CTC BIBO Filter Systems
Engineering Specifications

Your Air Filtration and Dust Collection Specialists.

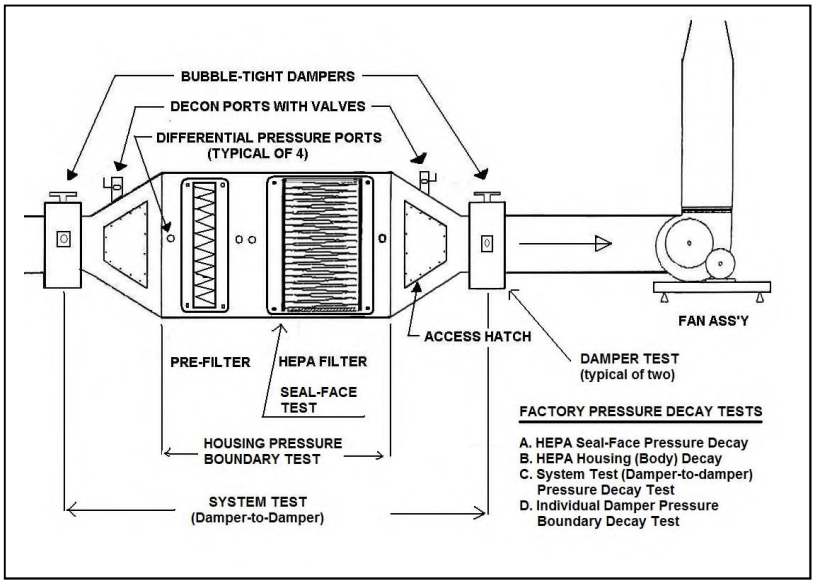
In-Situ Filter System Pressure-Decay Testing, rev 10-17

IAS Bulletin #172-10-17

While Factory Pressure-Decay Testing typically includes testing of various individual system components such as the housing (and/or housing seal-face) and bubble-tight dampers, as indicated in the schematic below, in-situ (or on-site) testing is limited by the fact that components are now assembled and sealed and cannot be separated for individual testing.

In-situ (or field) Pressure Decay Testing typically includes the following:

1. Closure of the inlet and outlet bubble-tight dampers.
2. Connection via test port (or DP port) of a small air compressor or vacuum to permit positive or negative pressure of the entire vessel, typically to +4"wg or -4"wg.
3. Shut-off of positive (or negative) feed via ball-valve.
4. Connection of a digital manometer to measure pressure differential between vessel and atmosphere.
5. Run test to duration specified (typically a 5-minute in-situ test duration) and measure DP data each minute to determine "Test Pass or Fail" given allowable pressure-decay of the vessel.
6. Recommended Pressure Decay allowance is 25% leakage for a test PASS. For example: 4.0"wc Initial Pressure (positive or negative) would be a Test Pass with up to 1.00"wc decay over a 5-minute test duration. (4.0-1.0/4.0 = 25% Decay)



PROJECT: **_ Hospital**

Spec Section: 23.----- Containment Filter System In-situ Pressure Decay Testing (Site Testing):

Suggested Testing Specifications: Containment Filter System to be tested at site for Damper-to-Damper leakage in accordance with ASME N-510, Pressure-Decay Method. System is pressurized using compressed air (or vacuum) to minimum **+/-5"wg** (+1250Pa or -1250Pa). Pressure is recorded using a digital manometer. Filter System to maintain 75% of Initial Recorded Pressure (or 25% Allowable Decay versus initial Pressure) for 5-minute test duration for test PASS.

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In-Situ Pressure Decay Testing, Notes & Qualifications:

POSITIVE PRESSURE DECAY TEST SET-UP:

1. Shut inlet and outlet bubble-tight dampers.
2. Disconnect gage piping from all ¼" DP ports on the housing. Plug all but one port with brass plugs.
3. Check all ports and access doors for security.
4. Connect compressor and manometer to the DP port coupling.
5. Pressurize cavity to 4"wc using portable compressor.
6. Allow system to stabilize for a couple of minutes.
7. **(For vacuum test substitute vacuum for compressor in Steps #4 & #5.)**
8. Once system stabilizes commence 5-minute decay test.
9. Record findings on IAS report form and submit to customer.

MANOMETER & TEST FITTING:

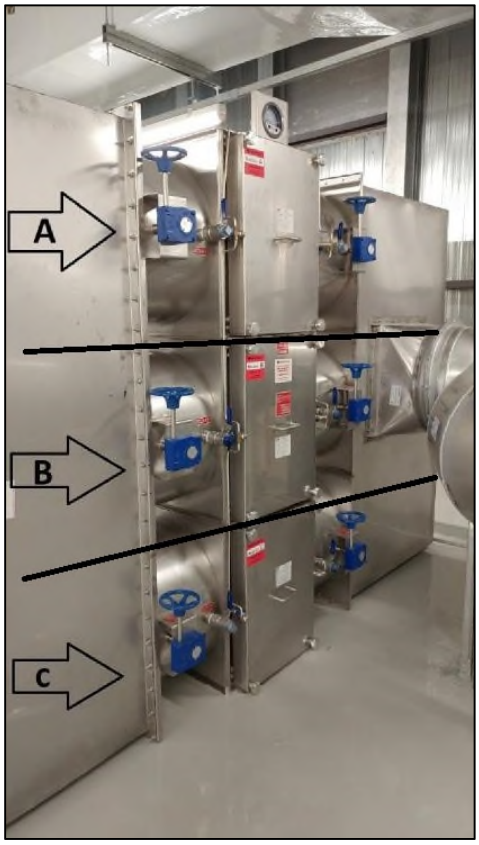
Use a digital manometer that allows for a -25"wc to +25"wc range, so the same manometer can be used for vacuum and positive-pressure testing requirements.
Connect the manometer using a barbed-fitting such that it measures the differential pressure between the housing cavity and atmosphere. Manometer should be able to switch between English & Metric measurements as required by the testing specifications. Always use new Teflon tape when connecting the test fitting to the ¼" DP port.

1. **SCHEDULING**: Whenever possible Pressure Decay Testing should be done as soon as filter systems are in final position, but prior to making any mating duct connections. This facilitates exterior access to the dampers in the case where soap-bubble testing is required on the damper seals.

2. **SOAP-BUBBLE TESTING**: It is extremely difficult to conduct in the field (In-Situ) pressure-decay testing and testing should only be conducted when the housing or components have clear and visible signs of damage that might have resulted in seam-weld breach. When required or requested, soap-bubble testing should be conducted under positive-pressure conditions, using a portable air compressor. Also, good lighting conditions are required if pinhole bubble-leaks are to be detected.

3. **OUTDOOR LOCATION TESTING**: Due to the use of electric equipment and meters, plus the sensitivity of this equipment to changing temperatures and atmospheric pressures, **testing should never be attempted on BIBO filter equipment that is located outdoors.** Equipment must be brought indoors where temperature and humidity are relatively stable in order to attempt any type of testing.

IN-SITU PRESSURE DECAY TESTING ON N+1 REDUNDANT SYSTEMS:



CTC Model B1-212-3x2 (3-module)

In-situ (in-the-field) Pressure Decay Testing on N+1 Redundant Filter Systems presents two particular obstacles versus testing on a single-module filter system:

First, an **N+1 Redundant** filter system is basically modular (building-block) construction, so testing for leaks between the modules is basically impossible, and repairs cannot be completed even if a pin-hole leak is detected during the soap bubble test. (It's important to note that the individual filter modules have been pressure-decay tested at the factory, with one leak test provided for each module.)

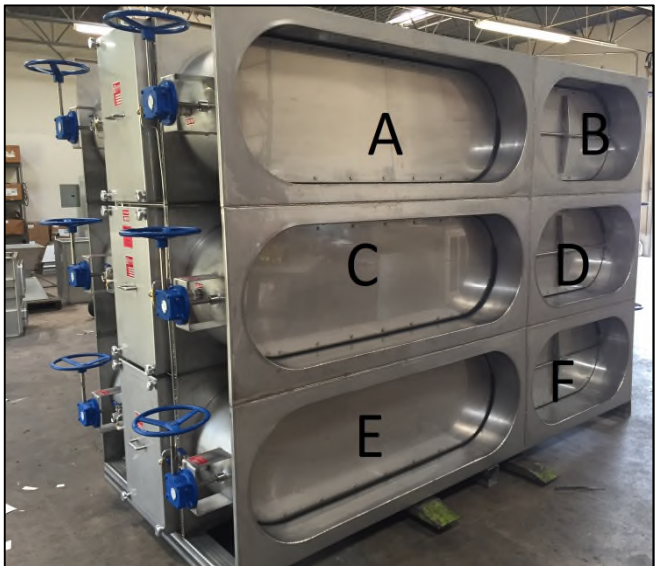
Second, an **N+1 Redundant** filter system is always ducted to-and-from the modules with large air plenums. Any testing must be conducted prior to the connection of the air plenums so that damper seals can be bubble tested. (Testing after duct connections are completed is pretty-well pointless since damper seals are inaccessible and repairs/replacement could not be completed.)

RECOMMENDATION:

IAS recommends against conducting In-Situ Pressure Decay Testing on any N+1 Redundant Filter System or any BIBO equipment located outdoors, due to the considerable obstacles in conducting a proper test (see points above).

Thus, in-situ pressure decay testing should be waived on N+1 Redundant filter systems and any BIBO filter equipment located outdoors.

CTC Model B1-212-3x5 (5-module)



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