

Simple Airflow Test

by Don Fugler



Do the phrases “This room is always too cold” or “My bathroom fan doesn’t do anything” ring a bell? Whenever a homeowner complains about the performance of some heating or ventilating equipment, it’s handy to have a flow-measuring device available to check out the complaint.

The Research Division of Canada Mortgage and Housing Corporation (CMHC) has been testing ventilation system performance for years, sometimes with specially built equipment. While this equipment can accurately measure flows, it’s too bulky, expensive, and fragile to be of real use in day-to-day inspections. So an inexpensive alternative was developed — the calibrated garbage bag.

To make the bag tester, open a wire coat hanger up until you have a rough rectangle. Now tape the open end of a garbage bag around the wire (make sure the bag has no holes in it). The result should look like a big green butterfly net (see photo, below).

To use the bag tester, crush the bag gently to deflate it, hold it over a supply

duct, and time how long it takes to inflate. Don’t worry about full inflation, just get the bag up and wrinkly. Since the bag has a fixed volume, the bigger the airflow, the faster it fills up. To estimate airflow, use the graph below, which calibrates a standard bag (Glad 66x91 cm) to CMHC’s expensive machine. For times when the graph isn’t handy, remember these simple numbers:

Time to Inflate	Airflow
3 seconds	50 cfm
5 seconds	30 cfm
12 seconds	10 cfm

You can also use the test for exhaust fans: Swing the tester up to a bathroom exhaust grille (this will fill the bag with air), then time how long it takes to almost completely deflate the bag.

The accuracy of the bag tester is nothing to write home about, but the test will certainly distinguish between a good duct and one that’s not working. In one case I know of, for exam-

ple, a householder grumbled about a cold second floor, despite several visits by his heating contractor. A 15-minute check with the bag tester showed that only two of his 18 supply ducts had flows over 10 cfm, compared with a healthy supply-duct flow of 40 to 80 cfm. Somehow, the furnace installer or service person hadn’t noticed this critical lack of flow, even after four years of complaints. In another case, a woman phoned about a cold bedroom on the last day of her new home warranty period. She wanted duct improvements to fix the problem. She was told over the phone how to test her duct, and discovered she had lots of airflow. Her cold room was due to other factors.

So give the bag tester a try. It works well, it works fast, and the results are immediately obvious, both to you and to your client. And if you don’t like the system after trying it out, just put the coat hanger in the bag, top it off with household waste, and toss the whole works. What do you have to lose? ■

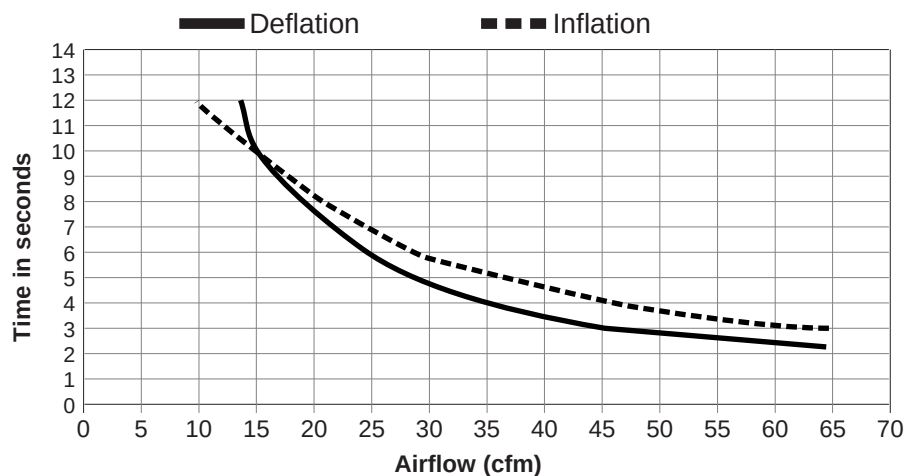
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A simple airflow tester: By counting the number of seconds it takes to inflate (or deflate) an ordinary plastic garbage bag, you can get a rough measurement of airflow in heating, cooling, and exhaust systems.

Duct Flow Estimating

CMHC Plastic Bag* Method



*Based on 66x91 cm Glad Refuse Bag

Calibrated airflow graph: On the left side of the graph, find the number of seconds it took to inflate or deflate the bag. Follow the grid horizontally until it intersects with the plotted line, then read down to the cfm scale at the bottom. Normal flow is between 40 and 80 cfm.