

FT 100

Cutting forces during drilling



Description

■ Measurement of feed force and torque

Investigation of cutting forces during drilling is fundamental to the teaching of cutting techniques. The setup comprises a transducer, which also holds the specimen being machined, and an amplifier unit with digital displays. The axial force (feed force) and torque occurring during cutting are measured using strain gauge transducers and digitally displayed on the amplifier unit.

The experiments must be conducted in a workshop environment, as a suitable drilling machine is required.

Learning objectives/experiments

- measuring feed force and torque at the cutting surface
 - ▶ influence of rotational speed, rate of feed, lubrication and cooling conditions
- influence of the cutting geometry of the drill
- influence of the material being machined

Specification

- [1] drilling measurement device
- [2] measurement of feed force and torque
- [3] strain gauge type measuring transducer
- [4] strain gauge amplifier with digital displays for axial force and torque
- [5] splash-proof stainless steel housing for transducer
- [6] GUNT software for data acquisition via USB under Windows 10

Technical data

Drilling diameter: max. 16mm

Specimens

- square LxW: 25x10...25x20mm
- possible materials: steel, brass, aluminium, copper, plastic

Measuring ranges

- axial force: 0...10kN
- torque 0...50Nm

Strain gauge in half-bridge configuration

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase

120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 220x150x230mm (transducer housing)

LxWxH: 230x210x120mm (amplifier)

Weight: approx. 20kg

Required for operation

PC with Windows recommended

Scope of delivery

- 1 measurement kit for drilling experiments, comprising transducer and strain gauge amplifier
- 1 GUNT software CD + USB cable
- 1 set of instructional material

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Optional accessories

WP 300.09 Laboratory trolley