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Creep and High Temperature Deformation of Metals and Alloys

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By the late 1940s, and since then, the continuous development of dislocation theories have provided the basis for correlating the macroscopic time-dependent deformation of metals and alloys—known as creep—to the time-dependent processes taking place within the metals and alloys. High-temperature deformation and stress relaxation effects have also been explained and modeled on similar bases.

The knowledge of high-temperature deformation as well as its modeling in conventional or unconventional situations is becoming clearer year by year, with new contemporary and better performing high-temperature materials being constantly produced and investigated.

This book includes recent contributions covering relevant topics and materials in the field in an innovative way. In the first section, contributions are related to the general description of creep deformation, damage, and ductility, while in the second section, innovative testing techniques of creep deformation are presented. The third section deals with creep in the presence of complex loading/temperature changes and environmental effects, while the last section focuses on material microstructure–creep correlations for specific material classes.

The quality and potential of specific materials and microstructures, testing conditions, and modeling as addressed by specific contributions will surely inspire scientists and technicians in their own innovative approaches and studies on creep and high-temperature deformation.

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