

## VENA® PEM COOL

Ref: DO 03.10 FT 359 Rev. 01    Date: 13/02/2023



### APPLICATIONS

Vena® PEM COOL is specially designed to fulfill the main requirements to use in the DI water and cooling systems of PEM (polymer electrolyte membrane) Fuel Cells.

Specially designed for the passage of deionized water or coolants.

The use of improve peroxide cured silicone ensure the ultra-low content of leachable substances and component inertness in PEMFC ambient.

### PROPERTIES

- Good mechanical properties.
- Low conductivity.
- 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 resistance to thermal aging and oxidizing agents (oxygen, ozone, UV).
- Hoses are capped so that they can be delivered with the lower possible level of contaminants.
- Operational temperature range from -60°C (-75 F) to +180°C (356 F), it may reach up to 200°C (392 F) during short periods of time.

### CONSTRUCTION

- Blue and smooth inner layer of peroxide cured silicone, smooth and customized color external layer.
- Usually, external blue color used for water and coolant application, but color could be customized under request
- This reference is manufactured with three polyester fabric reinforcements.
- Can be produced with customized lateral outlets and metal screwed connections for adapting any sensor
- Can be equipped with stainless steel or aluminum connections

Alternatives:

**PEM COOL PLUS:** One more layer of polyester fabric reinforcement to greater pressure resistance.

**PEM COOL WIRED:** Encapsulated coopered steel spring wire for vacuum resistance and bend availability.

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**REGULATIONS**

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.

Meets or exceeds operating requirements of SAE J20 R1.

**TECHNICAL SPECIFICATIONS**

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	16.2	234.4	48.5	703.3
13	1/2	4.30	0.17	9.7	140.6	29.1	421.7
19	3/4	4.30	0.17	7.3	105.4	21.8	316.1
25	1	4.30	0.17	5.9	85.6	17.7	256.7
32	1 1/4	4.30	0.17	4.9	70.8	14.7	212.5
38	1 1/2	4.30	0.17	4.3	62.2	12.9	186.5
45	1 3/4	4.30	0.17	3.8	54.7	11.3	164.0
51	2	4.30	0.17	3.4	49.7	10.3	149.1
57	2 1/4	4.30	0.17	3.2	45.7	9.5	137.0
63	2 1/2	4.30	0.17	2.9	42.3	8.8	127.0
70	2 3/4	4.30	0.17	2.7	39.1	8.1	117.2
76	3	4.30	0.17	2.5	36.5	7.6	109.5
80	3 1/8	4.30	0.17	2.3	33.6	7.0	100.8
90	3 1/2	4.30	0.17	1.9	27.8	5.7	83.2
100	4	4.30	0.17	1.7	23.9	5.0	71.8

**PROPERTIES**

**Silicone properties**

The inner peroxide silicone rubber compound is an organopolysiloxane mixture. The typical properties of this silicone are listed below:

Property	Method	Unit	Value
Hardness	ISO 868	Shore-A	70±5
Specific gravity	ISO 2781	g/cm <sup>3</sup>	1,24±0.02
Tensile strength	ISO 37	MpA	>7
Elongation at break	ISO 37	%	>200
Tear Strength	ISO 34	kN/m	>19

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**Fabric properties**

The typical properties of the polyester mesh fabric are:

Property	Method	Unit	Value
Weight	ISO 3801	g/m2	145±5%
Thickness	-	mm	0.45±0.05
Break strength (length)	ISO 13934-2	N	>500
Break strength (width)	ISO 13934-2	N	>450
Break elongation (length)	ISO 13934-2	%	>60
Break elongation (width)	ISO 13934-2	%	>60



**LIMITATIONS**

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

This type of tube is not recommended for applications with negative pressure (vacuum), excepts Vena® PEM COOL WIRED alternative.