KN1000

40 Years hydrogen-free a-C/ta-C DLC coatings deposited by CVAE: deposition methods and application

Jörg Vetter[1], Beno Widrig[2], Michael Mock[3], Jürgen Ramm[2], Helmut Rudigier[2]

[1]Oerlikon Balzers Coating Germany GmbH, Bergisch Gladbach, Germany [2]Oerlikon Balzers, Oerlikon Surface Solutions AG, Balzers, Liechtenstein [3]Oerlikon Balzers Coating USA, Lake Orion, United States

joerg.vetter@oerlikon.com

Diamond-like carbon (DLC) films deposited by cathodic vacuum arc evaporation (CVAE) have attracted worldwide interest from research groups and industry since the beginning of the 1990s. Hydrogen-free amorphous carbon (a-C) coatings were first deposited by CVAE about two decades after the first description of hydrogenated a-C coatings (a-C:H) deposited by glow-discharge techniques. The first scientific report describing carbon coatings deposited by CVAE was published in 1976 [1]. This paper highlights the development and broad potential of hard ta-C/a-C coatings deposited by direct (DCVAE) and filtered (FCVAE) cathodic arc evaporation, including pulsed arc. The number of industrial applications of ta-C and a-C coatings continues to increase, mainly for tribological coatings to reduce wear and friction. Various industrial applications of coatings deposited by CVAE for tool applications are described.
.

[1] N.N. Matyushenko, V.E. Strel'niskij, A.A. Romanov, V.T. Tolok, X-ray investigation of metastable modification of carbon (Russian), Dokl. Akad. Nauk UkrSSR, Ser. A, 5 (1976) 459-460

Keywords
hydrogen-free DLC
ta-C
ARC
a-C
properties