

Results of ACCUBALANCE[®] Air Capture Hood Testing at Tennessee Technological University

Application Note TI-122

In May 1997, the Model 8370 ACCUBALANCE[®] capture hood was tested at an independent test facility to verify the accuracy of the instrument. This test facility is located in Cookeville, Tennessee, at Tennessee Technological University. The testing at this facility is sponsored by the National Environmental Balancing Bureau (NEBB), a non-profit organization which establishes and directs a national and international program to upgrade and maintain uniform standards for the testing, adjusting, and balancing of environmental systems. The test was witnessed by an engineer from TSI who is familiar with the operation of the ACCUBALANCE[®] capture hood.

The test system consisted of a blower, four flow nozzles, and 40 feet (12.2 m) of straight duct with a 2' x 2' (610 mm x 610 mm) four-way throw diffuser on the end. The flow standards were ASME precision gas flow nozzles with flow vs. differential pressure calibration curves supplied by the manufacturer. The accuracy of the whole system was verified the week before the test by a Pitot tube traverse. In addition, the system was checked for leaks and found to be tightly sealed at a pressure of 7 inches H₂O (1750 Pa).

The test system was only capable of testing in supply mode, but this was not viewed as a problem. The ACCUBALANCE[®] capture hood is calibrated on the same calibration system in both supply and exhaust mode. Therefore, if the supply measurements were found to be accurate, it could be assumed that the exhaust measurements were accurate also.

One tested ACCUBALANCE[®] capture hood was a new instrument chosen at random from a production batch of ten instruments. The other tested ACCUBALANCE[®] capture hood had been used by a customer for a month. Both ACCUBALANCE[®] capture hoods were tested in supply mode from 100 to 2000 CFM (50 to 1000 l/s). The first ACCUBALANCE[®] capture hood was tested over the entire range, then the test was repeated with the second ACCUBALANCE[®] capture hood. Twelve data points were taken for each instrument. The results of the testing are as follows:

- ACCUBALANCE[®] capture hood serial number 97030130 had a maximum error of 8.25% of reading at 210 CFM (99 l/s) and an average error of 3.34% of reading.
- ACCUBALANCE[®] capture hood serial number 97040057 had a maximum error of 5.00% of reading at 180 CFM (85 l/s) and an average error of 1.39% of reading.

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- 23 of 24 data points were within published ACCUBALANCE[®] capture hood specifications (one point was at 103% of allowable error).

As a result of this testing, it was determined by the independent NEBB test facility that the ACCUBALANCE[®] capture hood meets and even exceeds published specifications when used in well-defined flow conditions. This is in addition to the fact that the calibration of the ACCUBALANCE[®] capture hood is and always has been traceable to NIST.

The data for each test is shown in tabular and graphical form below.

Table 1: Raw Data from Test of ACCUBALANCE[®] Capture Hood Serial Number 97030130

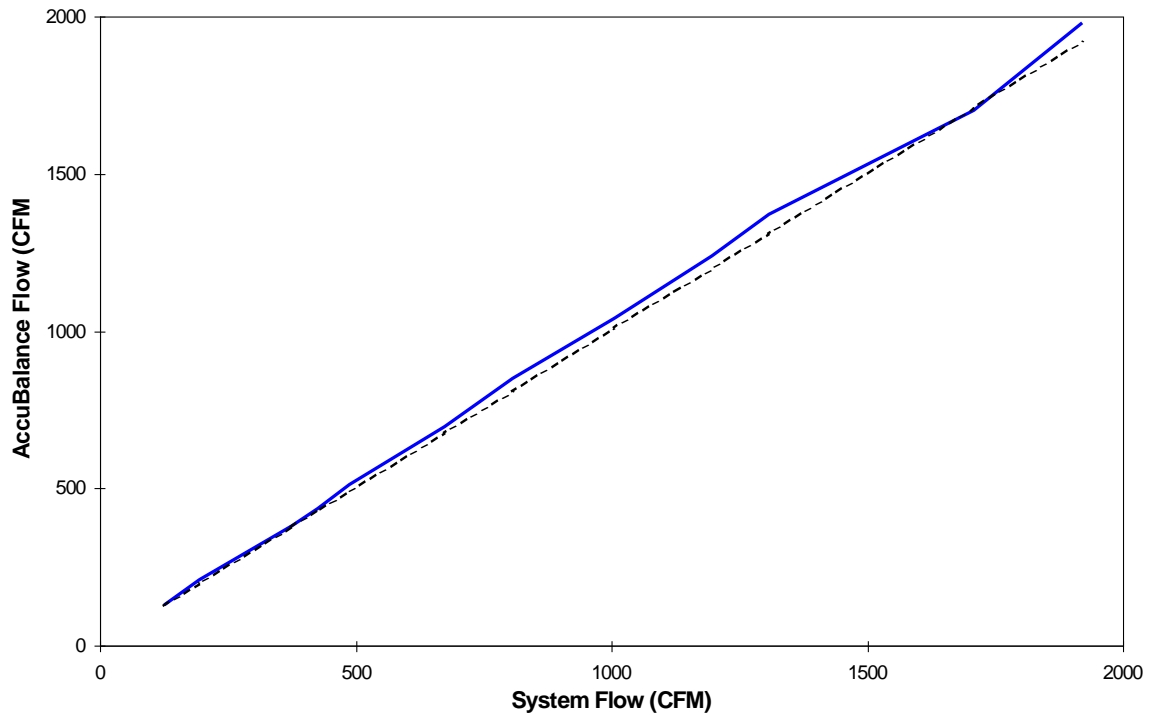
System Flow (CFM)	ACCUBALANCE Flow (CFM)	Difference in CFM	Difference in Percent
126	128	2	1.59
194	210	16	8.25*
375	380	5	1.33
427	435	8	1.87
488	510	22	4.51
674	695	21	3.12
808	850	42	5.20
1007	1040	33	3.28
1196	1240	44	3.68
1309	1370	61	4.66
1709	1700	-9	-0.53
1921	1980	59	3.07
Average Difference in Percent			3.34

*This is the only error that was larger than allowed according to the published specifications of the ACCUBALANCE[®] capture hood.

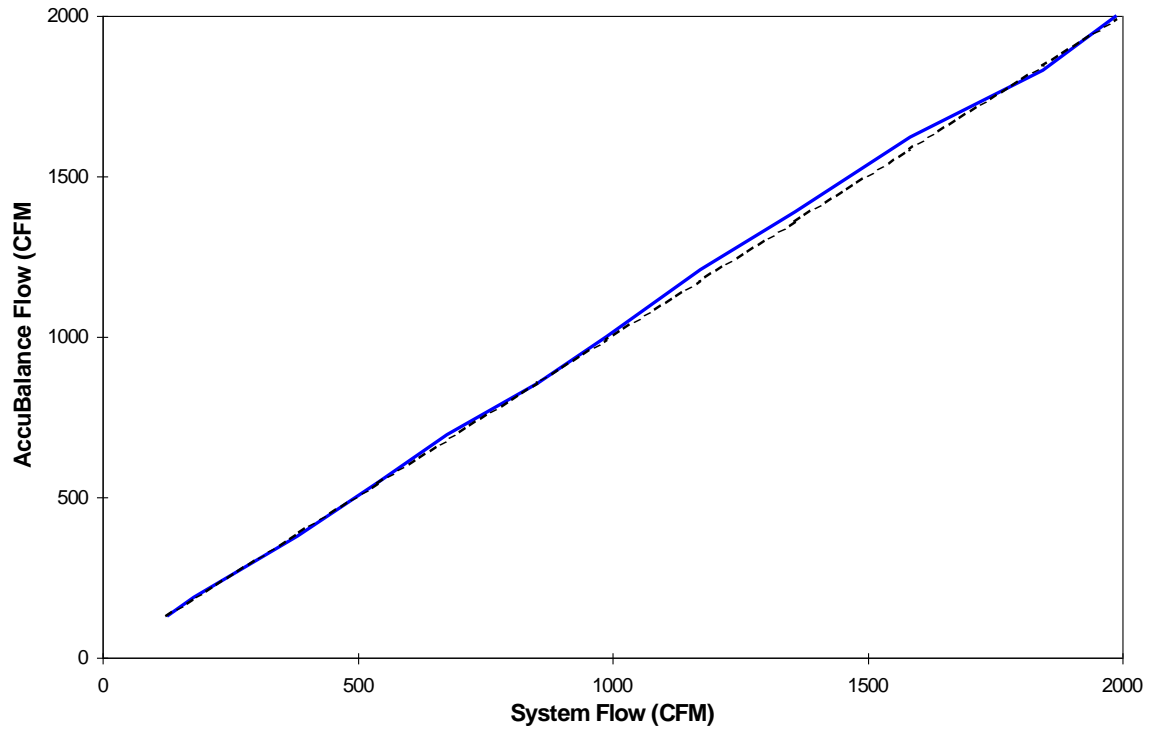
Table 2: Raw Data from Test of ACCUBALANCE® Capture Hood Serial Number 97040057

System Flow (CFM)	ACCUBALANCE Flow (CFM)	Difference in CFM	Difference in Percent
128	128	0	0.00
180	189	9	5.00
384	380	-4	-1.04
540	545	5	0.93
676	695	19	2.81
853	855	2	0.23
988	1000	12	1.21
1173	1210	37	3.15
1359	1390	31	2.28
1584	1620	36	2.27
1845	1830	-15	-0.81
1988	2000	12	0.60
Average Difference in Percent			1.39

Graph of Test Data for AccuBalance Serial Number 97030130



Graph of Test Data for AccuBalance Serial Number 97040057



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