MATERION

COATING MATERIAL NEWS

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ACHIEVING MECHANICALLY DURABLE COATINGS

Applications to Polymer Substrates

Engineering thin-film coatings to withstand abrasive and impact forces involves complex physics and chemistry problem solving. Hardness, internal and external bond strengths, and surface abrasive wear resistance, are physical properties determined by materials and deposition processes. An additional parameter is the relationship of the surface chemistries of the multi-layer interfaces and layer thicknesses.

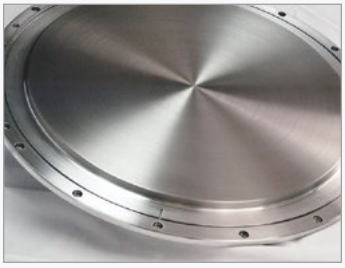
Coating of polymer surfaces poses special considerations imposed by temperature limitations and compositional, thermal expansion coefficient, and hardness differences compared with coating materials and deposition processes. We begin the discussion with a model that illustrates the construction and composition of a multi-layer coating designed for durability.

Mechanical Properties Related to the Physical Durability of Thin Films

The mechanical hardness and wear resistance of coatings have been topics of extensive discussion in previous Coating Material News issues. The model presented in Figure 1 illustrates the multiple and inter-related components that influence and determine the hardness, strength, and wear properties of mechanically durable thin films. The model applies to any substrate material. Later we apply it to polymer surfaces. Read more...

MANUFACTURING METAL/ALLOY SPUTTERING TARGETS PRESENTATION

International Symposium on Sputtering & Plasma Processes Presented by David Sanchez



I was privileged to speak at the 14th International Symposium on Sputtering and Plasma Processes (ISSP 2017) at the Kanazawa Institute of Technology in Japan. My presentation and poster delved a bit deeper and took a more critical look at the technologies central to metal sputtering targets. The Technical Paper ("Reactive Deposition – Enabling Enhanced Thin Film Performance"), based on the presentation, explores various aspects of reactive deposition.

Recap of Some Key Points

Since metal targets enable the formation of metal films, fully reacted oxide, nitrides and even exotic carbides and selenides are central to thin film technology. In order to meet the demands for high density, high performance coatings – there are challenges to the production of metal targets that must be met that influence process control and repeatability. Beyond the extraction, purification and raw material source technologies, macroscopic failure modes are as varied as the formation technologies themselves. Read more...

IN THIS ISSUE

Visit Materion At This Year's SPIE Laser Damage Event

As an established supplier of specialty materials for laser applications, Materion Advanced Materials is proud to be a sponsor of this year's SPIE Laser Damage event during September 24-27, 2017. The conference is being held at the Boulder Millennium Hotel, Boulder, Colorado. Read more...

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