

Coatings production for military applications

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Coatings possess a wide range of applications in both civil as well as, military sectors. This includes their use for protection of materials from corrosion, abrasion, oxidation, for optical transmission and reflection tuning in certain wavelength regions, with application in filters, fire-resistant coatings, anti-fog, and memory devices....

Coating properties depend on a number of interrelated parameters and also on the manufacturing technique. Due to its properties (easy control, environmental friendly, versatility, scalable and low cost) sputtering methods are among the most used techniques for coating production. Sputtering is traditionally employed to coat planar surfaces. However, by using coaxial sputtering the inner surface of pipes can be also coated. The sputtered coatings properties strongly depend on the parameters used in the sputtering process, such as working gas pressure, distance between the target and

the substrate, substrate temperature, and voltage applied to the cathode. Moreover, the chemical composition of the target can be designed by using reactive sputtering. Therefore, the coating properties can be tuned to the desired value by properly selecting the sputtering parameters. It is worthwhile to mention that such a selection also allows improving the adhesion of the coating to the surface, which is one of the most critical points.

In this talk, the capabilities of sputtering to develop corrosion, oxidation, and abrasion protective coatings as well as, lubricating and radiation-resistant coatings will be shown highlighting those related to Security and Defense. The influence of the sputtering parameters on the coatings properties will be illustrated. The capabilities and ongoing work of the Institute of Nuclear Fusion related to the fabrication of coatings will be presented.