



## STORAGE INSTRUCTIONS

### SPIRAPAK and KPAK ULTRAFILTRATION MODULES

#### A. SHELF LIFE

KMS SPIRAPAK and KPAK modules leave the factory conditioned with a glycerin storage solution. Subject to the limits shown in Sections B & C below, spiral wound modules, kept sealed and in original packaging, will have a two year shelf life from ship date from KMS.

#### B. HANDLING

1. The boxes should not be dropped or crushed.
2. The modules should be stored horizontally.

#### C. NEW MODULE STORAGE CONDITIONS

1. Modules shall be kept unopened in original packaging.
2. Store modules indoors and out of direct sunlight.
3. Do not allow the modules to freeze and they should be kept at less than 40°C (104°F).
4. Storage temperature must be kept between 10°C and 30°C (50 to 86°F), at relative humidity below 70%.

#### D. USED MODULE STORAGE SOLUTIONS

1. **Short-term shut-down (up to 30 days):** The spiral wound membrane modules should be thoroughly cleaned. The modules should then be filled with fresh water at 5-25°C (41 to 77°F). Exchange storage water with fresh water every one to two weeks.
2. **Long-term shut-down (30 days or longer):** The spiral wound modules should be thoroughly cleaned. The modules should then be filled with one of the following chemicals:
  - a. KOCHKLEEN® 180 (or equivalent) solution at pH 3-4
  - b. Phosphoric acid solution at pH 3.
  - c. Sodium bisulfite solution at 2,000 mg/l, 5-25°C, and pH 3-4.

Replace storage solution every 30 days.

#### E. POST-STORAGE CLEANING PROCEDURE

SPIRAPAK and KPAK modules should be cleaned according to a KMS recommended procedure prior to restarting the system on production.

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04/15 Rev 15-2