

Functional Molecules and Materials

Nanostructured Diamond-like Carbon Coatings for Advanced Optical Metrology Components

[application areas]

Nanotechnology, electronics.

[year of invention]

2011.

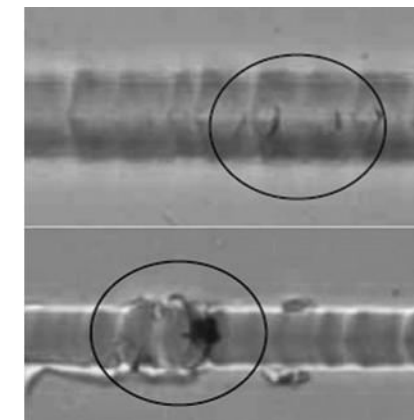
[author]

Prof. habil. dr. Sigitas Tamulevičius,
Dr. Šarūnas Meškinis,
Dr. Viktoras Grigaliūnas.

[features, technical specifications]

Photomasks and optical scales for photovoltaic measurement systems are made of chrome-plated glass. Due to the relatively low hardness of float glass and chrome coating, the produced photomasks and scales are not resistant to abrasion and scratches, and can be easily damaged mechanically. The issue can be resolved by using special protective diamond-like carbon coatings. Diamond-like carbon coatings have significantly higher hardness than glass and chrome due to sp³ bonded carbon matrix.

Up for proposal are new radio-frequency-plasma-activated chemical vapour deposition and direct ion beam deposition technologies for nanostructured diamond-like carbon coatings, able to increase the resistance of relevant surfaces against mechanical abrasion and the effects of harmful substances. There is ongoing examination of the effect of surface preparation on the adhesion of diamond-like carbon coatings with the substrate, the effect of synthesis parameters and chemical composition of diamond-like carbon coatings on the mechanical and optical properties of such coatings.



[contacts]

KTU National Innovation and Entrepreneurship Centre
59 K. Baršausko St. Kaunas, Lithuania
+370 695 37440,
info@nivc.lt nivc.ktu.edu

Order Laboratory Equipment and Scientific and Applied Research apcis.ktu.edu

[novelty]

The project is new in the way that nanostructured diamond-like carbon coatings have not been applied in this context before.

[technological readiness level]

A product prototype.

[what are we looking for in this stage of development?]

Funding for further research and completion of the prototype; buyers for the prototype; R&D orders related to the invention.

[patenting]

Getting ready for patenting.

[commercialisation]

Nanostructured diamond-like carbon coatings were tested at Precizika Metrology in real production conditions. Performance tests of photomasks and scales protected by such coatings showed that the coatings increase the mechanical resistance of photomasks and scales, coatings do not add any additional limbo errors during the exposure, nor do they distort the amplitude and phase characteristics of initial electrical signals shown by displacement transducers.

[alternatives] None.