

Technical Service Bulletin

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HYDRAcap[®] Storage Procedure

This Technical Service Bulletin provides information required to store HYDRAcap[®] Ultrafiltration modules or elements under the following circumstances:

1. Storage of HYDRAcap[®] modules/elements as spares.
2. Storage of HYDRAcap[®] modules/elements in-situ after they have been placed in service.

Introduction

For the purpose of this TSB, the term “module” refers to products comprised of an outer shell, in which hollow fiber membranes are fixed at the ends, as well as, end caps, clamps, and product end adapters. The term “element”, denoted by an ‘E’ at the end of the product name, refers to products comprised only of an outer shell, in which hollow fiber membranes are fixed at the ends. Elements are normally operated inside of a pressure vessel.

HYDRAcap[®] modules/elements are typically stored in a 0.95% sodium bisulfite (SBS) to prevent biological growth. Alternatively, modules/elements can be stored in 30% calcium chloride (CaCl₂) solutions if there is potential to expose modules/elements to freezing conditions.

Storage as Spares

New HYDRAcap[®] modules/elements can be safely stored for up to 2 years in a SBS solution and up to 4 years in a CaCl₂ solution provided that the following guidelines are met:

1. The modules/elements are stored horizontally. Modules are stored with feed ports facing up.
2. The modules/elements are protected from direct sunlight and stored in a cool, dry place.
3. The solution is changed based on the table below:

Table 1: Storage solution replacement time

	Ambient Temperature (°C)	
SBS	2-30	Change solution every 24 months
	2-35	Change solution every 18 months
	2-45	Change solution every 12 months
Calcium Chloride	2-30	Change solution every 48 months
	2-35	Change solution every 42 months
	2-45	Change solution every 36 months

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

4.1. For HYDRAcap[®] modules that will be stored horizontally:

- A. Remove the plastic caps on all three side ports.
- B. Drain 1 Liter of old preservative from the module.
- C. Through the upper feed port of the module, introduce either a 0.95% SBS or 30% CaCl₂ solution. Use city water or equivalent when possible to make up the solutions.
 - i. HYDRAcap[®] 80 - 2000 ± 50 ml of solution.
 - ii. HYDRAcap[®] 60 - 1500 ± 50 ml of solution.
 - iii. HYDRAcap[®] 40 - 1000 ± 50 ml of solution.
- D. Place caps onto all three ports to maintain cleanliness, prevent evaporation and reduce neutralization of SBS storage solution.
- E. For storage, place the modules horizontally with the feed ports facing up.

4.2. For HYDRAcap[®] elements:

- A. Open the vacuum sealed bag.
- B. Drain 1 Liter of old preservative from the element and bag.
- C. With the element standing on one end, pour either a 0.95% SBS or 30% CaCl₂ into the core tube. Use city water or equivalent when possible to make up the solutions.
 - i. HYDRAcap[®] 80 - 2000 ± 50 ml of solution.
 - ii. HYDRAcap[®] 60 - 1500 ± 50 ml of solution.
 - iii. HYDRAcap[®] 40 - 1000 ± 50 ml of solution.
- D. Reseal vacuum sealed bag to maintain cleanliness, prevent evaporation and reduce neutralization of SBS storage solution.
- E. For storage, place the modules horizontally.

Storage in-situ

HYDRAcap[®] module(s)/element(s) that have already been rinsed, commissioned, and/or placed in service can be safely stored for up to 3 months by simply backwashing the

module(s)/element(s) with sodium bisulfite (SBS) and isolating the module(s)/element(s) to ensure no loss of storage solution. When filling the modules with the SBS solution, ensure all air is completely removed from the rack. The backwash water used should be fresh UF filtrate. The table below shows the concentration of SBS needed for different storage times. If the storage time exceeds the allowed time, the SBS backwash procedure should be repeated.

Table 2: Concentration of SBS needed for various storage times

Storage Time	Concentration of SBS
Up to 2 weeks	0.10%
Up to 1 month	0.50%
Up to 3 months	0.95%

NOTE: It is also possible to use calcium chloride solution in-situ; however, please note that calcium chloride is corrosive to metals.

If the user prefers to store the modules/elements off the rack without using an SBS backwash, they may perform a CEB3, rinse and store per the procedure below. The modules/elements must be backwashed with fresh UF filtrate before being placed back into service.

1. For HYDRAcap[®] modules that will be stored horizontally:
 - A. Remove the plastic caps on all three side ports.
 - B. Drain all excess water from the module.
 - C. Through the upper feed port of the module introduce either one of the SBS solutions listed in Table 2 or a 30% calcium chloride solution. Use city water or equivalent when possible to make up the solutions.
 - i. HYDRAcap[®] 80 - 2000 ± 50 ml of solution.
 - ii. HYDRAcap[®] 60 - 1500 ± 50 ml of solution.
 - iii. HYDRAcap[®] 40 - 1000 ± 50 ml of solution.
 - D. Place caps onto all three ports to maintain cleanliness, prevent evaporation and reduce neutralization of SBS storage solution.
 - E. For storage, place the modules horizontally with the feed ports facing up.

2. For HYDRAcap[®] elements:
 - A. Remove the module(s) from the rack.
 - B. Drain all excess water from the module.
 - C. With the element standing on one end, pour either one of the SBS solutions listed in Table 2 or a 30% calcium chloride solution into the core tube. Use city water or equivalent when possible to make up the solutions.
 - i. HYDRAcap[®] 80 - 2000 ± 50 ml of solution.

- ii. HYDRAcap[®] 60 - 1500 ± 50 ml of solution.
 - iii. HYDRAcap[®] 40 - 1000 ± 50 ml of solution.
- D. Elements must than be placed in vacuum sealed bag to maintain cleanliness, prevent evaporation and reduce neutralization of SBS storage solution. Please contact Hydranautics for storage bags if necessary.
- E. For storage, place the modules horizontally.

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