

## Technical Service Bulletin

March 2002 TSB133.02

### Integrity Testing for HYDRAcap® Module.

This Technical Service Bulletin provides information for testing the integrity of the HYDRAcap® module in a HYDRABLOC™.

#### Integrity Testing

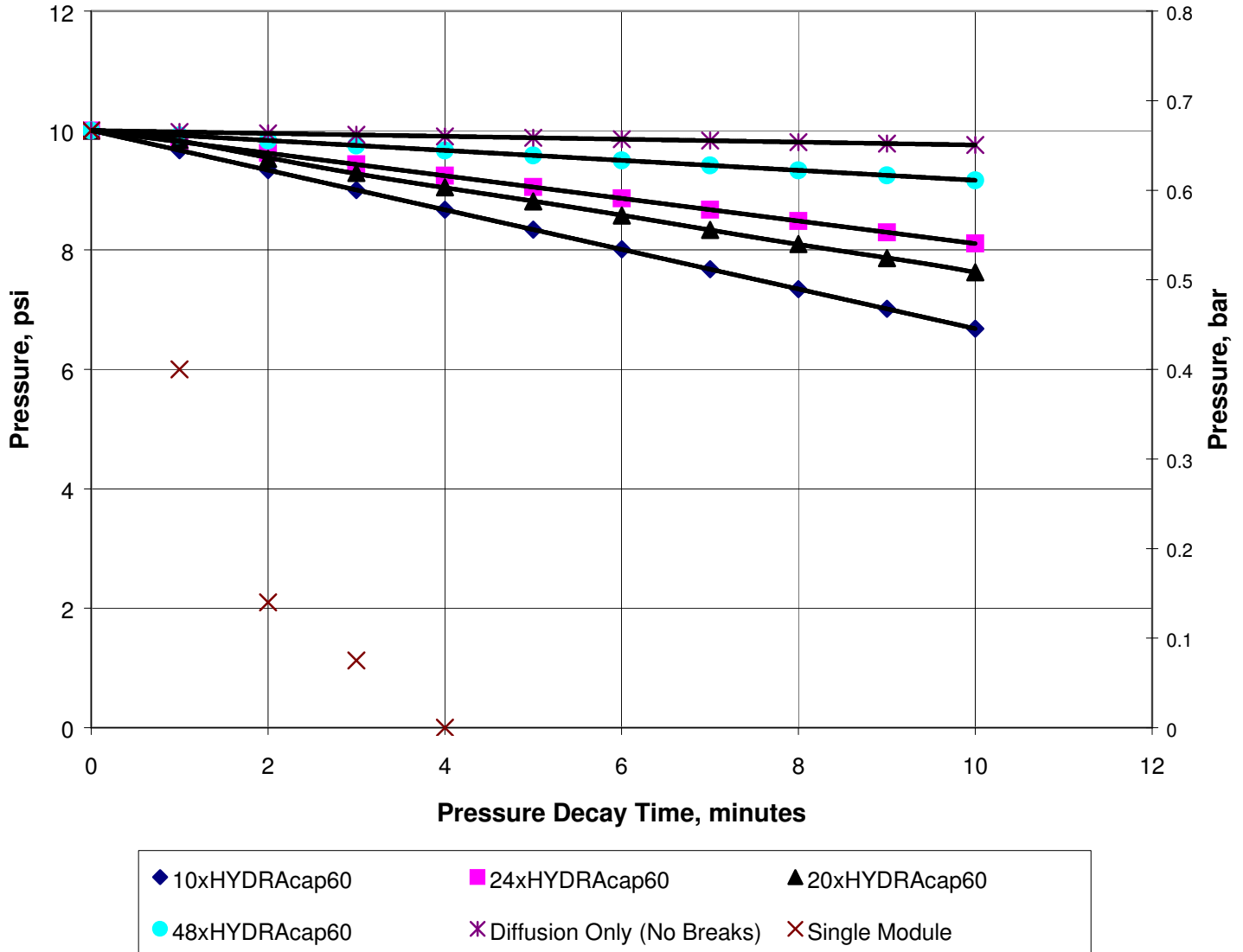
Occasionally, a HYDRAcap® fiber may break, resulting in a loss of integrity. Broken fibers compromise the filtrate quality by allowing the passage of particulate matter. Though a broken fiber(s) may not be noticeable from the measured turbidity of the filtrate, drinking water systems in particular may require the detection and isolation of broken fibers. The integrity test utilizes **oil free** air at 15 psi (1.0 bar) to identify HYDRAcap® modules with broken fibers.

1. Shut down the HYDRABLOC™ to be tested.
2. Relieve pressure in the feed/concentrate, within the HYDRABLOC™, by opening the drain valves on the feed (feed bottom) and concentrate (feed top) manifold (5-10 seconds).
3. Any filtrate valves on the HYDRABLOC™ should remain open to atmospheric pressure.
4. After the equilibration of the feed/concentrate pressure (5-10 seconds), close the concentrate (feed top) valve of the HYDRABLOC™, and introduce oil free air (@15 psi) to the concentrate manifold (feed top).
5. After the feed side has drained (5-15 minutes), close drain valves and allow HYDRABLOC™ to pressurize.
6. Once the HYDRABLOC™ has reached 15 psi of air pressure wait 2 minutes before continuing.
7. If the HYDRABLOC™ does not pressurize to the desired 15 psi, it may be necessary to inspect the HYDRABLOC™ for air leaks.
8. Close air supply valve and ensure filtrate effluent valve remains open.
9. Monitor the pressure decay of the feed air pressure for 5 to 10 minutes, dependent on the number of modules in the HYDRABLOC™. See Figure 1. for examples of pressure decay due to one broken fiber. If pressure decay is excessive a visual inspection of the decay will be required (see step 11).

10. Diffusion of air through the water filled pores of the membrane will lead to a pressure decay of approximately 0.03-0.04 psi (20-30 mbar) for a 24 module HYDRABLOC™ in 5 minutes (dependent on the volume of the pipework manifolds, etc.). A single broken fiber in a 24 module rack will give a pressure decay in excess of 0.07 psi (50 mbar) in 5 minutes, so a decay of 0.07 psi in 5 minutes is normally used to indicate the presence of a single broken fiber for this size of rack.
11. To identify the module(s) with the broken fiber(s), repeat the test while visually inspecting the clear piece of filtrate piping leaving each module on the filtrate port side. Significant amount of air bubbles will be observed in this pipe if the HYDRAcap® module has a broken fiber(s). Note that small air passage is normal due to air diffusion through the membrane. Only sharp differences in air flow between two neighboring HYDRAcap® modules will expose a leaking module. A slight buzzing or vibrating noise may also be an indication of a leaking module.
12. Mark any leaking modules for subsequent repair.
13. After the 5 to 10 minutes pressure hold test period, open the feed and concentrate valves.
14. Repair modules with broken fibers and reconnect to the HYDRABLOC™ manifold. (See TSB 134 for repair instructions).
15. Forward flush to remove trapped air from the HYDRABLOC™ (15-30 seconds).
16. The HYDRABLOC™ is now ready for processing.

**NOTE: Air release valves at the top of the feed and concentrate manifold may be required to remove any remaining trapped air and prevent water hammer.**

## Figure 1. HYDRABLOC™ Pressure Decay Rates with One Broken Fiber



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