

UNRESOLVED CHALLENGES: A JOURNEY IN THERMAL SPRAY TECHNOLOGY

Last half a century, I have been involved in research and development in almost all aspects of Thermal Spray Technology. Studies include fields such as design and development of spray guns, process characterization, engineered coatings, conceptualization and development of novel spray techniques, coating characterization, intricacies of cold spray technique and coating, etc. During this journey, some of these studies have been abandoned due to various 'worldly' reasons.

A typical example is the measurement of coating thickness. Of all the coating properties, thickness is the most basic and absolutely required data. When the substrate-coating pair has materials with large difference in either electrical or magnetic properties, one can use Eddy or Magnetic probes to quickly and reliably(?) record the thickness. But, when this is not the case, (such as WC-Co coating on any non-ferrous substrate), this technique fails. In fact, the Cobalt content in the WC-Co coating makes this measurement near to impossible even on ferrous substrates. From the time Max Scoop developed the first spray gun in 1910 till today, a single reliable and universal thickness probe has not been developed. This is one of the unresolved challenges in (my) journey in thermal spray.

This talk will cover a few of these unresolved challenges and attempt to indicate possible avenues to resolve them. For instance, can we exploit the explosive growth of technologies such as nuclear, laser, etc. and resolve this issue of coating thickness will be discussed.

Hopefully, the present-day students and scientists will have the opportunity, interest and time to take up and resolve these challenges.