

Cold Spray: From initial concept to a successful coating process

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Cold spray is an all-solid-state process that uses a high-speed gas jet to accelerate powder particles towards a substrate where they plastically deform and consolidate upon impact to form a coating. The basic idea behind cold spray is fairly simple and the concept has already been patented in the early 20th century. However, the technology needed to put the idea into practical use was complex at the time and required further development. Consequently, it took 80 years for its first demonstration that happened accidentally during a two-phase flow gas dynamic experiment in Russia. Since then, efforts have been devoted for the development of this process into a practical industrial technology and the number of related patents and research publications has grown exponentially.

This presentation reviews the cold spray process and technology from the early idea and initial development in Russia to its world-wide expansion. It will provide a general perspective on the current capability of this process and an overview of its status in the world from the technology and research activities point of view.