

# SUSPENSION SPRAYING: "INDUSTRY 4.0 READY"

Lower surface roughness and greater homogeneity of the microstructure – these properties distinguish suspension-sprayed coatings from layers classically sprayed with powder. The Fraunhofer IWS offers the entire process chain, from industry-proven hardware up to customized coating solutions for the component.

Suspension spraying delivers high-quality, thermally sprayed coatings. Submicro- or nanopowders that are finely dispersed in water or in organic solvents are used as spray feedstock. The suspensions can be used both for atmospheric plasma spraying (APS) and in high velocity flame spraying (HVOF). For continuous industrial use, high process stability and reliability are necessary. These criteria can only be fulfilled if qualified user-specific hardware components are applied.

## Suspension feeders as a basis for environmentally friendly digitization of coating processes

The Fraunhofer IWS researchers developed a stand-alone suspension feeder suitable for industry. For this task, they created the so-called "three pressure vessel approach", which makes it possible not only to spray conventional coating compositions in continuous use, but also to fabricate multilayer and composite coatings. The team integrated industrial sensors and actuators, as well as smart cascade controllers and data log functions, for automated process control and analysis. Simple recognition of error sources and the minimization of disturbing influences enabled the scientists to develop innovative spraying strategies; they also guarantee increased process reliability and reproducibility. This way, Fraunhofer IWS has created the preconditions for process digitization with the objective of self-controlling procedures. This also offers environmental benefits: the IWS researchers produced corrosion and wear protection coatings and coating solutions for

*Suspension feeder based on the "Three pressure vessel approach"*



electric and thermal isolation from aqueous and alcoholic suspensions on industrial scale. The accompanying tests were successful.

### 1 High velocity flame spraying using suspensions.

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