

Phase Diagrams and Phase Distribution Diagrams for the WnM Project

M. to Baben, K. Hack

GTT-Technologies, Herzogenrath, Germany

The goal of the WnM project is to predict composition and processing regimes for laser cladding materials. The application are tribologically loaded sealings. A desired microstructure might be an austenite with hard carbide precipitates but without intermetallic phases. The Nickel content should be minimized in order to avoid cold-welding during application. Additionally, costly elements should be avoided.

Thermodynamic modelling is used to navigate phase formation in 10-dimensional chemical composition space (Fe-Mn-Ni-Cr-Al-Ti-V-C-B). Chemical composition space is mapped using automated FactSage calculations based on the SpMCBN database. Based on 3000 calculations, composition regions can be identified with desired phase formation for the WnM project.