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Report on the developed steels

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Executive Summary

The document provides a comprehensive review of the main atomization methods currently available, highlighting their respective advantages and limitations. Within the consortium, three techniques were evaluated for producing the required powder: Gas Atomization, Centrifugal Atomization, and Ultrasonic Atomization.

The selection of the new HTCS alloy variant was guided by its performance in hot stamping applications, as well as the goal of reducing reliance on critical alloying elements to improve sustainability.

The report also details the material production process, including the generation of atomized powders and their chemical compositions. The following section presents the initial characterization of the HTCS alloy, covering both the base material and its compositional variants. A thorough microstructural analysis was conducted, supplemented by dilatometric testing to investigate phase transformations and determine key thermal parameters, including Ac1, Ac3, Ms, and Mf temperatures.

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