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Synergism at Work

TECHNICAL DATA SHEET – sav*E*® OM 53

sav*E*® Phase Change Materials (PCM) are organic or inorganic chemical compounds that have large amount of heat energy stored in the form of Latent Heat which is absorbed or released when the materials change state from solid to liquid or liquid to solid. The PCM retains its latent heat without any change in physical or chemical properties over thousands of cycles. Various specific temperature savE® PCM's are commercially available (-33^0C to $+89^0$C) depending upon the applications.

Applications

PCM provides energy efficient solutions for many industries including:

- Insulation for Building and Piping Products
- Biopharmaceutical Transportation
- Telecommunications and Heat Sinks
- Hot and Cold Storage
- Food / Poultry / Milk Products Transportation
- Boiler and Hot Water Systems Industry looking to exploit Off-Peak Electricity Tariffs / Reducing Chilling Equipment Costs by Storing Energy at Off-Peak Hours

However there is no limit as to who can apply PCM technology to their operation, to improve thermal management, cost and energy efficiencies.

PLUSS® Encapsulation

Pluss® pioneered the use of HDPE panels as encapsulation for PCMs in India. Our calculations for total heat transfer across thin membranes show that HDPE/ PP is as good as aluminum, stainless steel, etc. Pluss® encapsulations are thin enough to give good overall heat transfer coefficient with good mechanical strength.

***savE*® - OM 53**

savE® - OM 53 is an organic chemical based PCM having melting temp. of 53^0C. It stores thermal energy as latent heat in its crystalline form. On changing phase, this latent heat is released or absorbed, allowing the ambient temperature within the system to be maintained.

savE® - OM 53 is constituted of the right mix of various salts, additives and nucleating agents allowing equilibrium between solid and liquid phases to be attained at the melting point. The sav*E*® OM 53 is free flowing in molten state and can be encapsulated in various forms .

Why *savE*® OM 53?

savE® - OM 53 has a phase change temperature of 53^0C , a temperature that makes it ideal for several heating/cooling thermal energy applications. Some of its salient features include:

- The salt is chemically and thermally stable by using PLUSS® proprietary additives
- Mixture of organic compounds .

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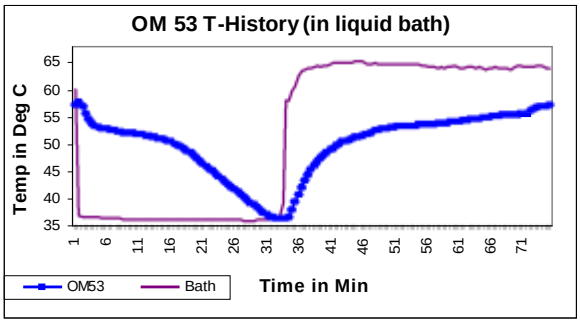
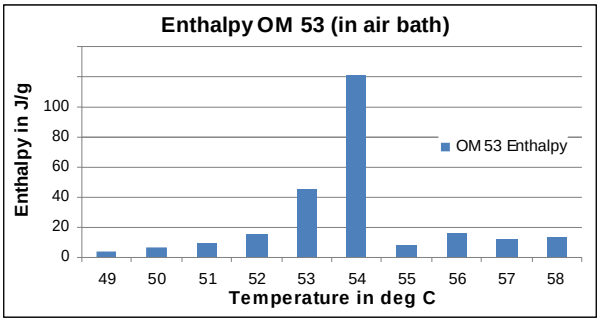
Technical Specification:

Product	: *savE*®
Series	: OM 53
Description	: Mixture of Organic materials
Appearance	: White waxy Solid (below 53^{0}C)

T-History Test



T-History graph *savE*® OM 53



Enthalpy Vs Temp *savE*® OM 53

A 30g sample is taken in a test tube in molten condition and placed in a temperature controlled bath. A temperature sensor is placed in the test tube and bath to record the temperatures using a datalogger. The bath (liquid bath) is maintained at around 36 ^{0}C during the freezing cycle and at around 62^{0}C (air bath) during the melting cycle.

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Property	Value*	Test Method	Test Conditions (if any)
Freezing Temp. (^{0}C)	53	PLUSS® T - History	@ 36 ^{0}C (liquid bath)
Melting Temp . (^{0}C)	54	PLUSS® T - History	@ 62 ^{0}C (air bath)
Latent Heat (kJ/kg)	250	PLUSS® T - History	From 48 to 57 ^{0}C
Liquid Density (kg/m^3)	0.87	ASTM D891-95	@ 63^{0}C
Solid Density (kg/m^3)	0.91	PLUSS® Internal	@ 30^{0}C
Liquid Specific Heat (J/g.K)	2.3 to 2.4	Theoretical Value**	--
Solid Specific Heat (J/g.K)	1.6 to 1.7	Theoretical Value**	--
Thermal Conductivity (W/m.K)	N.A.	--	For Liquid
Thermal Conductivity (W/m.K)	N.A.	--	For Solid
Base Material	Organic	-	-
Congruent Melting	Yes	-	-
Flammability	Combustible at high temperature		-
Thermal Stability (cycles)	Under test	PLUSS® Internal	-
Max.Operating Temp. (^{0}C)	~80	-	-

*- Nominal Values. Actual values lie in a range. Consult test certificate for details.
** - Calculated from literature value

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