The Global Market for Nanocoatings

Description: In the last decade, considerable efforts have been made to develop ultra-high performance nanocoatings. Novel nanomaterials are leading to new and multi-functionalities in coatings for packaging, barrier films, electronics, printing and medical devices. Nanocoatings are providing cost-effective solutions in industries with demanding applications and performance requirements such as oil and gas, automotive, aerospace, photovoltaics, power generation, shipping and transportation. Nanocoatings offer vastly improved optical, magnetic, electronic, catalytic, mechanical, chemical, and tribological functionalities.

Nanomaterials are allowing companies to meet changing global trends in the industry such as demand for multi-functional, decorative/aesthetically enhanced and service free or low maintenance coatings with enhanced protection and longer operation life. Environmental sustainability is also an important factor across most coatings markets.

The key element that nanocoatings provide is protection-from ice, pollutants, UV, fire, heat, bacteria, marine life, touch and corrosion. These factors cost global industry billions in maintenance, loss and downtime each year and can pose a significant public health hazard.

In the coating sector, high transparency, water proofing, oxygen barrier function and enhanced protection against corrosion, heat, ice etc. are increasingly important requirements and have been driving the adoption of nanocoatings. The incorporation of nanomaterials into thin films, coatings and surfaces leads to new functionalities, completely innovative characteristics and the possibility to achieve multi-functional coatings and smart coatings. The use of nanomaterials also results in performance enhancements in wear, corrosion-wear, fatigue and corrosion resistant coatings. Nanocoatings demonstrate significant enhancement in outdoor durability and vastly improved hardness and flexibility compared to traditional coatings.

Industries affected include:

Oil and gas
- Corrosion and scaling chemical inhibitors.
- Self-healing coatings.
- Smart coatings.
- Coatings for hydraulic fracturing.

Aerospace & aviation
- Shape memory coatings.
- Corrosion resistant coatings for aircraft parts.
- Thermal protection.
- Novel functional coatings for prevention of ice-accretion and insect-contamination.

Renewable energy
- Anti-fouling protective coatings for offshore marine structures.
- Anti-reflective solar module coatings.
- Ice-phobic wind turbines.
- Coatings for solar heating and cooling.

Automotive
- Anti-fogging nanocoatings and surface treatments.
- Improved mar and scratch resistance.
- Flexible glass.
- Corrosion prevention.
- Multi-functional glazing.
- Smart surfaces.
- Surface texturing technologies with enhanced gloss.
- New decorative and optical films.
- Self-healing.

Textiles & Apparel
- Sustainable coatings.
- High UV protection.
- Smart textiles.
- Electrically conductive textiles.
- Enhanced durability and protection.
- Anti-bacterial and self-cleaning.
- Water repellent while maintaining breathability

Medical
- Hydrophilic lubricious, hemocompatible, and drug delivery coatings.
- Anti-bacterial coatings to prevent bacterial adhesion and biofilm formation.
- Hydrophobic and super-hydrophobic coatings.
- Lubricant coatings.
- Protective implant coatings.
- High hardness coatings for medical implants.
- Infection control.
- Antimicrobial protection or biocidic activity.

Marine
- Anti-fouling and corrosion control coatings systems.
- Reduced friction coatings.
- Underwater hull coatings.

Buildings
- Thermochromic smart windows.
- Anti-reflection glazing.
- Self-cleaning surfaces.
- Passive cooling surfaces.
- Air-purifying.

Consumer electronics
- Waterproof electronic devices.
- Anti-fingerprint touchscreens.

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