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Specialty Gases Market Report by Type (High Purity Gases, Noble Gases, Carbon Gases, Halogen Gases, and Others), Element (Argon, Nitrogen, Helium, Carbon Monoxide, Methane, Oxygen, Hydrogen, and Others), Application (Manufacturing, Electronics, Healthcare, Academics, and Others), Packaging Type (Packaged, Bulk and On-site), Sales Type (Captive, Merchant), and Region 2024-2032

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Abstracts

The global specialty gases market size reached US$ 11.3 Billion in 2023. Looking forward, IMARC Group expects the market to reach US$ 20.3 Billion by 2032, exhibiting a growth rate (CAGR) of 6.6% during 2024-2032. The rising demand for specialty gases in numerous sectors, various technological advancements, and the implementation of stringent government policies due to environmental awareness among individuals are some of the major factors propelling the market.

Specialty gases are high-purity gases utilized in various applications that require strict control over gas mixtures' compositions. They are produced to precise specifications and are rigorously tested to maintain stringent purity levels, often surpassing 99.999% purity. They are essential in several industries, ranging from healthcare and pharmaceuticals to environmental monitoring, manufacturing, and scientific research. Some common examples include zero gases used for baseline calibration in environmental testing, medical gases for therapeutic and diagnostic purposes, and process gases deployed in semiconductor production. Additionally, the unique properties and assured quality of specialty gases make them integral to the operational success of various industrial, research, and medical fields.

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The market is primarily driven by rapid industrialization across the globe. In addition, the escalating demand for specialty gases in the chemical industry for addressing unwanted characteristics found in industrial gases and facilitating various refining and processing tasks represents another major growth-inducing factor. Moreover, the medical and healthcare sectors are contributing to the market's expansion as they utilize compressed specialty gases for sterilizing devices and delivering clean air to patients, free from contaminants and dust. Besides this, the widespread adoption of solar power systems is also accelerating market growth. These systems rely on specialty gases such as nitrogen, argon, silane, trichlorosilane, phosphoryl chloride, and ammonia to enhance energy absorption, improve operational efficiency, and ensure cost-effectiveness in processing silicon photovoltaic cells. Furthermore, the increasing utilization of specialty gases to boost agricultural yield and the extensive research and development (R&D) efforts are expected to further create a positive market outlook.

Specialty Gases Market Trends/Drivers:
The rising product demand in various industries

The increasing product demand across several industries such as electronics, petrochemical, and healthcare is contributing to the market growth. In addition, the rising utilization for specialty gases in the healthcare sector for various medical applications such as anesthesia, respiratory therapies, and medical imaging is influencing the market growth. Also, the growing geriatric population and advancements in medical treatments further drive the demand for specialty gases in healthcare settings. Moreover, the expanding electronics industry is extensively using specialty gases in semiconductor manufacturing processes, including chemical vapor deposition, etching, and wafer cleaning representing another major growth-inducing factor. As the demand for consumer electronics, smart devices, and electric vehicles continues to rise, the need for specialty gases in electronics manufacturing is expected to grow steadily. Furthermore, the growing petrochemical industry relies on specialty gases for applications such as gas chromatography, leak detection, and gas purging, which is creating a positive market outlook.

Various technological advancements

The development of advanced gas purification and manufacturing techniques has improved the quality and purity of specialty gases allowing precise control over gas compositions, ensuring consistency and reliability in various applications. Additionally, several advancements in analytical instrumentation have increased the demand for

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specialty gases in fields such as environmental monitoring, chemical analysis, and pharmaceutical research. For instance, gas chromatography and mass spectrometry techniques require high-purity specialty gases to achieve accurate and reliable results. Besides this, the continuous innovation and improvement in gas handling, storage, and distribution systems have also contributed to the growth of the specialty gases market by ensuring the safe and efficient delivery of gases to end-users.

The implementation of stringent environmental policies

The increasing use of specialty gases in environmental monitoring applications, including air quality analysis, greenhouse gas (GHG) emissions monitoring, and water quality analysis is influencing the market growth. As governments and regulatory bodies impose stricter emission limits and monitoring requirements, the demand for specialty gases used in environmental analysis and compliance testing has escalated. Additionally, the growing focus on sustainable practices and renewable energy sources has led to the growing utilization of specialty gases in industries such as solar and wind energy, and fuel cells. Moreover, the rising need for precise gas mixtures and purities in these applications further drives the demand for specialty gases, creating growth opportunities in the market.

Specialty gases Industry Segmentation:
IMARC Group provides an analysis of the key trends in each segment of the global specialty gases market report, along with forecasts at the global, regional and country levels from 2024-2032. Our report has categorized the market based on type, element, application, packaging type and sales type.

Breakup by Type:

High Purity Gases
Noble Gases
Carbon Gases
Halogen Gases
Others

Carbon gases dominate the market

The report has provided a detailed breakup and analysis of the market based on the type. This includes high purity gases, noble gases, carbon gases, halogen gases, and others. According to the report, carbon gases represented the largest segment.

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Carbon dioxide (CO2) is widely used in industries such as food and beverage, oil and gas, and healthcare. In the food and beverage industry, it is used for carbonation of beverages and as a refrigerant. In the oil and gas sector, it is utilized for enhanced oil recovery and as an inert gas during drilling operations. Moreover, carbon dioxide finds extensive applications in the healthcare industry for diagnostic and therapeutic purposes. Additionally, carbon monoxide (CO) is employed in various industrial processes, including chemical synthesis, metal fabrication, and as a reducing agent in metallurgical applications. Its toxic properties are harnessed in controlled environments for the calibration of gas detectors and sensors. Furthermore, the widespread use of carbon gases in diverse industries positions them as the largest s segment, owing to their essential role in multiple applications and sectors.

Breakup by Element:

Argon
Nitrogen
Helium
Carbon Monoxide
Methane
Oxygen
Hydrogen
Others

Carbon monoxide holds the largest share of the market

A detailed breakup and analysis of the market based on the element has also been provided in the report. This includes argon, nitrogen, helium, carbon monoxide, methane, oxygen, hydrogen, and others. According to the report, carbon monoxide accounted for the largest market share.

Carbon monoxide (CO) is one of the most prominent and widely used gases, making it the largest type of element in terms of market share. It is a colorless, odorless gas produced by the incomplete combustion of carbon-containing fuels that is widely used in various industries due to its unique properties and applications. Additionally, the rising demand for carbon monoxide in the chemical industry as it serves as a vital raw material and intermediate in the production of several chemicals, such as acetic acid, methanol, and formaldehyde is contributing to the market growth. These chemicals find applications in numerous sectors, including plastics, pharmaceuticals, and textiles,

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thereby driving the demand for carbon monoxide. Moreover, carbon monoxide finds significant usage in the metallurgical industry for the reduction of metal ores. It acts as a reducing agent in processes such as iron and steel production, assisting in the extraction of metals from their ores. Furthermore, the extensive use of carbon monoxide in the medical field as a medical gas for various therapeutic purposes, hyperbaric oxygen therapy, and as a component of medical gas mixtures used in respiratory care is augmenting the market growth.

Breakup by Application:

Manufacturing
Electronics
Healthcare
Academics
Others

Healthcare accounted for the largest market share

The report has provided a detailed breakup and analysis of the market based on the application. This includes manufacturing, electronics, healthcare, academics, and others. According to the report, healthcare represented the largest segment.

The increasing use of specialty gases in the healthcare industry is due to the rising application of specialty gases in several medical uses such as anesthesia, respiratory therapies, and diagnostic procedures. Additionally, anesthetic gases such as nitrous oxide and oxygen are essential for surgical procedures to ensure patient comfort and safety. Moreover, specialty gases find application in medical imaging techniques such as magnetic resonance imaging (MRI) and positron emission tomography (PET). These imaging technologies rely on specific gas mixtures, such as helium, xenon, and carbon dioxide, to enhance imaging quality and accuracy, accelerating market growth. Furthermore, the extensive use of specialty gases in laboratory research and analysis in the pharmaceutical and biotechnology sectors for gas chromatography, mass spectrometry, and other analytical techniques employed for drug discovery, quality control, and research purposes is also increasing the product applications in healthcare settings.

Breakup by Packaging Type:

Packaged

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Bulk and On-site

Bulk and on-site exhibit a clear dominance in the market

The report has provided a detailed breakup and analysis of the market based on the packaging type. This includes packaged, bulk, and on-site. According to the report, bulk and on-site exhibit a clear dominance in the market.

Bulk and on-site packaging enable the production and delivery of customized gas mixtures customized to specific customer requirements. Additionally, several industries such as electronics, pharmaceuticals, and research and development often require specialty gases with precise compositions and purities leading to escalating demand for bulk and on-site packaging allowing for flexibility in creating these specialized gas mixtures, ensuring optimal performance and results in various applications. Bulk and on-site packaging are particularly well-suited for industries with large-scale gas consumption. Moreover, several industries such as healthcare, electronics, petrochemicals, and manufacturing often have continuous and substantial gas requirements. Bulk packaging enables the storage and delivery of gases in large quantities, ensuring uninterrupted supply for industrial processes. Furthermore, the escalating demand for on-site packaging provides a dedicated and localized gas supply directly at the customer's facility, offering convenience, reliability, and responsiveness to their specific needs.

Breakup by Sales Type:

Captive
Merchant

Captive sales type dominates the market

The report has provided a detailed breakup and analysis of the market based on the sales. This includes captive and merchant captive. According to the report, captive accounted for the largest market share.

In captive sales, the gases are typically produced and used by the same company for their own specific applications. These companies have their own production facilities or gas plants to meet their internal requirements. Additionally, captive sales are common in industries that have unique gas requirements or specialized processes. For instance, a semiconductor manufacturer may produce its own specialty gases to ensure the precise

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quality and purity required for its manufacturing processes are maintained.

Merchant sales involve the production and distribution of specialty gases by gas manufacturers to several customers across different industries. In this sales type, specialty gas manufacturers produce gases in large quantities and distribute them to various end-users through a network of distributors and suppliers.

Breakup by Region:

North America
United States
Canada
Asia Pacific
China
Japan
India
South Korea
Australia
Indonesia
Others
Europe
Germany
France
United Kingdom
Italy
Spain
Russia
Others
Latin America
Brazil
Mexico
Others
Middle East and Africa

Asia Pacific exhibits a clear dominance in the market

The report has also provided a comprehensive analysis of all the major regional markets, which include North America (the United States and Canada); Europe (Germany, France, the United Kingdom, Italy, Spain, Russia, and others); Asia Pacific

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(China, Japan, India, South Korea, Australia, Indonesia, and others); Latin America (Brazil, Mexico, and others); and the Middle East and Africa. According to the report, Asia Pacific accounted for the largest market share.

Asia Pacific is the largest growing region due to rapid growth in the specialty gases market. In addition, the expanding industrial base, increasing investments in infrastructure development, and technological advancements in countries such as China, Japan, South Korea, and India are major contributors to the growth in this region. The rising demand for electronic devices, growth in automotive production, and expanding healthcare industry are key drivers of the Asia Pacific region.

North America is driven by the presence of various key players in numerous sectors such as healthcare, electronics, automotive, and manufacturing. In addition, several technological advancements, the expanding semiconductor industry, healthcare services, and the increasing focus on clean energy technologies are contributing to the growth of the region.

The European market is driven by industries such as healthcare, automotive, chemical, and research laboratories. In addition, the growing focus on sustainable development and environmental regulations has led to increased demand for specialty gases used in renewable energy technologies and emissions control influencing the market growth in Europe.

Besides this, Latin America, Middle East, and Africa regions are also witnessing rising sales of specialty gases due to expanding industrial and manufacturing sectors, increasing investments in infrastructure projects, construction, and growing healthcare services.

Competitive Landscape:
The competitive landscape of the market is characterized by the presence of several key players competing for market share. These companies are engaged in the manufacturing, distribution, and supply of specialty gases to various industries. Additionally, several key players are embracing sustainability by incorporating eco-friendly practices in their operations. They are investing in renewable energy sources, reducing greenhouse gas (GHG) emissions, and promoting energy-efficient technologies. Moreover, various leading companies are investing significantly in research and development (R&D) activities to develop innovative specialty gas products and solutions. They are focusing on improving gas purity, developing customized gas mixtures, and enhancing gas handling and storage technologies that allows them to

meet the evolving demands of industries and maintain a competitive edge in the market.

The report has provided a comprehensive analysis of the competitive landscape in the market. Detailed profiles of all major companies have also been provided. Some of the key players in the market include:

Advanced Specialty Gases Inc.
Advanced Gas Technologies Inc.,
Air Products and Chemicals Inc.
Airgas
DuPont de Nemours Inc.
Honeywell International Inc.
Kanto Denka Kogyo Co. Ltd.
Messer Group
Mitsui Chemicals
Norco
Nova Gas Technologies Inc.
Praxair
Showa Denko K.K.
Taiyo Nippon Sanso Corporation
The Linde Group
Welsco Inc.

Recent Developments:
In December 2022, Air Products and Chemicals, Inc. and AES Corporation unveiled plans for a groundbreaking green hydrogen production facility in Texas, USA. This pioneering project, which involves a significant investment of USD 4.0 Billion, aims to address the increasing demand for zero-carbon fuels in the transportation and industrial sectors of the nation.
In February 2023, Linde made an announcement regarding a lasting partnership with OCI to provide clean hydrogen and other industrial gases to OCI's recently established blue ammonia facility in Beaumont, Texas. Linde will be responsible for constructing, owning, and operating an on-site complex, ensuring the supply of clean hydrogen and nitrogen needed for OCI's annual production of 1.1 million tons of blue ammonia. To meet this demand, Linde will sequester over 1.7 million tons of CO2 emissions annually, enabling the provision of clean hydrogen to OCI.
Praxair, which collaborated with Linde plc following a merger, has been expanding its presence in the specialty gases market. The company has been investing in new production facilities and distribution networks to cater to the increasing demand. Praxair

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has also been actively involved in developing specialty gas solutions for specific industries, including healthcare, aerospace, and electronics.

Key Questions Answered in This Report:
How has the global specialty gases market performed so far, and how will it perform in the coming years?
What are the drivers, restraints, and opportunities in the global specialty gases market?
What is the impact of each driver, restraint, and opportunity on the global specialty gases market?
What are the key regional markets?
Which countries represent the most attractive specialty gases market?
What is the breakup of the market based on the type?
Which is the most attractive type in the specialty gases market?
What is the breakup of the market based on the element?
Which is the most attractive element in the specialty gases market?
What is the breakup of the market based on the application?
Which is the most attractive application in the specialty gases market?
What is the breakup of the market based on the packaging type?
Which is the most attractive packaging type in the specialty gases market?
What is the breakup of the market based on the sales type?
Which is the most attractive sales type in the specialty gases market?
What is the competitive structure of the global specialty gases market?
Who are the key players/companies in the global specialty gases market?

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