Area C: PROCESSING

SYMPOSIUM: No. C.8

Title: Innovative heat treating routes

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Abstract

Scope

High performance components made of modern metallic alloys often require specific and application oriented heat treatment recipes and processes. Knowledge-based design of heat treatment sequences combined with innovative heat treatment technologies are enablers for the realization of excellent functional and structural properties. This symposium covers both fundamental and applied topics concerning any technical aspects of the wide field of heat treatment.

Description

This symposium focusses on heat treatment of metallic materials. Detailed knowledge of metal physical mechanisms allows the design of specific ~~processes~~ procedures in order to achieve excellent property profiles. Thus, basic understanding of process-microstructure-property relationships should be one focus of this symposium. Contributions with respect to any metals and alloys of technical relevance, like steels, particular tool steels, nickel and cobalt superalloys, light alloys and copper alloys are highly welcome. Of particular actual interest is the combination of such materials processed by additive manufacturing (AM) and heat treatment. On the other side the development of innovative and modern processes and the realization of digitally driven process control offer new possibilities in the

field of heat treatment and thus shall be presented here. Also local heat treatment technologies are of particular interest. Digital transformation also triggers the development in the field of heat treatment. Therefore, contributions focusing on simulation and modelling and the use of machine learning and artificial intelligence in order to establish digital twins and digital shadows of heat treatment processes or mechanisms are highly welcome.

Targeted topics

The subjects of interest include but are not limited to:

- Innovative heat treatment technologies
- Laser and electron beam based methods
- Surface layer processes and local heat treatment
- Post processing of AM-parts
- HIP as heat treatment process
- Integration of heat treatment into the entire process chain
- Process-microstructure-property relationships
- Heat treatment and residual stresses
- Numerical simulation of heat treatment processes
- Use of machine learning and artificial intelligence in heat treatment processes
- Modern process monitoring techniques
- Repeatability and of industrial heat treatment processes