

Study of Tribology parameters on Ti-Al-N coatings deposited by PAPVD Technique

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Ti-Al-N coatings have been deposited on AISI 304 steel substrates by PAPVD - Reactive Pulsed Arc method and characterized structurally, mechanically and tribologically. The friction coefficient was measured using a Ball on Disc tribometer with a tungsten carbide ball (WC). The test was stopped each 1000 laps to measure the wear rate. To study the effect of tribology parameters on coating behavior a factorial experiment design was used, with two load and speed levels (1N, 3N and 10cm/s, 20cm/s) to study the interactions. The obtained hardness was around 22 GPa, The results showed the influence of tribological parameters on coating tribology behavior COF and wear rate., The COF in all samples was around to 0,75. When high load and low speed was used, rapid coating failure was observed, due to high system deflection, producing fatigue failure. For these coatings the wear rate and wear profile showed like coating pile up inside the wear track. This phenomenon is due to formation of iron oxide in the wear track, a decrease of COF was observed when load low and high speed was used, indicating a low shear tribo-film formation.