

TECHNICAL DATASHEET

PRODUCT DESCRIPTION

Phase Change Materials (PCM) are organic or inorganic chemical compound that store large amount of thermal energy as Latent Heat which is absorbed or released when the materials change state from solid to liquid or liquid to solid. The latent energy during the phase change can be used to store the energy obtained from a source and can be released later when needed. A Phase Change Material retains its latent heat without any change in physical or chemical properties for over thousands of thermal cycles of freezing and melting.

With high energy storage density, Phase Change Materials can be packaged in HDPE or LDPE bottles or pouches, metallic encapsulations and used after conditioning them for the required action of absorbing or releasing energy.

PCM IP39

The PCM IP39 is a positive inorganic phase change material useful for applications involving low temperature requirements. The properties of IP39 make it suitable to be used for applications involving medicine, vaccines and bio-medical transport applications, building thermal comfort etc. PCM IP39 is used for shipper boxes for controlled temperature transport providing suitable temperature range for long hours in tough ambient conditions.

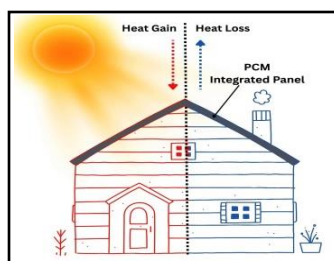
KEY FEATURES

- High heat storage capacity
- Consistent performance over repeated thermal cycles
- Non-toxic and biodegradable

TYPICAL APPLICATIONS



Medicine and Vaccine transport



IP39				
Sr. No.	THERMOPHYSICAL PROPERTY	NOMINAL VALUE	UNIT	TEST METHOD
1	TEMPERATURE RANGE			
	MELTING	(32) to (42)	°C	T-History Method
	FREEZING	(23) to (29)	°C	T-History Method
2	LATENT HEAT			
	MELTING	190*	kJ/kg	T-History Method
		170 (35) to (41)		
FREEZING	215*	kJ/kg	T-History Method	
3	SPECIFIC HEAT			
	LIQUID	4.27	kJ/kg-K	T-History Method
	SOLID	4.13	kJ/kg-K	T-History Method
4	DENSITY			
	LIQUID	1680-1800	kg/m ³	ASTM D891-95
	SOLID	1200-1250	kg/m ³	ASTM D792-08
MAX OPERATING TEMPERATURE 80°C				

* The Latent enthalpy values are corresponding to the temperature range shown in Sr. No. 1

** The above values are nominal values based on calculation methods formulated in-house. Actual property values for the produced batch shall be provided with the certificate of Analysis. The properties in PCM batches are acknowledged to be within $\pm 2\%$ of the nominal values presented above.

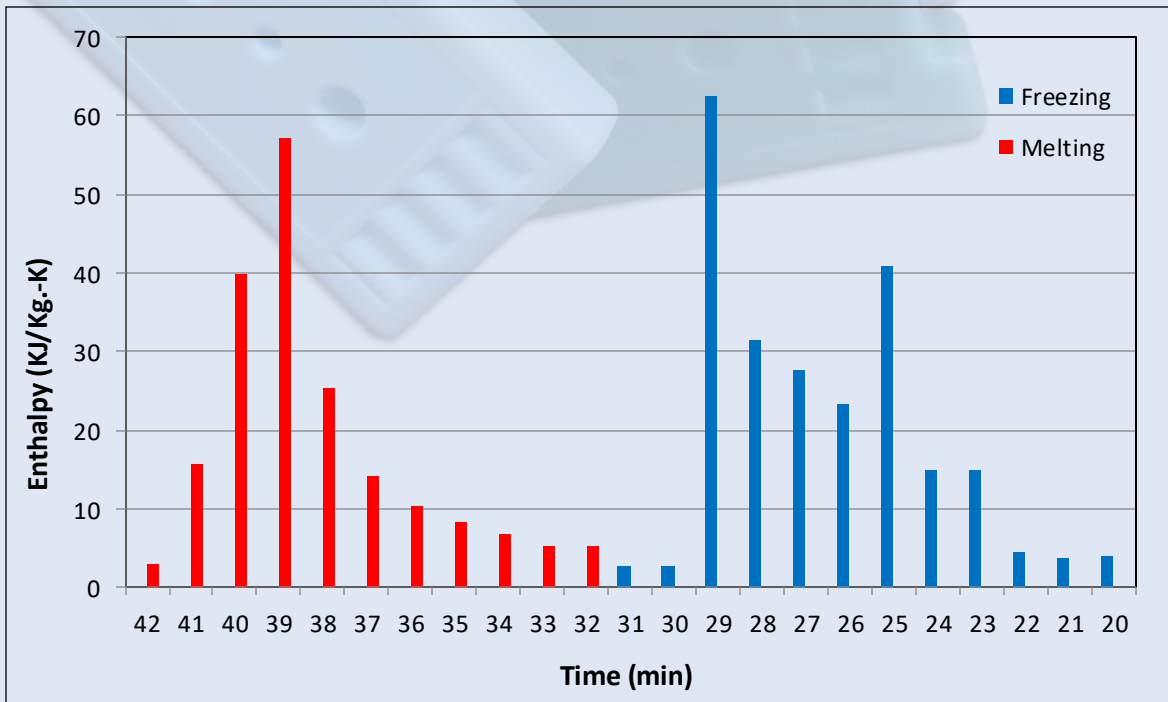


Figure 1: Enthalpy of IP39 against temperature

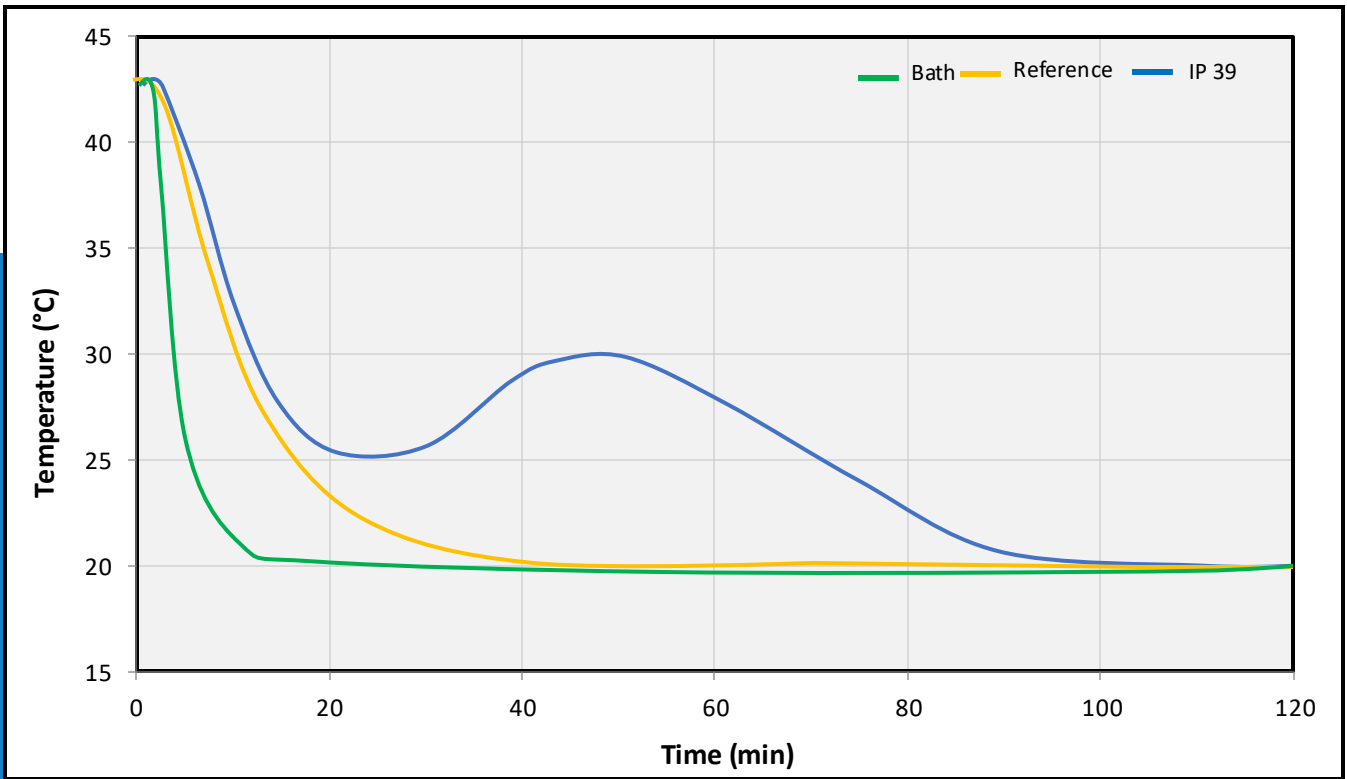


Figure 2: Freezing Curve of IP39

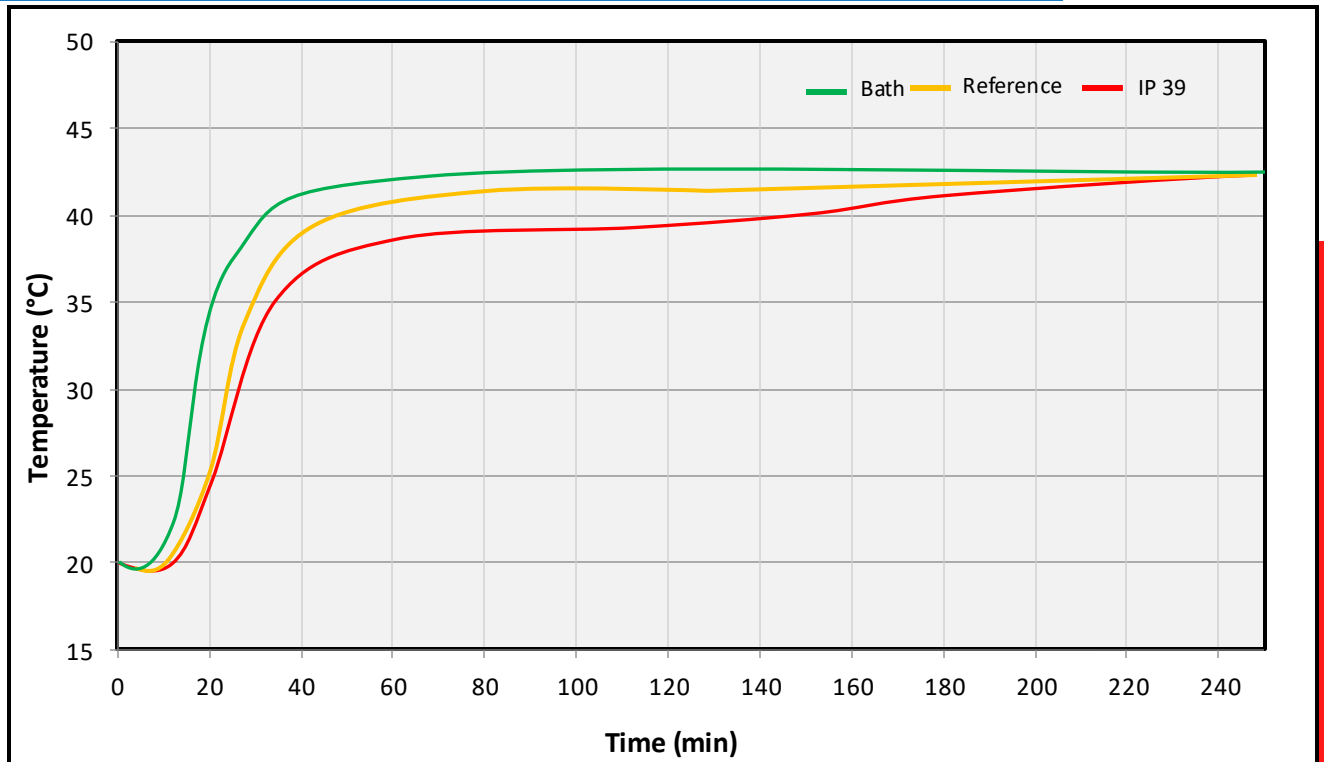


Figure 3: Melting Curve of IP39

ENCAPSULATIONS

The PCM IP39 can be encapsulated into HDPE bottles, LDPE pouches, HDPE drums or metallic encapsulations which are leak-proof and comply to food grade standards.



Sr. No.	Size (mm)	Vol (mL)	Qty per bottle (gm)	Colour
1	160 x 110 x 30	400	650	Yellow, White

**Other colour and sizes can be made available on demand*



Sr. No.	Capacity (kg)	Colour
1	20	Blue
2	50	Blue
3	250	Blue

**Other colour and sizes can be made available on demand*



Sr. No.	Size (mm)	Qty (gms)	No. of cells	Colour
1	610 x 157	2640	4-celled	White
2	495 x 157	1980	3-celled	White
3	457 x 157	1620	3-celled	White

**Other colour and sizes can be made available on demand with or without multi-cell pouches*

Disclaimer: The thermophysical properties indicated in this datasheet are based on the methods formulated in-house and should be used for thermal calculations pertaining to the specific application. It is highly recommended to users to test the material for their specific design and provide acceptance regarding suitability of the product to their use case. This information provided herein is subject to change without any prior notice in view of continuous improvement in product development. All information regarding usage and handling of the product shall be conveyed in documented form on request for bulk orders. This publication is exclusive right of B P Refcool, which forbids any reproduction and disclosure without its express consent. All care has been taken to ensure that the prices and information were correct at publication, however, B P Refcool takes no responsibility for their use. B P Refcool reserves the right to apply any change at any time and without notice.