

Poster-Session

Optimisation of high-temperature tool materials by diffusion processes

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The economical forming of high-strength Titanium- and Ti(Al) alloys at high temperatures between 750 and 1250 °C places special demands on the tools. Tool materials with high heat resistance are used here. In the temperature range up to 800 °C, these are nickel and cobalt-based materials (Nimonic 75, Stellite21), and in the temperature range up to 1250 °C, molybdenum-based materials (TZM, MHC). In order to give these materials an above-average service life, surface treatment is necessary. Diffusion processes can significantly improve the edge layer properties in terms of hardness as well as the tribological behaviour in terms of Titanium- or Ti(Al) adhesion. By gas boronising and plasma nitriding, the surface hardness can be increased to over 2000 HV and the coefficients of friction can be reduced to <0.1. Initial results show very good phase stability of the adjusted surfaces in vacuum up to more than 1000 °C.