

# Polyhydroxyalkanoate (PHA) Market, Global Outlook and Forecast 2022-2028

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## Abstracts

Polyhydroxyalkanoate (PHA) is a storage material for carbon and energy sources in microorganisms. When carbon sources are abundant and other nutrients (N/P/S, etc.) are insufficient, they will be synthesized in different microorganisms. PHA synthesis the main costs are the substrate cost in the fermentation stage and the cost of downstream extraction and purification.

The diversity of PHA monomer structure is mainly different from the difference in the side chain group on the C-3 position, in which the monomer with 3-5 carbon atoms is short-chain PHA (SCL PHA), and the number of carbon atoms above 6 is medium and long chain. PHA (MCL PHA). In the general structural formula of PHA, R can be an alkenyl group, a benzene ring, an alkyl group, etc., usually m is 1, and n represents the degree of polymerization, which determines the molecular weight of the polymer. Poly-3-hydroxybutyric acid (PHB) with a methyl side chain is the most common. Poly-3-hydroxybutyric acid (PHB) has thermoplasticity like polypropylene and has brittleness and poor thermal stability; polyhydroxybutyric acid-co-hydroxyvaleric acid copolymer (PHBV) has more good strength, hardness, greater elasticity, lower melting point. Short-chain PHA presents a hard crystal; medium- and long-chain PHA is a thermoplastic elastomer with good flexibility, low hardness, slow crystallization rate, and the melting temperature is mostly kept in the range of 39-61 °C; short-chain medium- and long-chain copolymerization The PHA (SCL-MCL PHA), by adjusting the monomer ratio, obtains a copolymerized PHA material that combines the excellent properties of short-chain and medium-long chains. PHA synthesis methods include microbial fermentation (wild bacteria method, recombinant engineering bacteria method), transgenic plant method, activated sludge method, and microbial fermentation method are the main ways of biosynthesizing PHA at present. The microorganisms that synthesize PHA are mainly divided into three categories: pure bacteria, engineering

bacteria and mixed bacteria. In the process of biosynthesizing PHA, there are disadvantages such as high sterilization cost, high consumption of fresh water, and easy contamination by discontinuous fermentation, resulting in lower competitiveness of industrial biotechnology compared with chemical processes.

This report contains market size and forecasts of Polyhydroxyalkanoate (PHA) in global, including the following market information:

Global Polyhydroxyalkanoate (PHA) Market Revenue, 2017-2022, 2023-2028, (\$ millions)

Global Polyhydroxyalkanoate (PHA) Market Sales, 2017-2022, 2023-2028, (MT)

Global top five Polyhydroxyalkanoate (PHA) companies in 2021 (%)

The global Polyhydroxyalkanoate (PHA) market was valued at 176.8 million in 2021 and is projected to reach US\$ 338.2 million by 2028, at a CAGR of 9.7% during the forecast period 2022-2028.

The U.S. Market is Estimated at \$ Million in 2021, While China is Forecast to Reach \$ Million by 2028.

PHB-Poly(3-hydroxybutyrate) Segment to Reach \$ Million by 2028, with a % CAGR in next six years.

The global key manufacturers of Polyhydroxyalkanoate (PHA) include Danimer Scientific, Kaneka, Nafigate Corporation, Tian'an Biopolymer, Biomer, Shenzhen Ecomann Technology, RWDC Industries, Newlight Technologies and CJ CheilJedang, etc. In 2021, the global top five players have a share approximately % in terms of revenue.

MARKET MONITOR GLOBAL, INC (MMG) has surveyed the Polyhydroxyalkanoate (PHA) manufacturers, suppliers, distributors and industry experts on this industry, involving the sales, revenue, demand, price change, product type, recent development and plan, industry trends, drivers, challenges, obstacles, and potential risks.

Total Market by Segment:

Global Polyhydroxyalkanoate (PHA) Market, by Type, 2017-2022, 2023-2028 (\$

Millions) & (MT)

Global Polyhydroxyalkanoate (PHA) Market Segment Percentages, by Type, 2021 (%)

PHB-Poly(3-hydroxybutyrate)

PHBV-poly(3-hydroxybutyrate-co-3-hydroxyvalerate)

P34HB-poly(3-hydroxybutyrate-co-4-hydroxybutyrate)

PHBHHxpoly(3-hydroxybutyrate-co-3-hydroxyhexanoate)

Global Polyhydroxyalkanoate (PHA) Market, by Application, 2017-2022, 2023-2028 (\$ Millions) & (MT)

Global Polyhydroxyalkanoate (PHA) Market Segment Percentages, by Application, 2021 (%)

Packaging

Biomedical Implant

Agricultural

Food Services

Others

Global Polyhydroxyalkanoate (PHA) Market, By Region and Country, 2017-2022, 2023-2028 (\$ Millions) & (MT)

Global Polyhydroxyalkanoate (PHA) Market Segment Percentages, By Region and Country, 2021 (%)

North America

US

Canada

Mexico

Europe

Germany

France

U.K.

Italy

Russia

Nordic Countries

Benelux

Rest of Europe

Asia

China

Japan

South Korea

Southeast Asia

India

Rest of Asia

South America

Brazil

Argentina

Rest of South America

Middle East & Africa

Turkey

Israel

Saudi Arabia

UAE

Rest of Middle East & Africa

## Competitor Analysis

The report also provides analysis of leading market participants including:

Key companies Polyhydroxyalkanoate (PHA) revenues in global market, 2017-2022 (Estimated), (\$ millions)

Key companies Polyhydroxyalkanoate (PHA) revenues share in global market, 2021 (%)

Key companies Polyhydroxyalkanoate (PHA) sales in global market, 2017-2022 (Estimated), (MT)

Key companies Polyhydroxyalkanoate (PHA) sales share in global market, 2021 (%)

Further, the report presents profiles of competitors in the market, key players include:

Danimer Scientific

Kaneka

Navigate Corporation

Tian'an Biopolymer

Biomer

Shenzhen Ecomann Technology

RWDC Industries

Newlight Technologies

CJ CheilJedang

PHB Industrial S.A.

Mango Materials

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