

PRODUCT

SUSTAINION™ X37 Anion Membrane Grade-RT

Handling and Storage of Dioxide Materials Sustainion™ Anion Membranes

Before You Start

Follow standard safety practices. Refer to the **SDS** information that was shipped with the membrane.

Handle membranes carefully! Any punctures, creases or scratches may lead to leaks. **ALL** surfaces in contact with membranes should be smooth and free of sharp projections, however small. This applies to the receiving, inspection, storage, pretreatment, cutting and mounting areas, as well as electrolyzer components.

Membranes will expand and contract based on moisture content. To eliminate wrinkling and subsequent operating problems, it is necessary to:

- Expand membranes **BEFORE** mounting, by appropriate pretreatment.
- Maintain 100% humidity in the cell once the membrane is mounted.

Storage and Handling

- *The membranes are shipped in dry form on a liner. They should be stable like this, when kept in a sealed bag (for around 30 days) if they are not exposed to excessive humidity or moisture.*
- *If it is routinely exposed to changes in humidity and temperature or any moisture, DM recommends activating and storing the membranes in 1 M KOH bath even for a long-term duration.*
- *In order to prevent decreasing the shelf life, care should be taken to minimize repeatedly opening the sealed bag, the membrane piece or roll arrives in. Additionally, it is important to immediately close and seal the bag once the user is done extracting the required membrane section.*
- *Avoid exposure to high temperatures (in excess of 40 °C).*

Release from liner and activation

- Please consult our video demonstration for a guide of the release and activation process: <https://youtu.be/vPDtBNQ14eg>
- The sequence of steps are detailed here for your reference as well:
- Tear the seal and carefully withdraw the membrane on its liner from the bag.
- Instead of cutting to the exact device active area (to avoid cracking in its initial dry brittle form), **please immediately soak a slightly larger membrane piece** in KOH as advised below (and shown in the first part of the video link):
- Place the membrane in a 'large' bath or container containing 1 molar potassium hydroxide solution.
- The membrane side should be facing down (towards the KOH solution) and the liner should be facing up.

- Initially, the membrane with the liner may curl in the solution. It can be kept flat by placing weights such as glass stoppers or small filled bottles on the edges/corners of the liner.
- The KOH activation will cause the membrane to swell and separate from the liner within ~ 4-5 hours after which the weights on the edges can be removed.
- *If the membrane has not automatically dislodged from the liner after 5 hours, the user may have to carefully separate it from the liner themselves. A sharp knife or razor can be used at the corner of the membrane to create a small crevice between the liner and membrane. The membrane can then be carefully and slowly pulled off the liner starting with that end by the help of some blunt tweezers.*
- **After removal from the liner, the membrane must be continued to be activated for a total of at least 48 hours before application.** (A fresh 1M KOH bath must be introduced after the first 24-hour mark in order to ensure complete ion exchange)
- Once activated, the membrane is less prone to cracking, but it can still tear if mishandled. Users are urged to lay the membrane piece flat on a large clean glass slide or flat polypropylene slab before carefully using a sharp razor blade or scissor to cut it to their required dimensions. The membrane should be thoroughly washed with deionized water prior to mounting in a cell to wash off the excess surface KOH. The remaining membrane can be placed back in the 1M KOH bath where it can be stored for atleast a couple of months. (DO NOT LET THE MEMBRANE DRY OUT).
- The membrane should be thoroughly washed with deionized water prior to mounting in a cell to wash off the excess surface KOH.
- All surfaces in contact with membranes during handling, inspection, pretreatment or in service should be smooth and free of sharp projections, however small.
- Do not place the membranes outside of solution for extended periods or they will become brittle.

Identification

- Membrane sheets are identified by membrane type and Lot#.
- The membranes can be positioned in the cell using either side of the membrane.

Cutting

- Membranes can be readily cut out with a knife, razor or scissors.
- However, membrane dimensions may change because of changes in relative humidity. Also, membranes will expand when exposed to different pretreatment and electrolyte conditions. If consideration is not given to dimensional changes, holes for bolts or liquid ports may not be positioned properly.



Dioxide Sustainion® membrane product.



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Pretreatment

NOTE: If you have any concerns about pretreatment, before proceeding contact your DM technical representative.

Mounting in the Electrolyzer

- Mount membranes immediately after any required further pretreatments to prevent drying.
- Maintain 100% humidity in the electrolyzer after installation of the membrane to prevent excessive membrane shrinkage

The manufacture and Dioxide Materials Sustainion™ membranes are covered under one or more U.S. Patents:

U.S. Patent 9,370,773

U.S. Patent 9,481,939

Other U.S. and foreign patents pending.

For further information on the Sustainion™ membrane products, please contact:



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