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Technical Data Sheet

FC-815/810-RFS

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1. Membrane specification

1.1 General description

The proton exchange membranes (PEM) produced by The Mobility F.C. Membranes Company GmbH is a composite membrane that is intended for use in hydrogen proton exchange membrane fuel cell (PEMFC) applications. The membrane is composed of i) a proton conductive ionomer and ii) a mechanical reinforcement iii) an immobilized chemical additive. The ionomer is a perfluorosulfonic acid based polymeric material for the conductance of protons. The mechanical reinforcement is an expanded polytetrafluoroethylene film. A chemical radical scavenger is added to the ionomer resin while producing the membrane. The chemical additive is fully integrated into the ionomer molecular matrix and the ionomer is fully impregnated into the porous mechanical reinforcement to form a continuous film product.

1.2 Identification

Membranes are identified by membrane type and identification number (Lot Number). Please refer to this type and identification number in case of queries. The experimental samples are labelled as VM (VM= Versuchsmuster in German language, in English Experimental Sample)

1.3 General use

The intent and purpose of this membrane is for research and development, and demonstration purposes only. The materials should be handled under controlled conditions, and resulting products made with or use of the delivered material should not be placed on the open market.

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2. Physical and Chemical Data

Table 1: Membrane Characteristics

Characteristics	**Units**	**Value**
Membrane Type		cation exchange membrane
Appearance		transparent with no intensive color
Backing Film		multilayer PET
Additive		rare earth and/or transition metal based
Counter Ion		H^+ form
Delivery Form		dry film with one sided PET backing
Dry Thickness	µm	10 or 15 µm ± 2.0 µm
Young's modulus [a)]	MPa	> 500
Tensile Strength [a)]	MPa	>50/30
Elongation until break [a)]	%	>90
Maximum dimensional swelling in MD/TD direction [b)]	%	< 3/3
Combined Chemical and Mechanical Durability [c)]	cycles	> 100,000 or 2300h
Hydrogen Crossover [d)]	mA/cm^2	< 3

(a) Determined by stress-strain measurement performed at T = 25°C and 50 % relative humidity, in machine direction
(b) Immersion in 100°C de-ionized water for 1h, no direct contact with air during the treatment
(c) cOCV test performed at 90°C cell temperature, H2/Air, OCV, humidity cycling 30s dry (0%RH) 45s wet (100%RH), ambient pressure (105kPa ab), failure defined as H_2 crossover exceeding $15mV/cm^2$
(d) Hydrogen crossover collected during test in (d) and (e)

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