

In-Line HIPIMS-TiN_xO_y to Produce Colorful Decorative Coatings

Yu-De Liou^a, Ying-Hung Chen^a, Ju-Liang He^a

^aDepartment of Materials Science and Engineering, Feng Chia University, No. 100, Wenhwa Rd., Seatwen District, Taichung City 40724, Taiwan.

Abstract

Many study works based on batch-type PVDs (physical vapor deposition) have been commercialized, as an alternative to wet processes, due to their environment-friendly and color adjustable characteristics, as well as many other features. However, it will be more feasible to use in-line PVD system to produce decorative coatings by taking the advantages of cost-effectiveness, small-piece capability and high throughput.

In the present study, the decorative coatings based on TiN_xO_y are produced on motorcycle chain plates by using in-line system, where high power impulse magnetron sputtering (HIPIMS) technique is powered. It is found that the obtained coatings are strongly adhered with their color adjustable over a large range (blue, orange, peach red, ocean blue, gem green, champagne gold, violet purple and rosy gold, etc). The color can be controlled by the repeated entering of the tray (substrate holder) into deposition zone as well as the flow ratio of oxygen to argon during deposition. As a whole, the in-line HIPIMS system is feasible for producing high-quality decorative coatings.

Keywords: decorative coatings; in-line coating; high power impulse magnetron sputtering.