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Stages in the progress of plasma assisted PVD since its discovery and challenges for coating processes in future manufacturing.

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Plasma assisted PVD (PAPVD) processes have seen considerable improvements over the past 60 years. This presentation identifies four distinct waves of development, starting with simple DC diode systems followed by enhanced plasma systems based on methods such as arc and electron beam evaporation. This stage was paralleled by improvements in sputter-based processes. More recently we have seen the emergence of coating processes tailored for the increased demands of practical product applications, including dedicated high throughput systems for many different types of products. At the same time, in recent years we have seen considerable developments associated with the rise of Industry 4.0, together with the increased digitalisation of coating processes and the coatings themselves. Many Manufacturing-based economies are now seeing a move to a "Made Smarter" approach. This has many implications for advanced coatings. Not only must digitalisation be implemented but coatings and coating processes must be integrated into the product design process, as required by all High Value Manufacturing (HVM) techniques. The presentation will explain some of the implications of this transformation, and will describe two initiatives taking place in the UK to bring together industrial and academic researchers to face the challenges of digitalisation in the coatings sector.

Keywords

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