

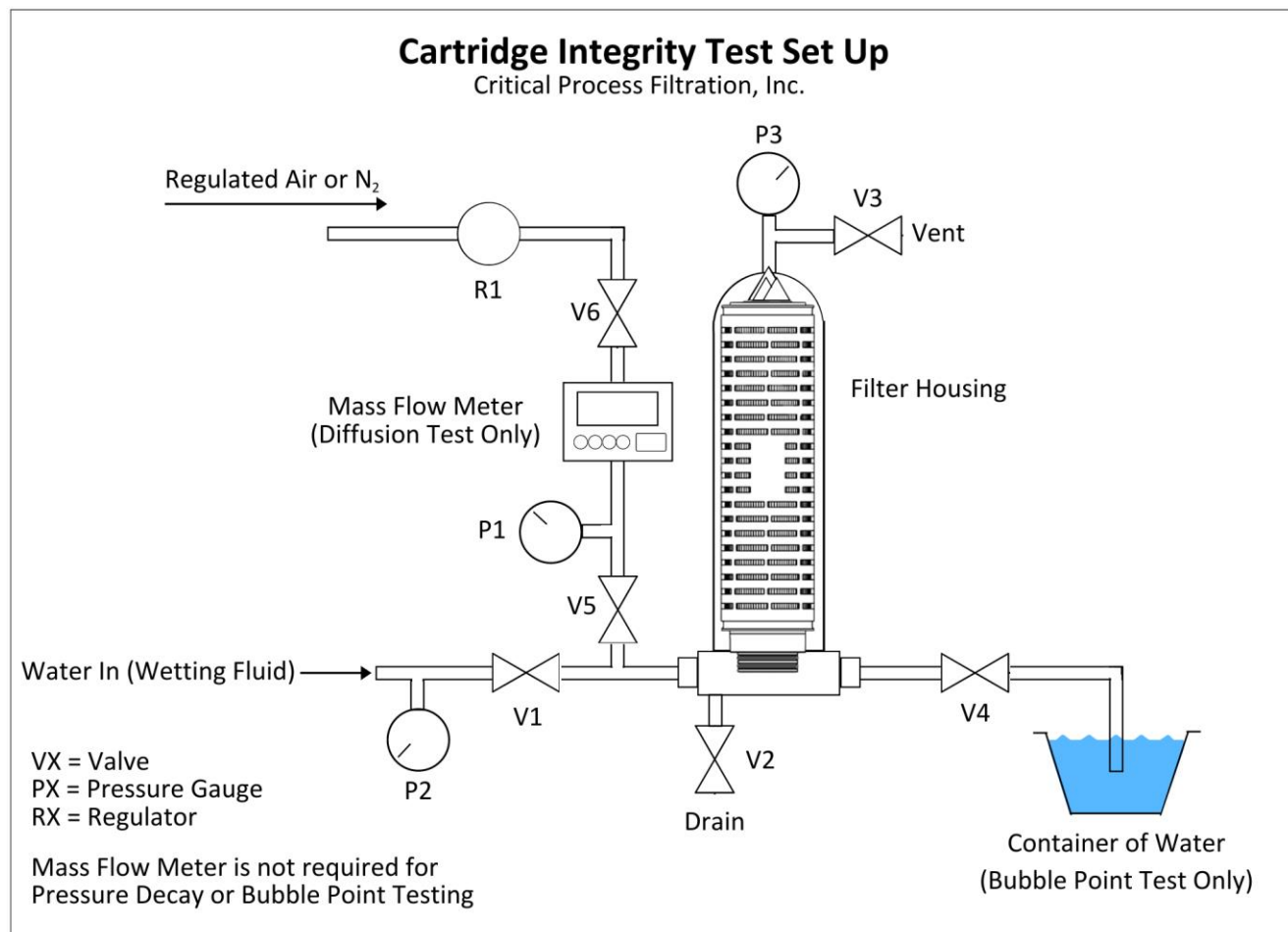
## Pressure Decay Test

All test procedures outlined below should be followed when performing pressure decay testing of cartridge filters.

The schematic below represents a cartridge integrity test set up with all of the piping, valves, gauges and regulators needed to properly integrity test filters in place.

NOTE: Schematic shows a filter housing with a single 10" cartridge installed. Different length cartridges can be accommodated by switching out the housing bowl. Different end fittings can be accommodated with adapters.

[Contact CPF Customer Service](#) for additional details on multi-filter housing installation.



*Cartridge Integrity Test Set Up*

# Integrity Test Parameters

Pore Size (µm)	Bubble Point (psi)	Pressure Decay <sup>1</sup> / Diffusion <sup>2</sup> Test Pressure (psi)
0.03	*	60
0.10	*	48
0.22	≥ 50	35
0.45	≥ 25	20
0.65	≥ 19	15
0.80	≥ 15	12

\* Bubble Point exceeds maximum operating parameters

<sup>1</sup>Pressure Decay Test Formula

$$DP = D * T * Pa / V$$

DP = Maximum allowable Pressure Drop (starting pressure – final pressure at end of test interval)

D = Diffusion Rate limit (from cartridge data sheet)

T = Time (minutes) typically, 10 minutes

Pa = Atmospheric Pressure (14.7 psi)

V = Upstream Volume of test apparatus (cc)  
Can be calculated by filling the upstream side with water, then draining through V2 and measuring water volume

<sup>2</sup>Diffusion specification values are shown on the Data Sheet for the cartridge being tested

## Important Notes

- ALL connections must be air tight. Any leaks in the plumbing can cause inaccurate readings. It is recommended to leak check the system on a regular basis.
- Marginal integrity failures can often be the result of inadequate cartridge wetting. As indicated in the instructions below, re-wet the module and retest.
- Gross failures could be the result of improperly installed cartridge in the housing, or a plumbing leak. Make sure the cartridge is properly installed with any O-Rings undamaged and properly seated. Check the system for air leaks.

## Cartridge Installation & Wetting

1. Make sure all parts required to install the cartridge in the housing are available
2. Install the cartridge in the housing, ensuring all fittings and connections are tight
3. If a pre-wetted cartridge is being tested, skip to the appropriate integrity test section
4. To wet out a cartridge:
  - a. Make sure all valves are closed
  - b. Connect feed water to the "Water In" line
  - c. Open valves V3 (Vent) and V4 (outlet)
  - d. Slowly open V1 to allow wetting fluid to enter the housing
  - e. Once fluid is observed coming out of the vent with no bubbles, close V3
  - f. Adjust V1 as necessary to feed ~2 liters per minute per 10" length
  - g. Allow fluid to flow for ten (10) minutes
  - h. Slowly close V4 until inlet pressure (P2) reads 15 – 20 psi
  - i. Allow fluid to flow for an additional five (5) minutes
  - j. Close V1
  - k. Open V2 and V3 to allow housing to drain

## Bubble Point Test Procedure

1. Install cartridge into housing
2. Follow wetting instructions if necessary
3. Start with all valves closed
4. Connect regulated air or nitrogen line to V6
5. Connect flexible tubing to V4 and run the other end to a container of water
6. Open valves V2 (Drain), V3 (Vent) and V4 (outlet)
7. Set pressure regulator to 2 psi
8. Open V5, then V6
9. Allow system to purge any upstream fluid
10. When flow from Vent and Drain is mostly air, close V2 and V3
11. Increase pressure in 2 psi increments, holding for at least 5 seconds each time (pressure reading on P3)
12. Bubble Point pressure is determined by:
  - a. A significant increase in mass flow reading (if present)
  - b. A steady stream of bubble from V4 tubing into the water container
13. Relieve pressure at the regulator
14. Close valves V6 and V5
15. Open valve V3 to completely relieve upstream pressure
16. Remove cartridge from housing

NOTE: If the cartridge appears to fail the initial bubble point test, repeat the Cartridge Wetting procedure and increase the rinse time to twice the initial amount to assure that the media has been properly wetted. Then, retest. If necessary, check the cartridge seal in the housing.

## Pressure Decay Test Procedure

1. Install cartridge into housing
2. Follow wetting instructions if necessary
3. Start with all valves closed
4. Connect regulated air or nitrogen line to V6
5. Open valves V2 (Drain), V3 (Vent), and V4 (outlet)
6. Set pressure regulator to 2 psi
7. Open V6, then V5
8. Allow system to purge any upstream fluid
9. When flow from Vent and Drain is mostly air, close V2 and V3
10. Slowly increase the air pressure (pressure reading on P3) to value specified in table
11. Close valve V5
  - a. Allow system to stabilize for 2 minutes
  - b. Re-pressurize if necessary by opening V5
12. Read pressure on P3 at end of test time (typically 10 minutes)
13. Cartridge passes integrity test when the pressure drop is less than the calculated amount
14. Relieve pressure at the regulator
15. Close valves V6 and V5
16. Open valve V3 to completely relieve upstream pressure
17. Remove cartridge from housing

If the cartridge appears to fail the initial test, repeat the Cartridge Wetting procedure and increase the rinse time to twice the initial amount to assure that the media has been properly wetted. Then, retest. If necessary, check the cartridge seal in the housing.

## Diffusion Flow Test Procedure

1. Install cartridge into housing
2. Follow wetting instructions if necessary
3. Start with all valves closed
4. Connect regulated air or nitrogen line to V6
5. Open valves V2 (Drain), V3 (Vent), and V4 (outlet)
6. Set pressure regulator to 2 psi
7. Open V6, then V5
8. Allow system to purge any upstream fluid
9. When flow from Vent and Drain is mostly air, close V2 and V3
10. Slowly increase the air pressure (pressure reading on P3) to value specified in table
11. Allow the system to equilibrate
12. Adjust pressure regulator as necessary to maintain test pressure at P3
13. Allow the mass flow meter reading to stabilize
14. Cartridge passes integrity test when the diffusive flow meets the specification listed on the data sheet
15. Relieve pressure at the regulator
16. Close valves V6 and V5
17. Open valve V3 to completely relieve upstream pressure
18. Remove cartridge from housing

If the cartridge appears to fail the initial diffusion test, repeat the Cartridge Wetting procedure and increase the rinse time to twice the initial amount to assure that the media has been properly wetted. Then, retest. If necessary, check the cartridge seal in the housing.

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