R403.3.5 shall be 2.0 CF/min per 100 SF conditioned space with air handler installed OR 1.75 CF/min per 100 SF conditioned space without air handler.	1%
19	Improved building envelope – 2 ACH50 with ERV or HRV installed tested certified.	10%
20	Improved building envelope – 2 ACH50 with balanced ventilation tested certified. See 2021 IMC for balanced ventilation definition.	4%
21	Improved building envelope – 1.5 ACH50 with ERV or HRV installed tested certified.	12%
22	Improved building envelope – 1 ACH50 with ERV or HRV installed tested certified.	14%
23	Energy Efficient appliances (minimum 3 appliances not to exceed 1 of each type with following efficiencies.	
	• Refrigerator – Energy Star Program product specification for consumer refrigeration products, version 5.1 8/5/21	7%
	• Dishwasher – Energy Star Program requirements for residential dishwashers, version 6.0 1/29/2016.	
	• Clothes dryer – Energy star program requirements product specification for clothes dryers, version 1.1 5/5/17.	



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