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Argon Gas Market Assessment, By Application [Pure Form, Mixture Form], By End-use Industry [Metallurgy, Electrical and Electronics, Healthcare, Food & Beverage, Energy & Power Generation, Automotive, Construction, Others], By Storage & Supply Mode [Cylinders, Bulk and Micro Tanks, Drums, Others] By Region, Opportunities and Forecast, 2017-2031F

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Abstracts

Global argon gas market is projected to witness a CAGR of 6.5% during the forecast period 2024-2031, growing from USD 8.12 billion in 2023 to USD 13.44 billion in 2031. The revenue expansion of the metallurgy industry is boosting the growth of the argon gas market. For instance, as per United States Geological Survey (USGS), titanium production in Australia was 660 thousand tons in 2021, an increase of 10% as opposed to 2021.

The dominance of the Asia-Pacific region in the argon gas industry is acting as another growth-inducing factor. For instance, according to the Organisation Internationale des Constructeurs d'Automobiles (OICA), in 2022, the Asia Pacific region production of automobiles in the Asia-Pacific region registered a growth of 7%.

The increasing prevalence of chronic diseases, the development of advanced healthcare facilities, and the recent innovations related to medical equipment are some of the crucial variables accelerating the growth of the healthcare industry. In line with the healthcare industry expansion, the argon gas demand is booming as it is deployed in surgical instruments, thereby accelerating the revenue advancement of the market. In addition, the growth of the metallurgy industry at the global level is attributed to prime factors such as increasing demand for manufactured goods, growing adoption of 3D

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printing and additive manufacturing, sustainable cost reduction, and technological advancements. Thus, the bolstering metallurgy industry is boosting the demand for argon gas since the gases are utilized in metal manufacturing and processing activities, which, in turn, is propelling the growth of the market.

Moreover, recent investments in the development of new argon gas manufacturing facilities will create a favorable growth potential for the market growth during the projected forecast period. For instance, Air Water Inc.'s subsidiary, Air Water America, is planning to construct an air separation unit in Rochester, New York, to develop an integrated gas supply business from manufacturing to sales of industrial gases, including argon. The plan is to begin construction in November 2024 and start operations in September 2025. This facility will have a manufacturing capability of 240 tons/day and will be the group's first gas manufacturing base in North America. However, the availability of various substitute products for argon gas is a prime restraint limiting the growth of the market.

The Increasing Adoption of Argon Gas in the Healthcare Industry is Accelerating the Market Growth

In the healthcare sector, argon gas is used for procedures such as retinal phototherapy, retinal realignment, and tumor ablation. Additionally, it is used in pure form or mixtures for analysis and quality control in hospitals, as well as in plasma gas for inductive coupled plasma (ICP) emission spectrometry and other medical applications. The key players having a significant share in the global argon market are offering argon gas for application in the healthcare industry.

For illustration, Air Liquide Healthcare, a subsidiary company of Air Liquide, a global player in the argon gas industry, is offering Air Liquide Healthcare argon gas for the healthcare industry. Argon gas is employed as a blanket gas in graphite furnace atomic absorption spectrometry (GFAAS) and as a carrier gas in gas chromatography for a wide range of detectors. Henceforth, the inert properties of argon make it beneficial for performance quality improvement in the healthcare industry. As a result, the increasing adoption of argon gas in the healthcare industry is proliferating the market growth.

Booming Metallurgy Industry is Augmenting Traction for Market Growth

Argon gas is a colorless, odorless, non-flammable, and non-toxic gas, which makes it ideal for use in the metallurgy industry. Argon gas is utilized as a blowing gas during the manufacturing process of higher-quality metals to avoid the formation of nitrides. As a

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result, argon gas is often deployed in the manufacturing and processing of metals such as steel, titanium, and others. In steel production, argon gas is deployed in ladle metallurgy, vacuum degassing, and continuous casting to stir the metal and facilitate refining steps, along with stream shrouding and tundish inerting. The rapid adoption of steel across various end-use industries, including building and construction, automotive, aerospace, marine, and industrial products are some of the prime factors facilitating the robust growth of the steel industry.

For instance, according to the recent data published by the World Steel Association (WSA), in 2022, the global production of crude steel was 1,885 million tons. The top 5 markets for crude steel production were China, India, Japan, the United States, and Russia with a volume of 1,018 million tons, 125.3 million tons, 89.2 million tons, 80.5 million tons, and 71.5 million tons, respectively. Hence, the booming metallurgy sector is fueling the demand for argon gas since it plays a vital role in the manufacturing process, providing a protective atmosphere for various metalworking steps and contributing to the quality of the final products. This determinant is augmenting the market growth.

Beneficial Technical Properties of Argon Gas are Prompting Manufacturers to Develop New Manufacturing Facilities

The various technical properties associated with the argon gas include melting point at -189°C, boiling point at -185.7°C, 0.00178 grams per centimeter cube density, and molecular weight/molar mass at 39.948 u. The above-mentioned characteristics make argon gas less conductive than regular air, promoting its use as a better thermal insulating gas. As a result, argon gas is ideal for a range of end-use industries such as metallurgy, electrical and electronics, healthcare, food & beverage, and energy and power generation. Thus, the argon gas manufacturers at the global level are targeting to develop new manufacturing facilities to cater to a wide range of end-use industries. For instance, in October 2022, Air Liquide invested USD 539.72 million (EURO 500 million) in three new plants in Taiwan to supply ultra-pure nitrogen, oxygen, and argon gas, with the first plant expected to be operational in 2024. Therefore, beneficial technical properties related to argon gas are prompting the leading players to develop new manufacturing facilities, which, in turn, is supplementing the growth of the argon gas market.

Significant Share of the Asia-Pacific Region in the Global Argon Gas Market

The Asia-Pacific region is experiencing rapid industrialization, leading to an increased demand for industrial gases, including argon gas. Additionally, the growth in sectors,

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such as electronics, manufacturing, and energy, is driving the demand for argon gas in the region. Likewise, the increasing urbanization and infrastructural growth in the Asia-Pacific region are creating new opportunities for the argon gas market.

For instance, according to the recent statistics published by the United States Geological Survey (USGS), in 2021, titanium production in Vietnam was 122 thousand tons, and in 2022, it was 160 thousand tons, representing a year-on-year growth rate of 31.1%. In addition, India's iron & steel production was 78 thousand tons in 2021, and it reached 83 thousand tons in 2022, an annual growth rate of 6.4%. Henceforth, the increase in the production of metallurgy-related products, including iron, steel, and titanium, among others, is spurring the demand for argon gas in the Asia-Pacific region, which is further amplifying the growth of the market in the region.

Impact of COVID-19

Stringent protocols were implemented across various regions, including North America, Europe, and Asia-Pacific, to curb the surging COVID-19 cases in 2020. The supply chain of argon gas was disrupted as the leading manufacturing units for automotive, metallurgy, and construction halted their operation. The World Steel Association's Short Range Outlook released in April 2021 reported that global steel consumption declined by 0.2% in 2020, with the largest percentage decline recorded in North America, the European Union, the United Kingdom, and Africa. Hence, the decrease in the revenue of the end-use industries restricted the argon gas market growth in 2020.

However, on the contrary, the demand for healthcare facilities increased exponentially in 2020, which boosted the segmental revenue growth of the market. Furthermore, at the end of 2020, governments of various nations implemented aggressive measures to promote industrial manufacturing activities, which significantly accelerated the argon gas market.

Impact of Russia-Ukraine War

The Russia-Ukraine war had a significant impact on the argon gas industry, as Ukraine is a major supplier of noble gases, including argon, which is essential for various applications, including semiconductor chip production. The conflict disrupted the supply of noble gases, leading to concerns about the structure and resilience of global supply chains, particularly for strategically sensitive technologies. The disruption in the supply chain further forced chipmakers to review their stockpiles, which led to a surge in wholesale prices of rare gases, including argon. The conflict also pushed European gas

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prices to record levels, affecting chemical producers and potentially leading to gas rationing and production cuts.

In addition, various argon gas manufacturers halted their production activities in Russia, which impacted the supply of gases in the global market. For instance, in September 2022, Air Liquide disengaged its production activities in Russia. Therefore, the war between Russia and Ukraine has had a substantial impact on the argon gas industry, affecting supply chains, prices, and the availability of noble gases essential for various applications, including chip manufacturing.

Key Players Landscape and Outlook

The key industry leaders involved in the manufacturing of argon gas in the global market are Air Products and Chemicals, Inc., Air Liquide, Linde plc, Messer, Praxair Technology, Inc., MATHESON TRI-GAS, INC., Iwatani Corporation., Steelman Gases Pvt. Ltd., Bhuruka Gases Limited, and Ellenbarrie industrial Gases. These players have highly advanced modern infrastructure for developing, producing, storing, and supplying argon gas. Major players are deploying various strategies, entering mergers & acquisitions, formulating strategic agreements & contracts, and developing, testing, and introducing new solutions and services.

In July 2023, Sol India Pvt Ltd, an Indian industrial and medical gas manufacturer, commenced the development of a new gas manufacturing facility in India. The new gas manufacturing plant will produce & supply gases such as industrial oxygen, liquid medical gas, liquid nitrogen, and argon. Thus, the development of new manufacturing facilities related to argon gas will foster the supply of gases in the global market in the upcoming years.

In July 2023, a multi-year contract was awarded for the acquisition of a large cryogenic plant to cool tens of thousands of tons of liquid argon for DUNE detectors in South Dakota. This contract highlights the growing interest in argon gas and its applications in various industries, including aerospace and defense.

In December 2022, Air Liquide, a global player involved in the manufacturing and supply of argon gas, opened a new facility with a cylinder filling station (CFS) that fills 3000 cylinders per day and 70 tons per day capacity air separation unit (ASU) in Maharastra, India. This new facility will serve various small and medium organization customers of liquid argon, argon-CO2 mixtures, oxygen, liquid nitrogen, oxygen, and nitrogen in high-pressure cylinders. Hence, the inauguration of a new facility targeted to serve multiple

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end-use industries is augmenting the revenue growth of the argon gas market.

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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

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