

WP 140

Fatigue Testing Machine



- * **Continuous adjustment of the load amplitude**
- * **Differently shaped test bars demonstrate the influence of notching and surface finish**
- * **Digital counter for load cycle display**
- * **Automatic shut down on test bar fracture**
- * **Data acquisition available as accessory**

Learning Objectives / Experiments

- fatigue strength of bars subject to cyclic bending load
- influence of different curvature radii and surface finish on fatigue strength
- stress-number (S-N) curve

Technical Description

Using this experimental unit, the basic principles of fatigue testing can be taught.

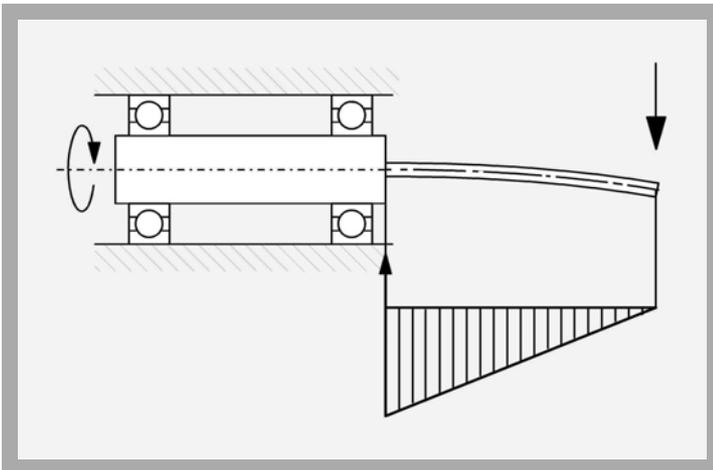
A rotating metal test bar, clamped at one end, is loaded using a spring balance with a point force. This results in a cyclic bending load on the cylindrical test bar. The amplitude of the cyclic loading can be continuously adjusted using a threaded spindle with hand wheel. After a certain number of load cycles, the test bars breaks as a result of material fatigue. In this case the motor is shut down automatically by the stop switch. The number of load cycles is counted by an electrical counter and displayed digitally. This can also be used for measuring the speed.

Differently shaped test bars enable the influence of notching and surface finish on fatigue strength to be demonstrated.

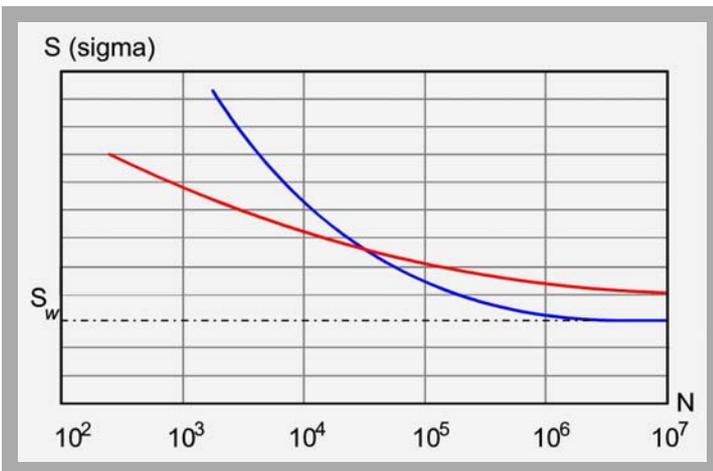
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1 protective hood, 2 drive motor, 3 switch box, 4 tools, 5 test bar, 6 support, 7 test bar, 8 loading device with spring balance and hand wheel for adjustment



The load on the test bar corresponds to that of a clamped bending bar. As the test bar rotates, a sinusoidal cyclic bending load is applied.



Stress-number (S-N) diagram for two different materials
N: number of load cycles, S: stress load on the test bar
With an increasing number of load cycles, the permitted loading on a material approaches the fatigue strength S_w asymptotically.

Specification

- [1] experimental unit for fatigue strength testing
- [2] 3 sets of cylindrical test bars made of steel, special shape bars for demonstrating the influence of notching and surface finish
- [3] loading device with movable support, threaded spindle with hand wheel, spring balance
- [4] automatic shut down on test bar fracture by stop switch integrated into the movable support
- [5] drive via electric motor
- [6] speed measurement via contactless inductive speed sensor
- [7] electronic load cycle counter, can also be used to indicate the speed

Technical Data

- Motor
- speed: 2.800min^{-1}
 - output: $0,37\text{kW}$
- Load: $0\text{...}300\text{N}$
- Electronic load cycle counter
- 8-digit digital display
 - can be switched to display speed
- Test bars
- material: steel Ck35
 - 3 different shapes

Dimensions and Weight

- LxWxH: $840\times 420\times 560\text{mm}$
Weight: approx. 41kg

Required for Operation

- 230V, 50/60Hz, 1 phase or 120V, 60Hz/CSA, 1 phase

Scope of Delivery

- 1 experimental unit
- 3x 3 test bars
- 1 manual

Order Details

020.14000 WP 140 Fatigue Testing Machine

WP 140 ***Fatigue Testing Machine***

Available Accessories:

Product no. Order text

020.14001 WP 140.01 Set of 3 Test Bars

020.14020 WP 140.20 Data Acquisition System