

Solar Cold Storage – Precooling + Staging Application

Powered with hybrid ice technology

This cold storage works on hybrid ice technology with features such as fast cooling, cooling backup from thermal energy storage for non-solar hours and no requirement of electric batteries to power the compressor. Using the hybrid ice technology, compressor and thermal energy storage work in tandem to boost the cooling performance.

This cold storage is ideal for short term storage and aggregation of the fruits, vegetables, flowers, and other perishable commodities at the farmgate level. The system can also be utilized as a ripening chamber for fruits.

The entire system is automatic and doesn't require user intervention. The solar integration is jointly developed in partnership with National Institute of Solar Energy, Government of India.



Features

FLEXIBLE CONFIGURATION

Can retrofit to existing system;
Large capacity systems feasible with multiple refrigeration units

0 to 15 °C TEMPERATURE RANGE

World's one of the few solar cold storage based on thermal energy storage with wide temperature applications

SITE & USAGE OPTIMIZED SIZING

Sizing of compressor, solar panels & energy storage is optimized for site & usage conditions

MUTI CHAMBER

Same system can have 2 chambers with different temperature set points

Specifications

Description	5 MT	8 MT	20 MT
Internal storage volume	750 cubic feet	1200 cubic feet	3000 cubic feet
Temperature range	4 to 15 °C 0 to 8 °C (optional)	4 to 15 °C 0 to 8 °C (optional)	4 to 15 °C 0 to 8 °C (optional)
Cooling backup capacity	200 MJ	250 MJ	550 MJ
Precooling capacity per day	500 kg	800 kg	2000 kg
Compressor	2 to 2.6 TR	3 to 3.5 TR	5 to 6 TR
Solar photovoltaic panels	5 to 6 kWp	8 to 10 kWp	14 to 18 kWp
Multiple chamber options	1 & 2		
System configuration	Indoor: on-site assembly Outdoor: containerized or on-site assembly		Indoor: on-site assembly

Notes:

1. All performance data is based on 5 kWh/m²-day of global solar horizontal irradiance and standard operating conditions
2. Cold storage capacity is indicative and commodity dependent
3. Precooling capacity is defined as cooling of the incoming material from 30 °C to 7 °C
4. Alternate power supply such as grid backup is strongly recommended for system operations during cloudy conditions
5. Cold storage capacity other than the mentioned sizes are possible and can be designed as per requirement
6. Rendered picture shown in the brochure is representative in nature

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Advantages over other 5 MT solar cold storage

Parameters	Inficold	Competition	Inficold advantages
No. of chambers with independent temperature	2	1	Can store multi commodities at different temperature in 2 chambers
Temperature range	4 to 15 °C (standard) 0 to 8 °C (optional)	4 to 15 °C	Wider commodity storage possibility
Solar photovoltaics	5.4 kWp (standard) 6 kWp (optional)	5 kWp	1.08 times solar output due to bigger solar panels
Solar photovoltaics make	Tier 1 brands	Tier 3 unknown brands	Better quality and reliability
Compressor	2 HP (standard) 3 HP (optional)	1.5 HP	1.34 times compressor
Solar structure tilt	11 degrees	No tilt	1.1 times solar output due to tilt
Solar output on a sunny day	18.9 kWh/day	16.2 kWh/day	1.2 times overall solar output
Quantity of phase change material for ice energy storage	1100 kg	366 kg	3 times energy storage
Electrical battery capacity	4800 Vah (standard) 7200 Vah (optional)	2400 Vah	2 times battery capacity
Electrical battery discharge rating	C10 (10% of capacity)	C20 (5% of capacity)	Longer battery life
Electrical battery OEM warranty	5 years	3 years	1.67 times battery OEM warranty
Electrical battery make	Exide / Amaron / Okaya	Unknown brands	Better quality and reliability
Axial fans	Brushless	Carbon brush	10 times longer life
Condenser construction	Copper	Aluminium	3 times longer life
Roof water proofing	Steel roofing	Plastic tape	No chances of water leakage
Ice energy storage capacity measurement	Quantity	Temperature	Accurate measurements improve energy efficiency and operational planning
Technology development	Jointly developed with National Institute of Solar Energy, Govt of India	None	Technology developed in public private partnership model
Integration with existing cold storages	Yes	No	Retrofit existing cold storage
Solar refrigeration kit for channel partners to integrate with their own solar PV and PUF panels	Yes	No	Lower cost Promote entrepreneurship