RED1-351-22

**IECC: R408.2.2, TABLE R408.2**

**Proponents:**

Mary Koban, representing AHRI (mkoban@ahrinet.org)

### 2024 International Energy Conservation Code [RE Project]

**Revise as follows:**

R408.2.2 More efficient HVAC equipment performance option.

Heating and cooling *equipment* shall meet one of the following efficiencies.In situations where multiple heating or cooling systems of the same type are installed (two ducted or ductless heat pumps for example) credit shall be given for the lowest efficiency product meeting the level specified.

Centrally Ducted Systems:

* 1.
* ​High Performance Cooling (Option 1)-​​​Greater than or equal to ~~16~~15.2 SEER2 and 12 EER2 air conditioner in all Climate Zones
* 2.
* High Performance Cooling (Option 2)-Greater than or equal to ~~18 SEER (~~16.~~9~~0SEER2~~)~~ and ~~14 EER (13.4~~ 12 EER2~~)~~ air conditioner in all Climate Zones.
* a.
* 3
* High Performance Gas Furnace (Option 1)- Greater than or equal to 9~~2~~5% AFUE natural gas furnace in Climate Zones 4A, 4C, 5, 6, 7, and 8.
* 3b.
* High Performance Gas Furnace (Option 1)-Greater than or equal to 90% AFUE natural gas furnace in Climate Zones 0,1,2,3 and 4B
* a.
* 4
* High Performance Gas Furnace and Cooling (Option 1) -Greater than or equal to 95% AFUE natural gas furnace and 15.2 SEER2/ 12 EER2 in Climate Zones 4A,4C, 5, 6 ~~and~~ 7 ~~and 8~~.
* 4b.
* High Performance Gas Furnace and Cooling (Option 1)- Greater than or equal to 90% AFUE natural gas furnace and 15.2 SEER2/ 10 EER2 in climate zones 0, 1, 2, 3, and 4B for air conditioner
* a.
* 5
* High Performance Gas Furnace and Cooling (Option 2)-Greater than or equal to 9~~5~~7% AFUE natural gas furnace and 16.0 SEER2/12 EER ~~in other Climate Zones~~ for air conditioner in Climate Zones 4A, 4C, 5,6,7 and 8.
* 5b.
* High Performance Gas Furnace and Cooling (Option 2) - Greater than or equal to 95% AFUE and 16 SEER2/10 EER2 air conditioner in climate zones 0, 1, 2, 3, and 4B
* a.
* 6
* High Performance Gas Fornace and HP (Option 1)- Greater than or equal to 95% AFUE natural gas furnace and 8.~~5~~​​​​​​1 HSPF2/~~16.0~~15.2 SEER2 air source heat pump in Climate Zones 4A, 4C, 5,6,7,and 8.
* 6b.
* High Performance Gas Furnace and HP (Option 1) - Greater than or equal to 90% AFUE furnace and 7.8 HSPF2 / 15.2 SEER2/10.0 EER2 air source heat pump in Climate Zones 0, 1,2,3, and 4B
* a.
* 7
* High Performance Gas Furnace (Option 2) -Greater than or equal to 9~~6~~7 % in AFUE natural gas furnace inc Climate Zones 4A, 4C, 5, 6, 7 and 8.
* 7b.
* High Performance Gas Furnace (Option 2)- Greater than or equal to 95%  AFUE natural gas furnace in Climate Zones 0, 1, 2, 3, and 4B.
* a.
* 8
* High Performance HP (Option 1)-Greater than or equal to 8.~~5~~1 HSPF2/~~16.0~~15.2 SEER2 air source heat pump in Climate Zones 4A, 4C, 5, 6,7 and 8.
* 8b.
* High Performance HP (Option 1)– Greater than or equal to 7.8 HSPF2/ 15.2 SEER2/ 11.7 EER2 air source heat pump in Climate Zones 0, 1, 2, 3, and 4B
* a.
* 9
* Greater than or equal to ~~9 HSPF (7.6~~ 8.5 HSPF2) /~~16 SEER~~ ~~(~~15.2SEER2/~~12 EER2 )~~ air source heat pump in Climate Zones 4A,4C,5,6,7 and 8.
* High Performance HP (Option 2)-
* 10. 9b.
* High Performance HP (Option 2)-Greater than or equal to ~~10 HSPF (~~8.~~5~~2 HSPF2 / ~~)~~ ~~/16SEER (15.2~~ 16.9 SEER2/12 EER2 ~~)~~ air source heat pump in Climate Zones 0,1,2,3, and 4B.
* 10.
* 11.
* Ground source HP-Greater than or equal to 16.1 EER/ 3.~~5~~1 COP ground source heat pump.

Ductless Systems:

* ~~2~~1a.
* 1
* Single Zone: Greater than or equal to 8.5 HSPF2/~~16.9~~15.2 SEER2 variable speed air source heat pump in Climate Zones 4A, 4C, 5, 6, 7 and 8.
* .
* 11b
* Single Zone: Greater than or equal to 7.8 HSPF2/15.2 SEER2 / 11.7 EER2 variable spped air source heat pump in climate zones 0, 1, 2, 3, and 4B.
* ~~3~~2.
* 1
* Multi Zone: 8.5 HSPF2/16.9 SEER2 variable speed air source heat pump (Non-Ducted Indoor Units).
* ~~4~~3.
* 1
* Multi Zone: 8.5 HSPF2/15.2 SEER2 variable speed air source heat pump (~~Ducted or~~ Mixed Indoor Units)

TABLE R408.2 CREDITS FOR ADDITIONAL ENERGY EFFICIENCY

**Portions of table not shown remain unchanged.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Measure Number | Measure Description | Credit Value |  |  |  |  |  |  |  |  |  |  |
|  |  | Climate Zone 0 ~~& 1~~ | Climate Zone 1 | Climate Zone 2 | Climate Zone 3 | Climate Zone 4A | Climate Zone  4B | Climate Zone 4C | Climate Zone 5 | Climate Zone 6 | Climate Zone 7 | Climate Zone 8 |
| R408.2.2(1) | High performance cooling system option 1 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(2) | High performance cooling system option 2 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(3a) | High performance gas furnace option 1 | 0 | 0 | 0 | 0 | TBD | 0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(3b) | High performance gas furnace option 2 | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(4a) | High peformance gas furnace and cooling option 1 | 0 | 0 | 0 | 0 | TBD | 0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(4b) | High performance gas furnace and cooling system option ~~21~~ | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(5a) | High performance gas furnace and cooling system option 2 | 0 | 0 | 0 | 0 | TBD | 0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(5b) | High performance gas furnace and cooling system option 2 | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(6a) | High performance gas furnace and heat pump system option 1 | 0 | 0 | 0 | 0 | TBD | 0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2.(6b) | High performance gas furnace and HP option 1 | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(7a) | High performance gas furnace option 2 | 0 | 0 | 0 | 0 | TBD | 0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(7b) | High performance gas furnace option 2 | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(8a) | High performance heat pump system option 1 | 0 | 0 | 0 | 0 | TBD | T0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2.(8b) | High performance heat pump system option 1 | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(9a) | High performance heat pump system option 2 | 0 | 0 | 0 | 0 | TBD | 0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(9b) | High performance heat pump system option ~~32~~ | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(10) | Ground source heat pump | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(11a) | Ductless - Single zone | 0 | 0 | 0 | 0 | TBD | 0 | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(11b) | Ductless Single Zone option 2 | TBD | TBD | TBD | TBD | 0 | TBD | 0 | 0 | 0 | 0 | 0 |
| R408.2.2(12 ) | Ductless - Multizone (Non-ducted indoor unit) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(13) | Ductless – Multizone ( Mixed) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

**Reason:**

Dear IECC Residential SC and Committee Members, we noted that Table 408.2 was difficult to update in cdpaccess.  We did truncate the table and only concentrated on the HVAC portion for the submission. However, cdpaccess still did not capture our edits clearly.  Therefore, we are attaching a spreadsheet (PDF) for your reference so you can see what we did. We provded more energy efficient product options by climate zones matched with potential credits.This caused us to add rows 3b, 4b, 5b, 6b, 7b, 8b, and 11b. (The concept in 9b was already captured in the original table.)  We also split out Climate zones 4A, 4B, and 4C since credits are noted by granularity of climate zone 4. We also split out climate zones 0, 1 as we are still waiting for analysis from PNNL.  Therefore, climate zones 0 and 1 may be different.    
  
On August 16, 2022, President Joe Biden signed the Inflation Reduction Act (IRA) into law. The Act, which contains dozens of provisions related to climate change and prescription drug prices, includes measures that provide federal income tax credits for high efficiency HVAC and water heater products.  This proposal aligns Additional Energy Credits with the IRA, provides even more energy credits for higher-efficiency equipment, and will encourage homeowners and builders to install efficient water heater products.  Therefore, AHRI members suggest to align with Energy Star product specifications and CEE tiers when defining efficiency levels for HVAC options in R408.2.2. AHRI notes that the following sections of R408.2.2 align with these sections of either Energy Star v5.0 or CEE Tier 2 or 3.  AHRI members note that aligning with these options provide the industry at large multiple product options that provide energy benefits and potentially provide tax credits.

AHRI reiterates that data from PNNL was not available.  Therefore, AHRI felt it was prudent to provide multiple options/scenarios to ensure energy-efficient options are available to the marketplace based on the current energy efficiency levels noted by Energy Star and CEE.

* **R408.2.2.1 –** The proposal aligns with Energy Star
* **R408.2.2.2**- The proposal aligns with CEE Tier 2
* **R408.2.2.3a**- The proposal aligns with Energy Star
* **R408.2.2.3b**- The proposal aligns with Energy Star
* **R408.2.2.4a-** The proposal aligns with Energy Star
* **R408.2.2.4b-** The proposal aligns with Modified Energy Star due to lack of exact equipment type under Energy Star
* **R408.2.2.5a-** The proposal aligns with CEE Tier 3/ CEE Tier 2
* **R408.2.2.5b-** The proposal aligns with Modified CEE Tier 2 due to lack of exact equipment type under Energy Star
* **R408.2.2.6a-** The proposal aligns with Energy Star
* **R408.2.2.6b-** The proposal aligns with Modified Energy Star due to lack of exact equipment type under Energy Star
* **R408.2.2.7a-** The proposal aligns with CEE Tier 3
* **R408.2.2.7b-** The proposal aligns with CEE Tier 2
* **R408.2.2.8a-** The proposal aligns with Energy Star
* **R408.2.2.8b-** The proposal aligns with Energy Star
* **R408.2.2.9a-** The proposal aligns with Energy Star Most Efficient
* **R408.2.2.9b-** The proposal aligns with Energy Star Most Efficient
* **R408.2.2.10**- The proposal aligns with Energy Star
* **R408.2.2.11a-** The proposal aligns with Energy Star
* **R408.2.2.11b-** The proposal aligns with Energy Star

**Bibliography:**

AHRI notes that the Tax Provisions in the Inflation Reduction Act of 2022 can be found at this  
link https://crsreports.congress.gov/product/pdf/R/R47202

For convenience, AHRI also provided AHRI's review of the Inflation Reduction Act.

**Cost Impact:**

The code change proposal will neither increase nor decrease the cost of construction.

This code change is not expected to increase or decrease the cost of construction. This code will enable more architects, builders and consumers to use energy efficient products due to potential Tax Incentives provided by the Inflation Reduction Act. Therefore, since there are more energy efficient HVAC options available, which may shorten lead time to complete residential build, this code may actually result in decreased construction costs.

**Revise as follows:**

R408.2.2 More efficient HVAC equipment performance option.

Heating and cooling *equipment* shall meet one of the following efficiencies. In situations where multiple heating and/or cooling systems are installed (section 408.2.2) each serving a different zone, credits shall be given based on weighted average of square footage of the zone served by each system.

~~Centrally Ducted Systems:~~

* 1. ​High Performance Cooling (Option 1)-​​​Greater than or equal to ~~16~~15.2 SEER2 and 12.0 EER2 air conditioner.
* 2. High Performance Cooling (Option 2)-Greater than or equal to ~~18 SEER (~~16.~~9~~0 SEER2~~)~~ and ~~14 EER (13.4~~ 12.0 EER2~~)~~ air conditioner.
* 3a. ~~7.~~ High Performance Gas Furnace (Option 1)-Greater than or equal to 9~~6~~7 % AFUE ~~natural~~ fuel gas furnace.
* 3b. High Performance Gas Furnace (Option 2)- Greater than or equal to 9~~2~~5% AFUE ~~natural~~ fuel gas furnace.
* 3c. High Performance Gas Furnace (Option 3)-Greater than or equal to 90% AFUE fuel gas furnace.
* 4a. High Performance Gas Furnace and Cooling (Southern Option 1)- Greater than or equal to 90% AFUE fuel gas furnace and 15.2 SEER2/10.0 EER2 air conditioner.~~in climate zones 0, 1, 2, 3, and 4B for air conditioner~~
* 4b. High Performance Gas Furnace and Cooling (Southern Option 2) - Greater than or equal to 95% AFUE fuel gas furnace and 16.0 SEER2/10.0 EER2 air conditioner. ~~in climate zones 0, 1, 2, 3, and 4B~~
* 5. High Performance Gas Furnace and HP (Southern Option) - Greater than or equal to 90% AFUE fuel gas furnace and 7.8 HSPF2/15.2 SEER2/10.0 EER2 air source heat pump.
* 6. High Performance HP (Southern Option)–Greater than or equal to 7.8 HSPF2/15.2 SEER2/11.7 EER2 air source heat pump.
* 7a. ~~4~~ High Performance Gas Furnace and Cooling (Northern Option 1)-Greater than or equal to 95% AFUE ~~natural~~ fuel gas furnace and 15.2 SEER2/12.0 EER2 air conditioner ~~in Climate Zones 5, 6 and 7~~.
* 7b. ~~5~~ High Performance Gas Furnace and Cooling (Northern Option 2)-Greater than or equal to 9~~5~~7% AFUE ~~natural~~ fuel gas furnace and 16.0 SEER2/12.0 EER ~~in other Climate Zones~~ air conditioner.~~.~~
* 8 ~~6~~ High Performance Gas Furnace and HP (Northern Option)- Greater than or equal to 95% AFUE ~~natural~~ fuel gas furnace and 8.~~5~~​​​​​​1 HSPF2/~~16.0~~15.2 SEER2 air source heat pump capable of meeting a capacity ratio ≥ 70% of heating capacity at 5 °F versus rated heating capacity at 47 °F.
* ~~7b. High Performance Gas Furnace (Option 2)- Greater than or equal to 95% AFUE natural fuel gas furnace in Climate Zones 0, 1, 2, 3, and 4B.~~
* 9 ~~8~~. High Performance HP (Northern Option)-Greater than or equal to 8.~~5~~1 HSPF2/~~16.0~~15.2 SEER2 air source heat pump capable of meeting a capacity ratio ≥ 70% of heating capacity at 5 °F versus rated heating capacity at 47 °F.
* ~~9. Greater than or equal to 9 HSPF (7.6 HSPF2) /16 SEER (15.2SEER2) air source heat pump~~
* ~~10. -Greater than or equal to 10 HSPF (8.5 HSPF2) /18SEER (16.9 SEER2) air source heat pump~~
* 10 ~~11.~~ Ground source HP-Greater than or equal to 16.1 EER/ 3.~~5~~1 COP ground source heat pump.

~~Ductless Systems:~~

* ~~21a.~~
* ~~1~~
* ~~Single Zone: Greater than or equal to 8.5 HSPF2/16.915.2 SEER2 variable speed air source heat pump in Climate Zones 4A, 4C, 5, 6, 7 and 8.~~
* ~~.~~
* ~~11b~~
* ~~Single Zone: Greater than or equal to 7.8 HSPF2/15.2 SEER2 / 11.7 EER2 variable spped air source heat pump in climate zones 0, 1, 2, 3, and 4B.~~
* ~~32.~~
* ~~1~~
* ~~Multi Zone: 8.5 HSPF2/16.9 SEER2 variable speed air source heat pump (Non-Ducted Indoor Units).~~
* ~~43.~~
* ~~1~~
* ~~Multi Zone: 8.5 HSPF2/15.2 SEER2 variable speed air source heat pump (Ducted or Mixed Indoor Units)~~

TABLE R408.2 CREDITS FOR ADDITIONAL ENERGY EFFICIENCY

**Portions of table not shown remain unchanged.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Energy Credit** | | | | | | | | |
| **Section** | **Energy Credit Measures** | **CZ 1** | **CZ 2** | **CZ 3** | **CZ 4** | **CZ 4C** | **CZ 5** | **CZ 6** | **CZ 7** | **CZ 8** |
| R408.2.2(1) | High Performance Cooling (Option 1) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(2) | High Performance Cooling (Option 2) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(3a) | High Performance Gas Furnace (Option 1) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(3b) | High Performance Gas Furnace (Option 2) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(3c) | High Performance Gas Furnace (Option 3) | TBD | TBD | TBD |  |  |  |  |  |  |
| R408.2.2(4a) | High Performance Gas Furnace and Cooling (Southern Option 1) | TBD | TBD | TBD |  |  |  |  |  |  |
| R408.2.2(4b) | High Performance Gas Furnace and Cooling (Southern Option 2) | TBD | TBD | TBD |  |  |  |  |  |  |
| R408.2.2(5) | High Performance Gas Furnace and HP (Southern Option) | TBD | TBD | TBD |  |  |  |  |  |  |
| R408.2.2(6) | High Performance HP (Southern Option) | TBD | TBD | TBD |  |  |  |  |  |  |
| R408.2.2(7a) | High Performance Gas Furnace and Cooling (Northern Option 1) |  |  |  | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(7b) | High Performance Gas Furnace and Cooling (Northern Option 2) |  |  |  | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(8) | High Performance Gas Furnace and HP (Northern Option) |  |  |  | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(9) | High Performance HP (Northern Option) |  |  |  | TBD | TBD | TBD | TBD | TBD | TBD |
| R408.2.2(10) | Ground source HP 16.1 EER/3.1 COP | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |