Best Practices

- Prep the PCM (phase change material) panels before use according to one of the described methods provided by VeriCor.
- Ensure all components are clean and free of damage.
- Lay panels flat when turning them solid (to disperse liquid throughout the panel).
- Enable ample air flow around all panel sides.
  - Use spacers (pencils) or racks.
- Freezing/melting times vary depending on number of panels being prepped and equipment being used.
- Assemble using all six panels for maximum hold time.
  - Using less panels does not change the holding temperature, but does decrease the hold time.
- Panels are reusable (10,000+ cycles).
  - End-of-life disposal: Panels are a plastic #2, typically recycled by businesses/communities. PCM is nontoxic and readily biodegradable.
- Use a calibrated data logger or other temperature monitoring device to observe internal temperature.
- Avoid unnecessary opening of the Cool Cube™ after loading payload. Opening of the Cool Cube™ will decrease hold time.
- An infrared temperature thermometer can assist in ensuring the panels reach a safe pack-out temperature (good for finding out the approximate temperature of each panel).
- The farther the ambient temperatures are from the melting point, the quicker PCM will change states (solidify/liquefy).

Remove PCM Panels
Prep PCM Panels
Assemble PCM Panels
Pack-Out Product
Close Bag/Case

Various methods based on type of panel, equipment available & purpose.
Cool Cube™ Refrigerator PCM Panels
for vaccine, blood, medicine & more.

Panel Prep

2.1 Lay panels flat in a freezer until all the PCM (phase change material inside the panel) turns solid. At -15°C/5°F the PCM will solidify in a couple hours.

2.2 Transfer panels into a room temperature environment just before use to allow the PCM inside to rise to the optimal 1°C. Approximate times:
- "03" size = 5 minutes
- "08" size = 10 minutes
- "28" size = 15 minutes
- "96" size = 20 minutes

2.3 Wipe off condensate & shake. After frost turns to condensate, the panel is above 0°C. Shake panels to verify that the PCM is completely solid. If liquid is heard, re-freeze (Step 2.1) and proceed. Using liquid PCM decreases the hold time considerably.

*** After Step 3 (before pack-out), insert a thermometer and close to monitor when the Cool Cube™ gets to the 1°C mark. If below the 1°C mark, wait until it warms up to 1°C before packing out. To speed up the process, transfer panels into a room temperature environment for a couple of minutes and re-check. Pack-out at 1°C will ensure a maximum hold time between 1° and 6°C.

DO NOT assemble panels directly from a freezer, as they may be initially below 0°C.

Prep Method E: Freezer/Room Prep to maintain 1-6°C

PCM Panel Shake Test

Fridge Temp PCM Physics
Cold 3°C (37.4°F) 6°C (42.8°F)
Solid Solid/Liquid Combination 4.5°C (40.1°F) Solidifying/Melting Pt.
Warm 6°C (42.8°F)
Liquid

ISTA 7D Thermal Performance Study
Lab-Qualified Hold Times When Starting with Solid PCM

<table>
<thead>
<tr>
<th>Qualified Temps:</th>
<th>2-8°C</th>
<th>1-6°C</th>
<th>1-10°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool Cube™ 03</td>
<td>Utilizing Six (6)</td>
<td>65 hrs</td>
<td>39 hrs</td>
</tr>
<tr>
<td>Cool Cube™ 08</td>
<td>Refrigerator Temp</td>
<td>76 hrs</td>
<td>53 hrs</td>
</tr>
<tr>
<td>Cool Cube™ 28</td>
<td>PCM Panels (Blue Tab/Label)</td>
<td>103 hrs</td>
<td>68 hrs</td>
</tr>
<tr>
<td>Cool Cube™ 96</td>
<td></td>
<td>126 hrs</td>
<td>112 hrs</td>
</tr>
</tbody>
</table>

Times listed are based on lab validated, 24-hour cycles of a summer profile (hot ambient temperatures) without the additional thermal mass of a payload, which if conditioned properly, will improve hold times. Actual performance times may vary.

For Technical Support Call (608) 526-6901