CRITICAL PROCESS FILTRATION, INC.

Product Instructions

Pressure Decay Test

Hydrophilic Capsule

Preface

All integrity test procedures outlined below should be followed when performing integrity testing of membrane filters only. Use of these procedures on other types of filters such as polypropylene or glass fiber capsules will not give consistent or accurate results. Before starting the procedure ensure your system is set up properly. If you need guidance we have instructions here.

Introduction

If a mass flow meter or automated diffusion test is not available, a pressure decay test can be used to test filter integrity. This test operates on the same principal of air diffusing through a wetted membrane at pressure below the bubble point. If upstream air feed is shut off after pressurization, the pressure will slowly decay as air diffuses through the membrane. The magnitude of pressure decay can be used to determine integrity using the equation presented below.

This test is used to identify any potential leaks based on measuring a pressure change in your membrane filter over a predetermined timeframe. Follow these instructions to properly perform a diffusive test on your membrane filter.

The Pressure Hold Test, also known as Pressure Decay, is dependent on the specified diffusional flow and volume upstream of the filter and downstream of the system valve.

The pressure decay limit can be calculated using the following equation:

Equation 1 - Pressure Hold Test Formula:

$$D(T)(Pa) = (DP)(Vh)$$

Rearranging this equation gives:

$$DP = (D) \times (T) \times (Pa) / (Vh)$$

Where: D = Diffusion rate cc/min
T = Time (minutes)
Pa = Atmospheric Pressure (14.7 psi)
DP = Pressure Drop (psi)
Vh = Upstream volume of apparatus (cc)

If Vh is unknown, it can be determined by filling the upstream with water, draining it back to a receptacle and measuring the volume in ccs.

Pressure Decay Test Procedure

1. Install and rinse capsule as per Capsule Wetting instructions.
2. Typical setup for pressure decay testing is shown in Figure 1.
3. Start with all valves closed.
4. Open V0 and set pressure regulator to the required test pressure (same pressure indicated for diffusion testing on the product data sheet).
5. Open V1 and Drain D to purge any upstream fluid from the system.
6. When all upstream fluid has been purged, close Drain D and open V2. Downstream must be open to ambient pressure during the test.
7. If necessary, adjust the pressure regulator to the test pressure specified on the capsule data sheet.
8. Allow the system to equilibrate.
9. Close V1. Note pressure at P1 and start a timer.

10. At the end of the specified time interval (usually 10 minutes) note the pressure at P1. Calculate the pressure drop by subtracting the end pressure from the starting pressure.

The cartridge is considered integral if the measured pressure drop is less than or equal to the calculated DP from Equation 1 above.

Procedure Note

If the capsule appears to fail the initial test, repeat the Capsule 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 capsule connections to make sure there are no leaks.

Filter Integrity should be tested in accordance with current good manufacturing practices for all critical applications before and after use. It is up to each customer to determine the best method and protocol required. The information provided is a recommendation and guide for integrity testing procedures, and the importance of proper cartridge wet out.

Any Questions?

For help determining the test values or additional information, contact customerservice@criticalprocess.com or call us at (603) 880-4420.

Critical Process Filtration, Inc. is an ISO-9001 certified manufacturer of process filters. We have been helping customers for over 25 years to build and improve process filtration systems. Our comprehensive testing, analysis, and validation services support your team whenever needed. Partnering with you and your process team is how we deliver your company's solution right the first time.

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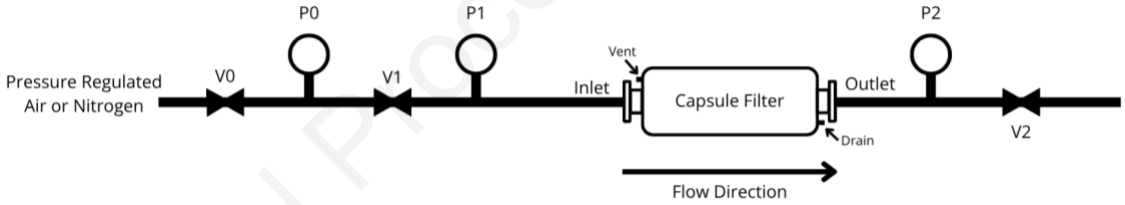

Figure 1: Capsule Pressure Decay Testing

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