

## Technical Service Bulletin

December 2021 TSB331.05

### HYDRAcap™ MAX Storage Procedure

This Technical Service Bulletin provides information required to store HYDRAcap™ MAX modules and elements as spares or in-situ after they have been placed in service as well as provide recommendations for transit.

#### Introduction

HYDRAcap™ MAX modules and elements are stored from our factory in a 30% w/v calcium chloride (CaCl<sub>2</sub>) to prevent biological growth.



**CAUTION: WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN HANDLING CALCIUM CHLORIDE. CaCl<sub>2</sub> CAN CAUSE SKIN AND EYE IRRITATION. 30% CALCIUM CHLORIDE IS ALSO CORROSIVE TO METALS. RINSE ANY SOLUTION OFF METALS .**

#### Modules and Elements

The HYDRAcap™ MAX product line is offered in either a module or element form. Modules are self-contained, low pressure units, while elements need to be installed in a separate pressure vessel housings and can operate at higher pressures.

#### Storage of New Modules and Elements as Spares

New HYDRAcap™ MAX modules and elements can be safely stored for up to 2 years provided that the following guidelines are met:

- 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

- Modules are to be stored horizontally with filtrate ports facing up.
- Elements are to be stored horizontally and properly preserved in a sealed bag.
- Modules and Elements must be protected from direct sunlight and stored in a cool, dry place between 0-40°C

## Storage Replacement Solution

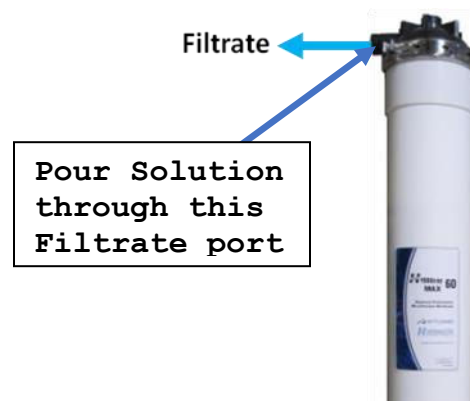
If the solution needs to be changed on a module, follow the procedure below:

1. For modules with end caps, please remove caps on all ports.



***Figure 1: HYDRAcap™ MAX end port caps and plugs.***

2. Drain the old preservative from the module, approximately 1.5 – 2.5 liters depending on the module size.
3. Place caps on all ports, but leave the upper filtrate port open.
4. Through the upper filtrate port of the module, introduce the 30% w/v CaCl<sub>2</sub> 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



***Figure 2: HYDRAcap™ MAX upper half of the module showing filtrate port and where to pour in preservative.***

5. Place the last cap on the upper filtrate port to maintain cleanliness, prevent evaporation, and reduce neutralization of CaCl<sub>2</sub> storage solution.
6. Place the modules horizontally with the filtrate ports facing up

If the solution needs to be changed on an element, follow the procedure below:

1. Drain old preservative from the element, approximately 1.5 – 2.5 liters depending on the size.
2. Place the feed end in a element bag while keeping the top end of the element exposed.
3. Through the upper port, introduce a 30% w/v CaCl<sub>2</sub> solution at the volumes seen below.
  - 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. Properly seal the bag and place the element horizontally.

### **Storage in-situ**

HYDRAcap™ MAX module(s) and element(s) that will be stored on racks should follow the procedures below:

1. If the modules/element(s) have been used, conduct an MC1 (maintenance clean with chlorine) and continue to step 3.
2. If the modules/elements 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/elements 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)/element(s) to ensure the filtrate water does not drain from the system.
5. If the module(s)/element(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/elements. 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/element 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 module or element is to be stored for more than 1 month, preserve the system with a 30% calcium chloride solution.

- 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).



**CAUTION: 30% CALCIUM CHLORIDE IS ALSO CORROSIVE TO METALS. RINSE ANY SOLUTION OFF METALS .**

***Table 2: Solution required for various storage times.***

<b>Storage Time</b>	<b>Solution</b>
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

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

- Conduct an MC1 (maintenance clean with chlorine).
- Ensure the modules or elements are thoroughly rinsed with fresh HYDRAcap™ MAX filtrate and free from any residual chlorine.
- Remove the module(s)/elements from the rack.
- Drain all excess water.
- Follow steps 1 through 6 in the *Storage Replacement Solution* section above

## **Transportation**

HYDRAcap™ MAX module(s)/element(s) being transported between the factory and plant site should adhere to the steps in the *Storage of New Modules and Elements as Spares* section above:

Typically Hydranautics crates contain 6 modules/elements to a crate. These crates are not to exceed stacking 2 high for shipping and storage purposes. For shipments containing less than 6 modules/elements, smaller crates may be used. In these cases, observance must be kept to avoid stacking larger crates on top of the smaller crates.

During transportation, the modules should not be subject to:

- colliding impact
- direct sunlight
- rain
- mechanical damage

**Note:** For cold locations, do not allow the products to freeze. Calcium Chloride has a lower freezing point and acts as an anti-freezing agent, but care should still be taken to ensure products do not freeze.

### **Hydranautics Corporate office**