Revision: Jan 2018

VANADion™ Membranes

VANADion™ 20

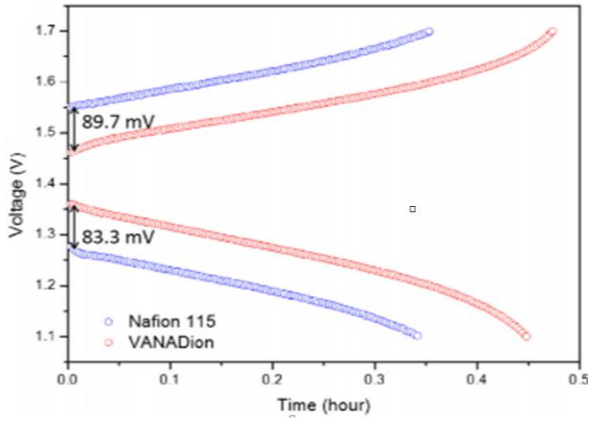
Description

The VANADion™ 20 Membrane is a composite membrane with an excellent performance in flowing electrolyte electrochemical energy storage batteries and other electrochemical applications. The membrane is usually supplied in a dry form but should be properly wetted out prior to use. Its rugged support allows for easy and fault free cell assembly. The high conductivity of the membrane allows for high cell power output while maintaining good cell voltage. The membrane has a positive side orientation and should be noted in cell assembly and start-up.

Physical Properties

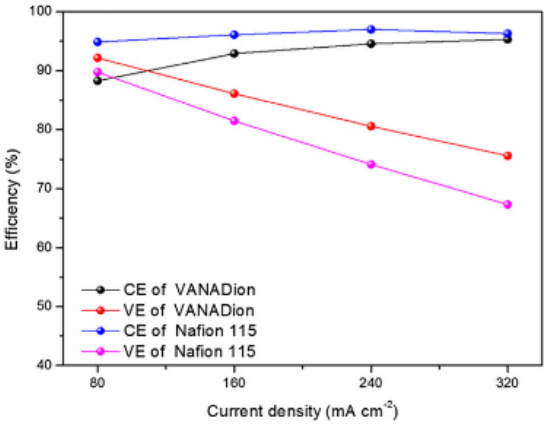
Thickness: 10 mils +/- 1 mil (254 +/- 25.4 microns)
Operating Temperature: 0 – 50 C
Specific area resistance in 30% H_2SO_4 at 25°C: 0.1 Ohms-cm^2 area.

Typical Application Performance of VANADion™-20 [1]

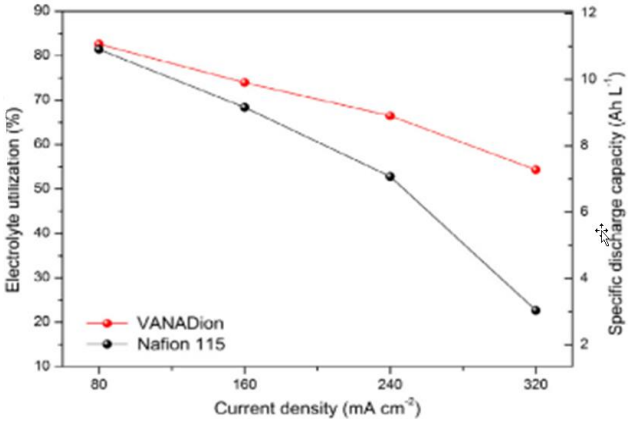


Typical charge / discharge curve comparison of the VANADion-20™ with NAFION™ N115 in a Vanadium Redox flow battery, both cells operating at 240 mA/cm^2.

[1] Zhou X,Zhao T,An L, Zeng Y, Zhu X Performance of a vanadium redox flow battery with a VANADion membrane. Applied Energy 2016: 180:353-359



Columbic efficiency, voltage efficiency of VRFBs assembled with Nafion 115 and the VANADion membrane at various current densities.



Electrolyte utilization of VRFBs assembled with Nafion 115 and the VANADion membrane at various current densities.

Product Handling and Use

General care in handling should be done to keep the membrane flat and to prevent sharp folds and creases in the membrane.

Membranes should be hydrated in DI water by floating the membrane with the positive (coated) side of the membrane facing DI water. Allow 10 – 20 minutes for the DI water to soak into the membrane ; a slight expansion of the membrane will occur and the membrane will turn colors from a light grey to a darker grey color, indicating proper hydration has occurred. Alternatively, membranes can be loaded into the cell in the dry state, and the DI water electrolyte introduced into the Positive (+) marked face of the membrane and allowed to soak for 10 minutes ***before*** process electrolyte is introduced and circulated to the opposite side of the membrane. -X designation is for Battery applications, -L designation is for Semiconductor applications. Once membrane has been wet out do not let membranes dry out.

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