

## **CHARACTERIZATION OF PVD COATINGS DEPOSITED ON POWDER METALLURGY STEELS**

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### **Abstract:**

Powder metallurgy (PM) steels have high resistance to abrasion, but PVD coatings improve their lifetime even more. Besides for cutting parts, they are also used for severe and most demanding forming operations in pressworking tools. Two powder metallurgy cold work steels were used as substrates for applying of physical vapour deposition (PVD) coatings: Vanadis 4 and Vanadis 6 (Uddeholm). The following PVD coatings were applied in Balzers: Balinit B, Futura+WC/C, Lumena (applied in deposition system by cathode arc evaporation).

The following examinations and tests were performed: microhardness, nanoindentation, scratch test, test results of the adhesion, roughness test results, as well as the scanning electron microscope and glow discharge optical emission spectroscopy (GDOES) depth profile results. Based on the examination results and on feedbacks from the tool users, the mentioned PVD coatings on PM steels operating in the pressworking tools are evaluated. Benefits of using powder metallurgy steels in pressworking tools are discussed.