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The Global Market for Anti-Fog Coatings and Films

https://marketpublishers.com/r/G6F2AA43D7E5EN.html
Date: February 2021
Pages: 92
Price: US$ 850.00 (Single User License)
ID: G6F2AA43D7E5EN

Abstracts

The advent of engineered surfaces in the last decade has produced new techniques for enhancing a wide variety of surfaces and interfaces of materials. For example, the use of engineered surface textures in the micro- and nano-scale has provided non-wetting surfaces capable of achieving less viscous drag, reduced adhesion to ice and other materials, self-cleaning, anti-fogging capability, and water repellency. These improvements result generally from reduced interface contact (i.e., less wetting or non-wetting) between the solid surfaces and contacting liquids.

Undesirable surface behaviour can create problems in a range of optical applications. The utilization of advanced surface coating technologies can be used to address a wide variety of these problems. Examples include:

Cleaning optical surfaces is time consuming, expensive, or impossible.

Fingerprints negatively impact the performance of optics.

Functional issues due to liquid behaviour on surfaces.

Contamination and fouling materials negatively impact optical behaviour.

Improved adhesive/bonding characteristics are desired on optical surfaces.

Surface is not lubricous enough.

Wettability of an optical surface is not ideal.

Fogging & moisture build up negatively impact optical performance.

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Anti-fog coatings are also known as non-mist coatings and have grown in use in eyewear and headgear in the last few years. Fogging by moisture condensation on transparent substrates presents a major challenge in several optical applications that require excellent light transmission characteristics, such as eyeglasses and vehicle windshields, and can lead to serious hazards involving in blurred vision, light scattering, energy consumption and safety hazard during the usage process of transparent glass and plastics. These problems limit the uses of transparent polymeric materials.

Their development has accelerated though breakthroughs in the use of inorganic materials such as TiO_2, or SiO_2, polymers containing polar functions such as hydroxyl (OH), carboxyl (COOH), and ester groups (COOR),and the textured or porous surfaces.

Applications that benefit from anti-fog treatments include:

- eyewear (e.g., safety goggles, face shields)
- optical instruments (e.g., cameras, microscopes, endoscopic instruments)
- externally located gauges and signs
- visors or sport goggles.
- display screens (e.g., computer monitors, mobile device displays)
- military helmets
- photovoltaic modules
- car windshields and lamp casings.

There are two main types of anti-fog coatings:

- Hydrophobic and superhydrophobic coatings that repel water, making it bead and run off of the lens.
- Hydrophilic and superhydrophilic coatings that form a thin coating of water over the lens.

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Combinations of both have also been developed.

Report contents include:

- Anti-fog coatings technology assessment.
- Global revenues for anti-fog coatings and films 2019-2030, by market.
- Market challenges.
- Market drivers and trends in anti-fog coatings and films.
- Markets for anti-fog coatings and films including Automotive, solar panels, healthcare and medicine, display devices and eyewear (optics), food packaging and agricultural films.
- 34 Company profiles. Companies profiled include Aculon, Inc., Akzo Nobel, Clariant AG, Daikin Industries, Ltd., Hydromer, Inc, Nano-Care Deutschland AG, NATOCO Co., Ltd., NEI Corporation and many more.

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