

TRP SERIES

Thermal Runaway Protection Pad

Saint-Gobain® Norseal® TRP Series is manufactured by **Saint-Gobain** Performance Plastics Corporation, Tape Solutions business, and comes with a soft, compressible pad that is intended to provide a high degree of protection against battery thermal runaway event. TRP Series keeps pouch/prismatic cells under a defined range of compression throughout the life of the battery pack. The thermal cushioning of TRP protects adjacent cells from going exothermic and helps prevent the propagation of a thermal event from one cell to another.

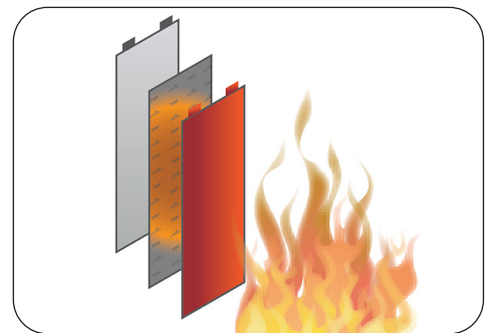
Norseal TRP is a homogeneous, soft, compressible material that is supplied either in rolls or sheets, making it very safe and easy to handle for assembly processes.

Norseal TRP is specially intended to provide the following features:

- Minimize thermal runaway event by protecting adjacent cells, thereby preventing a cascading event
- Predictable Compression Force Deflection behavior across a wide temperature range and throughout the life of the product
- Excellent compression set resistance

Available Sizes

Standard thickness: 2.0, 3.2 and 4.78 mm



APPLICATIONS

- Compression pads for pouch cell battery packs
- Cushioning pads for hard shell cell battery packs
- Pads between modules to contain thermal runaway event

Norseal TRP Series — Properties

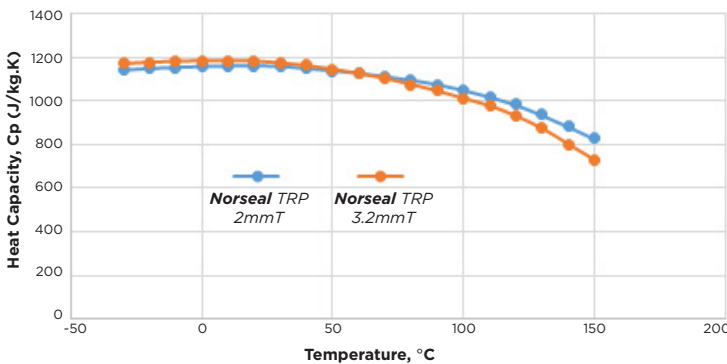
Performance tests are run using standard test procedures. The values presented are typical values and should not be used for specification purposes.

Property	Test Method	Typical Value
Color	-	Blue
Thickness, mm (in)	-	2.0 (0.078), 3.2 (0.125), 4.78 (0.188)
Areal Density (for 3.2 mm thickness), kg/m ² (lbs/ft ²)	-	1.02 (0.21)
Compression Force Deflection, kPa (psi) @ 25%	ASTM D1667	76 (11)
Compression Force Deflection, kPa (psi) @ 50%	ASTM D1667	170 (25)
Compression Set, %	ASTM D1056	5
Thermal Insulation (R-value), K.m ² /W(h.ft. ² °F/Btu.in)	ASTM C518	0.33 (1.9)
Temperature Range (conservation of mechanical properties), °C (°F)	Internal	-50 - 200 (-58 - 392)
Dielectric Strength	ASTM D-149	85 (V/mil), 3.4 (kV/mm)
Flammability (UL File E57750)	UL94	Pass V-0, 5VA

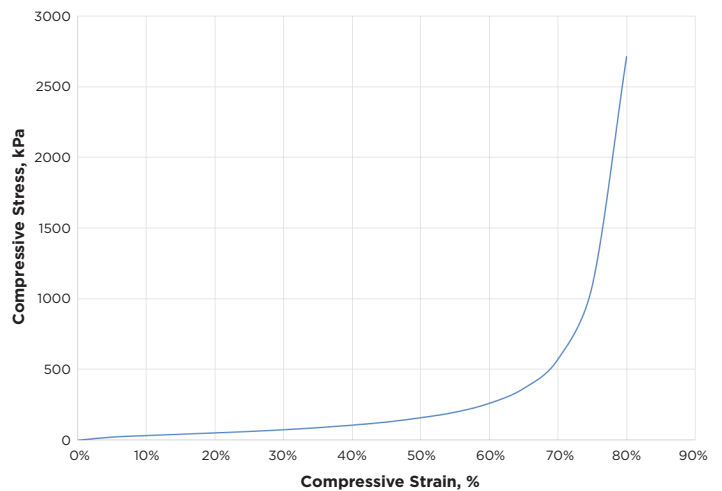
Thermal Conductivity vs. Compression Rate (for 3.2mmT material)

% compressed	Thermal Conductivity
	W/mK
0	0.09
27	0.09
53	0.12

Specific Heat Capacity vs. Temperature



Typical Compression Force Deflection Curve



Important Instructions

Because **Saint-Gobain** cannot anticipate or control every potential application, we strongly recommend testing of this product under individual application conditions prior to commercial use.

Shelf Life

120 months from date of shipment for base material when stored in original packaging at temperatures up to 70°F (21°C), < 50% relative humidity, and away from direct sources of heat and direct sunlight. (See the applicable data sheets for pressure sensitive adhesive options).

IMPORTANT: It is the user’s responsibility to ensure the suitability and safety of Saint-Gobain products for all intended uses and that the materials to be used comply with all applicable regulatory requirements. Saint-Gobain assumes no responsibility for any product failures that occur due to your actions or inactions, including your use, design, fabrication or application of the products into which the materials are incorporated.

WARRANTY: This document should not be considered a warranty or a guarantee. The descriptions of the Product provided hereinabove may vary based on specifications requested and testing protocols. Typically, Saint-Gobain warrants that product(s) will meet mutually agreed specifications at delivery and Saint-Gobain honors any breach of warranty claims for six (6) months from delivery of the products. If a product is determined to be nonconforming with its warranty, Saint-Gobain’s sole obligation is, at its option, to either replace the nonconforming products or reimburse the purchase price for the same.

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