RED1-320-22

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Note: This is a replacement proposal for RED1-320-22 for consideration by the IECC-R HVACR Subcommittee. Changes shown in strikethrough and underline are to the text in PCD1 of the IECC-R and IRC Chapter 11.

2024 IECC-R and IRC Chapter 11

Add new definitions as follows:

ENTHALPY RECOVERY RATIO. Change in the enthalpy of the outdoor air supply divided by the difference between the outdoor air and entering exhaust air enthalpy, expressed as a percentage.

LATENT EFFECTIVENESS. The effectiveness determined using only measured humidity ratios, heat of vaporization values, and mass airflow rates.

Revise as follows:

N1103.6.1 (R403.6.1) Heat or energy recovery ventilation. Heat or energy recovery ventilation systems shall be provided as specified in either Section N1103.6.1.1 (R403.6.1.1) or N1103.6.1.2 (R403.6.1.2), as applicable.

Add new text as follows:

N1103.6.1.1 (R403.6.1.1) Group R-2 occupancy *dwelling units*. Within buildings of Group R-2 occupancy, *dwelling units* shall be provided with a *balanced ventilation system* having an *enthalpy recovery ratio* of not less than 50 percent at cooling design condition and not less than 60 percent at heating design condition. In climate zones 0A, 1A, 2A, and 3A, the *balanced ventilation system* shall have a *latent effectiveness* not less than 40 percent.

Exceptions:

1. Dwelling units in Climate Zone 3C.
2. Dwelling units with not more than 500 square feet (46 m) of conditioned floor area that are located in Climate Zones 0, 1, 2, 3, 4C, or 5C.
3. Enthalpy recovery ratio requirements at heating design condition in Climate Zones 0, 1, and 2.
4. Enthalpy recovery ratio requirements at cooling design condition in Climate Zones 4, 5, 6, 7, and 8.
5. *Balanced ventilation systems* meeting each of the following requirements:
    a. Having a listed sensible recovery efficiency (SRE) determined in accordance with CAN/CSA C439 that is not less than 65 percent at 32 °F (0 °C), at an airflow not less than the design airflow. The SRE shall be determined from a listed value or from interpolation of listed values.
    b. In climate zones 0A, 1A, 2A, and 3A, having a listed net moisture transfer determined in accordance with CAN/CSA C439 that is not less than 40 percent at 95 °F (35°C), at an airflow not less than the design airflow. The net moisture transfer shall be determined from a listed value or from interpolation of listed values.

N1103.6.1.2 (R403.6.1.2) All other *dwelling units*. All other *d~~D~~welling units* shall be provided with a heat recovery or energy recovery ventilation system in Climate Zones 6, 7, and 8. The system shall be a balanced ventilation system with a sensible recovery efficiency (SRE) determined in accordance with CAN/CSA C439 that is ~~of~~ not less than 65 percent at 32°F (0°C) at an airflow ~~greater than or equal to~~ not less than the design airflow. The SRE shall be determined from a listed value or from interpolation of listed values.

Reason: This proposal establishes a requirement for a balanced ventilation system with heat recovery (i.e., an HRV or an ERV) for low-rise dwelling units buildings of Group R-2 occupancy based on a cost effectiveness analysis. The requirement aligns with the 2021 IECC-C requirements for dwelling units in buildings of Group R-2 occupancy. Additionally, within Exception 5, this proposal establishes a compliance path for smaller, in-suite H/ERVs that serve single dwelling units. Large, central H/ERVs serving multiple dwelling units are typically certified for performance based on testing conducted in accordance with AHRI 1060, "Performance Rating of Air-to-Air Exchangers for Energy Recovery Ventilation Equipment." Relevant sensible and latent energy transfer metrics for such units are the “enthalpy recovery ratio” and the “latent effectiveness.” Smaller, in-suite H/ERVs serving individual dwelling units are typically certified for performance based on testing conducted in accordance with CAN/CSA

C439. The relevant energy transfer metrics for such units are the sensible recovery efficiency (SRE) for sensible energy and the net moisture transfer for latent energy. Exception 6 to R403.6.1.1 (N1103.6.1.1) would facilitate the use of commonly specified H/ERVs for dwelling units (i.e., those tested in accordance with CSA C439), that are expected to achieve comparable in-situ performance. The target SRE aligns with that currently required in Section N1103.6.1 (R403.6.1) for dwelling units in Climate Zones 7 and 8. The target net moisture transfer metric would only be required for hot/humid climate zones to support IAQ, where moderation of outdoor moisture levels is especially important for managing indoor humidity. The value of 40% is achievable by most models while providing a significant reduction in latent loads associated with introducing outdoor air.

Cost Impact: The code change proposal will increase the cost of construction.
Cost effectiveness documentation supporting the existing 2021 IECC-C requirements for H/ERVs in R-2 dwelling units was submitted in that code cycle and was also submitted through ASHRAE 90.1 as the basis for establishing identical requirements in that standard. The assumptions used to characterize typical R-2 dwelling units in the 2021 IECC-C cost effectiveness study are also applicable to 2024 IECC-R R-2 dwelling units (at least in terms of the effects on ventilation energy use and savings), and so the cost effectiveness study does not need to be repeated to justify transitioning the requirements to the IECC-R. Stakeholders may refer to the cost effectiveness documentation submitted with the 2021 IECC-C code change for more information.