

Application Note – Thermal Energy Storage Solution (TESS) for Cold warehouse

Technical specifications of TESS

System Components -

- 1) Thermal Battery stack with the appropriate structure – A Thermal battery stack consists of 15 PCM(Phase Change Materials) modules. A PCM module has a thermal capacity of 153 kJ. The total weight of the thermal battery stack would be 15 kg.
- 2) Fixtures to mount Thermal battery stack: A set of three thermal battery stacks can be mounted using two standard fixtures which has a foot print of 7.8 sq.ft.

Schematic diagram of system -

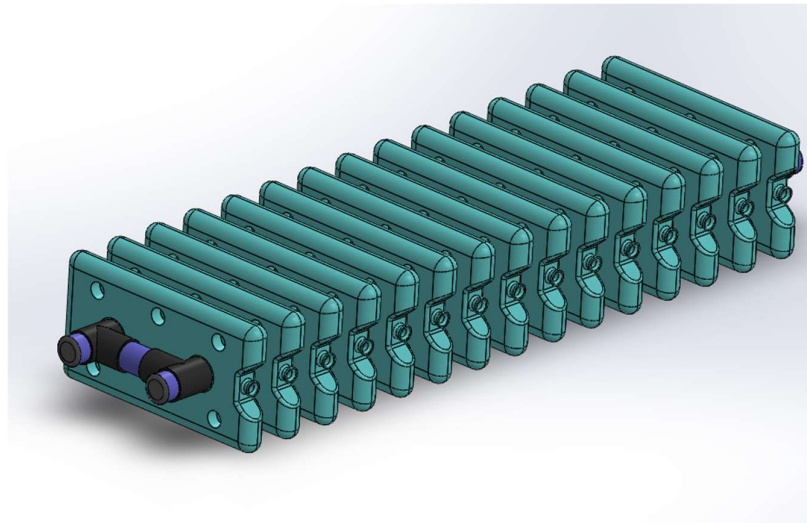


Figure 1: Representation of one Thermal battery stack.





Figure 2: Actual representation of TES system in a warehouse.

Description of system -

- When the refrigeration system turns on, the cold air temperature in the room should be minimum of +20°C. The Thermal battery stack starts getting activated/charged during this period.
- During power outage when the refrigeration system turns off, the temperature of the air will starts raising above +22°C. However, the Thermal battery will respond to the temperature increase as soon as the room temperature reaches +24°C.
- It is recommended that the two fans which are installed in the room are provided with an Inverter backup, so that there is sufficient convection in the room.

Note: The TES heat exchanger System is proprietary design of Pluss. The design will ensure the efficient charging and discharging of the PCM. The system can be also designed for minus temperature cold rooms too with required changes in the Phase Change Materials and the thermal battery stack design.