

# TRANSFORMER CONSERVATOR MEMBRANE (TCM) AIR-CELL



SEI designs TCM Air-Cells to be used inside cylindrical, elliptical, octagonal or rectangular shaped conservator tanks. The TCM Air-Cell floats in oil inside the conservator and expands/contracts by breathing through a flange placed in a customer-specified location, thus allowing the TCM Air-Cell to compensate for oil displacement due to temperature variations in the transformer.

The TCM Air-cell also acts as a barrier to separate undesirable elements in the atmosphere, such as water vapour, nitrogen, ozone and oxygen, from transformer oil within a conservator. This barrier also reduces condensation and oxidation inside the transformer and suppresses gas bubble formation in the transformer oil.

SEI custom fabricates each TCM Air-Cell to fit a client's specific conservator tank. All SEI TCM Air-Cells are designed to meet ANSI/IEEE C-57.12.80-1978, Sec: 6.5.5 standard. SEI specializes in quick delivery for custom TCM Air-Cells to meet the demands of field service operators.

## FABRIC

TCM Air-Cells are constructed from Temp-Shield™ 30 oz. (1017 g) urethane elastomer-coated nylon fabric that has been specifically designed to be compatible with transformer oils, silicon fluids and bio-degradable transformer oils. The fabric is highly abrasion-resistant and is extremely flexible, ensuring a long-term airtight barrier. Temp-Shield™ has a high temperature resistance (up to 130 degrees Celsius) and can be used in extreme low temperature settings up to -50 degrees Celsius. Temp-Shield's nylon substrate also stretches, offering protection against over pressurization or vacuum during installation.

## DESIGN

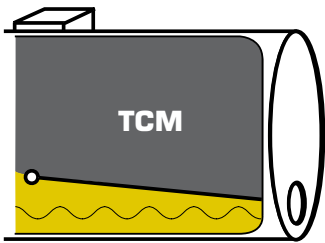
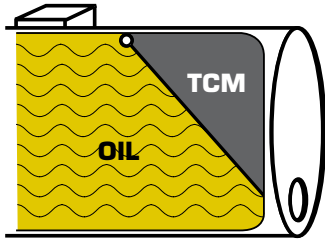
SEI offers a selection of standard TCM sizes. All seams are radio frequency welded and seam sealed then tested to insure seam strength and a long-term airtight barrier.

A flange is inserted into each TCM Air-Cell. This flange provides a point of entry allowing the TCM to act as a breather. Flanges can be located anywhere on the Air-Cell to match conservator tank design. SEI offers a variety of standard aluminum flanges.

Each TCM Air-Cell comes complete with hoops or handles that are used during deployment. These loops are also used to secure the Air-Cell to the conservator tank. SEI will place the handles according to your conservator tank design.

Each TCM Air-Cell is individually marked for identification to enable easy inventory tracking.

# Transformer Conservator Membrane Air-cell



When oil inside the conservator is at a high temperature, the TCM deflates. Likewise, when the oil is at low temperature, the TCM inflates with air.

	STANDARD	METRIC	ASTM TEST METHODS
<b>BASE FABRIC</b>			
Base Fabric Weight	13.0 oz/yd <sup>2</sup>	440 g/m <sup>2</sup>	
Fabric / Style	Nylon		
<b>COATED FABRIC</b>			
Total Weight	30.0±3.0 oz/yd <sup>2</sup>	1017±100 g/m <sup>2</sup>	
Coat Type	Polyester Polyurethane		
Thickness	32 Mil		
<b>MATERIAL PROPERTIES</b>			
Max. Operating Temperature	248 °F	120 °C	
Min. Operating Temperature	-58 °F	-50 °C	
Tensile Strength, Warp/Fill	696/616 lbs/in	600/540 DaN/5 cm	D751
Peel Adhesion	107 lbs/in	93 DaN/5 cm	
Tongue Tear	44/36 lbs	195/160 N	
Elongation	44%/25%		D751
Abrasion (per 100 cycles)	3.5 x 10 <sup>-5</sup> oz	9.9 x 10 <sup>-4</sup> g	D3389
Hydrostatic Resistance	12.7 psig	87 kPa	D751
Pressure Rating	5.8 psig	40 kPa	D751
Seam Strength	640/667 lbs/in	560/580 DaN/5 cm	D751
Permeability to N <sub>2</sub>	4.14 x 10 <sup>-17</sup> (cc/cm <sup>2</sup> s cm HG)		D1434
Permeability to O <sub>2</sub>	5.74 x 10 <sup>-17</sup> (cc/cm <sup>2</sup> s cm HG)		

## OPTIONS

- SEI can design and manufacture TCM Air-Cells to exact conservator tank size specifications and oil volume levels.
- SEI can design and fabricate custom flanges to meet specific conservator tank designs.
- SEI can offer alternate handles or securing tabs to meet bar or hook conservator tank attachment points.
- SEI specializes in quick delivery of custom TCM Air-Cells to meet the demands of field service operators. When required, SEI can engineer and manufacture a new Air-Cell in as little of 24 hours from an approved drawing or from a damaged tank.

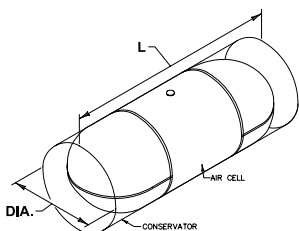
## STANDARD FLANGES



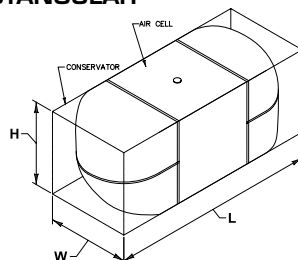
## HANDLE



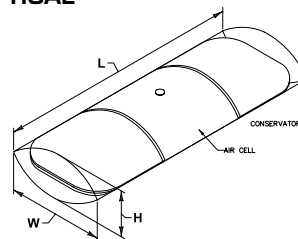
## CYLINDRICAL



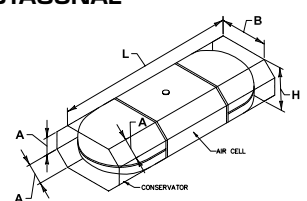
## RECTANGULAR



## ELLIPTICAL



## OCTAGONAL



Please include the dimensions of your TCM when placing your order.