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Type 4 Cylinder Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Material (Fully Carbon Fiber, Carbon Fiber +Glass Fiber), By Diameter (414 mm, 533 mm, 648 mm), By Length (60-inch, 80-inch, 90-inch,100- inch,120- inch), By Application (CNG, Biogas, Hydrogen, Others), By Region & Competition, 2021-2031F

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Abstracts

The Global Type 4 Cylinder Market is projected for substantial growth, expanding from USD 1.43 Billion in 2025 to USD 2.44 Billion by 2031, at a CAGR of 9.31%. These advanced composite pressure vessels, featuring a non-load-bearing polymer liner fully wrapped in carbon fiber, offer superior corrosion resistance and significant weight reduction compared to metal alternatives. Growth is primarily driven by the increasing adoption of Fuel Cell Electric Vehicles (FCEVs) and the expanding mobile gas transport infrastructure, particularly where maximizing payload is crucial. This trajectory is reinforced by global decarbonization mandates and substantial public funding for clean energy ecosystems; for instance, the Hydrogen Council noted USD 110 billion in committed capital for clean hydrogen projects by 2025.

Market Driver

The primary driver for the Global Type 4 Cylinder Market is the accelerating adoption of Hydrogen Fuel Cell Electric Vehicles (FCEVs), especially within the heavy-duty commercial transport sector. Long-haul trucks and transit buses require lightweight, high-capacity storage that doesn't compromise payload, making Type 4 cylinders essential. This demand is evidenced by Hexagon Purus's 55% year-over-year revenue increase to NOK 1,480 million in Q3 2024, largely due to hydrogen mobility and

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infrastructure solutions. Concurrently, stringent government decarbonization mandates and clean energy incentives create a supportive ecosystem by enforcing emission standards and providing substantial capital, such as the European Commission's €720 million award for renewable hydrogen projects. This subsidized supply availability, alongside a rapidly expanding global pipeline of clean hydrogen projects (1,572 by 2024 according to the Hydrogen Council), stimulates downstream adoption of these storage technologies.

Market Challenge

The main obstacle for the Global Type 4 Cylinder Market is the high cost of carbon fiber reinforced polymers (CFRP), which form the majority of manufacturing expenses. While providing essential strength and weight advantages, this material's price significantly raises the upfront cost of storage systems compared to steel cylinders or battery alternatives. This premium often outweighs operational efficiency gains in cost-sensitive industries, slowing the transition to mass commercial deployment. Consequently, the high unit economics contribute to a broader financing shortfall in the clean energy ecosystem, with the Hydrogen Council estimating a USD 335 billion investment gap by 2030 in the global hydrogen sector. This indicates that prohibitive costs for core components like Type 4 cylinders remain a critical impediment to market acceleration, despite their technical viability.

Market Trends

A key trend is the expansion into virtual pipeline and mobile gas transport applications, addressing the need to connect hydrogen production hubs with decentralized users and refueling stations. These high-capacity Type 4 bulk transport modules maximize payload and ensure safety during transit, bridging infrastructure gaps where fixed pipelines are unfeasible; Hexagon Purus reported that distribution solutions accounted for most of its Hydrogen Mobility and Infrastructure segment's NOK 1,782 million full-year revenue in Q4 2024. Simultaneously, strategic partnerships and vertical supply chain integration are consolidating advanced composite manufacturing to secure proprietary technologies and optimize unit economics. Leading manufacturers are acquiring and forming joint ventures to control the entire production value chain, exemplified by Worthington Enterprises' improved sales after integrating Hexagon Ragasco, which specializes in automated composite cylinder production.

Key Market Players

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Hexagon Purus ASA

Worthington Industries, Inc.

Luxfer Holdings PLC

NPROXX B.V.

Faber Industrie S.p.A.

ILJIN HYSOLUS Co., Ltd.

Sinoma Science & Technology Co., Ltd.

Everest Kanto Cylinder Limited

Rama Cylinders Private Limited

Quantum Fuel Systems LLC

Report Scope

In this report, the Global Type 4 Cylinder Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Type 4 Cylinder Market, By Material

Fully Carbon Fiber

Carbon Fiber +Glass Fiber

Type 4 Cylinder Market, By Diameter

414 mm

533 mm

648 mm

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Type 4 Cylinder Market, By Length

60-inch

80-inch

90-inch

100- inch

120- inch

Type 4 Cylinder Market, By Application

CNG

Biogas

Hydrogen

Others

Type 4 Cylinder Market, By Region

North America

United States

Canada

Mexico

Europe

France

United Kingdom

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- Italy
- Germany
- Spain

Asia Pacific

- China
- India
- Japan
- Australia
- South Korea

South America

- Brazil
- Argentina
- Colombia

Middle East & Africa

- South Africa
- Saudi Arabia
- UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Type 4 Cylinder Market.

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Available Customizations:

Global Type 4 Cylinder 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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