Technical Service Bulletin

October 2013 TSB331.03

HYDRAcap® MAX Storage Procedure

This Technical Service Bulletin provides information required to store HYDRAcap® MAX modules as spares or in-situ after they have been placed in service.

Introduction

HYDRAcap® MAX modules are stored in a 30% w/v calcium chloride ($CaCl_2$) to prevent biological growth.

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 can be safely stored for up to 2 years provided that the following guidelines are met:

- The modules are stored horizontally with filtrate ports facing up.
- The modules are protected from direct sunlight and stored in a cool, dry place.
- The calcium chloride solution is changed based on the table below:

Table 1: Storage solution replacement time

Ambient Temperature (°C)	
2-30	**Change solution every 24 months**
2-35	**Change solution every 18 months**
2-45	**Change solution every 12 months**

- If the solution needs to be changed, follow the procedure below:

1. Remove the caps on all four side ports.
2. Drain old preservative from the module, approximately 1.5 – 2.5 liters depending on the module size.
3. Through the upper filtrate port of the module, introduce the 30% w/v $CaCl_2$ solution.

    a. HYDRAcap MAX 40 – 1500 ml ± 50 ml of solution

b. HYDRAcap MAX 60 – 2000 ml ± 50 ml of solution
c. HYDRAcap MAX 80 – 2500 ml ± 50 ml of solution

4. Place caps onto all four ports to maintain cleanliness, prevent evaporation, and reduce neutralization of $CaCl_2$ storage solution.
5. For storage, place the modules horizontally with the filtrate ports facing up.

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 chlorine) and continue to step 3.
2. If the modules have not been used, ensure the preservative has been flushed from the system by following TSB 332. 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 (i.e. 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 calcium chloride (see step 6) is not used.
6. If the modules are stored for more than 1 month, preserve the system with a 30% calcium chloride solution.
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 calcium chloride).

Table 2: Solution required for various storage times

Storage Time	Solution
Up to 48 hours	HYDRAcap® MAX filtrate quality water or better
Up to 1 month	25 ppm sodium hypochlorite and check residual chlorine is at least 0.5 ppm
> 1 month	30% w/v Calcium Chloride

NOTE: Calcium chloride is corrosive to metals.

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.
4. Drain all excess water from the module.
5. Cap the bottom feed and filtrate ports.
6. Through the upper filtrate port of the module, introduce the 30% w/v $CaCl_2$ solution.

    a. HYDRAcap MAX 40 – 1500 ml ± 50 ml of solution
    b. HYDRAcap MAX 60 – 2000 ml ± 50 ml of solution
    c. HYDRAcap MAX 80 – 2500 ml ± 50 ml of solution

7. Place caps onto all four ports to maintain cleanliness, prevent evaporation, and reduce neutralization of $CaCl_2$ storage solution.
8. Place the modules horizontally with the filtrate ports facing up.

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