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Advanced PVD coatings: arc evaporation combined with HIPACJörg Vetter¹, Georg Erkens¹, Jürgen Müller¹¹Sulzer Metaplas, Bergisch Gladbach, Germany

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A new class of advanced PVD-coaters, the METAPLAS-DOMINO series, for dedicated coating applications comprise both improved vacuum arc evaporators (APA, Advanced Plasma Assisted) and high power impulse magnetron sputtering sources (HIPAC - High Ionized Plasma Assisted Coating). The ion cleaning is based on the (AEGD, Arc Enhanced Glow Discharge) process. It's possible to run the processes in different modes, e.g. pure APA arc evaporation or pure HIPAC magnetron sputtering. However the combination of the two high ionized deposition processes to generate multilayer, nanomultilayers and nanocomposite layers opens new horizons in tailoring of coating.

The arc evaporation itself is limited to specific cathode material properties (mostly metal alloys). HIPAC magnetron sputtering processes can be used to atomize and ionize materials which are difficult to evaporate or not evaporable by cathodic arc, e.g. Si, SiC, WC, TiB₂ and others. Specific features of the PVD system equipped with APA arc evaporators and HIPAC magnetron sources will be shown. First results of hybrid coatings will be presented.

Keywords

arc

sputtering

HIPAC

HIPIMS

multi layer