



**DOCKET**

**10-BSTD-01**

DATE FEB 23 2012

RECD. FEB 23 2012

Dockets Office, MS-4  
Re: Docket No. 10-BSTD-01  
1516 Ninth Street  
Sacramento, CA 95814-5512

February 23, 2012

Re: Proposed 2013 Title 24 Airflow Measurement Standards  
Section RA 3.3.3.2.1.1 through .3

California Energy Commission and the National Comfort Institute share common goals. We are united in our desire to save energy and the quest to accurately and effectively measure the performance of air conditioning and heating systems.

We do express concern however, regarding the proposed changes to the Title 24 sections referenced above that restricts airflow measurement to only three methods.

#### **Recommendation**

**While we do believe the three proposed test methods to be adequate and could tolerate their inclusion in Title 24, we encourage their acceptance and expansion of additional accepted airflow test methods. In recent years, HVAC and related energy practitioners have become more proficient with traditional balancing hoods, when used with the measurement and verification tests of total external static pressure, system component pressure drops, airflow traverses, system temperatures and equipment and system delivered BTU. These additional tests should also be included in the Title 24 compliance pathway for residential and non-residential verification. These tests verify system performance values specified by HVAC equipment manufacturers and are essential in measuring the effectiveness of HVAC system installation and efficient operation.**

Top quality air balancing hoods have been in use for decades and must not be written out of California's Title 24 requirements. Many field practitioners are heavily invested in these test instruments, as well as in other system performance measurement instruments required to effectively measure airflow under a variety of field conditions. The primary objection to traditional balancing hoods is the claim by a few researchers that backpressure reduces the airflow of the register. Current testing has documented backpressures of only 0.1 Pascals at airflows below 300 CFM. Traditional balancing hood backpressure is nearly unidentifiable and of no consequence in the majority of residential applications.

Consider the following 6 points as the decision is made to continue the use of traditional balancing hoods:

1. Air Balancing is specified by nearly every other efficiency and quality HVAC standard in the industry. These standards were published as valid standards before a fan powered flow hood existed. Experienced air balancers utilize a full suite of test instruments to measure airflow and verify system performance.

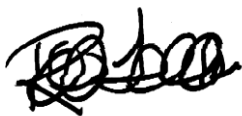
2. The fan powered flow hood is incapable of fulfilling the application as specified in Title 24. Its maximum airflow is 300 CFM, which is a fraction of the average return grille airflow found in California residential HVAC systems. Traditional balancing hoods are capable of measuring virtually all residential return grille airflows and can easily fulfill this Title 24 requirement.
3. The physical dimensions of the skirt included with the fan powered flow hood is 16" x 16" and is unable to be used on 90% of California residential return grilles. It is too small considering the average California Return Grille measures 14" x 24". It simply will not fit the grilles. Since the 2013 proposed return grille sizing chart will dramatically increase the dimensions of the grilles, a traditional flow hood is will be required because these hood manufacturers produce a variety of skirts to accommodate larger return grilles.
4. Additional concerns about the fan powered hood include:
  - a. The need to change flow rings that must be inserted into the fan powered hood during testing is cumbersome and doubles the test time on some projects.
  - b. If a powered flow hood is field constructed, as they surely will be due to cost restrictions, testing becomes a two person job, doubling the labor costs of testing.
  - c. The ongoing switch and configuration adjustments needed during testing substantially increases the chances of error.
  - d. Also, when the operator of the device needs to switch from return to supply airflow readings, another reconfiguration must be performed by removing the fan assembly from the hood housing, reconfiguring the fan assembly and reassembling the hood.
5. The manufacturer of the fan powered flow hood has been unable to adequately address the question of the fan powered hood's ability to work with an HVAC system's (ECM) variable speed fan. As the fan powered hood works to achieve neutral pressure, the functions and programming of a variable speed fan may cause the system fan to hunt to compensate for the changing pressure imposed by the fan powered hood. Since more and more variable speed fans are required to overcome the pressure drop of today's filters and coils this issue is of critical importance. Additionally our testing reveals the same concerns with the plenum pressure measurement and flow grid measurement methods when used with ECM type variable speed fans.
6. More than sufficient evidence has been provided by TSI to document the effectiveness of their hood to be included in the state program. (See the *TSI Comments for the 2013 Title 24 Energy Code Pre-rulemaking*) Or go to [http://www.tsi.com/uploadedFiles/Site\\_Root/Promotion\\_Pods/TSI%20Comments%20for%20the%202013%20Title%2024%20Energy%20Code.pdf](http://www.tsi.com/uploadedFiles/Site_Root/Promotion_Pods/TSI%20Comments%20for%20the%202013%20Title%2024%20Energy%20Code.pdf)

If the California Energy Commission has decided to specify individual test instruments, would it not be appropriate to add the fan powered hood to the list of existing industry proven air balancing hoods and expand the list to include other traditional air balancing test

instruments? This mission is to encourage more testing with better results, not less testing with questionable results.

The difficulty of performing the three proposed T-24 airflow tests is substantial and time consuming. To configure an HVAC system with cardboard and duct tape transitions needed to accept the specified test methods takes almost as long as it would take to complete traditional HVAC system performance testing in some homes. In addition, please note that the normal operating parameters of HVAC systems must be altered significantly while preparing the system for each of three the proposed T-24 airflow testing methods.

Working with several industry organizations including IHACI we have prepared an online petition that has been signed by over **550** industry professionals who agree with the facts presented in this document. Go to <http://www.gopetition.com/petitions/revisit-title-24-airflow-measurement-methodology.html> to view the names, comments and latest count.



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