Repair-Kit manual for Phoenix Filtration modules

This Manual is for repairing a membrane module with the Seccua repair-kit.

A. Content of the Repair-Kit:

Figure 1: content of the repair-kit

(1) Two End-cap with translucent bottom, whole to reach in and 3/4" connector to attached a hose for draining the element
(2) One Metal hand drill
(3) One Metal drill-bit, 3,2 mm
(4) One Metric thread-cutter (Size M4)
(5) Fifty insert-screws (M4)
(6) Fifty repair Pins for repair of single fibres
(7) One hand-gun for extrusion of two-component resin
(8) One dual-component Epoxy resin, one cartridge
(9) Five injection needles
(10) Ten plastic scrapers

B. Additional required tools:

(1) Flash light
(2) Allen key M8 – better torque key M8
(3) Pressurized air – oil free
(4) compressed air hose
(5) water hose
(6) pressure reducer

C. Procedure

If you have a damaged module in your unit, the membrane integrity test will detect it and set the unit automatically into stop mode, as soon as a Log-Removal-Value of 4 log (99,99%) can no longer be assured.

For Phoenix 7 and bigger systems: To figure out which module is defect (which side of the unit is damaged) it is necessary to do a Integrity test manually in stop mode

1. Set the unit into Stop-Mode
2. Connect you computer to the unit, using the Seccua PC Software.
3. Power valves V1 and V3 (switch the buttons to dark green) so that you can build up a pressure with the compressor.
4. Power valve V2 (button=light green) and inflate the air pressure to approx 1,55 bar (22.48 psi). You can read the pressure on the filtrate side as "P2".Stop the compressor when a pressure of 1,55 bar (22.48 psi) is reached.
5. Monitor the pressure loss for approximately 12 min. It should not be greater than 120 mbar/Module installed (1,74 psi/12 min).
6. If the pressure drops quicker, the defect module is within that half of the system.
7. If the pressure-drop is below the threshold, close V2 and open V4 (button=light green) and repeat step 5 to 7.
8. With Phoenix 7 and bigger systems it is necessary to do this pressure test on both sides, that you can determine which module is defect. It is also possible that 2 modules are damaged!Once the damaged module is determined, make sure you put the unit back into filtration to release the air from the filtrate side of the modules and perform a manually triggered cleaning cycle.
9. Please make sure that the modules have been used during the course of the last days. If this should not be the case, please operate the system in filtration mode (discharge the filtrate!) and perform at least one cleaning cycle until the modules are completely wettened. Otherwise the air diffusion through the membrane is too high and it is impossible to detect the leaking fiber.
10. Drain the whole water from the unit (modules and pipes).
11. Disassemble the defect membrane module and put it on a stand horizontally for comfortable operation and repair (see Figure 3).
12. Disassemble both module end caps
13. Fix the Seccua Repair-Kit End-caps on the membrane module
14. Assemble a ball-valve (f.e. the cleaning attachment) to the permeate connection. (When you use the cleaning attachment, disinfect it first before you connect it). See figure 3
15. Connect a water hose to the ball valve to fill up the module from the filtrate side with water until both Seccua Repair-Kit End-caps are full with water. (Fill only filtrate into the module's filtrate side)

Figure 2: Filling up the repair-kit openings with water

16. Expose the module with a pressure of 1,55 bar (22.48 psi). You can adjust this with the pressure

reducer in the repair-kit.

17. Expose the module with a pressure of 1,55 bar (22.48 psi). You can adjust this with a pressure reducer.

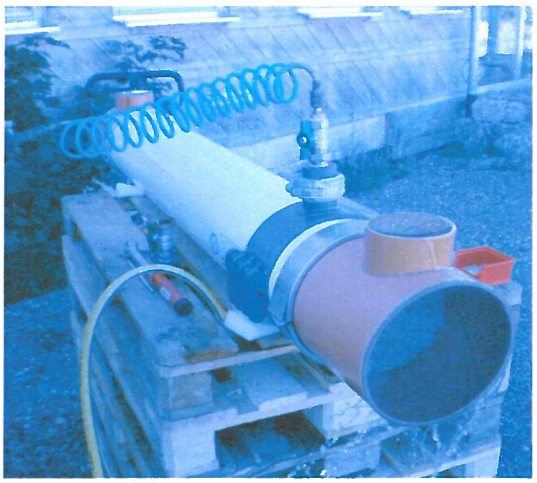

Figure 3: Connection of the pressure line.

18. After reaching the necessary pressure (1,55 bar / 22.48 psi) turn off the pressure.
19. Look through the repair-kit glass to see, which and how many membranes are defect and have to be repaired.

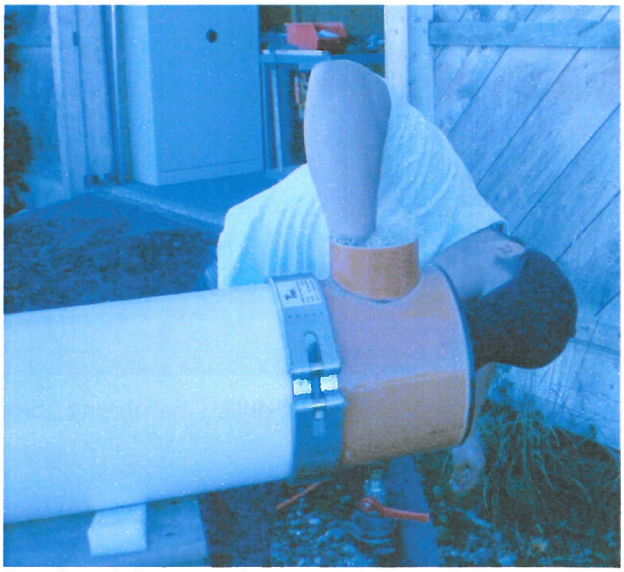

Figure 4: Flagging defect membranes

20. Mark the fibers, releasing a jet-stream of air, using the pins in the repair-kit, so that you can still see the defect membranes after de-watering the repair-kit.

If 15 or more Multibore-fibers should show a defect, the module has to be exchanged. This should first be done after the cause of defect was located and eliminated in order to prevent damaging the new element as well (e.g. damaged pre-filter, debris from installation, etc.) !

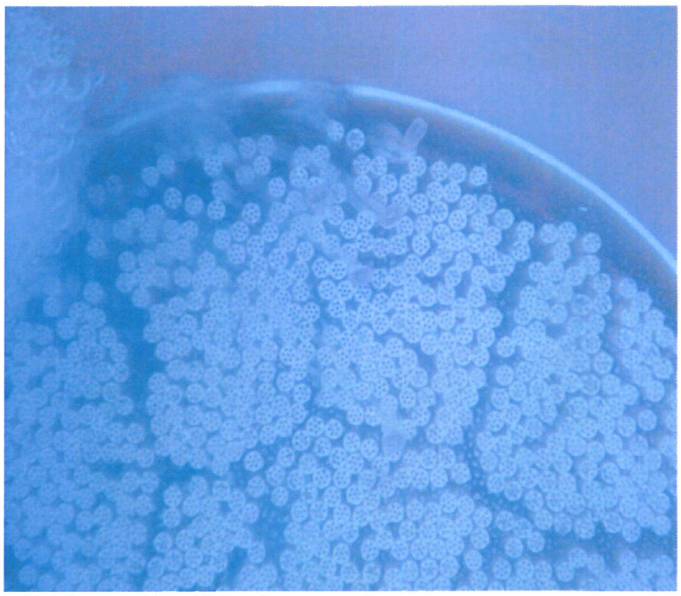

Figure 5: Flagged and blowing membranes

21. Repair every defect membrane fibre step by step.
22. Take the drill out of the repair-kit and drill max. 1.5 cm (0,6 in) into the defect membrane fibre.
23. Take the tapping-drill and drill a thread into the hole.

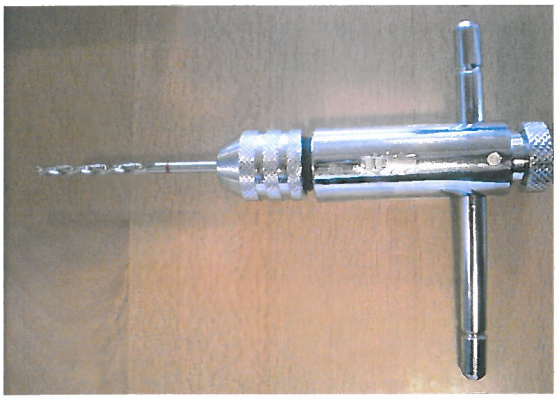

Figure 6a: Drilling tool

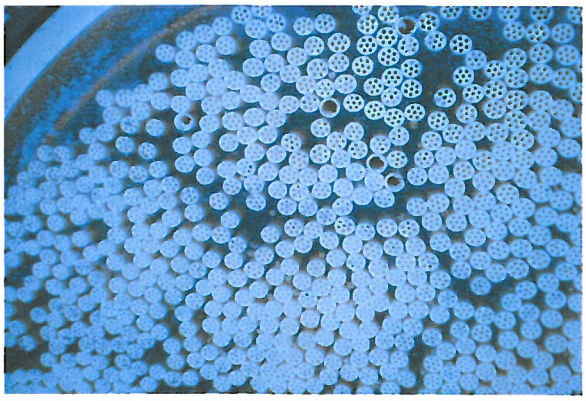

Figure 7: drilled membrane fibres

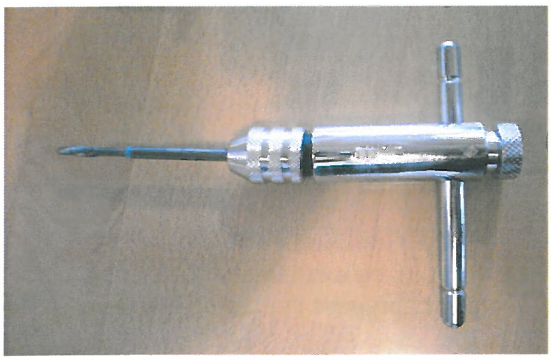

Figure 6b: Tapping drill

24. Do this with every defect membrane fibre and on both sides

25. Open the 2 component adhesives, extrude some to a smooth working surface (e.g. piece of plastic) and mix it properly and fill it into the injection needle. (Adhesives have to be mixed very good, to achieve the desired effect)
26. Fill up the drilled hole in the defect membranes with the mixed 2 component adhesives and insert the insert-screw deeply into the membrane fibre
27. Do this with every defect fibre on both sides
28. After gluing the last fibre, wait approximately 1 hour. This time is necessary for the adhesives to cure.
29. After that you can assemble the end caps onto the modules and mount the membrane module onto the Ultrafiltration unit again. Pull the screws at the end caps with 40 Nm.
30. Fill the unit with water and initiate several cleaning cycles backwashes.
31. Start filtration for approximately 15 min and discharge the produced water.
32. Set the unit into stop-mode and Initiate an automatic Membrane integrity test and verify if the unit achieves >4 log removal again.