



Washington State Building Code Council

Improving the built environment by promoting health, safety and welfare

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STATE BUILDING CODE OPINION NO. 20-14

CODE: 2018 Washington State Energy Code
2018 International Residential Code

SECTION: WSEC C406.2 / R406.3, H/ERV efficiency
IRC Section M1505.4.1.4, Balanced whole house ventilation

Background: *The metric referenced in Section C403.6 is "sensible recovery effectiveness", which is defined as follows:*

SENSIBLE RECOVERY EFFECTIVENESS. Change in the dry-bulb temperature of the outdoor air supply divided by the difference between the outdoor air and return air dry-bulb temperatures, expressed as a percentage, governed by AHRI Standard 1060.

AHRI Standard 1060 certainly provides one method for verification, but residential unitary systems are typically not certified to AHRI Standard 1060. Rather, they use CSA 439 and listing via HVI 920, which is similar, but not identical.

The Home Ventilating Institute (HVI) is the primary North American rating organization used to provide certified performance ratings of low-flow dwelling unit H/ERVs (e.g., flows below 400 cfm). HVI ratings are provided in accordance with CSA 439 and are listed in accordance with HVI 920. Further, listing of H/ERVs in accordance with HVI 920 is required by Section M1505.4.1.4 of the Washington State IRC. An H/ERV rated and listed in accordance with HVI 920 can also provide a viable ventilation solution for some commercial applications, including mid-rise and high-rise dwelling units, but further clarification is needed from the SBCC to determine how these units can comply with Section C403.3.6 of the Washington State IECC-C.

Section Table R406.3 requires a minimum "sensible recovery effectiveness" for H/ERVs used to comply with the Energy Credits available under Section 2, "Air Leakage Control and Efficient Ventilation Options." Table R406.3 provides credits for H/ERVs that have a "sensible heat recovery efficiency" of 0.65 or higher. However, I do not see a definition of this term. It seems like this table should reference the rated Adjusted Sensible Recovery Efficiency (ASRE) published by HVI at 32 dF (i.e., compliant with CSA 439 and listed in accordance with HVI 920). The requirements for the "sensible heat recovery efficiency" metric within this section are presumably based on building energy simulations that were performed using software that simulates the energy performance of the H/ERV heat exchanger separately from the energy use of the H/ERV fan, while accounting for the energy associated with both.

Guidance from HVI points to the "Adjusted Sensible Recovery Efficiency" as the metric that most closely approximates the "sensible recovery effectiveness." HVI provides guidance on when to reference an H/ERV's ASRE here:

<https://www.hvi.org/resources/publications/builder-guide/>.

The HVI Section 3 Directory for H/ERVs may be found here: <https://www.hvi.org/hvi-certified-products-directory/section-iii-hrv-erv-directory-listing/>. Click on the "Model Details" link for any given model to determine the ASRE.

QUESTION 1: When an H/ERV that is rated and listed in accordance with HVI 920 is used to comply with the "sensible recovery effectiveness" requirement in Washington State's IECC-C Section C403.3.6, can the product's rated Adjusted Sensible Recovery Efficiency (ASRE) at 32°F as listed in the HVI Section 3 H/ERV Directory be used as an alternate?

ANSWER 1: **Acceptance of an alternate method is at the discretion of the local code official. However, the proposed testing standard appears to be functionally equivalent.**

QUESTION 2: When electing to comply with the "sensible heat recovery efficiency" requirement in Washington State's IECC-R Table R406.3 "Air Leakage Control and Efficient Ventilation Options", can the product's rated Adjusted Sensible Recovery Efficiency (ASRE) at 32°F as listed in the HVI Section 3 H/ERV Directory be used as an alternate?

ANSWER 2: **Acceptance of an alternate method is at the discretion of the local code official. However, the proposed testing standard appears to be functionally equivalent.**

SUPERSEDES: None

REQUESTED BY: Kitsap County