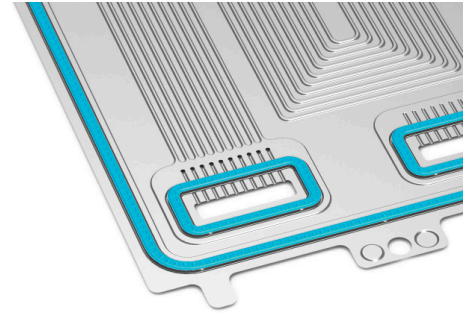


ELASTOMERIC SEALS FOR BIPOLAR PLATES



Bipolar Plates, the graphite or metal components which conduct electricity between adjacent membrane electrode assemblies, are often designed with seals that help channel the flow of gases and heat to and from the cell.

The **elastomeric seals** prevent leakage of coolant and reactant gases, and compensate for manufacturing tolerances of the adjacent components.

Freudenberg has developed seal materials that meet all requirements of the fuel cell environment and lifetime operation. For Bipolar Plates, our silicone material, or our superior polyolefin elastomer are typically selected.

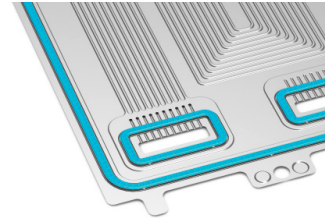
PEMFC/DMFC fuel cells using our materials feature in applications including: automotive drive trains and auxiliary power units, stationary and combined heat/power applications, stacks for off-grid/grid connected, and recreational vehicles.

Full service in-house engineering design team and network of locations available to support your fuel cell programs worldwide.

VALUES FOR THE CUSTOMER

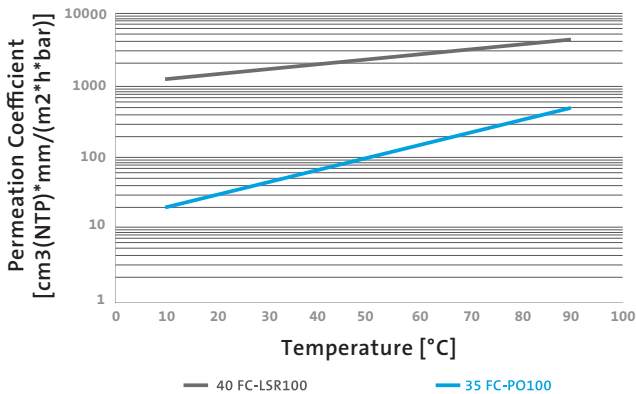
We can help design and manufacture integrated elastomeric seals and performance features for the Bipolar Plates in your fuel cell application.

- Experience with automated series production of elastomeric seals on bipolar plates since 2017
- Elastomers compatible with most materials used for Bipolar Plates
- Polyolefin Elastomer with low permeation, high adhesion, and enhanced compression set to meet the durability and performance requirements of the system
- Elastomeric seals integration increases ease of handling, assembly robustness, and durability
- Custom designed and precision-molded seal profiles channel the flow of gases and heat in the cell
- Three dimensional seal pattern to uniformly distribute the linear load and prevent leakage of coolant and reactant gases
- Accurate thickness distribution combined with low durometer compound for greater compensation of manufacturing tolerances in the stack

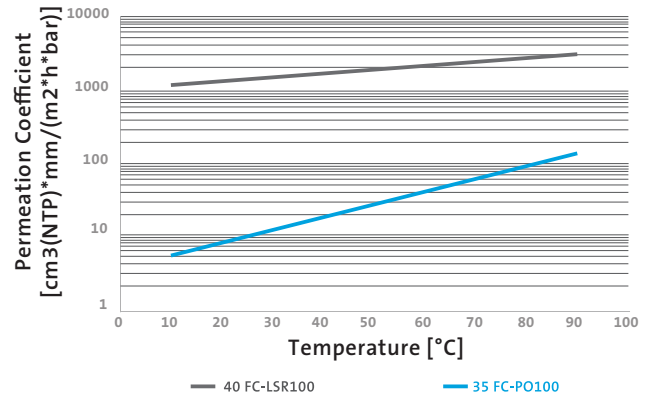


	35 FC-PO 100	43 FC-LSR 100
Material	Polyolefin Elastomer	Silicone Elastomer
Hardness (DIN 53505)	35 ± 5 Shore A	43 ± 5 Shore A
Temperature Range (°C)	- 40 ... 120	- 40 ... 150
Tensile Strength (MPa ISO 37)	2	5
Compression Set in % (measured in air)	< 20	< 25
	120° C / 25 % comp. 24 h (ISO 815)	120° C / 25 % comp. 24 h (ISO 815)
	< 35	
Compression Set in % in 2.5 M methanol solution pH 2	150° C / 25 % comp. 70 h (ISO 815)	
	< 45	
	90° C / 25 % comp. 1000 h (ISO 815)	

Hydrogen Permeation Behavior
of Fuel Cell Stack Seal Materials



Oxygen Permeation Behavior
of Fuel Cell Stack Seal Materials



The information contained herein is believed to be reliable, but no representation, guarantees or warranties of any kind are made to its accuracy or suitability for any purpose. The information presented herein is based on laboratory testing and does not necessarily indicate end product performance. Full scale testing and end product performance are the responsibility of the user.

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