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Refrigeration Oil Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Mineral Oil, Synthetic Oil), By Application (Air Conditioner, Refrigerator & Freezer, Automotive AC System, Others), By Region and Competition, 2020-2030F

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Abstracts

Market Overview

Global Refrigeration Oil Market was valued at USD 1.25 Billion in 2024 and is expected to reach USD 1.51 Billion by 2030 with a CAGR of 3.35% during the forecast period. Lubrication of refrigeration compressors is of utmost importance for ensuring their optimal performance and efficiency. The type of refrigeration oil used plays a crucial role in determining the overall performance of the compressors. As refrigeration compressors operate under varying temperature conditions, the temperature inside the compressors tends to rise. Therefore, it becomes imperative to minimize and dissipate the heat generated by the compressors. To achieve this, refrigeration oils are used to disperse heat from various components of the compressor, such as compression chambers and valves, while also assisting in sealing. The demand for refrigeration oils that effectively dissipate heat from compressor components has been on the rise, thereby driving the growth of the global refrigeration oil market.

In refrigeration and freezer systems, air conditioners, and automotive air conditioning systems, the compression temperature can reach peak levels of up to 180?C. The thermal and chemical stability of refrigeration oil plays a vital role in reducing the compression temperature, ensuring the proper functioning of air conditioners. Moreover, stringent environmental regulations have created new opportunities for the development

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of natural refrigeration oils, such as ammonia and carbon dioxide. This factor is expected to further fuel the growth of the global refrigeration oil market during the forecast period.

Refrigeration oils are gaining increasing importance and are being widely used in industrial heat pumps. Synthetic refrigeration oils are predominantly used in industrial compressors and heat pumps due to their superior efficiency compared to conventional oils. Furthermore, synthetic refrigeration oils are compatible with a wide range of refrigerants, including carbon dioxide and ammonia. Industrial refrigeration compressors, heat pumps, and low evaporators require the use of oils that effectively minimize heat generation, dissipate heat from the equipment, improve the lifespan of lubricant oils, and minimize shaft leakage. These factors have significantly contributed to the growing demand for refrigeration oil, driving the growth of the global market.

Key Market Drivers

Growing Demand of Refrigeration Oil in Food & Beverage Industry

Refrigeration oil plays a pivotal role in the functionality of refrigeration systems. It ensures the smooth operation of compressors, which are the heart of refrigeration mechanisms, by providing necessary lubrication. This, in turn, leads to efficient cooling and ultimately, better preservation of food products. The food and beverage industry heavily relies on refrigeration systems to preserve the quality and extend the shelf life of products. From storing raw materials to preserving prepared foods, refrigeration is integral at every step of the food processing chain. Consequently, the demand for refrigeration oil is intrinsically linked to the operation of the food and beverage industry. The global food and beverage industry has been witnessing significant growth over the past few years. Factors such as rising population, urbanization, and changes in lifestyle have led to an increased demand for processed and packaged foods. These factors, coupled with stringent food safety regulations, have necessitated the expansion of cold storage facilities, and refrigerated transport, leading to an upswing in the demand for refrigeration oil.

In the United States, the Department of Agriculture (USDA) reported that food and beverage manufacturing shipments reached over USD 1.3 trillion in 2023, up from USD 1.1 trillion just five years earlier, signaling steady industrial growth. Similarly, data from India’s Ministry of Food Processing Industries (MoFPI) shows the sector contributed nearly 12% to the country’s manufacturing GDP in 2022–23, with significant government investments aimed at expanding cold chain and refrigerated storage

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infrastructure. Refrigeration systems are essential to maintain the safety and quality of perishable goods, and this has led to a sharp rise in cold storage construction. For instance, China's National Bureau of Statistics highlighted that cold storage capacity exceeded 200 million cubic meters in 2022, with aggressive expansion plans underway as part of its national food security strategy. The European Union's Eurostat data also reflects consistent growth in food production and export volumes, further increasing reliance on refrigerated transportation and storage. The expansion of the food and beverage industry, reinforced by national policy efforts, makes it clear that the demand for refrigeration oil will continue to grow in the years ahead.

Key Market Challenges

Problems Associated with Oil Disposal and Recycling

Used refrigeration oil, if not disposed of properly, can have severe environmental consequences. Improper handling and disposal methods often result in contamination of soil and water resources, posing a significant threat to both human health and biodiversity. The regulation of used lubricating oil disposal varies at the state and federal level, highlighting the importance of proper management to mitigate environmental impacts.

Moreover, older refrigerators and freezers not only contain used refrigeration oil but also ozone-depleting refrigerants and/or foam blowing agents. These substances add another layer of complexity to the disposal process and require specialized handling. If released into the atmosphere, these ozone-depleting substances contribute to global warming and the depletion of the ozone layer, exacerbating environmental concerns.

In the context of the circular economy, recycling used refrigeration oil presents unique challenges. While the circular economy aims to recover materials, reduce waste, and promote recycling, the actual process of recycling refrigeration oil is complex and resource intensive. It requires advanced technologies and specialized facilities to extract, purify, and re-refine the oil for reuse. Furthermore, the characteristics of used oil and oil production pose specific sustainability issues that need to be addressed.

To meet the growing demand for higher-quality lubricants, re-refiners have increased their used oil re-refining capacity. However, they face sustainability challenges related to oil composition, impurities, and the overall energy and resource requirements of the re-refining process. These considerations make the recycling of refrigeration oil a nuanced and multifaceted issue that requires careful attention to ensure environmental

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sustainability.

Key Market Trends

Transition to Low-GWP Refrigerants

The refrigeration industry has been gradually transitioning from hydrochlorofluorocarbons (HCFCs) to hydrofluorocarbon (HFC) refrigerants, but now it is shifting its focus towards low-GWP hydrofluoroolefin (HFO) refrigerants as part of a broader push for sustainability and reducing the environmental impact of refrigeration systems. Low-GWP refrigerants, such as CO2 (or refrigerant R-744), R-290 (propane), and others, are gaining popularity as more sustainable alternatives. These refrigerants have a lower potential for contributing to global warming compared to traditional refrigerants.

In the United States, the Environmental Protection Agency (EPA), under its American Innovation and Manufacturing (AIM) Act, has implemented a phasedown of hydrofluorocarbons (HFCs) by 85% over 15 years, beginning in 2022. This has accelerated the shift to low-GWP alternatives like R-1234yf, R-290 (propane), CO?, and ammonia each requiring refrigeration oils that can handle the unique pressures, chemical properties, and thermal conditions of these new refrigerants. Similarly, the European Union, through its F-Gas Regulation, has set strict GWP thresholds and quotas, pushing industries to adopt eco-friendly refrigerants across sectors, including food, pharmaceuticals, and commercial buildings. The ongoing transition is not merely about the refrigerants themselves but also about the entire system compatibility, where refrigeration oils play a crucial role. As regulatory pressure intensifies and companies commit to sustainability goals, the demand for advanced, environmentally compatible refrigeration oils is expected to grow steadily, aligning with the global push toward climate-resilient cooling technologies.

Key Market Players

Eneos Holdings Inc.

Idemitsu Kosan Co. Ltd

EXXONMOBIL CORPORATION

Royal Dutch Shell Plc

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Total Energies SE

Chevron Corporation

Johnson Controls International plc

Cosmo Oil Lubricants Co., Ltd.

National Refrigerants, Inc.

BASF SE

Report Scope:

In this report, the Global Refrigeration Oil Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Refrigeration Oil Market, By Type:

Mineral Oil

Synthetic Oil

Refrigeration Oil Market, By Application:

Air Conditioner

Refrigerator & Freezer

Automotive AC System

Others

Refrigeration Oil Market, By Region:

North America

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United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia-Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

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South Africa

Saudi Arabia

UAE

Egypt

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Refrigeration Oil Market.

Available Customizations:

Global Refrigeration Oil Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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