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Cold Chain Packaging Refrigerants Market Forecasts to 2032 – Global Analysis By Type (Gel Packs, Ice Packs, Dry Ice, Liquid Nitrogen, Phase Change Materials (PCMs), Eutectic Plates, and Other Types), Packaging Type, Application, End Users and By Geography

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Abstracts

According to Stratistics MRC, the Global Cold Chain Packaging Refrigerants Market is accounted for $1.72 billion in 2025 and is expected to reach $3.38 billion by 2032 growing at a CAGR of 10.1% during the forecast period. Cold chain packaging refrigerants are specialized materials used to maintain low temperatures during the transportation and storage of temperature-sensitive products, such as pharmaceuticals, biologics, and perishable foods. These refrigerants—such as gel packs, dry ice, and phase change materials—help preserve product integrity by preventing temperature fluctuations. They are critical components of cold chain logistics, ensuring regulatory compliance and minimizing spoilage during long-distance or extended-duration shipments under controlled thermal conditions.

According to Pelican's 2020 Biopharma Cold Chain Logistics Sustainability Survey, around 38% of biopharma companies had used reusable rental containers, while 25% explored them in 2019.

Market Dynamics:

Driver:

Rising demand for temperature-sensitive pharmaceuticals

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The pharmaceutical industry increasingly relies on cold chain packaging refrigerants to preserve the efficacy of temperature-sensitive medications. With rising demand for vaccines, biologics, and specialty drugs, maintaining strict temperature controls is critical for preventing degradation. Advanced refrigerant technologies ensure safe transport and storage, supporting the growth of biologics and personalized medicine. Government regulations enforcing stringent temperature maintenance further drive the market demand. The expansion of pharmaceutical supply chains, particularly in emerging economies, fuels adoption of effective refrigerant solutions.

Restraint:

Complexity of regulatory compliance

Strict regulatory frameworks govern the transportation and storage of temperature-sensitive pharmaceuticals, creating compliance challenges for manufacturers. Companies must adhere to stringent global standards set by organizations such as the FDA and WHO, which often require significant documentation and validation. Meeting diverse regional regulations increases operational complexity, impacting logistics and supply chain efficiency. Non-compliance can lead to product recalls, legal consequences, and financial losses, deterring market growth.

Opportunity:

Global expansion of e-commerce and online grocery services

Consumers increasingly order perishable goods, including frozen foods, dairy, and fresh produce, necessitating effective cooling solutions during transportation. Retailers and logistics providers are incorporating advanced refrigerants to ensure product quality and safety in last-mile deliveries. The growth of direct-to-consumer pharmaceutical shipments further amplifies refrigerant adoption across healthcare logistics. Technological advancements in packaging materials and refrigerants support sustainable and efficient cooling methods for global e-commerce expansion.

Threat:

Supply chain disruptions and temperature excursions

Transportation delays, labor shortages, and geopolitical tensions can compromise

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temperature-controlled shipments, leading to product losses. Temperature excursions caused by inadequate cooling or unexpected environmental conditions pose threats to pharmaceutical and perishable goods quality. Rising costs of raw materials and energy consumption also challenge refrigerant market stability. Companies must invest in robust monitoring systems and predictive analytics to mitigate these risks and ensure regulatory compliance.

Covid-19 Impact

The COVID-19 pandemic significantly influenced the Cold Chain Packaging Refrigerants Market, reshaping logistics and supply chain priorities. The urgent global vaccine rollout heightened demand for efficient refrigerant solutions to preserve pharmaceutical stability during transportation. Supply chain disruptions, including labour shortages and logistics constraints, affected refrigerant availability and pricing. Post-pandemic, the growing reliance on telemedicine and direct-to-consumer pharmaceutical deliveries continues to drive demand.

The gel packs segment is expected to be the largest during the forecast period

The gel packs segment is expected to account for the largest market share during the forecast period, due to its versatility and efficiency in temperature maintenance. Gel packs offer consistent cooling for pharmaceuticals, food products, and biological samples, making them a preferred choice in cold chain logistics. Their ease of use and reusability enhance sustainability and reduce overall packaging costs. Advances in phase change materials have further improved gel pack performance, optimizing cooling duration and stability.

The diagnostic laboratories segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the diagnostic laboratories segment is predicted to witness the highest growth rate, due to the increasing demand for temperature-sensitive diagnostic materials. Blood samples, reagents, and testing kits require strict temperature control to maintain their integrity during transportation. Rising prevalence of infectious diseases and advancements in diagnostic technologies fuel demand for specialized refrigerant solutions. The expansion of laboratory networks and healthcare testing facilities worldwide further drives market growth.

Region with largest share:

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During the forecast period, the Asia Pacific region is expected to hold the largest market share due to the rapid expansion of pharmaceutical and food industries. Countries like China, India, and Japan are investing heavily in cold chain infrastructure to support growing healthcare and retail demands. Increasing consumer preference for fresh and frozen food products drives widespread adoption of efficient refrigerant solutions. Government regulations mandating stringent temperature maintenance for pharmaceuticals further propel market growth.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, owing to the region's advanced healthcare and food supply chain infrastructure. Stringent regulations governing pharmaceutical storage and transportation drive significant refrigerant adoption. Technological innovations in refrigerant materials and monitoring systems enhance cold chain efficiency and reliability. Expanding e-commerce operations, particularly in grocery and pharmaceutical delivery sectors, fuel market growth.

Key players in the market

Some of the key players profiled in the Cold Chain Packaging Refrigerants Market include Cold Chain Technologies, Peli BioThermal, Sonoco ThermoSafe, Nordic Cold Chain Solutions, Cryopak, CSafe, Softbox Systems, Sealed Air Corporation, Intelsius, Sofrigam, Tempack, Orora Group, Chill-Pak, Coolpac, and Blowkings.

Key Developments:

In December 2024, Sonoco Products Company announced it has entered into an agreement to sell its Thermoformed and Flexibles Packaging business ("TFP") to TOPPAN Holdings Inc. ("Toppan") for approximately $1.8 billion on a cash-free and debt-free basis and subject to customary adjustments (the "Transaction").

In March 2025, Cold Chain Technologies (CCT) has acquired Global Cold Chain Solutions, expanding its Asia Pacific presence & capabilities. Cold Chain Technologies ("CCT") and digital monitoring solutions for the transportation of temperature-sensitive life sciences products, today announced it has acquired Global Cold Chain Solutions ("GCCS"), a leading provider of passive cold chain solutions primarily in Australia and India. Terms of the transaction were not disclosed.

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Types Covered:

- Gel Packs
- Ice Packs
- Dry Ice
- Liquid Nitrogen
- Phase Change Materials (PCMs)
- Eutectic Plates
- Other Types

Packaging Types Covered:

- Active Refrigerants
- Passive Refrigerants
- Hybrid Systems

Applications Covered:

- Pharmaceuticals & Healthcare
- Food & Beverages
- Chemical Industry
- Floral and Horticulture
- Other Applications

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End Users Covered:

- Biopharmaceutical Companies
- Diagnostic Laboratories
- Food Processing Companies
- Logistics and Transportation Providers
- Retail and E-commerce
- Other End Users

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe

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- Asia Pacific
  - Japan
  - China
  - India
  - Australia
  - New Zealand
  - South Korea
  - Rest of Asia Pacific
- South America
  - Argentina
  - Brazil
  - Chile
  - Rest of South America
- Middle East & Africa
  - Saudi Arabia
  - UAE
  - Qatar
  - South Africa
  - Rest of Middle East & Africa

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What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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