

Advanced Joining Technologies

This book covers advances in fusion and solid-state welding processes including basics, welding metallurgy, defect formation, and the effect of process parameters on mechanical properties. Details of the microstructural and mechanical behaviors of weldments are included. This book covers challenges encountered during dissimilar welding of metal by fusion and solid-state welding processes, including remedial solutions and hybrid processes to counter the same. Numerical and statistical simulation approaches used in the welding process for parameter optimization and material flow studies are described as well. Features: - Provides details related to the microstructural and mechanical behaviors of welded joints developed by different welding processes. - Covers recent research content, metallurgical analysis, and simulation aspects. - Discusses the joining of plastics and ceramics. - Includes a dedicated chapter on machine learning and digital twin in welding. - Explores difficulties associated with the joining of dissimilar metals and alloys. This book is aimed at researchers and graduate students in material joining and characterization and welding.



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