

Help! Do I Have to Seal the Ductwork When I Change-out An HVAC System?

Most HVAC contractors have heard by now about the new California Energy Standards that take effect on October 1, 2005. Yes, the new energy standards really do require that HVAC contractors test and seal existing duct work when they replace an existing furnace, air handler, coil, outdoor condenser or packaged unit. As can be expected with any issue as significant as this; there are many questions. This summary will help clarify those questions.

Quick Overview of the New Rules

When a building permit is applied for on or after October 1, 2005 for a residential or nonresidential HVAC change-out, the installing contractor must test and seal the existing duct work. The requirement for nonresidential systems is statewide. For residential systems the rules only apply in parts of the state. The flowcharts on the following page list the specific climate zones, but in general the residential rules do not apply along the coastal areas of the state.



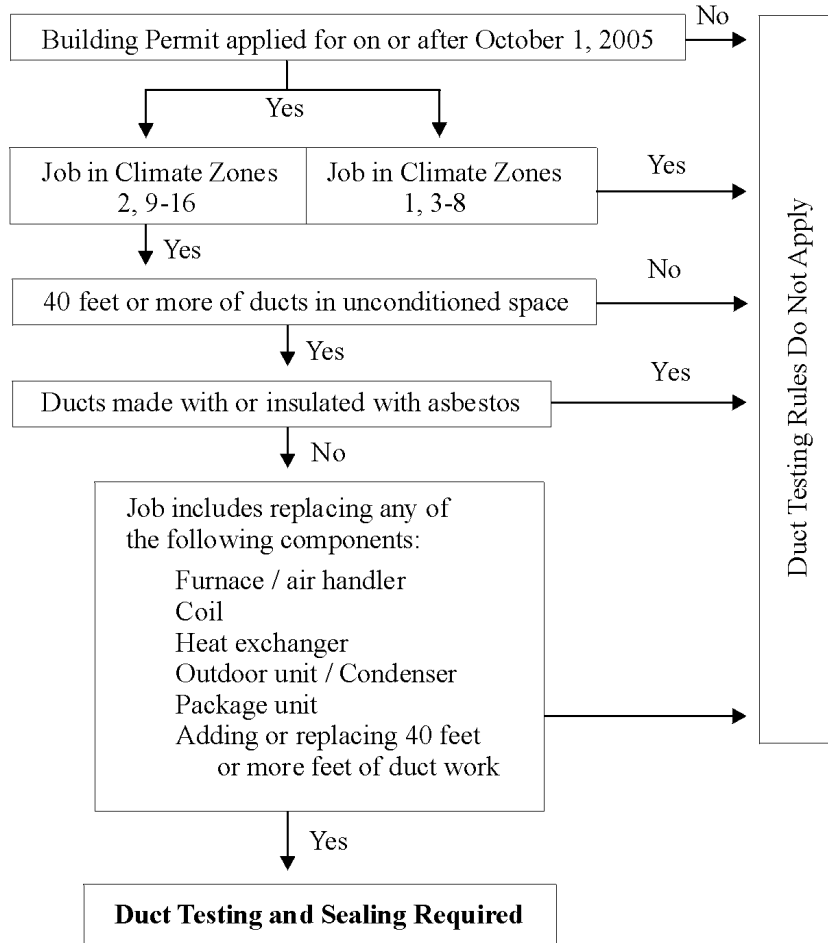
Doug Beaman shows a group of contractors how to perform a duct leakage test.

Do The Rules Apply to This Change-out?

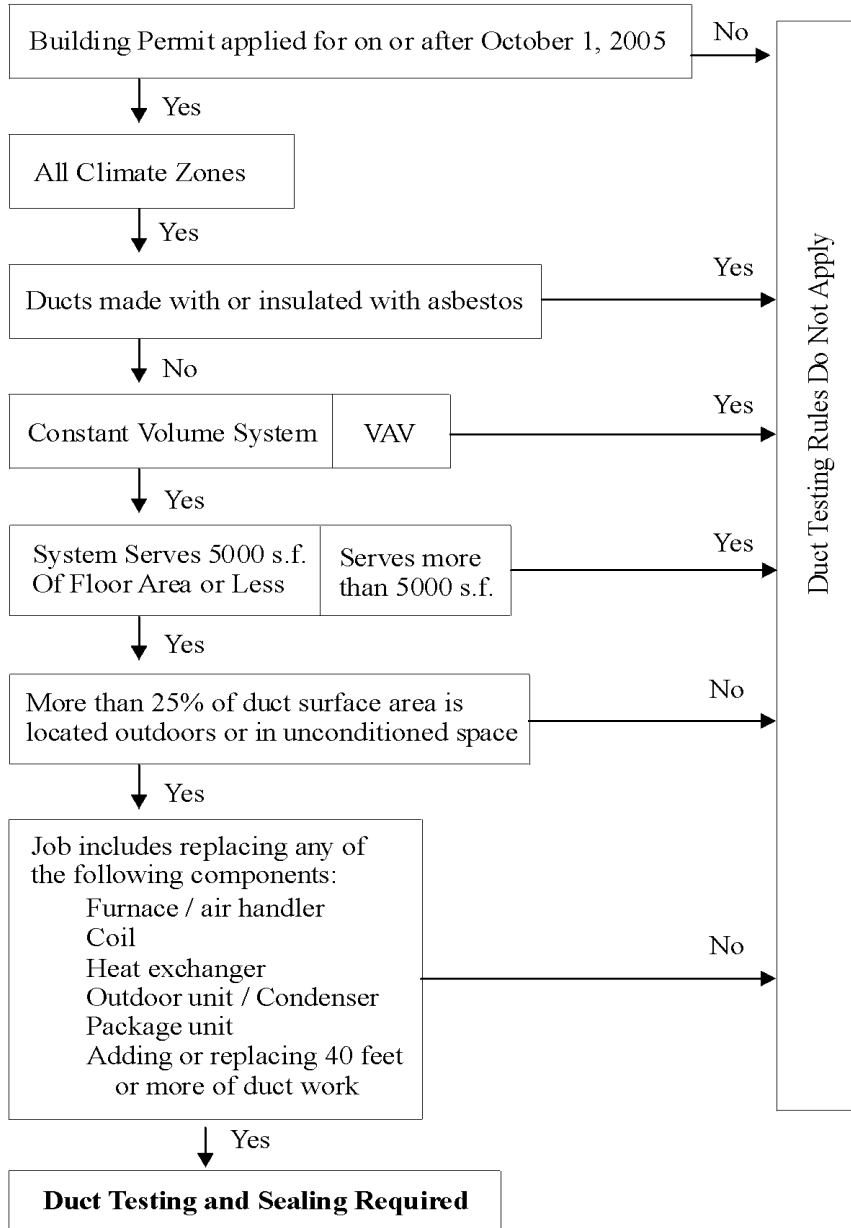
We have developed two flow charts to help you determine if the new rules apply to a particular job. One chart is for “Residential Change-Outs” and the other chart is for “NonResidential Change-Outs”. If the rules apply; follow the Step-by-Step process described on the following pages.

This summary was originally written for *Indoor Comfort News* by Douglas Beaman. Doug can be reached at Doug@DougBeaman.com or (209) 524-1000. This summary may not be duplicated without express written permission.

Residential HVAC Change-Outs



NonResidential Change-Outs



Step-by-Step Process

Use the flow chart to determine if duct sealing and testing apply to your job. If duct sealing and testing is required, follow these steps.

1. Contractors perform their standard change-out work with the customer. The duct testing rules do not interrupt the contractor in completing the change-out and ensuring that the customer’s heating or air conditioning system is fully functional.
2. The installing contractor tests for duct leakage and seals the duct work as necessary. Contractors are not required to be certified to perform this test. Contractors will need to have duct pressurization test equipment in order to perform the test. (Contractors may hire someone else to perform this test for them). The duct sealing may be completed at the same time as the change-out work or it may be scheduled at a different time for the convenience of the customer and the contractor. (Note: An upcoming article in ICN will discuss the steps and procedure that contractors commonly use to seal existing duct work).

3. Contractor completes form CF-6R showing results of contractor test. See sample at right. The HERS rater (see next step) will need to review the CF-6R before they perform their verification.

INSTALLATION CERTIFICATE (Page 4 of 12) **CF-6R**

Site Address Permit Number

INSTALLER COMPLIANCE STATEMENT FOR DUCT LEAKAGE

ALTERATIONS: Duct System and/or HVAC Equipment Change-Out		
4	Enter Tested Leakage Flow in CFM from CF-6R: Pre-Test of Existing Duct System Prior to Duct System Alteration and/or Equipment Change-Out.	
5	Enter Tested Leakage Flow in CFM: Final Test of New Duct System, or Altered Duct System for Duct System Alteration and/or Equipment Change-Out.	
6	Enter Reduction in Leakage for Altered Duct System [_____ (Line # 4) Minus _____ (Line # 5)] - (Only if Applicable)	
7	Enter Tested Leakage Flow in CFM to Outside (Only if Applicable)	✓ ✓
8	Entire New Duct System - Pass if Leakage Percentage ≤ 6% for Final or ≤ 4% at Rough-in [100 x [_____ (Line # 5) / _____ (Line # 2)]	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TEST OR VERIFICATION STANDARDS: For Altered Duct System and/or HVAC Equipment Change-Out Use one of the following four Test or Verification Standards for compliance:		
9	Pass if Leakage Percentage ≤ 15% [100 x _____ (Line # 5) / _____ (Line # 2)]	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
10	Pass if Leakage to Outside Percentage ≤ 10% [100 x [_____ (Line # 7) / _____ (Line # 2)]	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
11	Pass if Leakage Reduction Percentage ≥ 60% [100 x [_____ (Line # 6) / _____ (Line # 4)] and Verification by Smoke Test and Visual Inspection	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
12	Pass if Sealing of all Accessible Leaks and Verification by Smoke Test and Visual Inspection	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Pass if One of Lines # 9 through # 12 pass		
<input type="checkbox"/> Pass <input type="checkbox"/> Fail		

4. The contractor hires a certified HERS Rater to perform a 3rd party verification. The HERS rater **cannot** be an employee of the installing contractor.

5. At the option of the contractor, the HERS rater will verify 100% of the contractor’s test results or verify a sample of the jobs. If the contractor prefers to use sampling, at least one job out of every seven must be verified. The job will be randomly selected by the rater. If the sampled job fails the verification, additional jobs must be tested. The complete sampling and retesting rules are listed in the California Energy Commission regulations. The group of seven jobs does not have to be in the same city or county, just work completed by that contractor.

6. The HERS Rater will complete a CF-4R for each job; regardless of whether the home is tested or passed as part of the sample group. The CF-4R is provided to the contractor and building department. In essence, the HERS Rater is “spot checking” the test results of the installing contractor.

7. The building department will not “final” the job until it has met all building department inspection criteria and the CF-4R has been provided by the HERS Rater.

CERTIFICATE OF FIELD VERIFICATION & DIAGNOSTIC TESTING (Page 1 of 8) CF-4R

ALTERATIONS: Duct System and/or HVAC Equipment Change-Out			
Enter Tested Leakage Flow in CFM from CF-6R: Pre-Test of Existing Duct System Prior to Duct System Alteration and/or Equipment Change-Out.			
Enter Tested Leakage Flow in CFM: Final Test of New Duct System or Altered Duct System for Duct System Alteration and/or Equipment Change-Out.			
Enter Reduction in Leakage for Altered Duct System [_____(Line # 4) Minus _____(Line # 5)] – (Only if Applicable)			
Enter Tested Leakage Flow in CFM to Outside (Only if Applicable)		✓	✓
Entire New Duct System - Pass if Leakage Percentage ≤ 6% for Final or ≤ 4% at Rough-in [100 x [_____(Line # 5) / _____(Line # 2)]]		<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
TEST OR VERIFICATION STANDARDS: For Altered Duct System and/or HVAC Equipment Change-Out Use one of the following four Test or Verification Standards for compliance:		✓	✓
Pass if Leakage Percentage ≤ 15% [100 x _____(Line # 5) / _____(Line # 2)]]		<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Pass if Leakage to Outside Percentage ≤ 10% [100 x [_____(Line # 7) / _____(Line # 2)]]		<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Pass if Leakage Reduction Percentage ≥ 60% [100 x [_____(Line # 6) / _____(Line # 4)]] and Verification by Smoke Test and Visual Inspection		<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Pass if Sealing of all Accessible Leaks and Verification by Smoke Test and Visual Inspection		<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Pass if One of Lines # 9 through # 12 pass		<input type="checkbox"/> Pass	<input type="checkbox"/> Fail

Do I Have to be Certified To Test My Own Work

The installing contractor must perform a duct pressurization test on each of his jobs (or hire someone to perform the test). There is no certification required for the contractor’s duct leakage test (the contractor must, of course, be licensed as appropriate by the Contractor’s State License Board). Over the next several months, the utilities and other groups will be providing opportunities for contractors to attend hands-on duct testing training classes. Training information is provided below but watch your industry publications and supply house notices for additional training.



A smoke test is often helpful in locating leaks in the duct work.

HERS and CHEERS

HERS stands for Home Energy Rater System which is the state wide regulations governing 3rd party verifications. CHEERS stands for California Home Energy Efficiency Rating Services which is a non-profit organization that is certified as a HERS provider in California. CHEERS has been certified by the California Energy Commission (CEC) to provide training for CHEERS Raters. CHEERS Raters are not employees of CHEERS; rather they are certified by CHEERS and must comply with rules and regulations that are established by the CEC and enforced by CHEERS including Quality Assurance controls. Many HVAC contractors have become CHEERS Raters. Contractors that are also CHEERS Raters may seal and test their work but they may not perform the 3rd party verification on their own work.

How Do I Find A CHEERS Rater?

CHEERS Raters can be located by calling CHEERS at 1-800 4CHEERS or a list of CHEERS Raters is posted at www.CHEERS.org.

How Do I Become a CHEERS Rater?

CHEERS offers certification training classes to become a CHEERS Rater. Many CHEERS Raters are licensed C-20 contractors. Although a contractor may NOT be the HERS Rater for their own work, they may perform 3rd party verifications on jobs performed by other contractors. Information is available at www.CHEERS.org

How Do I Learn More?

The utilities and other organization will be offering a variety of training opportunities including hands-on duct testing classes in the months ahead.

1. Watch the ICN for schedules of hands-on training classes provided by suppliers, utilities and CHEERS.
2. Watch for a future article in the *Indoor Comfort News* on how to perform a duct leakage test.
3. Classes provided by California utilities; information is available at their web sites:
www.socalgas.com/erc
www.sdge.com/construction/seminars.html
www.pge.com/stockton

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