

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

Author: Ajay Kumar Gupta

Format: Paperback

ISBN: 9788195577521

Code: NI292

Pages: 376

Price: Rs. 1,650.00 **US\$** 43.95

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

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. 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. 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.

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 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. This book serves as a one-stop shop for everything you need to know about the Cold Storage Business, which is ripe for manufacturers, merchants, and entrepreneurs. 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.

Contents

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 Walls and Ceilings
Wall to Floor Joints
CA Doors
Observation Window
Penetrations
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

8. COLD CHAIN

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

9. COLD CHAIN AND REFRIGERATION

Health Facilities in Developing Countries

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

Ice Manufacture

Applications of Refrigeration in Different Food Products

Frozen Food Properties

Refrigerator Thermometers

Monitoring of the Refrigerator Temperature

Fridge Failure or Disruption of the Cold Chain

10. SHIPPING CONTAINERS

Refrigerated Container

Shipping Container Features

Comparison of Passive and Active System

Transport Operations

The Role of the Transport Operator

Distribution Vehicles

Air Circulation

Dispatching Product

Air Flow

The Essential Data Logger

11. THE COLD-CHAIN MONITOR

How to Use the Cold-Chain Monitor in Routine Forwarding of Vaccine Shipments

The Vaccine Vial Monitor

Proportion of Regional Vaccines Carrying VVMs

Recommendations on Improving Availability and Use of VVMs

Availability
Use
Cold Storage Temperature Legislation
Why Set -18°C for Thermal Stabilisation?
Vaccine Damage
Heat Damage
Solar Refrigerators
Components of Solar Refrigerator
12. COLD STORAGE FOR FISH AND MEAT
Introduction
Uses of Ice
Cold Storage Life of Frozen Fish
Cold Storage for Meat
Chilled Storage
Parameters Considered for the Design
Site Selection
Storage Temperature
Rate of Freezing
Relative Humidity
Calculation of Refrigeration Loads
Material Selection
Insulating Material
Meat Supply Cold Chain Management
Cold Chain in Slaughterhouse
Air Chilling
Immersion Chilling
Spray Chilling
Vacuum Chilling
13. WAREHOUSE
Cold Storage Warehouse Construction
Warehouse Cum Cold Storage
Central Location
Value-Adding Operation
Need for Warehousing
Types of Warehouses
Advantages
Disadvantages
Functions
Advantages of Public Warehousing
Disadvantages of Public Warehousing
Advantages of Private Warehousing
Disadvantages of Private Warehousing
Sequence of Warehousing Decisions
Determination of Storage Capacity
Fixation of Storage Charges
Storage Systems
Basic Warehouse Equipment
14. NABARD WAREHOUSING SCHEME
GOI Approved Nabard Warehousing Scheme
1. Mode of Financial Support
2. Eligible Institutions/Entities
3. Purpose/Activities
4. Priority Segments

- 5. Rate of Interest, Quantum of Support and Repayment Period
- 6. Accreditation by WDRA
- 7. Implementation Period
- Department of Storage and Marketing - Initiatives
 - A. Direct Lending to State Owned Entities
 - B. Accreditation/Registration of Warehouses
 - C. Capacity Building by Stakeholders
- 15. RURAL GODOWNS
 - Subsidy
 - Size
 - Institutional Lending
 - A. Eligible Financing Institutions
 - B. Term Loan
 - Pattern of Assistance
 - Monitoring
- 16. Solar Powered Cold Storage
 - Solar PV Powered Cold Storage System
 - A View of Solar PV Panels Installed
 - Advantages of Solar PV Powered Cold Storage System
 - Cost-Economics of the Solar PV Powered Cold Storage System
 - Requirement of Cooling System
 - Solar Cold Storage System Schematic
 - Solar Powered Movable Cold Storage Structure for Perishables
 - Solar Photovoltaic System With Power Control Unit for Cold Storage
 - Use of Solar Panel & Refrigeration in Cold Storage Through Alternate Technology
 - Benefits
 - Subsidy available
 - Off Grid Solar System
 - On Grid Solar System
 - Energy efficient Hybrid Solar System for Cold Storage in Remote Areas
 - Flow Chart for Power Switching in DC Inverter Air Conditioning System
 - PV Air Conditioning in Hybrid Cold Storage with Net Metering
 - Flow Chart of an Operation of the DC Inverter Air Conditioning System
- 17. ADDRESSES OF PLANT AND MACHINERY SUPPLIERS
- 18. SAMPLE PLANT LAYOUTS
- 19. PHOTOGRAPHS OF MACHINERY WITH SUPPLIER'S CONTACT DETAILS

About NIIR

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help,

Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

NIIR PROJECT CONSULTANCY SERVICES , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** npcs.india@gmail.com **Website:** NIIR.org

Fri, 26 Apr 2024 18:19:42 +0530