Affordable Cold Spray
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Thirty years after its original development cold spray (CS) has become a mature industrial process for manufacturing and repair in different branches of industry. Technical exploration has led to several commercial CS applications and produced 700+ published patent families, round about 2500 scientific papers, and nine textbooks (Aug 2020). Considerable knowledge is available to assess technical feasibility of projected tasks. To make it to the shop floor, new CS procedures usually will have to undergo some design to cost process. This presentation summarizes guidelines for industrial CS implementation and provides a toolbox for equipment selection. It outlines which information about the planned process is required to enter a cost optimization loop. The levers on costs are explained along with the role of the product specification.

CS users can choose from several spray, robotic, and diagnostic systems, as well as kinematic programming and process modeling software products. The presentation will elucidate the main trend in CS equipment development and expand on which systems are likely to match which tasks. It explains how to arrange workpieces in order to allow cost efficient operation of the CS station.

Further aspects covered are the economic effects of powder feedstock type and propellant gas kind, depending on the relationship between spray deposition efficiency and mechanical properties obtained. Recycling of powder or gas can significantly improve the economic efficiency of certain CS processes. The spray parameters can be set following a plain design of experiment.

Bio
Oliver is principal scientist of Siemens and has been driving industrial research on cold spray during the last 14 years. His work comprises basic materials and process research, application engineering, cost-efficient cold spray implementation, monitoring and inspection, development of computer vision, artificial intelligence and mathematical modeling. He is coinventor of 54 patent families. Oliver holds a diploma and PhD in physics and coauthored 70+ scientific papers.