

1. Record Nr.	UNINA9910557496503321
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Titolo	Fracture Mechanics and Fatigue Design in Metallic Materials
Pubbl/distr/stampa	Basel, Switzerland, : MDPI - Multidisciplinary Digital Publishing Institute, 2021
Descrizione fisica	1 online resource (180 p.)
Soggetti	Technology: general issues
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	<p>The accumulation of damage and the development of fatigue cracks under the influence of loads is a common phenomenon that occurs in metals. To slow down crack growth and ensure an adequate level of safety and the optimal durability of structural elements, experimental tests and simulations are required to determine the influence of various factors. Such factors include, among others, the impact of microstructures, voids, notches, the environment, etc. Research carried out in this field and the results obtained are necessary to guide development toward the receipt of new and advanced materials that meet the requirements of the designers. This Special Issue aims to provide the data, models and tools necessary to provide structural integrity and perform lifetime prediction based on the stress (strain) state and, finally, the increase in fatigue cracks in the material.</p>