

## Using Two Blower Door Fans to Conduct a Depressurization Test on a Single Building

The following procedure can be used to conduct a depressurization test on a building that requires two Blower Door fans in order to achieve a test building pressure of 50 Pascals.

### Set-Up

1. Install two Model 3 Blower Door fans in separate exterior doorways of the building using two sets of aluminum frames and nylon panels. Set up both fans for depressurization testing (i.e. the inlet side of the fans with the Flow Rings should be located inside the building). Mentally designate one fan as “**primary**” and the remaining fan as “**secondary**”.

**Note:** If you are using a 2 fan nylon panel, then both fans can be set up in the same doorway.

2. Be sure all interior doors are open so that both fans are connected to the entire conditioned space of the building. Set-up the building the same way you would for a standard single fan test.
3. Set up two gauges inside the building - one at each of the Blower Door fans. The gauge located with the **primary** fan will be used to measure both the change in building pressure (Pa), and airflow through the **primary** fan. Connect tubing to this gauge in the following manner:

**Primary Gauge** - Connect **green** tubing to the **Channel A Reference** tap, and run the other end of the **green** tubing outside through one of the patches in the bottom corner of the nylon panel. Be sure the outside end of the **green** tubing is well away from the exhaust flow of the Blower Door fan. Connect the **red** tubing to the **Channel B Input** tap and run the other end of the **red** tubing to the single pressure tap on the **primary** fan (near the handle). Leave the other pressure taps on the gauge open.

The gauge located with the **secondary** fan will only be used to measure airflow through the **secondary** fan. Connect tubing to this gauge in the following manner.

**Secondary Gauge** – Connect **red** tubing to the **Channel B Input** tap and run the other end of the **red** tubing to the single pressure tap on the **secondary** fan. Leave the other pressure taps on the gauge open.

### Conducting a One-Point CFM50 Test

1. Prepare the building for the Test.
2. Turn on both gauges and set them to read **Pressure** on **Channel A**, and **Flow** on **Channel B** (be sure **Channel B** is not set to **Flow@50**). On **Channel B** select the Model 3 fan with a Flow Ring configuration of **Open**.
3. With both fan inlets completely covered by the Flow Rings and No-Flow plate, take and enter a building baseline pressure measurement on **Channel A** using the Baseline feature on the **primary** gauge.

4. Remove all the Flow Rings from the **secondary** fan. Slowly turn on the **secondary** fan and increase its speed until the fan is running full speed.
5. Check the building pressure reading being displayed on **Channel A** of the **primary** gauge. The building depressurization should be less than 50 Pa.

**Note:** If the building depressurization is greater than 50 Pa, you need only a single Blower Door fan to conduct this test. Follow the standard single fan test procedure.

6. With the **secondary** fan continuing to run full speed, we will now begin to run the **primary** fan and adjust the fan speed so that the building pressure shown on **Channel A** of the **primary** gauge reads approximately -50 Pa.

**Importantly:** Before removing any of the Flow Rings and/or No-Flow plate on the **primary** fan, turn on the fan speed controller about a third of the way up. We want the fan blades on the **primary** fan turning fairly fast before removing Flow Rings and/or the No-Flow plate to prevent the fan blades from being turned backwards due to the building depressurization caused by operation of the **secondary** fan.

You will need to choose the appropriate Flow Ring configuration (i.e. **Open, Ring A, B, or C**) for the **primary** fan depending on the amount of additional airflow needed to get the building pressure to -50 Pa. Be sure the configuration setting on **Channel B** for the **primary** gauge is consistent with the Flow Ring you have installed on the **primary** fan.

7. Once the **primary** fan has been adjusted to depressurize the building by 50 Pa, set all of the gauges to Long Term averaging and wait until the pressure and flow numbers remain fairly steady. When the numbers are fairly steady, press the HOLD button on all gauges. Record the flow rates (in CFM) from the two fans and add them together. For example, if the **primary** fan flow reading was 2650 CFM and the **secondary** fan flow reading was 5,400 CFM, the total fan flow would be 8,050 CFM. Therefore, the baseline adjusted one-point test result for this building would be 8,050 CFM50.

### **Conducting a Multi-Point Test (8 Point Test from 50 Pa to 15 Pa)**

The test procedure for a multi-point test is essentially the same as the one-point test listed above, except that the fans will need to be adjusted to achieve multiple target building pressures (e.g. -50 Pa, -45 Pa, -40 Pa, -35 Pa, -30 Pa, -25 Pa, -20 Pa and -15 Pa). At each of the 8 target building pressures, the fan flow rates (in CFM) for the 2 fans will need to be added together.

#### **Tips on adjusting the 2 fans during a multi-point test:**

1. Start the test with the largest target pressure (-50 Pa) and work down to smallest target pressure (-15 Pa).
2. Adjustments to fan flow are typically made with the **primary** fan – this allows you to monitor the building pressure on the **primary** gauge as you adjust the **primary** fan speed.

3. Once the airflow reading on the **primary** fan drops below the minimum acceptable flow reading (300 CFM for **Ring B**, and 85 CFM for **Ring C**), you will need to shut off the **secondary** fan and continue the test procedure using only the **primary** fan. Remember to completely cover the inlet of the **secondary** fan if you shut it off.

After the secondary fan is shut off, install the appropriate Flow Ring on the **primary** fan, change the configuration setting on the **primary** gauge to match the Flow Ring installed, and complete the multi-point test

#### **Using TECTITE or TECTITE Express with a Two Fan test:**

1. To enter Two Fan test data into TECTITE or TECTITE Express, always set the Test Method field to **Manual** on the Test Settings screen.
2. On the Data Table screen, be sure the Flow Data Source field is set to **Flow**.
3. The fan flow rate entered for each target building pressure should be the sum of the flow rates from both fans. For example, if the **primary** fan flow reading was 1,150 CFM and the **secondary** fan flow reading was 5,500 CFM, the total fan flow rate entered into the program would be 6,650 CFM.