

Subarea POB3: Advanced methods of material surface modifications.

Title of the presentation: Shaping the structure and properties of surface layers of ductile cast iron by laser alloying

Author:

Dr hab. inż. Damian Janicki, RMT, damian.janicki@polsl.pl
Welding Department, Faculty of Mechanical Engineering

Abstract:

The lecture concerns the issue of shaping properties of ductile cast iron surface layers by laser alloying based on the in-situ synthesis of composite surface layers reinforced by TiC-type reinforcing particles. A novel approach to the above-mentioned in-situ synthesis of composite surface layers comprising both a control of the solidification conditions in the molten pool and composition of the melt by a proper selection of chemical composition of the alloying material was developed. The selection of the chemical composition of the alloying material took into account its influence on the morphology and mechanical properties of the reinforcing phase (TiC), phase composition of the matrix material, and also the homogeneity of the resulting composite layer, by effecting the intensity of the fluid flow in the molten pool.