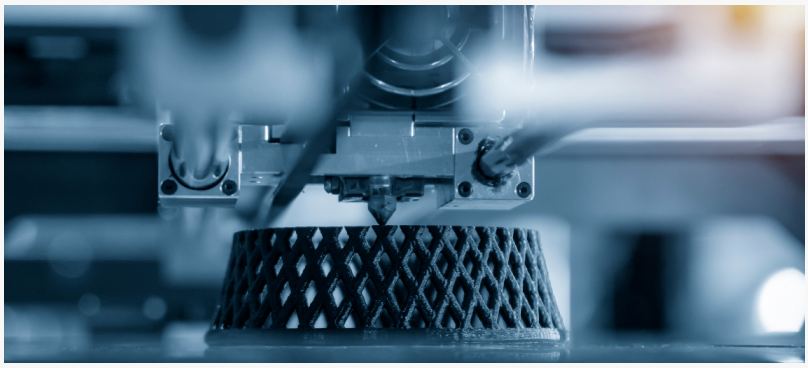
3D Printing Gases Market Research, Segmentation, Key Players Analysis and Forecast to 2033

The global 3d printing gases market is projected to reach $166.9 million by 2033, growing at a CAGR of 10.3% from 2024 to 2033



3D Printing Gases Markets Growth

WILMINGTON, DE, UNITED STATES, June 19, 2025 /EINPresswire.com/ -- Allied Market Research published a report, titled, "3D Printing Gases Market by Product (Argon, Nitrogen, Gas Mixtures), by Technology (Stereolithography, Laser Sintering, Poly-Jet Technology, Others), by End-Use (Design and Manufacturing, Healthcare, Consumer Products, Others): Global Opportunity Analysis and Industry Forecast, 2024-2033". According to the report, the "3D printing gases market" was valued at $63.1 million in 2023, and is estimated to reach $166.9 million by 2033, growing at a CAGR of 10.3% from 2024 to 2033.

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Exploring Growth & Innovation Opportunities

The rapid expansion of metal additive manufacturing is transforming industries such as aerospace, automotive, medical, and tooling, creating a strong demand for high-performance materials and reliable printing technologies, metal 3D printing utilizes a layer-by-layer approach to build parts from metal powders, which requires careful control of the environment to achieve optimal results. Markforged, a leader in 3D printing, expanded its capabilities by introducing the FX10, a next-generation composite printer, in October 2023. At Formnext 2024, the company unveiled the FX10 metal print head, making it the first industrial printer capable of printing both composite and metal parts. Additionally, Markforged's hardware and Eiger software received ISO 27001 security certification, underscoring their commitment to data security and privacy. In April 2024, INDO-MIM partnered with HP Inc. to advance end-use metal 3D printing in India. They installed two HP Metal Jet Binder 3D printers at INDO-MIM's Bengaluru facility, targeting sectors

such as automotive, aerospace, defense, consumer electronics, and medical equipment.

Moreover, In the Asia-Pacific region, the increasing adoption of 3D printing technologies across industries such as aerospace, automotive, and healthcare is driving the demand for advanced gas management systems. In May 2024, Agnikul Cosmos successfully launched India's first 3D-printed rocket engine. This achievement highlights India's growing capabilities in rapid and cost-effective rocket manufacturing. Metal 3D printing technologies such as Selective Laser Melting (SLM) or Direct Energy Deposition (DED) are used for manufacturing high-performance parts like rocket engines.

Importance and dominance of 3D printing gases is various industries

3D printing gases, such as argon, nitrogen, and gas mixture, are essential in additive manufacturing processes to create high-quality, defect-free parts. As per Midwest Engineered Systems Inc, In aerospace, over 30% of titanium parts in aircraft engines and structural components are produced using metal additive manufacturing, necessitating a controlled gas atmosphere to prevent defects. The medical industry also relies on high-purity argon and nitrogen for producing custom implants, with over 100,000 3D-printed implants already in use worldwide. The increasing demand for precision manufacturing in these sectors continues to drive innovation in 3D printing gas solutions.

Prime determinants of growth

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The growing use of metal additive manufacturing, which relies on inert gases to prevent oxidation and enhance print quality, is driving market expansion. In October 2024, ADNOC Gas, a leading energy company, unveiled plans to develop one of the largest digital libraries for critical components in the industry. This innovative digital warehouse will store scans of over 3,500 parts, enabling on-demand manufacturing via advanced 3D printing technology. ADNOC Gas expects to generate $50 million in savings by 2028, with this strategy reducing production lead times by 50%, minimizing operational downtime, and lowering CO emissions by eliminating the need for overseas shipping. This initiative highlights ADNOC Gas's commitment to leveraging modern 3D printing gas technologies for improved operational efficiency and sustainability.

Market Challenges & Solutions

The cost of high-purity gases and associated gas-handling equipment can be a barrier for small-scale or entry-level users. These gases are more expensive than industrial gases due to their high purity standards and complex manufacturing processes involving advanced blending, analysis, and cylinder preparation techniques. According to the MESA Specialty Gases & Equipment, a cylinder for industrial gas costs around $50, and a specialty gas cylinder can cost up to $500. All

these factors are expected to hamper the growth of the market. Some key solutions are as follows:

Bulk Gas Purchasing and Distribution Networks: Small-scale users benefit from joining group purchasing agreements or cooperative buying programs. By purchasing gases in bulk or through distribution networks, the price per unit can be significantly reduced.

Gas Reuse and Recycling: Investing in systems that allow for the capture, purification, and reuse of 3D printing gases could cut costs. Gas recycling systems are developed and integrated into 3D printing operations to minimize waste and reduce the need for constant replenishment of specialty gases.

Surge in Adoption of 3D Printing in Manufacturing in Asia-Pacific Region

The Asia-Pacific region is witnessing a significant surge in the adoption of 3D printing in manufacturing, driven by advancements in technology, government initiatives, and the increasing demand for customized and high-performance components. Countries such as China, Japan, South Korea, India, and Singapore are at the forefront of this growth, leveraging additive manufacturing (AM) to enhance production efficiency, reduce material waste, and accelerate product development. The rise of Industry 4.0 and smart manufacturing practices has further fueled the adoption of 3D printing across industries like aerospace, automotive, healthcare, and consumer goods. In October 2022, Air Liquide announced a substantial investment of $539.72 million (EURO 500 million) in three new plants in Taiwan. These facilities are set to supply ultra-pure nitrogen, oxygen, and argon gas, with the first plant expected to be operational in 2024. Moreover, In December 2024, the Asia-Pacific Commerce and Industry Confederation (APCIC) established the Chamber of 3D Printing and Advanced Manufacturing. This initiative aims to accelerate the adoption of Morden manufacturing technologies across the region, fostering innovation, collaboration, and strategic development to position the Asia-Pacific as a global leader in advanced manufacturing.

Want to Access the Statistical Data and Graphs, Key Players' Strategies:
https://www.alliedmarketresearch.com/3d-printing-gases-market/purchase-options

China's Strategic Investment in Additive Manufacturing

China is heavily investing in additive manufacturing for a wide range of sectors such as automotive, aerospace, electronics, and healthcare. The demand for customized automotive parts, electronics, and medical devices is increasing, particularly in high-growth sectors like smart manufacturing. The export of 3D printers from China grew from 656,000 units in 2017 to 2.539 million units in 2020, with a 25% year-on-year increase in the first three quarters of 2022 compared to the same period in 2021.

3D Printing Gases Industry News

In April 2024, the UK government introduced new export controls targeting emerging technologies, including metal 3D printers that utilize inert gases like argon or nitrogen for atmospheric control. These regulations require exporters to obtain licenses for shipping such technologies outside the UK, aiming to protect national security and align with similar measures in the US and EU.

The Additive Manufacturer Green Trade Association (AMGTA) reported in April 2024 that helium gas atomization is the most energy-efficient method for producing common metal powders used in 3D printing. This process consumes 13% less energy per kilogram of powder compared to argon and 28% less than nitrogen, highlighting the importance of gas selection in sustainable manufacturing practices.

Research published in November 2022 explored the synthesis of porous amorphous nitinol a nickel titanium alloy through the injection of argon gas into a liquid melt, followed by rapid cooling. This method demonstrated that varying the argon fraction could exponentially increase porosity, offering potential advancements in material properties for 3D-printed components.

Leading Market Players: -

Linde plc

Air Products and Chemicals, Inc

Airgas, Inc

Messer Group GmbH

TAIYO NIPPON SANSO CORPORATION

Air Liquide

Gaztron Engineering Private Limited

Matheson Tri-Gas, Inc

Coregas Pty Ltd

Universal Industrial Gases

Bargaining Power of Suppliers

Concentration of Suppliers: The suppliers of industrial gases (e.g., Air Liquide, Linde, Praxair) are

well-established, meaning they hold significant power over pricing and supply. However, there is a growing number of companies entering the specialized gas supply sector for 3D printing, which can slightly reduce supplier power. In January 2023, Linde acquired nexAir, LLC, enhancing its packaged gas distribution network in the southeastern U.S. This acquisition complements Linde's existing business and expands its footprint in a core and fast-growing geography.

Switching Costs: Switching between gas suppliers in 3D printing can be complex due to the unique requirements of each printer and material. This increases supplier power, as manufacturers may rely on specific gas compositions.

Recent Key Developments

In June 2023, Linde plc expanded its partnership with ExOne to enhance the production of high-performance 3D printing materials.

In March 2023, Air Products and Chemicals, Inc, announced a partnership with 3D Systems to deliver optimized gases for metal additive manufacturing processes.

In March 2024, Air Liquide introduced a new range of high-purity gases designed specifically for additive manufacturing, catering to processes like laser sintering and stereolithography.

The report provides a detailed analysis of these key players in the global 3D printing gases market. These players have adopted different strategies such as new product launches, collaborations, expansion, joint ventures, and agreements to increase their market share and maintain dominant shares in different regions. The report is valuable in highlighting business performance, operating segments, product portfolio, and strategic moves of market players to highlight the competitive scenario.

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