VENA® PEM CELL

Vena® PEM CELL has been especially designed and tested to meet the main requirements of Proton-Exchange Membrane Fuel Cell and contribute to the overall efficiency of these systems.

The use of high- purity and quality raw materials in Vena® PEM CELL ensures the ultra-low content of leachable substances and component inertness in Fuel Cell ambient. This, along with the low-permeability rate and great mechanical properties in Vena® PEM CELL and due the versatility of the material, makes it a good election for any part within a Fuel Cell system (either in the cathode, anode, or refrigeration lines).

Vena® PEM CELL material is used for the whole construction of the hoses, not only the inner layer, thus leading to the improvement of overall permeability and performance of the hose.

PROPERTIES

- Good mechanical properties.
- Low permeability.
- Excellent resistance to thermal aging and oxidizing agents (oxygen, ozone, UV).
- Excellent purity – extremely low extractables and volatile compounds content.
- Specific postcuring process and cleaning protocol is applied to reduce the amount of environmental and production contaminants. Pharma-grade treatment.
- Imparts almost no conductivity to contact fluids.
- Excellent chemical resistance.
- Hoses are capped so that they can be delivered with the lower possible level of contaminants.
- Operational temperature range from -50°C (-58 F) to +130°C (266 F), it may reach up to 150°C (302 F) during short periods of time.

Vena® PEM CELL material

Vena® PEM CELL is an EPDM-derived composite. The main properties of this material are listed below:

Property	Method	Unit	Value
Hardness	ISO 868	Shore-A	62±5
Specific gravity	ISO 2781	g/cm³	1,10±0,02
Tensile strength	ISO 37	MpA	>12
Elongation at break	ISO 37	%	>200
Tear Strength	ISO 34	kN/m	>35
Glass transition temperature (Tg)	ISO 11357	°C	-51

Resistance against DI WATER, 168 hours at 100°C, ISO 188

Property	Method	Unit	Value
Δ Hardness	ISO 868	Shore-A	1
Δ Tensile strength	ISO 37	%	8
Δ Elongation at break	ISO 37	%	-10

Resistance against coolant (Glysantin® FCG20-00/50), 168 hours at 108°C, ISO 188

Property	Method	Unit	Value
Δ Hardness	ISO 868	Shore-A	-2
Δ Tensile strength	ISO 37	%	8
Δ Elongation at break	ISO 37	%	30

Gas Permeability comparison between PEM CELL and FKM material on hose sample

HOSE	H2 Permeance ml/m2·day·atm	H2 Permeability ml·mm/m2·day·atm
BLACK FKM HOSE: 1mm layer FKM + 3 layers of Silicone (3,30mm of silicone)	58,77	255,60
VENA® PEM CELL : 4 layers of VENA® PEM CELL (4,30mm)	30,50	153,11

* test made according to ISO 15015-1 Plastics- Film and sheeting – Determination of gas-transmission rate – Part 1: Differential-pressure methods. This is equivalent to ASTM D1434-82(2009) e1 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting, Procedure M.

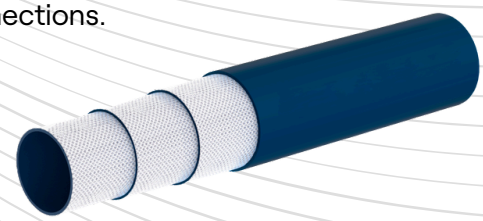
QUALITY AND COMPLIANCE

This reference is in accordance with the RoHS Directive 2002/95/EC and its subsequent amendments including the RoHS2 Directive 2011/65/EU and RoHS3 Directive 2015/863.

Inner Diameter		Wall Thickness		Working pressure ISO 1402		Bursting pressure ISO 1402	
mm	inch	+1.0/-0.5 mm	+0.04/ -0.02 inch	Bar at room temperature	Psi at room temperature	Bar at room temperature	Psi at room temperature
6	1/4	4,30	0,17	15.4	223.36	46.2	670.1
13	1/2	4,30	0,17	8.3	120.4	24.9	361.1
19	3/4	4,30	0,17	6.1	88.5	18.3	265.4
25	1	4,30	0,17	4.9	71.1	14.7	213.2
32	1 1/4	4,30	0,17	4.0	58.0	12.0	254.2
38	1 1/2	4,30	0,17	3.5	73.0	10.5	174.0
45	1 3/4	4,30	0,17	3.1	44.9	9.3	134.9
51	2	4,30	0,17	2.8	40.61	8.4	121.8
57	2 1/4	4,30	0,17	2.5	36.3	7.5	108.8
63	2 1/2	4,30	0,17	2.4	34.8	7.2	104.4
70	2 3/4	4,30	0,17	2.2	31.9	6.6	95.7
76	3	4,30	0,17	2.0	29.0	6.0	87.0
80	3 1/8	4,30	0,17	1.9	27.6	5.7	82.7
90	3 1/2	4,30	0,17	1.8	26.1	5.4	78.3
102	4	4,30	0,17	1.6	23.2	4.8	69.6

CONSTRUCTION MATERIALS

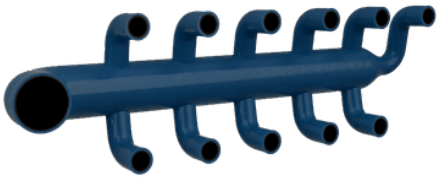
- Blue and smooth inner and outer appearance.
- This reference is manufactured with three polyester fabric reinforcements. Different shapes can be manufactured to adapt the construction to any installation and geometry requirement.
- Can be produced with customized lateral outlets and metal screwed connections for adapting any sensor.
- Can be equipped with stainless steel or aluminum connections.



Fabric properties

The typical properties of the polyester mesh fabric are:

Property	Method	Unit	Value
Weight	ISO 3801	g/m2	115±5%
Thickness	-	mm	0,45-0,1
Break strength (length)	ISO 13934-2	N	>450
Break strength (width)	ISO 13934-2	N	>480
Break elongation (length)	ISO 13934-2	%	>45
Break elongation (width)	ISO 13934-2	%	>60



LIMITATIONS

Respect the work pressure established values. High temperatures may affect the bursting and working pressure values.

CONTACT

venair
Fluid solutions. Solid performance.