

INTELLIGENT INTEGRITY TESTING

- ◇ Non-destructive integrity tests such as Bubble Point Test and Diffusion Flow Test for various media membrane filters require Pre-wetting of Filter Cartridge for the diffused flow of air through the Filter.
- ◇ Wettability of a membrane is related to the chemical properties of the membrane surface. Most polymers used to manufacture micro porous membranes are hydrophobic in nature i.e. non-wettable with water, these require a low surface tension fluid for wetting purpose.
- ◇ Reduction of Surface Tension of the wetting fluid either through addition of solutes, such as surfactants or low surface tension miscible solvents such as alcohol to water, will have a quick impact on wetting of dry membranes.
- ◇ The wetting difficulties get more and more in the focus for the operation of the filter integrity tests in general. By using the wetting device "it-flush", the filter wetting procedure is part of the automatic filter test process which is driven by the filter integrity tester "it-01"
- ◇ Hydrophobic filters are wetted with IPA-water solution prepared using 60% isopropyl alcohol (IPA) and 40% RO / DI water while hydrophilic filters are wetted with RO / DI water alone].

Automated Filter wetting procedure for Filter Integrity Test conducted using it-Flush in coordination with Filter Integrity Tester it-01 –



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- The bond formed by the intermolecular attractions characterises the wetting of the filters solid surface by the wetting liquid / fluid.
- All types of membrane from small disc to cartridge need to be wetted prior to non destructive Integrity testing.
- There is always a Diffusion of air which proceeds due to proper wetting of Filter's solid surface, before the bubble point test is initialised.
 - Driven by the integrity tester, the filter housing gets slowly filled. During the filling period, the filter housing has to be vented, as usual, with the small vent valve on the top.
 - After the filter housing has been filled, the wetting fluid gets under pressure.
 - This wetting pressure can be adjusted with the regulator on the inlet side of the filter housing.
 - Driven by the pressure, the wetting liquid flows through the membrane to the downstream side into a collecting vessel.
 - The flow is limited by a water nozzle which is mounted in parallel to the drain valve which is closed during this process.
 - These parts are located in the foot of the wetting device. The drain valve opens at the end of the wetting time period and 5 sec. later the integrity test starts by pressurizing the filter housing with air, the residual water is driven out.
 - When the test pressure has been reached, the stabilization phase starts and the usual integrity test goes on.
 - Caused by the way of wetting and testing in one procedure, errors caused by filter wetting are avoided as far as possible. The wetting procedure can be optimized and has got an important part of the Filter Integrity Test in general.

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✓ **Assuring the Proper wetting of Filter Cartridge**

- To check and assure the proper wetting of Filter, flow a small pressure of about 0.5-1 bar from the Test filter housing.
- Connect a transparent tube immersed in bucket filled with water to the outlet side of Filter housing.
- This air flow is to be conducted from inward towards the outward direction of Test Filter.
- Observe for the release of bubbles from the tube immersed in water bucket, if there is a high flow of bubble observed the filter is not wet properly.
- Re-wet the filter and assure the wetting again till moderate release of bubbles observed at the outlet tube.

