

The Global Market for Nanomaterials in Sustainable Biomaterials and Bioplastics

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Abstracts

Sustainable materials are of growing importance to society for environmental, security, and quality of life reasons. The use of biomaterials and bioplastics has grown rapidly in recent years as many consumers prefer products, especially in market such as packaging, that are sustainable and biodegradable. Recently there has been an increased focus on nanomaterials and renewable polymer resources to produce plastics that do not harm the environment.

A significant challenge in the development of bioplastics is that their mechanical properties are not comparable to petroleum-based plastics. However, the incorporation of nanomaterials into a range of applications allows for the use of less material and vastly improves mechanical and thermal properties, comparable to traditional plastics.

Applications where the use of nanomaterials is contributing to growth in the sustainable biomaterials and bioplastics market include:

Flexible and rigid packaging.

Nanocoatings on paper and plastic webs for vapor barrier.

Strength enhancement in paper, paperboard, and wood building products.

Nanocomposites in structural panels and composite structures.

Smart materials.

Smart packaging.

Printed electronics.

Self-healing materials and coatings.

Sustainable 3D printing.

Markets covered include:

Aerospace: Lightweighting, self-healing, reducing fuel consumption.

Automotive: Bio-based and recycled resins, natural fiber composites, nanofiller-reinforced foams and composites.

Biomedicine: Artificial body parts, tissue engineering, targeted drug delivery.

Construction: Sustainable construction/green building, aerogel insulation, biocement.

Biopackaging: Paper and board packaging, food packaging, barrier films.

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