Rotating Bending Testing Machine (RBTM)

When using high-strength materials it is very important to consider not only the fatigue strength but also the presence of surface defects when determining the fatigue life of components.

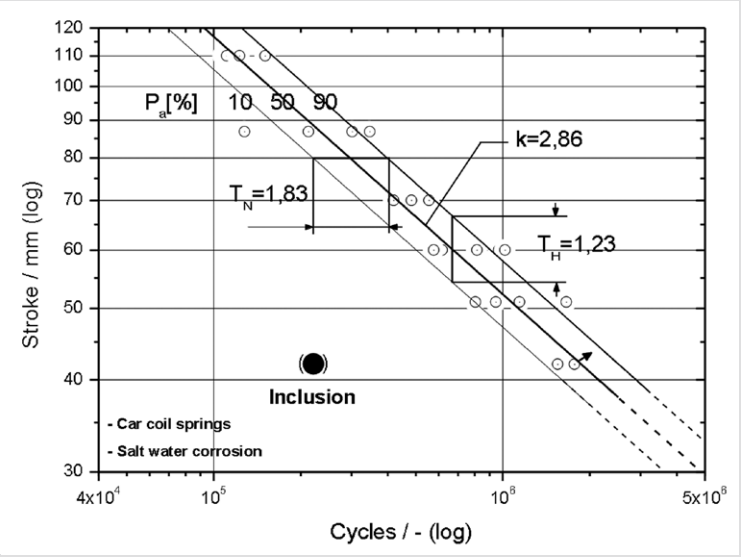
The **IABG Rotating Bending Testing Machine** allows the time and cost saving determination of the fatigue strength of high-strength materials, such as those used in the manufacture of springs and stabilizer bars.

Purpose of the rotating bending test

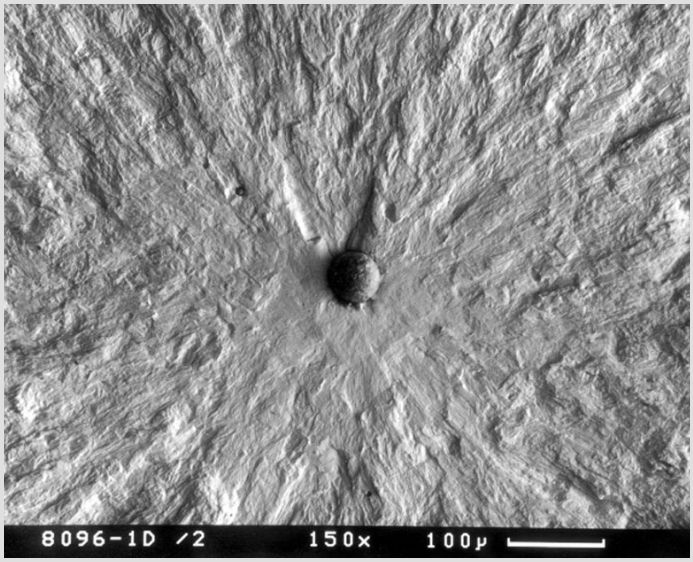
- Comparison of fatigue strength before the raw material is processed to become the final product.
- Material optimisation (e.g. type of material, heat treatments, shot peening parameters, scatter reduction, etc.)
- Discovery of cracks, inclusions or similar discontinuities in the material to determine the materials quality
- Assessment of the surface quality

Advantages compared to other existing testing machines

- Clamping of test bar is not necessary due to the utilisation of special purpose bearings
- High test frequency
- Tests a large and therefore representative material volume
- Short assembly and test specimen exchange time
- Reliable and low maintenance



Influence of an inclusion on durability



Example of a non-metallic inclusion in an SEM micrograph

Typical results

- Fatigue strength in the finite-life fatigue strength area
- Fatigue life
- Scatter along an S/N curve (Wöhler line)
- Distribution of material defects in material volume

Typical users

- Manufacturers of high strength steels
- Wire manufacturers for the spring and stabilizer bar industry
- Manufacturers of springs and stabilizer bars
- Generally all manufacturers producing steel of high purity

Technical data

- **Test specimens:** processed and unprocessed cylindrical bars or pipes (also for stepped shafts)
- **Diameter of bar / pipe:** d = 10 to 30 mm
- **Length of bar / pipe:** L = 60 d + 140 mm (or special sample shapes)
- **Test frequency:** f = 5 to 50 Hz (variable)
- **Power consumption:** < 1 kW
- **Properties:** no outward vibration, very quiet
- **Weight / measurements of machine:** ca. 1,000 kg, L = 2,600 mm, W = 1,000 mm, H = 1,500 mm
- **Load conditions:** load transfered over convex, non-wearing plastic bushings
- Load (stress) and strain measurements
- **Max. bending moment:** M_{max} = 3,6 kNm

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