



Drying of capsules and filter cartridges after the Water Intrusion Test (WIT)



Description of the drying of capsules and filter cartridges after the Water Intrusion Test (WIT)

1. Installation of the test with simple filter drying



1.2. Description

The capsule is mounted backwards on the drying unit after the WIT test. The drying process starts at 3 bar input pressure via the 4mm pressure gas tube with 2m length. Any remaining water in the membrane expels immediately towards the inlet side of the filter (Support of the hydrophobic property of the membrane!).

The hot air flows through the membrane to the inlet side of the filter. Any remaining water droplets are blown off. After 10 min of the drying phase the membrane is dry.

2. Installation of the filter cartridge drying



2.1. Description

The filter cartridge is mounted backwards on the drying unit after the WIT test. The drying process starts at 3 bar input pressure via the 4mm pressure gas tube with 2m length. Any remaining water in the membrane expels immediately towards the inlet side of the filter (Support of the hydrophobic property of the membrane!).

The hot air flows through the membrane to the inlet side of the filter. Any remaining water droplets are blown off. After 40 min of the drying phase the membrane is dry.

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2.2. Gravimetric evaluation of the drying process after the WIT

Capsule (NOVASIP)

Inlet pressure (bar)	Temp. of capsules at the inlet side (°C)	Temp. of capsules at the outlet side (°C)	Total drying time (min)	Weight before testing (g)	Weight after drying (g)
3 (2 m tube 6/4)	82	at the end of the drying phase 70	10	294	296

Filter cartridge (Sartofluor GA)

Inlet pressure (bar)	Temp. of capsules at the inlet side (°C)	Temp. of capsules at the outlet side (°C)	Total drying time (min)	Weight before testing (g)	Weight after drying (g)
3 (2 m tube 6/4)	82	not correctly measurable	30 40	337 337	342 337

2.3. Evaluation of the procedure

Due to the possibility of backward drying and direct flow through the filter membrane, the drying time is considerably reduced. The separate drying allows quick filter tests one after the other. While one capsule is drying, the second one can already be tested.

Note:

As an addition to the drying procedure, a steril filter can be installed before the filter dryer.

Conclusion:

This type of drying is recommended as a fast unproblematic drying after the Water Intrusion test.

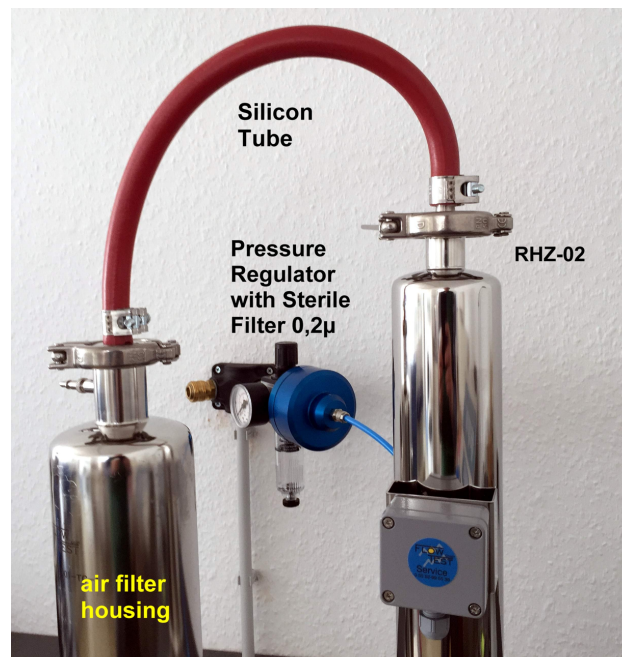
3. Installation of the test for the in-line filter cartridge drying

3.1. Description

The RHZ-02 filter dryer consists of the RHZ-02 duct heater that is mounted on the pedestal where the pressure connection is connected (Stäubli nipple RBE 03) too.

There is the tri-clamp connection with the heat-resistant silicone tube on the top. To dry the filter element, the silicone tube is connected onto the top of the filter housing. At the inlet side the valve is slightly open against the atmospheric pressure to allow moisture to escape.

The filter outlet must be open to the atmospheric pressure during the entire drying phase. When the filter flow starts, the valve must be closed again in order the filter drying is further accelerated by the flow. The dryer can be operated with the inlet pressure of max. 3.5 bar. The lead time to build up the heating temperature in the duct heater is approx. 30 minutes.



The heater must be operated with the purified compressed air, nitrogen or via a terminal sterile filter. If it is operated with nitrogen, ensure a good room ventilation!

The inlet temperature into the gas filter housing is approx. 82°C. A 10 inch filter element is dry after approx. 120 minutes. Due to the purely physical PTC control, overheating of the filter element is excluded.

3.2. Evaluation of measurements at the in-line drying after the WIT

Initial situation: 10" in-line filter system (PTFE sterile filter cartridge) inlet closed-outlet open (T-shaped)

Inlet pressure (bar): - Steril filter - 2 m tube length	Temp. at the top of the filter housing (°C)	Temp. at the outlet side of the filter housing (°C)	Total drying time (min)	Weight before testing (g)	Weight after drying (g)
3	82	56	60	337	395
3	82	59	90	337	375
3	82	65	120	337	339

3.3. Evaluation of the procedure

Favourable characteristics

The possibility of leaving the gas filter in the housing after the test means that no O-ring can be damaged by removing and installing the filter. The direct flow through the filter membrane accelerates the drying process considerably.

Drying is only carried out from the non-sterile side. The long flow of sterile air through the filter outlet creates a sterile environment at the outlet elbow.

Unfavourable characteristics

Some water can be collected at the TC adaptors or at the shut-off valve after the test, a certain amount of moisture will be noticeable again after opening the filter line.

Note:

In-line WIT tests are only recommended for water non-critical tests, such as in-line filter tests on tanks or fermenters.

When testing filters on nitrogen or compressed air lines, it is recommended to test the filters in an external housing together with the filter changing and then dry them externally.



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