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The Global Market for Nanodiamonds 2021

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Abstracts

Nanodiamonds (NDs) are diamond phase carbon nanomaterials that were initially used for their strong abrasive properties and as lubricant additives for industrial applications. Now they are impacting a broad range of markets including batteries, supercapacitors, skincare, biomedicine, coatings and plastics.

Main types of commercial NDs produced are categorized as high-pressure high temperature (HPHT) nanodiamonds, CVD diamond and detonation nanodiamonds (DND). Extremely small amounts of nanodiamond additives can modify a variety of thermal and mechanical properties in various parent materials. Properties include:

Diamond core: highest hardness (167 Gpa) and wear resistance

Highest thermal conductivity (2300 W/mK)

High electrical resistivity (10?? ?cm)

Low thermal expansion (1.0?10-6 K-1)

Wide band gap (5.47 eV {300 K})

High refractive index (2.417)

Low specific gravity (3.52)

Chemical/radiation resistance

Biocompatibility

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Large surface area (250- 450 m?/g)

High & controllable chemical activity of the surface.

Environmentally friendly (green additives).

Main current applications of Nanodiamonds in terms of volume demand are:

Fine polishing abrasives.

Coatings additives (galvanic and electroless).

Lubricant additives (oils and grease).

Reinforcing polymer fillers.

Other applications that will gain commercial prominence include skincare, biomedicine (e.g. drug delivery and biosensors) and batteries.

Report contents include:

Types of nanodiamonds and properties.

Production methods by producer.

Applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand.

Competitive landscape.

Markets for nanodiamonds including

lubricants

electroplating and anti-wear/friction coatings

polishing materials

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biomedicine

composites

thermoplastics

skincare

energy storage

Nanodiamonds pricing.

Global market consumption of nanodiamonds to 2030 (tons).

In depth company profiles including types produced, products, target markets, production capabilities, contact details. Companies profiled include Adamas, Carbodean, Daicel, NDB, Ray Techniques etc.

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Contents

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Tables

TABLES

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Figures

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