

Received from Mike Moore, Newport Partners, representing Broan-Nutone 8/20/20

(Note: Only addition is boxed "informative note")

2018 Seattle IECC-C Proposed Modification

Subject: Clarification of H/ERV performance metrics for Group R-1 and R-2 Occupancies through insertion of an SDCI Informative Note in Section C403.3.6

Submitted by: Mike Moore, Newport Partners, representing Broan-NuTone

Submitted to: Mr. Duane Jonlin, Energy Code and Energy Conservation Advisor, City of Seattle
Department of Construction and Inspections

Date: August 20, 2020

Sections affected: C403.3.6 (directly) and C403.7.6 Exception 2 (by reference only)

Proposed Modification:

C403.3.6 Ventilation for Group R-2 occupancy. For all Group R-2 dwelling and sleeping units, a balanced ventilation system with heat recovery system with minimum 60 percent sensible recovery effectiveness shall provide outdoor air directly to all habitable space. The ventilation system shall allow for the design flow rates to be tested and verified at each habitable space as part of the commissioning process in accordance with Section C408.2.2.

SDCI Informative Note. 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 Section C403.3.6 or C403.7.6 Exception 2, a specifier shall use the product's rated Adjusted Sensible Recovery Efficiency (ASRE) at 32 °F as listed in the HVI Section 3 H/ERV Directory. The specifier shall select the ASRE associated with a flow rate that is no less than the design flow rate. When the design flow rate is between two listed flow rates, interpolation of the ASRE shall be permitted.

C403.7.6 Energy recovery ventilation systems. Any system with minimum outside air requirements at design conditions greater than 5,000 cfm or any system where the system's supply airflow rate exceeds the value listed in Tables C403.7.6(1) and C403.7.6(2), based on the climate zone and percentage of outdoor airflow rate at design conditions, shall include an energy recovery system. Table C403.7.6(1) shall be used for all ventilation systems that operate less than 8,000 hours per year, and Table C403.7.6(2) shall be used for all ventilation systems that operate 8,000 hours or more per year. The energy recovery system shall have the capability to provide a change in the enthalpy of the outdoor air supply of not less than 60 percent of the difference between the outdoor air and return air enthalpies, at design conditions. Where an air economizer is required, the energy recovery system shall include a

bypass of the energy recovery media for both the outdoor air and exhaust air or return air dampers and controls which permit operation of the air economizer as required by Section C403.5. Where a single room or space is supplied by multiple units, the aggregate ventilation (cfm) of those units shall be used in applying this requirement. The return/exhaust air stream temperature for heat recovery device selection shall be 70°F (21°C) at 30 percent relative humidity, or as calculated by the registered design professional. 2. The energy recovery systems for R-1 and R-2 occupancies shall have a 60 percent minimum sensible heat recovery effectiveness, in lieu of 60 percent enthalpy recovery effectiveness. The return/exhaust air stream temperature for heat recovery device selection shall be 70°F (21°C), or as calculated by the registered design professional.

Exceptions:

1. The energy recovery systems for occupancy type I-2 hospitals, medical office buildings, and buildings that primarily consist of technical laboratory spaces, are permitted to provide a change of enthalpy of the outdoor air and return air of not less than 50 percent of the difference between the outdoor air and return air enthalpies, at design conditions. These occupancies are also permitted to utilize exception #3.
2. The energy recovery systems for R-1 and R-2 occupancies shall have a 60 percent minimum sensible heat recovery effectiveness, in lieu of 60 percent enthalpy recovery effectiveness. The return/exhaust air stream temperature for heat recovery device selection shall be 70°F (21°C), or as calculated by the registered design professional.

Reason: 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 to determine how these units can comply with Section C403.3.6 and Section C403.7.6 of Seattle's IECC-C.

Sections C403.3.6 and C403.7.6 of Seattle's IECC-C require a minimum "sensible heat recovery effectiveness" HERVs used for Group R-1 and R-2 occupancy. The requirements for the "sensible recovery effectiveness" metric within these sections 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. Assuming that this is the case, guidance from HVI points to the "Adjusted Sensible Recovery Efficiency" as the metric that most closely approximates the "sensible recovery effectiveness" referenced by C403.7.6 and C403.3.6. HVI provides guidance on when to reference an H/ERV's ASRE here: <https://www.hvi.org/resources/publications/builder-guide/>.