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 on a liner with a glycol-water solution to help with shelf-life. They should be stable in this condition when kept in a sealed bag if they are not exposed to excessive humidity or moisture. If it is routinely exposed to changes in humidity and temperature or any moisture, Dioxide Materials recommends activating and storing the membrane(s) in a 1M KOH bath for long-term duration. Avoid unnecessary exposure to high temperatures (in excess of 40 °C).

Release From Liner And Activation

Please consult our 'general' video demonstration for a guide of the release and activation process: **https://youtu.be/vPDtBNQ14eg**

The sequence of steps is detailed here for your reference as well:

- Open the packaging and carefully withdraw the membrane on its liner from the bag.
- Instead of cutting to the exact device active area, **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 bath or container of 1M KOH solution.
    - The membrane side should be facing down (towards the KOH solution).
    - Initially, the membrane with liner may curl in the solution. It can be kept flat by placing weights on the edges/corners of the liner. Alternatively, use a large enough bath that the curled membrane/liner remains submerged.

- The KOH activation will slowly cause the membrane to swell and separate from the liner. This process may take up to 8 hours. There might be slight quantities of brown residue visible from the release agent on the liner if it is left in solution for too long. It can be easily washed away from the membrane or discarded. The membrane must be continued to be activated for a total of at least 24 hours in a new 1M KOH bath at room temperature. If the membrane does not release from the liner, this is most likely due to not having enough OH-. Move the membrane into a new 1M KOH bath and allow to soak for an additional 24 hours.

- Once activated, the membrane is less prone to cracking, but it can still tear if mishandled. It is recommended 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 for storage. It is important that you **do not let the membrane dry out**.

- 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#. This information can be located on the bottom left of the packaging.

- The membranes can be positioned in the cell using either side of the membrane.

Characteristics

- **Color**: The membrane will vary from completely clear to slight yellow. (Pre)Treatment may also result in slight color change. This is normal and does not affect performance.

- **Thickness**: The dry membrane should measure ~50um. With the liner, ~100um.

Cutting

- Membranes can be readily cut out with a knife, razor, or scissors.
- 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.

Pretreatment

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

Mounting in the Electrolyzer

- Mount membranes immediately after pretreatment(s) 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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