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**Democratizing Diagnostics: Transforming Thermal Spray Production**

**Abstract**
Sensors play a critical role in thermal spray and cold spray processes, enabling operators to monitor, control, and improve coating quality in real time. By making key process data accessible and actionable, sensors transform how industrial production teams conduct quality control for coatings. Tecnar has been at the forefront of this shift, focused on democratizing information so that advanced diagnostics are not just the domain of R&D labs but a standard part of industrial production.

Over the past few years, the Accuraspray series have moved from being a research tool to a widely adopted production instrument in the automotive and aerospace industries. This transition has been driven by evolving the technology prioritizing the needs of production users such as reliability, ease of integration, and features that are simple yet deliver immediate, operational value. The presentation will cover examples of how the Accuraspray is being integrated into production settings and the value being derived from it.

The presentation will also cover a case study demonstrating the benefits of the process stability monitoring feature of the Accuraspray. The process stability tool was designed to monitor the variation in the standard deviations of the nominal empirical measurements taken by the Accuraspray. This feature highlights subtle variations in the spray process that are otherwise undetected. For a plasma transferred wire arc (PTWA) application, it was found that increased variability in the plume width was a strong early indicator of nozzle blockage or wear. Evolution of this feature led to a new monitoring and maintenance policy being established to detect nozzle damage in PTAW applications, being used at a major industrial spray plant.

Through this and other user-driven innovations, Tecnar continues to push the envelope in production diagnostics and reducing the barrier to entry with user-centric design, streamlined integration, for a near-perfect process, every shift.

**Biography**
Wania Jibran has been part of the thermal spray industry for over 6 years as a student researcher and a product leader. She holds a Master's degree in Mechanical Engineering from the University of Alberta, where she conducted research at the Advanced Heat Transfer and Surface Technologies Laboratory, focusing on developing advanced materials using cold spray and friction stir welding. She further expanded her expertise through post-graduate research at RWTH Aachen University, one of Europe's leading centers for surface engineering working on developing thermal sprayed coatings for improved lubrication in turbine bearings.

Wania is part of Tecnar Automation's Spray Sensors division, a group with over 25 years of experience delivering advanced diagnostics for coating processes worldwide. Born from National Research Council

of Canada (NRC) spin-off technologies, the division was founded with the mission of transforming cutting-edge research into robust, industrially proven products. Tecnar has launched several market leading diagnostic sensors such as the DPV and Accuraspray. Today, Tecnar's sensors are used in industries ranging from aerospace to biomed, enabling operators to capture and act on real-time process data to improve coating quality, consistency, and efficiency.