

Alternative Coating Compositions by Thermal Arc Spraying to Improve the Contact Heat Treatment in Press Hardening

Authors : Philipp Burger, Jonas Sommer, Haneen Daoud, Franz Hilmer, Uwe Glatzel

Abstract : Press-hardened structural components made of coated high-strength steel are an essential part of the automotive industry when it comes to weight reduction, safety, and durability. Alternative heat treatment processes, such as contact heating, have been developed to improve the efficiency of this process. However, contact heating of the steel sheets often results in cracking within the Al-Si-coated layer. Therefore, this paper will address the development of alternative coating compositions based on Al-Si-X, suitable for contact heating. For this purpose, robot-assisted thermal arc spray was applied to coat the high-strength steel sheets. This ensured high reproducibility as well as effectiveness. The influence of the coating parameters and the variation of the nozzle geometry on the microstructure of the developed coatings will be discussed. Finally, the surface and mechanical properties after contact heating and press hardening will be presented.

Keywords : press hardening, hot stamping, thermal spraying, arc spraying, coating compositions

Conference Title : ICMFSF 2023 : International Conference on Metal Forming and Sheet Forming

Conference Location : Lisbon, Portugal

Conference Dates : September 18-19, 2023