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The Energuy Comments on the Proposed 2019 Residential Energy Code

Thank you for the opportunity to comment on future code updates. The Energuy supports the mission of the CEC, and appreciates the collaborative and transparent process of code revision.

After reviewing the proposed changes, we have one issue which we would like clarified.

Under section 4.4.1.15 "Forced Air System Duct Sizing, Airflow Rate and Fan Efficacy" it states the following:

"Adequate airflow is critical for cooling equipment efficiency. Further, it is important to maintain adequate airflow without expending excessive fan power. §150.0(m)13 requires system airflow and watt draw to be HERS-verified. See Reference Residential Appendices RA3.3 for the applicable HERS verification procedures.

Forced air systems that provide cooling must comply either the airflow rate and fan efficacy verification, or may comply with the return duct design specifications given in Tables 150.0-C and D.:

1. Airflow and watt draw measurement and determination of fan efficacy:

When using the airflow (cfm/ton) and fan efficacy (watt/cfm) method, the following criteria must be met:

a. Provide airflow through the return grilles that is equal to or greater than
   - 350 CFM per ton of nominal cooling capacity for systems that are not small duct high velocity systems.
   - 250 cfm per ton is allowed for small duct high velocity systems."

Question: The phrase "through the return grilles" eliminates the two currently approved methods of measuring airflow using plenum pressure matching directly from the air handler access door, or using a flow grid inserted into the filter slot on the FAU. It should be noted that, in our professional opinion, these two options represent the most accurate tests to measure the actual airflow over the coils. As such, we would not want to see these options eliminated. Is this truly the intention of the CEC, or is this simply a textual error?

Whatever the answer is, we respectfully recommend the following amendment:

"Provide airflow ~~through the return grilles~~ that is equal to or greater than"

Thank you.

Bruce Edgar

1. **Filter design airflow and pressure drop labels:**

Document Text:

"The design airflow rate, and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter device shall be determined and posted on a sticker or label by the installer inside the filter grille or near the filter rack according to section 4.4.1.14.5 below."

…

"Space conditioning systems may use any of the three following compliance approaches

a. Install a filter grille or accessible filter rack that accommodates a minimum 2" depth filter, and install the appropriate filter.

b. Install a filter grille or accessible filter rack that accommodates a minimum 1" depth filter, and install the appropriate filter. The filter/grille must be sized for a velocity of ≤ 150 ft per minute. The installed filter must be labeled to indicate the pressure drop across the filter at the design airflow rate for that return is ≤ 0.1 inch w.c. (25 PA).

Use the following method to calculate the 1" depth filter face area required. Divide the design airflow rate (ft3/min) for the filter grille/rack by the maximum allowed face velocity 150 ft/min. This yields a value for the face area in ft2. Since air filters are sold using nominal sizes in terms of inches, convert the face area to in2 by multiplying the face area (ft2) by a conversion factor of 144 in2/ft2. Summarizing:

Filter Nominal Face Area (in2) = airflow (cfm) ÷ 150 x 144

c. Comply with Standards Tables 150.0-B and C (see Table 4-10 and Table 4-11), which prescribe the minimum total system nominal filter face area and return duct size(s). The installed filter must be labeled to indicate the pressure drop across the filter at the design airflow rate for that return is ≤ 0.1 inch w.c. (25 PA). Note: this option is an alternative to the Section 150.0(m)13 requirement for HERS verified fan efficacy and airflow rate, but requires instead, a HERS verification of the return duct design."

Question:

Does this mean that if the filter grill or rack accommodates a 2" depth filter or greater, design airflow and pressure drop labeling is NOT required?

2. **Performance testing for whole house fans**

Text:

"Whole house fans used in performance requirements may require HERS verification of the airflow rate and fan efficacy as explained in Section 4.3.3 (150.1(b)3)."

Question:

Will this require additional testing equipment, the capacity of whole home fans is well beyond the ability of duct blasters, flow hoods and flow grids to measure? Will there perhaps be a procedure for using a blower door fan for this?

3. Insulating Liquid Line

Text:

"If the liquid line is at an elevated temperature relative to outdoor and indoor temperatures, it should not be insulated. In those areas, heat escaping from it is helpful. When the liquid line runs through the attic, the attic temperature is higher than the liquid line temperature, so liquid lines running through attics should be insulated to reduce heat transfer from the surrounding environment into the refrigeration system."

Question:

a. This appears to be a recommendation, not a requirement. Correct?
b. Will there be a temperature zone map created for determining this?

4. Air Flow Measurement

Text:

"When using the airflow (cfm/ton) and fan efficacy (watt/cfm) method, the following criteria must be met:

a. Provide airflow through the return grilles that is equal to or greater than 350 CFM per ton of nominal cooling capacity for systems that are not small duct high velocity systems."

Question:

This appears to limit airflow testing to return grilles only, thus prohibiting testing though a filter slot at the FAU, or through the air handler access door. Are we to assume that this is NOT the case?