Handling, Preservation and Storage

Storage and Shipping of New FilmTec™ Elements

General

FilmTec™ Membrane Elements should be handled in such a way that biogrowth and change in membrane performance during long-term storage, shipping or system shut-downs are prevented. The elements should preferably be stored and shipped outside the pressure vessels and loaded into the pressure vessels just prior to start-up.

Follow accepted safety practices when using biocide solution as membrane preservations. Always wear eye protection. Consult the relevant Material Safety Data Sheets as supplied by the manufacturer of the chemicals.

Storage and Shipping of New FilmTec™ Elements

FilmTec™ Elements are tested and shipped either in dry condition or as wat and preserved elements. Wet elements are preserved in a standard storage solution containing a buffered 1wt% food-grade sodium metabisulfite (SMBS). The storage solution prevents biological growth during storage and shipping of elements. For preservative Material Safety Data Sheets please visit the Answer Center at www.dupontwatersolutions.com.

Wet elements are bagged in a durable, oxygen-barrier composite bag and preservative solution is delivered prior to vacuum sealing. Precise preservative volume and high bag integrity help ensure a stable preservative environment during transportation and storage.

Dry elements are bagged and sealed in a robust plastic bag. They do not require any preservation solution, but they should be kept in their sealed bag until they are used.

Please follow these guidelines for storage of FilmTec™ Elements:

- Store inside a cool building or warehouse and not in direct sunlight.
- Temperature limits: -4°C to +35°C (25°F to 95°F).
    - New dry elements will not be affected by temperatures below -4°C (25°F).
    - Elements stored in 1% SMBS will freeze below -4°C, but the membrane will not be damaged, provided the elements are thawed before loading and use.
- Keep new elements in their original packaging.
- Preserved elements should be visually inspected for biological growth 12 months after shipment and thereafter every three months. If the preservation solution appears to be not clear the element should be removed from the bag, soaked in a fresh preservation solution and repacked. Refer to the following section Preservation and Storage for guidelines.

Form No. 45-D03716-en, Rev 11
February 2026

Preservation and Storage

Any FilmTec™ Element **that has been used** and removed from the pressure vessel for storage or shipping must be preserved in a preservation solution as follows:

- Use the standard storage solution of 1% food-grade SMBS (not cobalt-activated) in good quality water (preferably reverse osmosis (RO) or nanofiltration (NF) permeate).
- Soak the element for 1 h in the solution; keep it in a vertical position so that the entrapped air can escape. Allow it to drip out and seal it into an oxygen barrier plastic bag. We recommend reusing the original bag or original spare bags available from DuPont. Do not fill the plastic bag with the preservation solution – the moisture in the element is sufficient, and leaking bags might create a problem during transport.
- Identify the element and the preservation solution on the outside of the bag.
- Storage conditions are the same as for new elements – please refer to section above: Storage and Shipping of New FilmTec™ Elements.
- Re-preserved elements should be visually inspected for biological growth every 3 months. If the preservation solution appears to be not clear, the element should be re-preserved and repacked as above.
- The pH of the preservation solution must never drop below pH 3. In the absence of a buffer such as is used in the original preservative for wet FilmTec™ Elements, a pH decrease can occur when bisulfite (BS) is oxidized to sulfuric acid. Therefore, the pH of the BS preservation solution should be spot checked at least every 3 months. Re-preservation is mandatory when the pH is 3 or lower.
- Wear protective gloves and sleeves to avoid prolonged contact with skin and sleeves when working with preservative.

Re-wetting of Dried Out Elements

Elements that have dried out after use may irreversibly lose water permeability. Re-wetting might be successful with one of the following methods:

- Soak in 50/50% ethanol/water or propanol/water for 15 minutes
- Pressurize the element at 10 bar (150 psi) and close the permeate port for 30 minutes. Take care that the permeate port is reopened before the feed pressure is released. This procedure can be carried out while the elements are installed in a system

  In this case, the pressure drop from the feed side to the concentrate side must not exceed 0.7 bar (10 psi) during high pressure operation with closed permeate port – otherwise the permeate backpressure near the concentrate end will become too high. Preferably, the permeate port is not completely closed but throttled to a value equal the concentrate pressure. Then there is no need for a special pressure drop limit.
- Soak the element in 1% HCl or 4% HNO_3 for 1 – 100 h. Immerse the element in a vertical position to allow the entrapped air to escape.

Shipping

Unless otherwise specified, when FilmTec™ Elements have to be shipped, they must be preserved with a preservation solution according to the section above: Preservation and Storage.

Make sure that:

- The plastic bag does not leak.
- The element is properly identified.
- The preservation solution is correctly labelled.

We recommend using the original packaging with the original polystyrene foam cushions to protect the element from mechanical damage. Elements with non-flush-cut product water tubes should be protected against damage to the product water tube ends.

The membrane elements will not be damaged by freezing temperatures during shipping provided the elements are thawed before loading and use.

Preservation of RO and NF Systems

The procedure of shutting down an RO/NF system has been described in Section 5.4 RO and NF Systems Shut-down from the from the FilmTec™ Reverse Osmosis Membranes Technical Manual (Form No. 45-D010504-en). Please, read it carefully before proceeding.

FilmTec™ Elements must be preserved any time the plant is shut down for more than a maximum of 48 h to prevent biological growth. Depending on the previous operational history of the plant, it will be necessary in almost all cases to clean the membranes prior to shut-down and preservation. This applies to cases when the membranes are known or assumed to be fouled.

After cleaning, the preservation should follow within the next 10 h as follows:

1. Totally immerse the elements in the pressure vessels in a solution of 1 – 1.5% SMBS venting the air outside of the pressure vessels. Use the overflow technique: circulate the SMBS solution in such a way that the remaining air in the system is minimized after the recirculation is completed. After the pressure vessel is filled, the SMBS solution should be allowed to overflow through an opening located higher than the upper end of the highest-pressure vessel being filled.
2. Separate the preservation solution from the air outside by closing all valves. Any contact with oxygen will oxidize the SMBS.
3. Check the pH once a week. When the pH becomes 3 or lower, change the preservation solution.
4. Change the preservation solution at least once a month.

During the shut-down period, the plant must be kept frost-free, and the temperature must not exceed 45°C (113°F). A low temperature is desirable.

Have a question? Contact us at:
www.dupont.com/water/contact-us

All information set forth herein is for informational purposes only. This information is general information and may differ from that based on actual conditions. Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where DuPont is represented. The claims made may not have been approved for use in all countries. Please note that physical properties may vary depending on certain conditions and while operating conditions stated in this document are intended to lengthen product lifespan and/or improve product performance, it will ultimately depend on actual circumstances and is in no event a guarantee of achieving any specific results. DUPONT ASSUMES NO OBLIGATION OR LIABILITY FOR THE INFORMATION IN THIS DOCUMENT. References to "DuPont" or the "Company" mean the DuPont legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. No freedom from infringement of any patent or trademark owned by DuPont or others is to be inferred.
DuPont™, the DuPont Oval Logo, and all trademarks and service marks denoted with ™, SM or ® are owned by affiliates of DuPont de Nemours, Inc. unless otherwise noted. © 2026 DuPont. All right reserved