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Sommario/riassunto

This thorough reference work discusses various causes of failure with integrated coverage of process metallurgy of steels by forging, casting, welding, and various heat treatment processes. The breadth of coverage and the numerous examples provide an invaluable resource for the designer, engineer, metallurgist, mechanical and materials engineers, quality control technicians, and heat treaters. Potential failures of heat treated steel are detailed to help identify cause in preventing future occurrence and improving reliability of heat treating process and part performance. With a detailed focus on steel failures, this work can help identify root causes of failure, even if a thermal process is not specifically being considered as cause. Potential failures are covered with respect to design, material composition, component production, and thermal processing. Beginning with design aspects of component failure, chapters are devoted to several aspects of steel manufacturing including casting, forging or powder metallurgy in addition to heat treating operations. Topics include production problems such as porosity, flaws, and surface defect that may influence failures occurring during subsequent heat treatment or during use. Many examples of heat treatment failures are provided with special focus on the demands of tool steels and aerospace materials.