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HYDRA Thermal Runaway Shield (TRS) Data Sheet

Characteristics

Property		Benefits
Bulk density	0.7 g/cc	Low mass
Areal density	0.13 g/cm ²	
Electrical conductivity	Surface nonconductive	No leakage currents from the battery
Thermal conductivity (x-y)		Enhanced version provides heat-spreading function
Standard version	0.4 W/m ² /K	
Enhanced version	25 W/m ² /K	
Phase transition temperature	100C	Good margin for thermal runaway shielding
Specific heat	3.0 J/g/C (up to 100C)	Increased system thermal inertia
Thermal energy dissipation	1700 J/g at 100C	High thermal dissipation per mass
Hardness	NA, pliable	Amenable to various cell arrangements Tolerant of battery pack dimensional variations
CTE	NA, pliable	Minimal mechanical stress coupling
Damage on freezing	None	Tolerant of cold temperatures

Resistance to Propane Torch in Open Air		
Standard version	19 sec. for back face to reach 100C	Good resistance
	No sustained combustion after heat source removed. Cooled to 40C in 1 min.	Fire safety
Enhanced version	54 sec. for back face to reach 100C	Excellent resistance
	No sustained combustion after heat source removed; cooled to 60C in 1 min.	Fire safety
Durability and Reliability Envelope material Mullen burst = 57 psi. Seal strength = 12 lb./in. Assembled TRS's currently being evaluated under normal conditions of use.		

Example Performance of the HYDRA TRS

