

Technical Service Bulletin

June 2018 TSB351.03

HYDRAcube Storage Procedure

This Technical Service Bulletin provides information required to store HYDRAcap MAX[®] modules, which are part of the HYDRAcube skid, as spares or in-situ after they have been placed in service.



CAUTION: THIS DOCUMENT CONTAINS CHEMICALS THAT CAN BE HARMFUL TO HEALTH. WEAR PROPER SAFETY EQUIPMENT WHEN HANDLING CHEMICALS.

Introduction

New HYDRAcap[®] MAX modules, which are part of the HYDRAcube assembly, are stored and shipped in a 30% w/v *calcium chloride* (CaCl_2) to prevent biological growth.



CAUTION: WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN HANDLING CALCIUM CHLORIDE. CaCl_2 CAN CAUSE SKIN AND EYE IRRITATION. 30% CALCIUM CHLORIDE IS ALSO CORROSIVE TO METALS. RINSE ANY SOLUTION OFF METALS .

NOTE: HYDRAcap[®] MAX modules must not be exposed to freezing conditions or fiber breakage may occur.

Storage of New Modules as Spares

New HYDRAcap[®] MAX modules that have not been assembled with the HYDRAcube headers (original end caps are still in place) can be safely stored for up to 2 years provided that the guidelines in TSB 331 are met.

Storage in-situ

HYDRAcap[®] MAX module(s) that will be stored on the racks should follow the procedures below:

1. If the modules have been used, conduct an MC1 (maintenance clean with *sodium hypochlorite*) and continue to step 3.

2. If the modules have not been used, ensure the preservative has been flushed from the modules by following TSB 352. Then, continue on to step 3 once the preservatives have been flushed.
3. If the modules will be stored for less than a 48 hour period, pump HYDRAcap® MAX filtrate quality water [i.e. from the Recovery Clean (RC) tank or filtrate break tank] or better (e.g. RO water) to the module(s) to ensure fibers do not dry out.
4. Isolate the module(s) to ensure the filtrate water does not drain from the system.
5. If the module(s) are stored on the rack for more than 48 hours and up to 1 month, it is recommended to pump at least a 25 ppm *sodium hypochlorite* solution into the modules. Higher chlorine concentrations may be necessary for some systems. In either case, ensure there is a residual free chlorine of at least 0.5 ppm in the module throughout the 1 month or less period. The table below shows the various solutions needed for different storage times. It is required to change out this *sodium hypochlorite* solution at least once per month if a preservative such as *Sodium Bisulfite* (SBS, see step 6) is not used.
6. If the modules are stored for more than 1 month, preserve the system with a 1% SBS solution opposed to CaCl₂ if there are any metal components on the system such as the plugs.
7. To restart the system, an MC1 needs to be conducted for modules that have been preserved with *sodium hypochlorite* (not necessary for systems stored for less than 48 hr or for systems stored with SBS).



CAUTION: WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN HANDLING SODIUM HYPOCHLORITE. SODIUM HYPOCHLORITE CAN CAUSE SKIN AND EYE IRRITATION.

Table 2: Solution required for various storage times

Storage Time	Solution
Up to 48 hours	HYDRAcube filtrate quality water or better
Up to 1 month	25 ppm sodium hypochlorite. Check residual chlorine is at least 0.5 ppm throughout the month
> 1 month	1% w/v Sodium Bisulfite

Storage of Used Modules Off System

If the user prefers to store the modules off the rack, follow the procedures below:

1. Conduct an MC1 (maintenance clean with chlorine).
2. Ensure the modules are thoroughly rinsed with fresh HYDRAcap® MAX filtrate and free from any residual chlorine.
3. Remove the module(s) from the rack and cube.
4. Replace the original HYDRAcap® MAX end caps and securely tighten the holding clamp.



Figure 1: HYDRAcap MAX original end caps

5. Drain all excess water from the module through the drain port. (See Figure 2).

	Component Name	Quantity per Module
1	Shell	1
2	Feed/Drain End Adaptor	1
3	Concentrate End Adaptor	1
4	Air Adaptor	1
5	Endcap	2
6	Clamp	2



Figure 2: Module Components and Port Configuration

6. To hold the preservative in the module, each port will need to be plugged or you will need to replace the headers with the original end caps and plugs.



Figure 3: Photo of original plugs and end caps.

7. Through the upper filtrate port of the module, introduce 30% w/v CaCl_2 solution. (Refer to figure 2 for port locations).
 - a. HYDRAcap MAX 40 – 1500 ml \pm 50 ml of solution
 - b. HYDRAcap MAX 60 – 2000 ml \pm 50 ml of solution
 - c. HYDRAcap MAX 80 – 2500 ml \pm 50 ml of solution
8. Place caps like those in figure 3 above onto all four ports to maintain cleanliness, prevent evaporation, and reduce neutralization of CaCl_2 storage solution.
9. Place the modules horizontally. If the original end caps are used, ensure the filtrate ports are facing up (Refer to figure 2 for port locations).

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