

Metamaterials Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2023-2028

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Abstracts

The global metamaterials market size reached US\$ 632.9 Million in 2022. Looking forward, IMARC Group expects the market to reach US\$ 2,876.2 Million by 2028, exhibiting a growth rate (CAGR) of 28.70% during 2022-2028.

Metamaterials are engineered macroscopic composites with an artificial, three-dimensional (3D), periodic cellular architecture. These composites are designed to achieve advantageous and unusual electromagnetic properties that cannot be found in natural materials. They are made using subwavelength building blocks, which allow extreme control over optical fields and provide negative refractive index characteristics. They help manage and manipulate light, sound, and other physical phenomena. As a result, they are widely used for designing wireless sensors with specified sensitivity and resolution for the agriculture and biomedical industries. They are also utilized in microwave devices and optical components that are based on electromagnetic radiation.

Metamaterials Market Trends:

With the escalating demand for plant-based food products worldwide, farmers are shifting towards integrated and advanced technologies to increase their total crop productivity. This represents one of the significant factors catalyzing the demand for miniature sensors based on metamaterials as they aid in accurate mapping of soil humidity and moisture. Apart from this, metamaterials find extensive application in telemetry systems that are widely employed in the aerospace industry for measuring meteorological data, including humidity, temperature, and barometric pressure. Moreover, metamaterial coatings are used to increase bandwidth, reduce the size, and enhance the radiator efficiency of small electric and magnetic dipole antennas. Additionally, as metamaterial absorbers are thin, lightweight, and can be utilized over a

wide frequency range, they are gaining traction in the electronics industry across the globe. Furthermore, with improvements in metamaterials, their industrial applications are expanding in photovoltaics (PV), microelectromechanical systems, lightweight materials, vehicles, and wireless communications. This, in confluence with the introduction of metamaterial absorber-based energy harvesting devices, is anticipated to impact the market positively.

Key Market Segmentation:

IMARC Group provides an analysis of the key trends in each sub-segment of the global metamaterials market report, along with forecasts at the global, regional and country level from 2023-2028. Our report has categorized the market based on type, application and end user.

Breakup by Type:

- Electromagnetic
- Terahertz
- Photonic
- Tunable
- Frequency Selective Surface
- Others

Breakup by Application:

- Absorber
- Antenna and Radar
- Cloaking Devices
- Super Lens
- Others

Breakup by End User:

- Aerospace and Defense
- Medical
- Automotive
- Consumer Electronics
- Energy and Power
- Others

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

Competitive Landscape:

The competitive landscape of the industry has also been examined along with the profiles of the key players being Acoustic Metamaterials Group Ltd, Echodyne Corp, Fractal Antenna Systems Inc., JEM Engineering LLC, Kymeta Corporation, Metamagnetics Inc, Metamaterial Technologies Inc., MetaShield LLC, Nanoscribe GmbH & Co. KG (Cellink AB), Plasmonics Inc. and TeraView Limited.

Key Questions Answered in This Report:

How has the global metamaterials market performed so far and how will it perform in the coming years?

What has been the impact of COVID-19 on the global metamaterials market?

What are the key regional markets?

- What is the breakup of the market based on the type?
- What is the breakup of the market based on the application?
- What is the breakup of the market based on the end user?
- What are the various stages in the value chain of the industry?
- What are the key driving factors and challenges in the industry?
- What is the structure of the global metamaterials market and who are the key players?
- What is the degree of competition in the industry?

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