

## Phase Change Material PCM 00P

**PCM 00P** is an inorganic chemical based PCM having a phase change temperature of 0°C. It stores thermal energy as latent heat in its crystalline form. During the phase change, this latent heat is released or absorbed while the temperature remains within a range of +/- 5°C.

### Why PCM 00P?

PCM00P is encapsulated with 400ml and 600ml bottles to be used as Cool-Packs in temperature control applications of +2 °C to +8°C.

In hot environments, savEnrg™ Cool-Packs are FROZEN at -5°C. During shipping, the PCM in the Cool-Packs change phase at 0°C, maintaining temperatures of 2-10°C inside the box.

In cold environments with sub-zero temperatures, savEnrg™ Cool-Packs are chilled by refrigeration at around +8°C. During shipping, the PCM in the Cool-Packs change phase at 0°C, maintaining temperatures of 2-5°C inside the box.

Specific calculations determine necessary sizes and quantities of TSM4 and/or TSM 6 bottles.

### Performance Test

To measure the efficiency of **PCM 00P in the TSM4 and TSM6 bottles**, a test was conducted. The bottles were charged (frozen) in a conventional freezer.

### Test Method

The charged packs with **PCM 00P** were kept in two types of insulated boxes. The boxes were exposed to ambient temps. The temperature inside the box and corresponding ambient temperatures were logged with respect to time.

### Test Conditions

Box "A"	
Size (L x W x H)	16" x 12" x 12"
Insulation thickness	2" inch
Insulation material	EPS Panels
TSM6 container size (L x W x H)	165 x 95 x 35mm
PCM quantity	1.0 kg (in 2 TSM6)
Box "B"	
Size (L x W x H)	13" x 13" x 10"
Insulation thickness	2" inch
Insulation material	PUF molded
TSM4 container size (L x W x H)	190 x 120 x 36 mm
PCM quantity	0.3 kg (in 1 TSM4)

## Test Results and Discussions

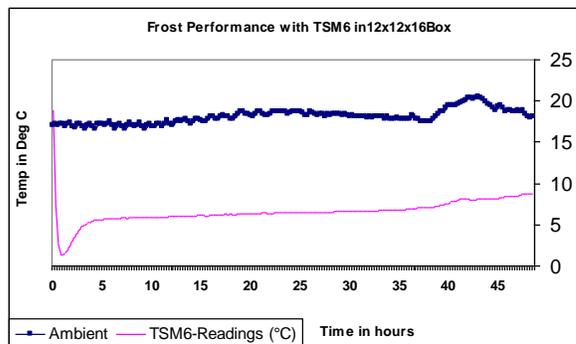


Fig. 01: Test result for PCM 00P in Box "A"

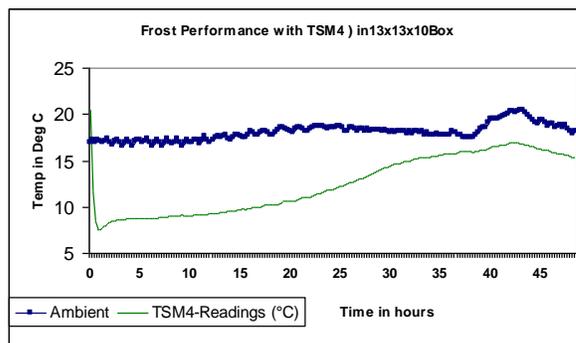


Fig. 02: Test result for PCM 00P in Box "B"

## Conclusion

1. Temperature in the box was +2°C to +8°C for approximately 45 hours in Box "A" and approximately 20 hours in box "B".
2. Size and insulation of the cooling box play an important role in the performance of savEnrg™ Cool-Packs.
3. In both boxes, the savEnrg™ Cool-Packs maintained stable temperatures for long hours.
4. By estimating the ambient temperatures, choosing the proper box size and insulation, the necessary size and quantity of savEnrg™ Cool-Packs can be calculated to maintain the desired temperature for the desired time.
5. Shipping boxes with savEnrg™ Cool-Packs can assure required shipping temperature control while optimizing packaging and conserving shipping costs.

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