



Features

Tesca Rotating Fatigue Testing Apparatus has been designed to introduce students to the effects of material fatigue using a sinusoidal variation of bending stress. A 2800rpm motor rotates a specimen through a gear and pulley arrangement between 5600 or 1425 rpm. The specimens are held within 'keyless' chucks and loaded using a cantilever arrangement, with the load being applied through a screw jack mechanism with integral cantilever load cell. The applied force is captured on the 'on-board' digital display along with the revolution count of the specimen. Both values can be reset and zeroed (tared) prior to the testing commencing. When failure occurs, a micro-switch stops the motor and the cycles to failure are registered on the digital display. The count remains when the motor is not running and the ability to reset the counter has been designed in. A safety guard shields all rotating parts.

Optionally digital display incorporates a USB socket, which allows a host computer (not supplied) to be connected to the apparatus. The software supplied with the apparatus allows the capture and reviewing of data. Through an appropriate spread-sheet software (not supplied), printing and manipulation of data can be completed.

Specially machined necked test specimens are provided in steel. These have a 4mm nominal neck diameter and are held in the unit using collet chucks. All tooling is provided to allow the removal and fitting of these specimens. A full technical instruction manual is supplied, which details full unit operation, experimental technique, example results and relevant theory.

Specifications

- To demonstrate the effects of fatigue
- To be self contained bench top unit on sturdy, heavy base plate
- To be data acquisitioned for capturing applied force, specimen revolutions
- Optional Data Acquisition software supplied

Note: Specifications are subject to change.

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- To test necked specimens of different materials
- To be fully guarded in order to restrain fractured specimen
- Rotate a loaded cantilever until failure occurs in rupture
- Specimen loading via screw jack mechanism with integral cantilever load cell
- Rotational speeds variable through gear ratios
- To have digital display of specimen revolutions, applied force on specimen
- Motor to stop automatically on specimen failure
- Reset and tare function for digital display
- To be supplied with mild steel test specimens
- Comprehensive technical manual

Experiments

- To make an introductory study of fatigue using a Wohler rotating fatigue apparatus, including the time to failure caused by various stress levels and materials
- Introducing students to S-N curves
- Material specification on fatigue limits
- Specimen geometry on fatigue limit
- The accessory affords bending fatigue of a cantilevered strip of metal or plastic in modes varying from alternating to fluctuating stresses

Operating Conditions

- Operating environment:
 - * Laboratory
- Storage temperature range:
 - * -25oC to +55oC (when packed for transport)
- Operating temperature range:
 - * +5oC to +40oC
- Operating relative humidity range:
 - * 80% at temperatures < 31oC decreasing linearly to 50% at 40oC