

## AIR DISTRIBUTION DUCT LEAKAGE

CEC-NRCA-MCH-04a-H (Revised 01/20)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-04a-H
AIR DISTRIBUTION DUCT LEAKAGE		(Page 1 of 4)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

<b>Compliance Results:</b>	HERS Rater in receipt of document (Signature/Date)
<input type="checkbox"/> Complies <input type="checkbox"/> Does NOT Comply	

Intent:	Submit one Certificate of Acceptance testing duct leakage rate for each newly installed, repaired, or altered heating, ventilating or air conditioning (HVAC) duct system (no sampling permitted). ( <a href="#">§140.4(l)1</a> , <a href="#">141.0(b)2D</a> , and <a href="#">141.0(b)2E</a> ) <b>NOTE: HERS Verification required.</b>
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<b>A. Construction Inspection</b>			
Building:	Floor:	Room/Area/Zone:	Control System:
Prior to Functional Testing, verify and document all of the following.			
1	Required documentation (check <b>all</b> of the following):		
<input type="checkbox"/>	a	Design, drawings, cut-sheets, <a href="#">NRCC-MCH-E</a> , as approved by the authority having jurisdiction. ( <a href="#">§10-103(a)2A</a> )	
2	System installation type (check <b>one</b> of the following):		
<input type="checkbox"/>	a	Qualifying newly constructed system ( <a href="#">§140.4(l)1</a> )	
<input type="checkbox"/>	b	Qualifying altered duct systems ( <a href="#">§141.0(b)2D</a> )	
		Qualifying altered space-conditioning systems. ( <a href="#">§141.0(b)2E</a> )	
3	System operational capacity ( <b>record one</b> of the following):		
<input type="checkbox"/>	a	Condenser Nominal Cooling Capacity (ton) ( <a href="#">NA 2.1.4.1</a> ):	
<input type="checkbox"/>	b	(if heating only) Heating Capacity (kBtu/h) ( <a href="#">NA 2.1.4.1</a> ):	
4	<b>Instrumentation Specification Requirements</b>		
	The apparatus for duct system pressurization and duct system leakage measurements must consist of a duct system pressurization and leakage airflow measurement device meeting the specifications below (check <b>all</b> of the following): ( <a href="#">NA 2.1.2</a> )		
<input type="checkbox"/>	a	The pressure measurement instrumentation is accurate to plus or minus 0.2 Pa and makes use of a static pressure probe. ( <a href="#">NA 2.1.2.1</a> )	
<input type="checkbox"/>	b	All measurements of duct leakage airflow shall have an accuracy of plus or minus 3 percent of measured airflow or better using digital gauges. ( <a href="#">NA 2.1.2.2</a> )	
<input type="checkbox"/>	c	All instrumentation used for duct leakage diagnostic measurements is calibrated according to the manufacturer's calibration procedure. ( <a href="#">NA 2.1.2.3</a> )	
Duct Systems – <b>Newly Constructed System</b>			
5	Duct connections meet the requirements of Standards §120.4 (a) through (f). ( <a href="#">NA 7.5.3.1(a)</a> )		
<input type="checkbox"/>	a	Confirm access to all installed plenums and duct work. ( <a href="#">NA 7.5.3.1(d)</a> , <a href="#">(f)</a> )	
<input type="checkbox"/>	b	Reference <a href="#">NRCC-MCH-E, Section L</a> to verify that the duct design requirement has been completed on the signed and approved form. ( <a href="#">NA 7.5.3(a) &amp; (e)</a> , <a href="#">§120.4(a)-(f)</a> )	
Duct Systems – <b>Newly Constructed Systems, Altered Duct Systems, and Altered Space-Conditioning Systems</b>			
6	Visually inspect and verify the seal of all of the following:		
<input type="checkbox"/>	a	Connections to plenums and other connections to the forced air unit. ( <a href="#">NA7.5.3.1(h)</a> )	
<input type="checkbox"/>	b	Refrigerant lines and other penetrations into the forced air unit. ( <a href="#">NA 7.5.3.1(i)</a> )	
<input type="checkbox"/>	c	Air handler door panel (do not use permanent sealing material, metal tape is acceptable). ( <a href="#">NA 7.5.3.1(j)</a> )	
<input type="checkbox"/>	d	Register boots sealed to surrounding material. ( <a href="#">NA 7.5.3.1(k)</a> )	
<input type="checkbox"/>	e	Connections between lengths of duct, as well as connections to takeoffs, wyes, tees, and splitter boxes. ( <a href="#">NA 7.5.3.1(l)</a> )	

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A. Construction Inspection			
Building:	Floor:	Room/Area/Zone:	Control System:
7	Inspect all plenums and enough of the installed duct work to be confident that all of the following are reasonably accurate (in descending order of priority): (check <b>all</b> of the following)		
<input type="checkbox"/>	a	Joints and seams are NOT sealed with a cloth-backed rubber adhesive tape unless used in combination with mastic and draw bands. <a href="#">(NA 7.5.3.1 (f), §120.4(b)2D)</a>	
<input type="checkbox"/>	b	Insulation Requirements – reference <a href="#">NRCC-MCH-E, Section L</a> , approved design drawing and cut-sheets (if available) for the system and verify the insulation by location has been installed as indicated and is either R-8, R-4.2 or located within conditioned space. Insulated flex duct must be also be labeled as either R-8 or R-4.2. <a href="#">(NA 7.5.3.1(g), §120.4(a), (c), and (d))</a>	
<input type="checkbox"/>	c	Drawbands: Reference the approved design drawing and cut-sheets (if available). Verify that all drawbands are specified to be stainless-steel worm-driven hose clamps or UV-resistant nylon duct ties, have a minimum tensile strength rating of 150 pounds, and make note of the manufacturer’s recommended tightening. Visually inspect a representative amount of drawband installations. <a href="#">(NA7.5.3.1(b), §120.4(b)2E)</a>	
<input type="checkbox"/>	d	Constriction of flexible ducts: Visually verify that the flexible ducts are not compressed against an immovable object, squeezed through an opening, or contorted to extreme configurations. Visually verify that any bend radius (at the centerline) in a flexible duct does not exceed one duct diameter. <a href="#">(NA 7.5.3.1(c))</a>	
<input type="checkbox"/>	e	For outdoor duct work, reference approved design drawing and cut sheets (if available). Verify that the insulation is protected from sunlight, moisture, equipment maintenance, wind, and weather by the appropriate application of aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation may also be protected by direct application of paint with a coating that is water retardant and provides shielding from solar radiation. <a href="#">(NA7.5.3.1(g), § 120.4(f))</a>	
Construction Inspection Compliance Results: <input type="checkbox"/> Complies <input type="checkbox"/> Does NOT Comply			

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B. Functional Testing			
Building:	Floor:	Room/Area/Zone:	Control System:
<b>STEP</b>	<b>Procedure – Pressurized duct leakage test</b>		
1	Temporarily seal all the supply registers and return grilles, except for one large centrally located return grille or the air handler cabinet access door or panel. (NA 2.1.4.2.1(c))		
2	Verify that all outside air dampers and/or economizers are sealed prior to pressurizing the system. (NA 2.1.4.2.1(c))		
3	Attach the fan flowmeter device to the duct system at the unsealed return grille or the air handler cabinet access door or panel. (NA 2.1.4.2.1(d))		
4	Install a static pressure probe at a supply register located close to the air handler, or at the supply plenum. (NA 2.1.4.2.1(e))		
5	Adjust the fan flowmeter to produce a positive 25 Pa (0.1 inches water) pressure at the supply register or the supply plenum with respect to the outside or with respect to the building space with the entry door open to the outside. (NA 2.1.4.2.1(f))		
6	Record the flow through the flowmeter, this is the duct leakage flow at 25 Pa (0.1 inches water). (NA 2.1.4.2.1(g))		CFM
7	Calculate the nominal air handler air flow: <ul style="list-style-type: none"> <li>Air conditioner or heat pump: 400 cfm per rated ton of cooling capacity (Table A-3a).</li> <li>Heating-only system furnaces: 21.7 cfm per kBtu/hr of rated heating output capacity (Table A-3b).</li> </ul> (NA 2.1.4.1)		CFM
8	Divide the duct leakage flow (STEP 6) by the nominal air handler airflow (STEP 7) and convert to a percentage (multiply by 100). (NA 2.1.4.2.1(h))		Percentage
9	PASS or FAIL <ul style="list-style-type: none"> <li>New duct system: 6% or less is passing. (§140.4(l)(1))</li> <li>Existing duct system: 15% or less is passing. (§141.0(b)2D or 141.0(b)2E)</li> </ul> (NA 2.1.4.2)		P/F
10	Return system to normal operating condition.		
Functional Test Compliance Results: <input type="checkbox"/> Complies <input type="checkbox"/> Does NOT Comply			

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**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	Phone:

**FIELD TECHNICIAN'S DECLARATION STATEMENT**

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Acceptance is true and correct.
- I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
- The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
- I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	ATT Certification Identification (if applicable):	
Address:	Phone:	Date Signed:

**RESPONSIBLE PERSON'S DECLARATION STATEMENT**

I certify the following under penalty of perjury, under the laws of the State of California:

- I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
- I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance, and attest to the declarations in this statement (responsible acceptance person).
- The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
- I understand that a HERS rater will check the installation to verify compliance, and that if such checking identifies defects the responsible builder/installer shall be required to take corrective action at his expense. I understand that Energy Commission and HERS Provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at the responsible builder/installer's expense.
- I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
- I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed: