

### 2019 HERS Alterations Verification Summary Table

| Scope of Work   | Duct Testing  | Refrigerant Charge   | Cooling Coil Airflow  | Fan Efficacy   |
|---|---|--|---|--|
|   | Mandatory Measure<br>All Climate Zones  | CZ's 2, 8-15<br>Prescriptive Req.                                | Mandatory Measure<br>All Climate Zones  | Mandatory Measure<br>All Climate Zones                             |
| <b>Entirely New System Equipment and Ducts</b><br>(Including Package Units & Mini-Splits)<br>Applies to Newly Constructed Buildings     | ≤ 5%<br><b>No Options</b><br><b>No Exceptions</b>   | Verify Charge<br>Verify Airflow<br>≥ 350 cfm/ton                 | ≥ 350 cfm/ton   | ≤ .45 Watts/cfm for Gas Furnaces<br>≤ .58 Watts/cfm for all others |
|   |   |  | <b>OR</b><br>Installer may demonstrate compliance using Return Duct Sizing per tables 150.0-B/C |  |
| <b>New Duct System</b><br>≥75% is new ducting and the retained portions are accessible and can be sealed                                | ≤ 5%<br><b>No Options</b><br><b>No Exceptions</b>   | N/A  | ≥ 350 cfm/ton   | ≤ .45 Watts/cfm for Gas Furnaces<br>≤ .58 Watts/cfm for all others |
|   |   |  | <b>OR</b><br>Installer may demonstrate compliance using Return Duct Sizing per tables 150.0-B/C |  |
| <b>Small Duct High Velocity System Equipment and Ducts</b>  | ≤ 5%<br><b>No Options</b><br><b>No Exceptions</b>   | Verify Charge<br>Verify Airflow<br>≥ 250 cfm/ton                 | ≥ 250 cfm/ton   | ≤ .62 Watts/cfm  |
|   |   |  | <b>OR</b><br>Installer may demonstrate compliance using Return Duct Sizing per tables 150.0-B/C |  |
| <b>GARAGES</b><br><b>Altered Ducts or System Components</b><br>Located in Garage Spaces Regardless of Duct Length or Piece of Equipment | ≤ 6%<br><b>OR</b><br>≤ 15% Total Leakage with All Accessible Leaks in the Garage Sealed using smoke | N/A  | N/A   | N/A  |
| <b>Altered Duct System</b><br>> 40' Replaced and < 75% of ducting has been replaced   | ≤ 15%<br><b>W/Options</b><br><b>See Exceptions</b>  | N/A  | N/A   | N/A  |
| <b>Altered Duct System</b><br>≤ 40' Installed or located in any space   | N/A   | N/A  | N/A   | N/A  |
| <b>Furnace/FAU Change-out Only</b><br>Existing ducting not altered  | ≤ 15%<br><b>W/Options</b><br><b>See Exceptions</b>  | N/A  | N/A   | N/A  |
| <b>Condenser or Coil Change-out Only</b><br>Existing ducting not altered  | ≤ 15%<br><b>w/options</b><br><b>See Exceptions</b>  | Verify Charge<br>Verify Airflow<br>≥300 cfm/ton                  | N/A   | N/A  |
| <b>Refrigerant containing component</b><br>Replacement of any of the following:<br>Line-set, TXV, Compressor or Filter Drier            | N/A   | Verify Charge<br>Verify Airflow<br>≥ 300 cfm/ton                 | N/A   | N/A  |
| <b>Package Unit</b><br>Existing ducting not altered   | ≤15%<br><b>W/Options</b><br><b>See Exceptions</b>   | Verify Airflow<br>≥300 cfm/ton                                   | N/A   | N/A  |
| <b>Ductless Mini Splits</b>   | N/A   | Verify Charge<br>Weigh-In Only                                   | N/A   | N/A  |
| <b>Ducted Mini Splits</b><br>Existing ducting not altered   | ≤ 15%<br><b>W/Options</b><br><b>See Exceptions</b>  | Verify Charge (weigh-in only)<br>Verify Airflow<br>≥ 300 cfm/ton | N/A   | N/A  |
| <b>Multi-Family Buildings Entirely New System Equipment and Ducts</b>   | ≤ 12%<br><b>OR</b><br>≤ 6%<br>Leakage to Outside  | Verify Charge<br>Verify Airflow<br>≥ 350 cfm/ton                 | ≥ 350 cfm/ton   | ≤ .45 Watts/cfm for Gas Furnaces<br>≤ .58 Watts/cfm for all others |
|   |   |  | <b>OR</b><br>Installer may demonstrate compliance using Return Duct Sizing per tables 150.0-B/C |  |

### Exceptions to Duct Sealing Verification

Exceptions do not apply to Entirely New or Replacement Space Conditioning Systems (Cut-In).

1. The system is not ducted (e.g., ductless mini-split, wall units, etc.).
2. There are less than 40 feet of ducts total in any space including plenums and the FAU.
3. The ducts are constructed, insulated, or sealed with asbestos.
4. The system was previously tested by a HERS Rater and that HERS Verification Certificate is available. Exception does not apply if more than 40 feet of ducts have been added or replaced since the original verification. It does apply to systems passed as part of a sample group.

### Exceptions to the Refrigerant Charge Verification

1. Air conditioning not installed or determined to be non-operational by the local code enforcement agency.
2. New package units with factory charge certified by installer on the CF2R-MCH-25. Minimum airflow must still be verified for ducted systems.

### Exceptions to System Airflow and Fan Efficacy Verification

1. The system is not ducted.
2. The system does not have air conditioning.
3. VRF (variable refrigerant flow) systems driving multiple indoor coils.

## 2016 HERS Verification Summary - Alterations

### Duct Testing Form – CF3R-MCH-20

In all climate zones, when space conditioning systems utilize forced air duct systems to supply conditioned air (heating or cooling), duct leakage verification will be required if;

- Greater than 40' of new or replacement ducts are installed, or
- New or replacement space-conditioning system equipment is installed including the FAU, condenser, evaporator coil and/or heating coil.

#### Compliance criteria:

- New duct system shall have total duct leakage  $\leq$  **5%**. No exceptions, No options.

#### Compliance criteria options for existing ducting

- Other duct systems shall have total duct leakage  $\leq$  **15%**, duct leakage to outside  $\leq$  **10%**, or use the Seal All Accessible Leaks protocol which requires a visual inspection and Smoke Test.

### Airflow Form – CF3R-MCH-23 / Fan-Efficacy Form – CF3R-MCH-22

In all climate zones, when space conditioning systems utilize forced air duct systems to supply cooling, if a duct system meets the definition of a 'NEW' duct system then;

- Measured Airflow shall be  $\geq$  **350 CFM/ton**, and
- Measured Fan Efficacy shall be  $\leq$  **0.45 Watts/CFM** for Gas Furnaces Only.
- Measured Fan Efficacy shall be  $\leq$  **0.58 Watts/CFM** for all other types of furnaces other than gas.

Small Duct High Velocity duct systems:

- Measured airflow shall be  $\geq$  **250 CFM/ton**, and
- Measured fan Efficacy shall be  $\leq$  **0.62 Watts/CFM**.

**Note: Cooling must be present but not necessarily newly installed to trigger this verification.**

Alternative to measured Airflow/Fan-Efficacy

- If the installed return system follows the sizing requirements of Table 150.0-B/C, reported on the MCH-28, testing Airflow and Fan-Efficacy is not required.

### Refrigerant Charge Form – CF3R-MCH-25

In Climate Zones 2 or 8 - 15, if a refrigerant containing component is altered, replaced or newly installed, refrigerant charge verification will be required.

**Note:** Charge verification applies to all system types including package units and mini-split systems. Refrigerant containing components include the condenser, evaporator coil, compressor, line-set, TXV/EXV, or filter drier.

As part of all charge verifications, ducted systems shall demonstrate **minimum airflow** requirements:

- New Duct Systems – See Airflow/Fan-Efficacy above.
- All other duct systems shall have measured **Airflow  $\geq$  300 CFM/ton**. If the system fails to meet the required 300cfm/ton, the installer shall perform all applicable steps in the Airflow Remediation protocol RA3.3.3.1.5.1

**Note: New package units are typically factory charged and are certified by the installer on the CF2R-MCH-25, in which case no CF3R will be required or generated. Mini-split and other VRF systems must use Rater Observation of the Installer's Weigh-in method.**