

Building Efficient Infrastructure for Fresh Produce



Cold Chains
A discussion

By

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Cold Chain

- A **cold chain** is a temperature controlled Supply Chain. An unbroken cold chain is an uninterrupted series of storage and distribution activities to ensure that the product being transported is maintained at a given temperature range. It is used to extend and to help ensure the shelf life to deliver safe and quality perishables to consumers.



Cold Chain is needed to...

- Enable Progress- to improve the way we feed City populations primarily- be in a better position to make available out of season products
- Reduce waste and be in a better position to meet increasing demand without increasing waste
- Enable export opportunities by leveraging on India's natural resources and change Global Supply footprint
- Create and Re-distribute wealth- by creating new job & entrepreneurial opportunity
- Improve quality of life by reducing food borne illness / contamination
- On a macro level, Cold Chains can spur measurable GDP growth in the Agricultural sector

Cold Chain is needed to...

- Export calls for long distance movements, while processing calls for long term storage. Cold Chain is needed to support both these primary needs.
- On the domestic front, in an ideal state, retailing in the modern format needs distributed sourcing, centralised holding and dispatch followed by de-centralised sales.
- Such cold chain distribution process is quality driven -often subject to validation by regulators or customers to ensure that there is no negative impact to the safety, efficacy or quality of the food / drug product. All processes that might impact the safety, efficacy or quality of the substance must be validated, including condition of storage and distribution of the product. This impacts injection of technology to an otherwise traditional sector.

Temperature control, an important fundamental requirement

- Temperature control, an important fundamental requirement, is a process in which change of temperature of a space (and objects collectively there within) is measured or otherwise detected, and the passage of heat energy into or out of the space is adjusted to achieve a desired average temperature. Most food articles need to be pre-cooled to a predetermined temperature before any prolonged storage.
- All these Refrigerated storage facilities essentially consist of thermally efficient enclosures, provided with a carefully rated refrigeration system. Scientific storage and handling within the enclosure is ensured with a well designed racking system, compatible with the materials handling devices that are employed to operate within.

Typical Processing and Cold Storage Facility



**SAFAL FRUITS & VEGETABLES
MARKET, BANGALORE A/c. L & T
LTD. Cold Stores- both Frozen &
positive temperature**

Modern Refrigerated Retail Facility



METRO CASH & CARRY PVT. LTD. BANGALORE

**The entire insulated building envelope & Refrigerated areas
(Cold Stores- both Frozen & positive temperature)**

Modern Refrigerated Retail Facility



ADANI AGRI FRESH LTD.

**Controlled Atmosphere Cold
Storage with PEB For 3 stores
at Rohru, Sanij- Pheoj &
Rewali, Himachal Pradesh**

A typical food distribution centre



**RADHAKRISHNA
FOODLAND
Food Distribution
Centre at Kalamboli,
Navi Mumbai**

A typical commercial multi product cold storage facility



**SAVLA FOOD & COLD
STORAGE PRIVATE
LIMITED,
Turbhe, Navi Mumbai**

A typical retail outlet



HYPERCITY
Malad, Mumbai

Temperature control, an important fundamental requirement

- Decomposition (or spoilage) is often the consequence of exposure of the food article to a temperature higher than that at which the product suffers irreversible change for the worse. It is a cascade of processes that go through distinct phases.
- Insulated shipping containers are part of a comprehensive cold chain which controls and documents the temperature of a product through its entire distribution cycle. The containers are often equipped with a refrigeration system, sometimes coupled with a 'phase Change Material in packs. Normal ice, dry ice, Gel packs (often formulated for specific temperature ranges) are the typical Phase Change materials. Some products (such as frozen meat) have sufficient thermal mass to contribute to the temperature control when times and distances of travel are within limits. A temperature data logger is often enclosed to monitor the temperature inside the container for its entire shipment.



Temperature control, an important fundamental requirement

- Personnel throughout the cold chain need to be aware of the special handling and documentation required for some controlled shipments. With some regulated products, complete documentation is required.
- The use of “off the shelf” insulated shipping containers does not necessarily guarantee proper performance. Several factors need to be considered.
- In specifying an insulated shipping container, primary characteristics to look for are: type and efficiency of the insulating material used and the thickness of the insulating material. These two attributes determine the main functionality of this component of the cold chain.
- In all phases, one should give importance to the question of moisture balance of the stored and transported product.

Cold Chain – Current Scenario

- Specialists in design and testing of packaging for temperature sensitive products are often needed. These may be consultants, independent laboratories, universities, or reputable vendors.
- Cold Chain growth requires robust basic infrastructure, including un-interrupted power supply, better Road network, Port facilities and Air Cargo capabilities.
- It was anticipated that strong Export, widespread Food Processing and a robust Retail sector would spur the growth of Cold Chain Infrastructure in India. Such a growth has not been witnessed so far. What could be the reasons?
- Moreover, the present economic downturn poses new questions in regard to where this activity is headed.
- Industry is seeking answers to these basic questions presently...

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Thank You !