

PROSTHETICS LOAD AND FATIGUE TESTING

INDUSTRIES: TEST AND MEASUREMENT / MEDICAL AND HEALTHCARE

SUMMARY

Customer Need / Challenge

Prosthetic limbs must be tested for extreme loading that can occur during falls, accidents, and sports movements. Fatigue testing of prosthetic components determines the expected lifespan of the components under normal usage.

Interface Solution

A static load test apparatus uses Interface S-type load cells attached to hydraulic actuators to apply and measure loads. A fatigue testing machine uses Interface fatigue-rated S-type load cells to apply and measure cyclic loads.

Results

Engineers determine whether prosthetic materials and designs will withstand the rigors of daily use and occasional highload situations.

MATERIALS

Interface Products

- SSMF Fatigue Rated S-type Load Cell rated between 25 and 2,500 pounds-force (lbf)
- SGA Signal Conditioner

Alternate Setup

- Model DIG-USB-F Fast USB Output Module
- Model 1000 Series Fatigue Rated LowProfile™ Load Cell

Additional Materials

- Tensile or compression machine
- Tilt table
- Customer Data Acquisition System

HOW IT WORKS

1. Various configurations of compression and tension test machines can be used depending on the type of prosthetic device being tested. Often the same machine can be used for static and fatigue testing.
2. An Interface S-type load cell is mounted between a hydraulic actuator and the device being tested.
3. During static testing, loads are applied to the specimen using the load cell signal as force feedback control of the test machine.
4. During a fatigue test, the actuator repeatedly applies and removes the force to simulate activity such as walking. Tilt tables may be used to apply forces at various angles to simulate the heel-to-toe movement of walking or running.

