

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^{11} Ωcm)

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

Large surface area (250- 450 m²/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

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.

Contents

1 RESEARCH METHODOLOGY

2 PROPERTIES OF NANODIAMONDS

2.1 Types

2.1.1 Commercial nanodiamonds

2.1.2 Fluorescent nanodiamonds (FNDs)

2.2 Production methods-advantages and disadvantages

3 APPLICATIONS

4 MARKETS FOR NANODIAMONDS

4.1 LUBRICANTS

4.1.1 Nanolubricants

4.1.1.1 Products

4.1.2 Market for nanodiamonds in lubricants

4.1.3 Applications

4.1.4 Global market consumption of nanodiamonds in lubricants to 2030 (tons)

4.2 ELECTRONIC POLISHING MATERIALS

4.2.1 Market for nanodiamonds in electronic polishing materials

4.2.2 Applications

4.2.3 Global market consumption of nanodiamonds in lubricants to 2030 (tons).

4.3 ELECTROPLATING AND ANTI-WEAR/FRICTION COATINGS

4.3.1 Market for nanodiamonds in electroplating and anti-wear/friction coatings

4.3.2 Applications

4.3.3 Global market consumption of nanodiamonds in electroplating and anti-wear/friction coatings to 2030 (tons)

4.4 COMPOSITES

4.4.1 Market for nanodiamonds in plastics

4.4.2 Fiber-based polymer composite parts

4.4.2.1 Market overview

4.4.2.2 Applications

4.4.2.3 Global market consumption of nanodiamonds in composites to 2030 (tons).

4.4.3 Metal-matrix composites

4.4.3.1 Market overview

4.4.3.2 Global market consumption of nanodiamonds in metal-matrix to 2030, tons

4.5 SKINCARE

4.5.1 Market for nanodiamonds in skincare

4.5.2 Market and applications

4.5.3 Global market consumption of nanodiamonds in skincare to 2030 (tons).

4.6 SUPERCAPACITORS

4.6.1 Market for nanodiamonds in supercapacitors.

4.6.2 Applications

4.6.3 Global market consumption of nanodiamonds in supercapacitors to 2030 (tons)

4.7 BATTERIES

4.7.1 Market for nanodiamonds in batteries

4.7.2 Applications

4.7.3 Global market consumption of nanodiamonds in batteries to 2030 (tons)

4.8 DRUG DELIVERY

4.8.1 Market for nanodiamonds in drug delivery

4.8.2 Applications

5 PRICING OF NANODIAMONDS

6 NANODIAMOND PRODUCERS AND PRODUCT DEVELOPER PROFILES 70 (30 COMPANY PROFILES)

7 EX-PRODUCERS

8 REFERENCES

Tables

TABLES

Table 1. Properties of nanodiamonds.

Table 2. Summary of types of NDS and production methods-advantages and disadvantages.

Table 3. Markets, benefits and applications of nanodiamonds.

Table 4. Nanomaterial lubricant products.

Table 5. Market overview for nanodiamonds in lubricants-market maturity, market demand, competitive landscape.

Table 6. Market and applications for nanodiamonds in lubricants-applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand.

Table 7. Market consumption of nanodiamonds in lubricants to 2030 (tons)

Table 8. Market overview for NDs in polishing materials-market maturity, market demand, competitive landscape.

Table 9. Market and applications for nanodiamonds in polishing materials-applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand.

Table 10. Global market consumption of nanodiamonds in polishing additives to 2030 (tons).

Table 11. Market overview for NDs in electroplating and anti-friction/wear coatings-market maturity, market demand, competitive landscape

Table 12. Market and applications for NDs in electroplating and anti-wear/friction coatings-applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand

Table 13. Global market consumption of nanodiamonds in electroplating and anti-wear/friction coatings to 2030 (tons).

Table 14. Market overview for nanodiamonds in composites-market maturity, market demand, competitive landscape

Table 15. Market overview for nanodiamonds in fiber-based polymer composite parts.

Table 16. Market and applications for nanodiamonds in fiber-based composite parts-applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand

Table 17. Global market consumption of nanodiamonds in thermosets to 2030 (tons)

Table 18. Global market consumption of nanodiamonds in thermoplastics to 2030 (tons).

Table 19. Market and applications for NDs in metal matrix composites-market maturity,

market demand, competitive landscape.

Table 20. Global market consumption of nanodiamonds in metal-matrix to 2030, tons.

Table 21. Market overview for NDs in skincare (cosmetics).

Table 22. Market and applications for nanodiamonds in skincare

(cosmetics)-applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand

Table 23. Global market consumption of nanodiamonds in skincare to 2030 (tons).

Table 24. Market overview for nanodiamonds in supercapacitors-market maturity, market demand, competitive landscape.

Table 25. Market and applications for nanodiamonds in supercapacitors- applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand.

Table 26. Global market consumption of nanodiamonds in supercapacitors to 2030 (tons).

Table 27. Market overview for nanodiamonds in batteries -market maturity, market demand, competitive landscape.

Table 28. Market and applications for NDs in batteries- applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand.

Table 29. Global market consumption of nanodiamonds in batteries to 2030 (tons).

Table 30. Market overview for NDs in drug delivery.

Table 31. Different nanoparticle vehicles used in nanomedicine.

Table 32. FDA-approved nanotechnology-based products and clinical trials.

Table 33. NDs for drug delivery-applications, benefits, market megatrends, market drivers for use of nanodiamonds, technology challenges, competing materials, market demand.

Table 34. Pricing of nanodiamonds, by producer/distributor.

Table 35. Production methods, by main ND producers.

Table 36. Adamas Nanotechnologies, Inc. nanodiamond product list.

Table 37. Carbodeon Ltd. Oy nanodiamond product list.

Table 38. Daicel nanodiamond product list.

Table 39. FND Biotech Nanodiamond product list.

Table 40. JSC Sinta nanodiamond product list.

Table 41. Plasmachem product list and applications.

Table 42. Ray-Techniques Ltd. nanodiamonds product list.

Table 43. Comparison of ND produced by detonation and laser synthesis.

Table 44. Ex-producers of nanodiamonds.

Figures

FIGURESS

Figure 1. Detonation Nanodiamond.

Figure 2. DND primary particles and properties.

Figure 3. Functional groups of Nanodiamonds.

Figure 4. Market consumption of nanodiamonds in lubricants to 2030 (tons).

Figure 5. Global market consumption of nanodiamonds in polishing additives to 2030 (tons).

Figure 6. Global market consumption of nanodiamonds in electroplating and anti-wear/friction coatings to 2030 (tons).

Figure 7. Global market consumption of nanodiamonds in thermosets to 2030 (tons).

Figure 8. Global market consumption of nanodiamonds in thermoplastics to 2030 (tons).

Figure 9. Global market consumption of nanodiamonds in metal-matrix to 2030, tons.

Figure 10. Prototypes of nanodiamonds, fullerene and lignin sunscreen.

Figure 11. Global market consumption of nanodiamonds in skincare to 2030 (tons).Source: Future Markets, Inc.

Figure 12. Global market consumption of nanodiamonds in supercapacitors to 2030 (tons).

Figure 13. Global market consumption of nanodiamonds in batteries to 2030 (tons).

Figure 14. Application of NDs in biomedicine based on synthesis method.

Figure 15. NBD battery.

Figure 16. Neomond dispersions.

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