

## The Complete Book on

# COLD STORAGE, COLD CHAIN & WAREHOUSE

(with Controlled Atmosphere Storage & Rural Godowns) 5th Edition The Complete Book on Cold Storage, Cold Chain & Warehouse

(with Controlled Atmosphere Storage & Rural Godowns)





## INTRODUCTION



The cold storage industry has evolved rapidly over the past several years, which makes it hard to keep up with all of the latest information on cold storage and cold chain. That's why we've compiled this comprehensive guide on everything you need to know about cold storage,...

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... including common types of cold storage, different equipment used in cold storage, and more! Whether you're looking to start your own business or just want to learn more about the field of cold storage.

Book Link: <u>The Complete Book on Cold Storage, Cold Chain &</u> <u>Warehouse (with Controlled Atmosphere Storage & Rural</u> <u>Godowns) 5th Edition</u>



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A cold storage facility preserves fruits and vegetables for a longer period of time. Entrepreneurs and **MSMEs in the food and beverage** industry are the most likely to choose this business. Cold Storage is a one-time investment industry with a significant initial outlay.

Read Similar Articles: <u>Cold storage</u>

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In comparison to other small firms, however, the returns are higher and on a long-term basis. The overall average capacity utilisation in cold storage is 75%, indicating the cold chain business in India's long-term viability.

Related Feasibility Study Reports: <u>Cold storage, Controlled</u> <u>Atmosphere Storage, Multipurpose, Multi-commodity Cold</u> <u>Storage</u>



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Private companies own and run 92 percent of cold storage facilities in India. A cold storage warehouse can maintain your goods at the proper temperature for long periods of time. The term "cold chain" refers to the process of controlling the temperature of perishable goods from point of origin to final consumer in order to ensure quality and safety.

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The global Cold Storage Market is expected to grow at a CAGR of 14.10 percent. The global demand for processed foods, perishable foods, and medical equipment is increasing. Increased technical innovation is another influence in the cold storage sector. Cold storage is being promoted by government legislation around the world about the safety precautions for storing temperature-sensitive food and medical products.





The Complete Book on Cold Storage, Cold Chain & Warehouse (with Controlled Atmosphere Storage & Rural Godowns) 5th Edition

The book covers a wide range of subjects relating to start Cold Storage Business. It also offers information on machinery suppliers, as well as photographs of the equipment and plant layout. A detailed guide to the Cold Storage industry and entrepreneurship.

Read our Books Here: <u>Infrastructure, Hospitality, Medical, Entertainment, Warehouse,</u> <u>Real Estate, Education, Cold Storage, Cold Chain, Controlled Atmosphere Storage &</u> <u>Rural Godowns</u>

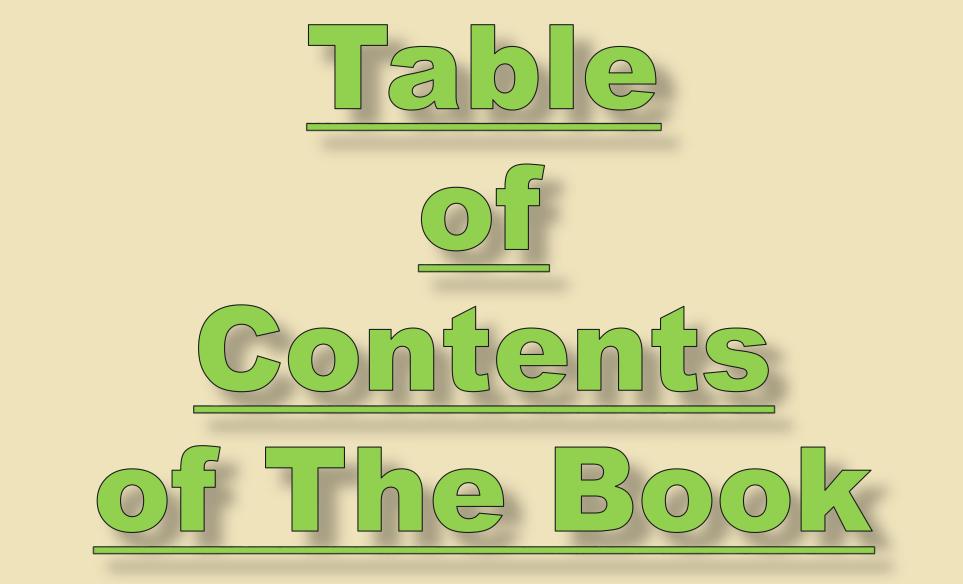


## This is the only book on the market that covers all aspects of commercial cold storage start-up. It's a veritable feast of how-to information, from concept through equipment procurement.

Watch other Informative Videos: <u>Cold storage, Cold Chain, Controlled Atmosphere Storage,</u> <u>Refrigerated Warehousing, Warehouse & Rural Godowns, and Temperature Controlled</u> <u>Supply Chain</u>







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#### **1. INTRODUCTION**

- History of Cold Storage
- Efficient Cold Storage Management
- Clean and Calibrate
- Know Your Hot and Cold Spots
- Pre-cool
- Use Humidifiers
- Avoid Air Pollution
- Rotate Your Product
- Inspect the Quality of Your Product on Arrival
- Keep Score
- Selection of Location for the Cold Storage
- Cold Storage Chain
- Emergence of Cold Chain Logistics
- Providing Temperature Controlled Environments
- Refrigerated Containers



#### **2. CONTROLLED ATMOSPHERE STORAGE**

- Importance of Controlled Atmosphere
- Fruits and Vegetables Storage under CA
- Indoor Storage
- Outdoor Storage
- Harvesting Apples at Optimum Maturity
- Guidelines for Placing Apples into CA Storage
- Temperature and Carbon Dioxide Interactions on Quality of Controlled Atmosphere-stored Apples
- Pears
- The Use of Cooling and Cold Storage to Stabilize and Preserve Fresh Stone Fruits
- Ethylene Concentrations in Controlled Atmosphere Storage
- Construction
- Sealing Wails and Ceilings
- Wall to Floor Joints
- CA Doors
- Observation Window
- Penetrations



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### **3. REFRIGERATION**

- Refrigerated Rail Cars
- Planning a Cold Storage
- Cold Store Capacity
- Refrigeration Plant Requirements
- Compressors
- Power Requirements
- Methods of Refrigeration
- Capacity Rating
- Factors Limiting Storage Life
- Cost of Freezing
- Care and Cleanliness
- Working in Cold Rooms
- Vapour Barriers
- Types of Cold Stores
- Prefabricated Cold Stores
- Layout of a Typical Cold Store
- The Drying Process of Potatoes
- The Curing Process of Potatoes



- Increasing the Temperature of the Potatoes After Storage
- Electrical Installation
- Substation
- General Specifications for Refrigeration System
- Refrigeration Processes
- Thermal Insulation & Refrigeration System, Control and Safety Devices
- Refrigeration Cycles
- Types of Compressors
- Piston Compressors
- Rotary Compressors
- Screw Compressors
- Vapour Compression Cycle
- Compressor
- Condenser
- Receiver
- Evaporator
- Rooms for machines, Electricals etc.
- Typical Specifications of Refrigeration System

- Vapour Absorption System
- Ammonia Refrigeration System
- Physical Properties
- Chemical Properties
- Cold Storage for Fruits and Vegetables
- Storage Conditions
- Temperature
- Incompatibility
- Cold Storage B.I.S Specification
- Working in Cold Rooms
- Examples of Food Processing by Refrigeration and Storage
- Meat Products
- Fishery Products
- Dairy Products
- Freezing System
- Indirect Contact Systems
- Plate Freezers
- Freezers for Liquid Foods
- Direct-Contact Systems
- Immersion





- 4. FOOD STORAGE GUIDELINES FOR CONSUMERS
- Dairy Products
- Recommended Food Storage Chart
- **5. BANANAS COLD STORAGE**
- Conditions of Harvesting and Putting into Store Harvesting
- Criteria of Ripeness
- Qualify Characteristics for Storage and Transport
- Method of Storage
- **6. COLD STORAGE PLANT AUTOMATION**
- 7. ABSORPTION REFRIGERATOR
  - a. Transport Handling
  - **b.** Installation of Refrigerators and Freezers
  - c. Maintenance
  - d. Choice of Refrigeration Equipment Failures Related to Absorption Refrigerators
  - a. Leaks
  - **b.** Repair of Leaks on Cooling Units
  - c. Fuel Consumption

- Comparison between Vapor Compression and Absorption System
- Compressor
- Condenser
- Receiver
- Expansion Valve
- Difference Between Refrigeration and Heat Pump System
- Water-Lithium Bromide Vapor Absorption Refrigeration System
- Special Features of Water-Lithium Bromide Solution

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- Cold Chain Diagram
- Importance of Maintaining the Cold Chain
- The Effective Cold Chain
- National Centre for Cold-Chain Development
- Cold Chain Development in India-Modernization of the Infrastructure of Cold Storage of Perishables
- Growth of Cold Storage Industry
- Verification and Validation
- Components of Cold Chain





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- Domestic (Kitchen) and Bar Refrigerators
- Types of Cold Chain Refrigerators
- Cold-Chain Maintenance, Repair and Replacement
- Maintenance of Equipment
- Distribution and Transport
- Estimation of Transportation
- Cold Chain and Logistics Management
- Costs of Cold Chain and Logistics Management
- Importance of Cold Chain and Vaccine Logistics Management
- Electrical Cold Chain Equipments
- Walk-in-Freezers (WIF)
- Walk-in-Coolers (WIC)
- Deep Freezer
- Cold Chain Management
- Maintenance of the Vaccine Refrigerator



- Cold Box
- Cold Boxes: Types and Usage
- Uses
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- Why Set -18°C for Thermal Stabilisation?
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- Rate of Freezing
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- Calculation of Refrigeration Loads
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- Warehouse Cum Cold Storage
- Central Location
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- Need for Warehousing
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- Advantages
- Disadvantages
- Functions
- Advantages of Public Warehousing
- Disadvantages of Public Warehousing
- Advantages of Private Warehousing
- Disadvantages of Private Warehousing
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- Determination of Storage Capacity
- Fixation of Storage Charges
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- Basic Warehouse Equipment



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- GOI Approved Nabard Warehousing Scheme
  - 1. Mode of Financial Support
  - 2. Eligible Institutions/Entities
  - 3. Purpose/Activities
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  - 5. Rate of Interest, Quantum of Support and Repayment Period
  - 6. Accreditation by WDRA
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- Department of Storage and Marketing Initiatives
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- Solar Powered Movable Cold Storage Structure for Perishables
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- Use of Solar Panel & Refrigeration in Cold Storage Through Alternate Technology
- Benefits
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- On Grid Solar System
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- PV Air Conditioning in Hybrid Cold Storage with Net Metering
- Flow Chart of an Operation of the DC Inverter Air Conditioning System

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**17.ADDRESSES OF PLANT AND MACHINERY SUPPLIERS** 

**18.SAMPLE PLANT LAYOUTS** 

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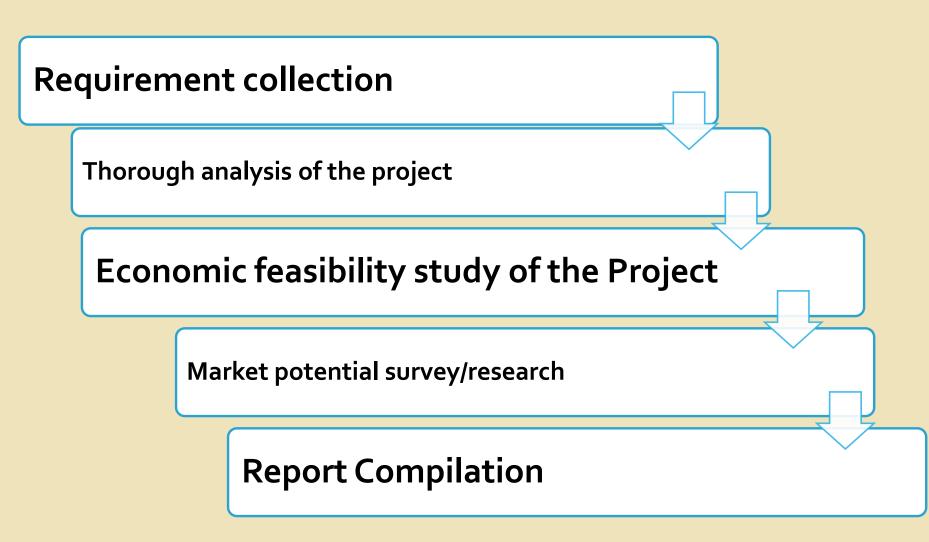




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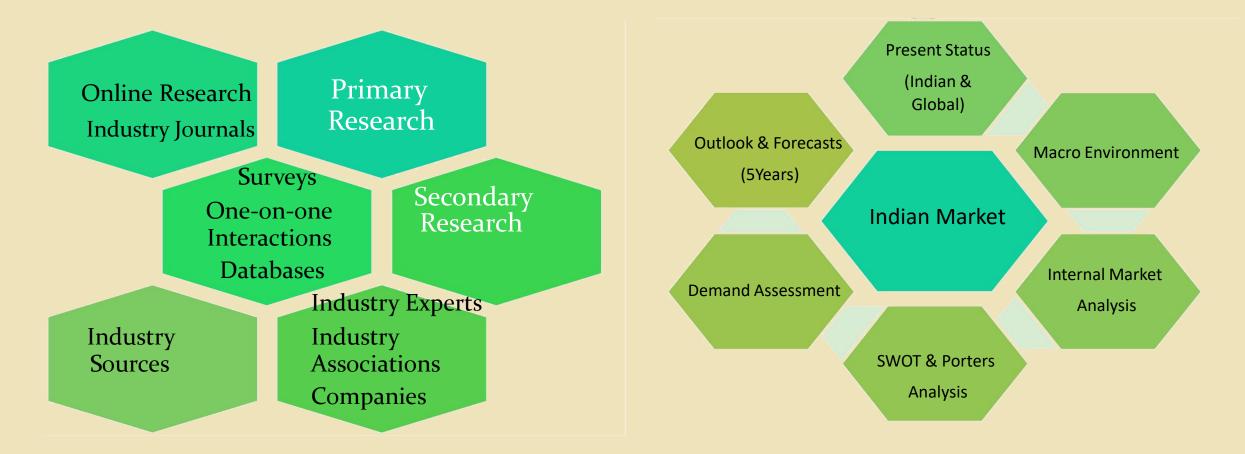
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