

Fatigue Cracks (V2/Ü1)

Modul: Ermüdungsfestigkeit
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Inhalt

The classical strength calculation considers components without any defects and cracks. However, their existence changes the strength behavior of components and structures leading to failure below the static strength or fatigue strength. In contrast to this, fracture mechanics assumes the existence of cracks in structures and components. **The English-speaking lecture** Fatigue Cracks deals with the fundamentals of fracture mechanic. In particular, the following content is discussed:

- * Introduction to cracks in components and technical structures
- * Fracture Mechanical Fundamentals
- * Fatigue crack growth under cyclic loading
- * Experimental determination of fracture mechanical material parameters
- * Simulation of fatigue crack growth
- * Further application of fracture mechanical concepts and methods (e.g. Mixed-Mode loading, service loading, functional graded materials, various examples for damage cases)



Voraussetzungen

Basics knowledge of technical mechanics (static and strength of material) and material science

Ziel der Veranstaltung

With the content of the "Fatigue Cracks" course, students are able to...

- * assess damage that has occurred in the past as a result of crack growth and to identify the damage cause and measures for damage prevention,
- * describe the essential fracture mechanical fundamentals and parameters and to apply them independently to simple crack problems,
- * describe the term fatigue crack growth and to apply fracture mechanical concepts for evaluating the propagation behavior of fatigue cracks,
- * name relevant material parameters and functions for fatigue crack growth, to describe their experimental determination and to evaluate essential influencing factors,
- * name and explain further fracture mechanical applications (e.g. mixed mode loading, service loading, functional graded materials).

Literatur

- * Richard, H. A.; Sander, M.: Fatigue Crack Growth: Detect - Assess - Avoid, Springer Vieweg, Wiesbaden 2016
- * Richard, H. A.; Sander, M.: Ermüdungsrisse. Springer Vieweg, Wiesbaden, 2012
- * Richard, H. A.; Sander, M.: Technische Mechanik. Festigkeitslehre. Springer Vieweg, Wiesbaden, 2013

Ergänzende Veranstaltungen

- * Betriebsfestigkeit (Modul: Ermüdungsfestigkeit)
- * N.M. i.d. Produktentwicklung 1 (Modul: Bauteilgestaltung)
- * N.M. i.d. Produktentwicklung 2 (Modul: Numerische Verfahren i.d. Produktentwicklung)
- * Strukturanalyse 1 und 2 (Modul: Strukturanalyse)