

# Global Dry Ice Market Outlook to 2027

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## Abstracts

Dry ice is the solid form of carbon dioxide, which is used primarily as a cooling agent. Its advantages include lower temperatures than that of water ice and not leaving any residue. It is useful for storing and transporting various sensitive materials, mainly in the healthcare and food and beverage industries. According to BlueQuark Research & Consulting, the global Dry ice market is expected to witness a significant growth rate during the forecast period. The market for dry ice is being driven by the rising demand in blast cleaning due to the ever-growing industrial sector and increasing use as a refrigerant for frozen food items, replacing water-based ice. However, the difficulty in handling the extremely cold dry ice that can cause burns and the government norms of eliminating it from food items are expected to hinder the growth of the market in the near future.

According to an ice cream storage test conducted by Cook's Illustrated magazine, 5 pounds of dry ice takes only about half the space and keeps a certain volume of the product frozen for three times longer periods when compared to 5 pounds of water based ice. The above-mentioned fact, along with dry ice's no clean-up requirement advantage and its ability to keep oxygen away, aids in replacing ice with dry ice as a refrigerant for frozen food items. In June 2019, the National Frozen & Refrigerated Foods Association of the United States reported growth of USD 918 million over the previous 52 weeks, with sales standing at a staggering USD 54.6 billion back then. Ice cream (USD 6.7 billion), pizza (USD 4.8 billion), seafood (USD 4.8 billion), novelties (USD 4.6 billion), and complete meals (USD 4.5 billion) were the top five frozen department categories during the 52 week period in the United States. With developed regions such as Europe and North America leading the global frozen food market, emerging countries such as India and China are also showing significant growth potential, affecting the global dry ice market in tandem. Dry ice is not only an excellent refrigerant in supermarkets and convenience stores for keeping perishable items such as seafood, meat and poultry, gourmet foods, baked goods, and dairy (ice cream, milk,

cheese) frozen but also a cost-effective and environmentally friendly option, making it vital in the efficient transportation of such goods during long and distance shipping. GWP (global warming potential), an indicator of a gas' greenhouse effect, is a measure of the amount of energy absorbed by 1 ton of an emitted gas, relative to that absorbed by 1 ton of an emitted carbon dioxide (CO<sub>2</sub>). The lower the GWP value and the higher the cooling capacity, the better are the refrigerants. R744 (dry ice) with a GWP value of 1 and an ODP (Ozone Depletion Potential) value of 0, is amongst the least threatening refrigerants, environmentally. Besides, it has higher cooling capacities compared to other refrigerants, making it cost-effective. The non-toxic nature and non-flammable nature add to the advantages, playing a major role in the growth of dry ice's application as a refrigerant. Dry ice, which had completely been out of the refrigerant race for over 50 years, is currently being employed as an environmentally benign, low-temperature refrigerant in supermarkets and as the low-temperature stage of large industrial freezing and cold storage systems. With the slow offset of the COVID-19 pandemic, the steady growth of dry ice as a refrigerant is imminent, as the much safer frozen food industry is expected to grow in the coming years.

In October 2020, with the launch of the ASCO Dry Ice Pelletizer P15(i), ASCO CARBON DIOXIDE Ltd introduces an optimized follow-up model of the ASCO Dry Ice Pelletizer A120P. The compact and powerful new machine converts liquid CO<sub>2</sub> into dry ice pellet quickly and economically with a production capacity of 120 kg/h (264.6 lb/h). In August 2020, Swiss dry ice and CO<sub>2</sub> recovery plant specialist, Comtecswiss has exclusively announced the launch of its new oil-free dry ice machine, described as a 'world innovation' in this ever-growing market. Moreover, in October 2019, researchers from the University of Sheffield, in collaboration with Icetech Technologies, have used dry ice to develop a new solution for the problem of leaves on the line, which cause cancellations, delays, and timetable changes for rail passengers. In July 2019, Air Liquide announced that its Airgas division has recently opened its new dry ice facility and liquid carbon dioxide in Stockton, California.

The global Dry Ice Market is segmented on the basis of Commercial Form, Grade, and Application. The application segment is further segmented as Commercial (Food and Beverage Processing, Transport and Distribution, Fire Fighting, Entertainment Industry), Industrial (Blast Cleaning, De-gassing, Cutting Fluid), Medical and Scientific Research, Others. Food and Beverage processing was found to be the major application of Dry Ice.

Modern-day manufacturing and processing of food involve highly complex automated machines, innovative technologies, and a safe environment. Further, Sanitation is a

vital element in food and beverage production. FDA, USDA, and EPA-approved dry ice blasting is the safest process to clean containers, mixers, conveyors, and ovens, leaving no harmful secondary waste behind. Microbial growth, lipid oxidation, physical (color, flavor, textural changes), and biochemical and enzymatic reactions are the major limiters to a food product's shelf life. Apart from sanitizing the processing equipment, dry ice also plays a significant role as a refrigerant and preservative in the food and beverage processing industry. Preserving food through non-cyclic refrigeration is, in fact, one of the most common applications of dry ice. Besides helping with the storage and shelf-life extension, dry ice is also commonly used in the packing and transportation sector of the food industry. Apart from sanitization, dry ice plays a significant role in the food and beverage processing industry as a refrigerant and preservative. Preserving food through non-cyclic refrigeration is, in fact, one of the most common applications of dry ice. Besides helping with the storage and shelf life extension, dry ice is also commonly used in the packing and transportation sector of the food industry. Food grade dry ice is a key ingredient in all the soft drinks we see, and small loose cubes of dry ice can also be used to safely chill bar beverages. The market for dry ice is likely to witness significant growth in the food and beverage processing sector during the forecast period.

Based on geography, the global Dry ice Market is segmented into Asia Pacific, North America, South America, Europe, and Middle East & Africa. North America is expected to be the dominant region with several market players accounting for a major share of the market, majorly due to the high demand for dry ice in the healthcare industry as it is used by hospitals and laboratories in storage and transportation when they need to ship temperature-sensitive items. Dry ice can also be used to clean medical and industrial equipment with the much-known dry ice blasting method. Moreover, its significant usage in Food and Beverage industries for preserving frozen foods when freezers are not available or in an emergency is expected to further drive the market.

The United States is the world's largest economy. The country's GDP has decreased at an annual rate of 5% in the first quarter and 9.5% in the second quarter of 2020 due to the ongoing coronavirus pandemic. But it grew around 7.4 percent in the third quarter due to ease in the lockdown. The United States is one of the most prominent regions in the global healthcare industry, experienced a growth of 4.6% (USD 3.6 trillion) in 2018 in the country's health expenditure. This led to USD 11,172 expenditure on health care per person, which accounted for 17.7% of the Gross Domestic Product (GDP), making the United States a country that spends most on health care per person. Some of the primary healthcare companies in the region are CVS Health Corp., UnitedHealth Group Inc., McKesson Corp., AmerisourceBergen Corp., Cardinal Health Inc., and Anthem

Inc., among others. Further, the government's efforts by investments in research and technologies and launching healthcare programs such as Medicaid and Medicare (federal health insurance program) accounts to drive the dry ice market. Medicare spending grew nearly 6.4% to USD 750.2 billion in 2018, or 21 percent of total National Health Expenditure (NHE), whereas Medicaid spending grew about 3.0% to USD 597.4 billion in 2018 or 16 percent of total NHE. The federal government spent nearly USD 1.2 trillion on health care in the fiscal year 2019. Apart from the health care sector, dry ice also plays a significant role in the United States' food and beverage industries. Food & beverages and related industries contributed USD 1.109 trillion to the United States GDP in 2019, accounting for a 5.2% share. The demand for frozen food in the United States due to an increase in the working population, introduction of longer-shelf-life products, and rising demand from various end-users, ranging from restaurants and hotels to fast-food chains is anticipated to further drive the dry ice market. On the food front, a record USD 1.71 trillion was spent on food and beverages in 2018 at grocery stores and other retailers and away-from-home meals and snacks in the United States alone. With a 13.0-percent share, a food ranked third behind housing (32.8 percent) and transportation (17.1 percent) among the average American household's expenditures in 2019. Some of the major food and beverage companies in the region are PepsiCo., Tyson Foods, Nestle, JBS USA, Kraft Heinz Co., Mars Inc., and Smithfield Foods Inc., among others. Hence, growing applications of dry ice in the food and beverage and healthcare industries are likely to boost the market in the region.

In the year 2019, The global market for dry ice was found to be partially fragmented with major key players, including Linde Plc, Continental Carbonic Products, Inc., Yara International, Air Liquide, Dry Ice Corp., and Cold Jet, among others.

Dry ice sales reportedly increased dramatically after Pfizer released positive results for its COVID-19 vaccine candidate, which must be stored at minus 112 degrees Fahrenheit in order to be safe. Utilizing the dry ice the companies have developed specifically designed, temperature-controlled thermal shippers that can be used as temporary storage units for 15 days by refilling with dry ice. The companies have developed specially designed, temperature-controlled thermal shippers, utilizing dry ice to maintain temperature conditions of  $-70^{\circ}\text{C}\pm 10^{\circ}\text{C}$ . They can be used as temporary storage units for 15 days by refilling with dry ice.

Our Global Dry ice Market report provides deep insight into the current and future state of the Dry ice Market across various regions. The study comprehensively analyzes the Dry ice Market by segments based on Commercial Form (dry ice pellet, dry ice Block, Slices, and Others), By Grade (Food Grade and Industrial Grade), By Application

(Commercial (Food and Beverage Processing, Transport and Distribution, Fire Fighting, Entertainment Industry), Industrial (dry ice blast cleaning, De-gassing, Cutting Fluid), Medical and Scientific Research, Others), and by Geography (Asia Pacific, North America, Europe, South America, and Middle-East and Africa). The report examines the market drivers and restraints, along with the impact of Covid-19 are influencing the market growth in detail. The study covers & includes emerging market trend, market developments, market growth opportunity, market swot analysis, market dynamics, dry ice market size, and challenges in the industry. This report also covers extensively researched competitive landscape sections with profiles of major companies including their market share and projects.

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EX N.V. - CRYONOMIC

Corporation

ARBON DIOXIDE

tal Carbonic

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K

RCO2

Gases



International

CO2 Systems

Ice

ra International

ang Sida Cryogenic Machine

*Companies is not exhaustive*

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