

## DOW™ Ultrafiltration DOW Ultrafiltration Fiber Repair Protocol

### Equipment

You will need the following to complete the fiber repair procedure:

- Concentrate tube plug\*
- Air supply apparatus\*
- Oil-free compressed air [recommended pressure: 3.0 bars (44 psi)]
- Loctite 406 glue\*
- Repair pins\*
- Personal protection equipment (gloves, safety glasses, etc.)
- Knife or diagonal cutters

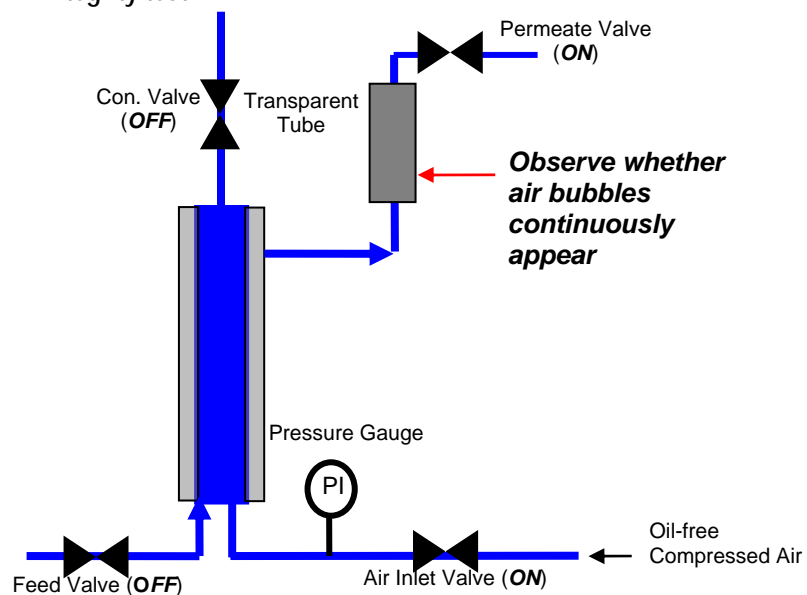
\* Available from Dow in a DOW™ Ultrafiltration Fiber Repair Kit

### Step 1: Integrity Test (See Figure 1)

Use your OEM's preferred procedure to find and localize a leaking module. An example might be a skid pressure hold test and the use of transparent bubble tubes to find leaking modules. The bubble test using transparent tubes has been selected to illustrate how it is done.

1. Take the module out of the filtration mode.
2. Drain the module from the feed side.
3. Close feed and concentrate valve and align permeate side to allow flow to drain through the transparent tube. Also isolate the bank of modules being tested from other operating banks of modules.
4. Pressurize the drained side of the module with oil-free compressed air from the air inlet valve, and slowly raise the air pressure to 1.5 bars (21 psi). Some displaced water will flow out the permeate side.
5. If large continuous air bubbles appear in the transparent tube then the module has broken fibers. Smaller and infrequent bubbles are the result of air diffusion through the pores of the ultrafiltration membrane. If leaks are confirmed, move to STEP 2.

Figure 1. Integrity test



## Step 2: Fiber Repair

### Watch the DVD included in the fiber repair kit for visual demonstration.

During this step, the broken fibers are located and repaired using the concentrate tube plug, repair pins and glue.

1. Drain the module from the feed side.
2. Remove the top end cap. Keep the bottom end cap on.
3. Isolate the module to perform repair by closing valves or sealing remaining openings.
4. Place the positioning block into the concentrate outlet tube. Then put in the fastening nut. Next, put in the cylinder block and screw in the fastening bolt. *[Positioning block, fastening nut, cylinder block and fastening bolt are part of the concentrate tube plug assembly.]*
5. Connect the air supply line.
6. Supply oil-free compressed air to the module and slowly raise pressure to 1.5 bars (or 21 psi).
7. Provide a water stream to cover the permeate end of the fibers to help locate any leaks.
8. As the air pressure rises, continuous air bubbles will appear at the location of a broken fiber. Mark the broken fiber with a pin.
9. Continue applying air and water until all broken fibers are located and marked.
10. Depressurize the module using the air release valve.
11. If the broken fibers are near the concentrate tube plug then remove the concentrate tube plug to provide room for repair.
12. Take a new repair pin and place a drop of glue on the end of the pin. Use it to replace the fiber- marking pin immediately. Push the pin firmly into the leaking fiber. Let the repair cure for 5 minutes before trimming the extruding portion of the pin with a knife or diagonal cutters. Repeat for all broken fibers.
13. Repeat steps 4 - 8 to make sure all broken fibers are repaired.
14. To complete the repair, depressurize the membrane, remove the concentrate tube plug, and reassemble the top end cap, remove seals, and realign valves for operation. You have successfully repaired a DOW™ Ultrafiltration module!

## Note – Concentrate Tube Plug

Improper assembly and operation of the concentrate tube plug may affect performance and could result in nullification of the Limited Warranty. Pay special attention to positioning of the parts so no tilting takes place. Tilting can lead to unnecessary wear and tear. Do not operate at an air pressure greater than 1.5 bars (or 21 psi). Failure to follow the protocol set forth herein for assembly and operation of the Concentrate Tube Plug may cause it to fail and may pose a safety risk to the operator or damage the module if it is ejected.

## Limited Warranty

If operating limits and guidelines given for DOW™ Ultrafiltration Modules are not strictly followed, the Limited Warranty will be null and void. Refer to the DOW™ Ultrafiltration Module Limited Warranty for more detail.

For product sales governed by German law, a "Limited Warranty" will not be granted.

**DOW™ Ultrafiltration**  
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