



Cold Spray for Space & Aviation



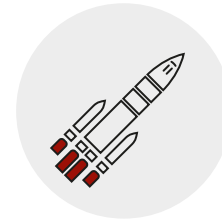
Expanding the Limits of Aerospace Manufacturing

High-Performance Metal Coatings and Additive Manufacturing – A Solid-State Process without Melting Materials. Ideal for Lightweight Structures, Repair Applications, and Critical Components in Aerospace Environments.

Cold Spray for Space

Cold Spray Additive Manufacturing – CSAM of Rocket nozzles and extensions

- Buy to fly ratio close to one, due to high deposition efficiencies and additive manufacturing method
- Large geometries with minimal wall thickness, to save as much weight as possible
- High flexibility on materials used with high deposition rates

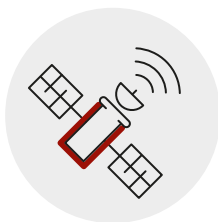
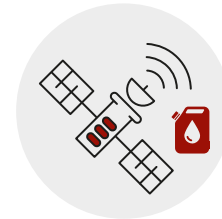


Manufacturing Rocket Combustion Chambers

- Reduction of manufacturing time from several months to a few weeks, compared to conventional methods, like electroplating
- Suitable for inner liner and outer jacket manufacturing, i.e. multi-material designs, even with non-weldable materials
- No limitation on sizes, up to a few meters can be realized

Seamless fuel tank manufacturing

- Flexible on tank geometries
- Due to the high density of cold sprayed material no leaking and no pressure issues
- Optimized wall thickness, i.e. minimized weight



Radiation shielding for Satellites

- Due to high material flexibility, optimal shielding effect
- Already low coating thickness can have a high impact on shielding efficiency
- Flexible on material combinations, multi-material stacking or coating of material composites to increase shielding efficiency

Ready for Takeoff?
It's time to fly. Contact us!

Impact Innovations GmbH
+49 8636 695190-47
sales@impact-innovations.com
www.impact-innovations.com

Cold Spray Additive Manufacturing redefines efficiency and performance in aerospace and space industries – enabling lightweight designs, rapid production, and cost-effective repairs for rockets, satellites, and aircraft components.



impact

Cold Spray for Aviation

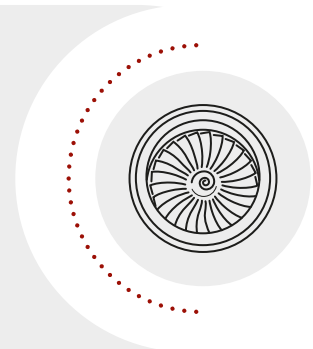
Aluminum Repair

- Optimized Cold Spray process, able to get 4% elongation, 370 MPa tensile strength and 240 MPa adhesion strength in as sprayed status, while using nitrogen as propelling gas
- Cost savings compared to helium cold spraying by a factor of over 250
- On-site repair without disassembling to reduce downtime and costs



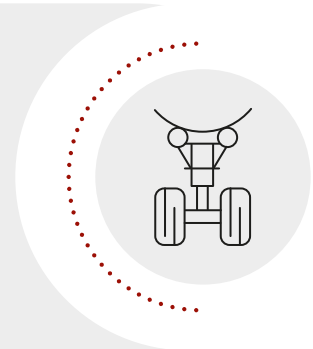
Aircraft Components

- Apply functional coatings on different components, like on nacelles, fan blades and other parts
- Repair of fan blades and propeller blades, to overcome long lead-times and expensive replacements
- Repair of housing parts, after different damages, caused by corrosion, abrasion and/or wear



Landing Gear

- Reconstruction and repair of pistons and cylinders of main landing gear
- Reconstruction and repair of main housings and cylinders of nose landing gear
- Reduce cycle time for repair by a factor of 5 compared to conventional methods and realize cost savings of over 50%



Impact Innovations EvoCSII Systems Hard Facts

Gas chamber temperature
up to 1850 °C / 3362 °F

Inlet pressure at the control unit max. 100 bar / 1450 psi

Process gas temperature at nozzle entrance
up to 1100 °C / 2012 °F

Process gas pressure at nozzle entrance
up to 60 bar / 870 psi

Top particle velocity >1000 m/s with process gas nitrogen

Lightweight spray gun with
integrated heater < 30 kg / 66 lb

Continuous control of more than 150 process
parameter and system data

Ready for 24/7 operations

High deposition rate of up to 60 kg/h / 132 lb/h

High deposition efficiency up to 99,8%

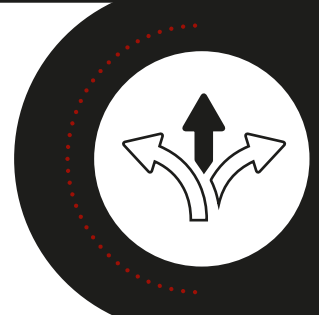
High-Precision Technology & Application Expertise

Impact Innovations is the **Global Technology Leader** for industrial Cold Spray equipment – Your Solution Partner from **Application Development to Industrialization**.



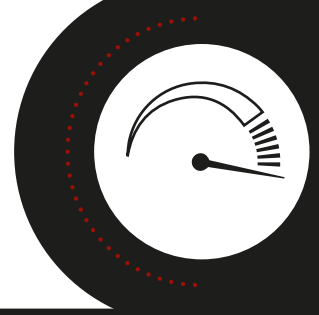
Flexible system solutions from R&D to industrial scale manufacturing

- Material flexibility with widest range of metals and alloys
- From thin coatings to additive manufacturing of large components
- From individual repairs to scalable 24/7 mass production
- Modular plug-&-play hardware for tailor-made solutions



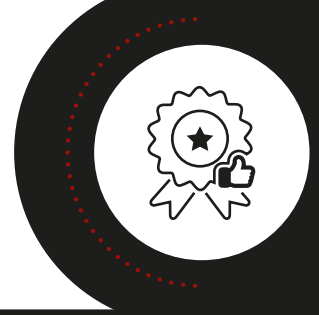
Best performing metal coatings and structures

- No phase transformation and oxidation due to a solid-state process
- Outstanding and adjustable material properties
- Unique material combinations to maximize component performance
- Assured and repeatable quality from prototypes to high volumes



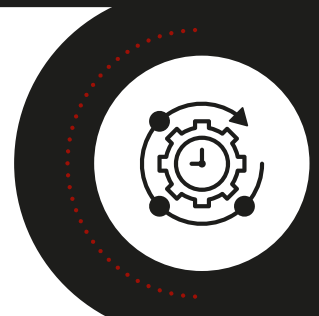
Top quality Made in Germany

- Robust cold spray hardware developed for industrial use
- Continuous online process monitoring and quality control
- Maintenance and user-friendly equipment design
- Future-proof system architecture for digital manufacturing



High resource-efficiency for sustainable production

- Fast spray process with up to 99,8% deposition
- Short cycle time due to high spray rates up to 60 kg/h / 132 lb/h
- Low Total Cost of Ownership (TCO)
- Green process with zero emissions



Innovation partner from idea to industrial success

- Application development experts pushing the technological boundaries
- Solution partner for application specific engineering and industrialization
- On-site and online customer support and service
- Groundbreaking results enabled by pioneering hardware

