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Sinopsis

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Many new or relatively new welding processes, such as friction stir welding, resistance spot welding, and laser welding, are being increasingly adopted to replace or improve on traditional welding techniques. Before advanced welding techniques are employed, their potential failure mechanisms should be well understood and their suitability for welding particular metals and alloys in different situations should be assessed. Failure Mechanisms of Advanced Welding Processes provides a critical analysis of advanced welding techniques and their potential failure mechanisms.

The book first covers the mechanics modeling of spot welds, applications to fatigue life predictions, resistance spot weld failure mode, and weld performance for aluminum alloys, dual phase steels, and TRIP steels. It then discusses fatigue behavior of spot welded joints in steel sheets, the nondestructive evaluation of spot weld quality, solid state joining, and failure mechanisms in friction stir welds, before describing the microstructure characteristics and mechanical properties of laser weld bonding of magnesium alloy to aluminum alloy. The book also explores fatigue in laser welds, weld metal ductility, the joining of lightweight materials using reactive nanofoils, and fatigue life prediction and improvements for MIG-welded advanced high strength steel weldments.

With its distinguished editor and international team of contributors, this book is a standard reference for anyone using modern and advanced welding processes in the automotive, shipbuilding, oil, gas and metal fabrication industries.