TE15 Energy Absorbed at Fracture

Compact, bench-mounting apparatus for introducing students to impact testing

- Small-scale, convenient bench-mounting impact tester
- Ideal introduction to commonly used material impact testing techniques
- Many safety features including enclosure of all moving parts and mechanically interlocked guard
- Allows investigations into the resistance of materials to crack propagation and the influence of temperature on fracture properties
- Includes digital display of energy absorbed at impact, and angular position before and after impact
- Visually effective, interesting and motivating experiments
- Ideal for student group work or classroom demonstrations

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TecQuipment

TE15 Energy Absorbed at Fracture

Description

A small-scale, bench-mounting, notched-bar impact tester. The equipment provides an effective, convenient and safe introduction to the principles of common impact testing techniques, enabling investigations into the resistance of materials to crack propagation and the influence of temperature on fracture properties.

The apparatus consists of a main unit, an instrumentation unit and a power supply. The main unit consists of a pendulum supported in a rigid frame by low-friction bearings. The pivot arrangement includes an angular encoder to measure the angular position of the pendulum over its range of movement. The apparatus is fully enclosed with an interlocked guard covering all moving parts. Adjustable feet on the base of the unit enable accurate levelling of the equipment.

To perform a test, students raise the pendulum to the start position, where it is held by an electromagnet. They then clamp a specimen in a holder, which safely slots into the base of the frame at the lowest point of the pendulum swing. The separate instrumentation unit controls the release of the pendulum and measures and displays its angular position before and after the impact. The unit also directly displays energy absorbed by the impact in Joules.

The equipment is designed to fracture plain carbon steel, brass, copper or aluminium specimens. Lengths of each of these materials are included, along with a hacksaw and cutting jig to enable cost-effective and convenient manufacture of test specimens. The cutting jig ensures repeatability of the notch position in each specimen and therefore valid comparisons of test results.

As well as comparing impact properties of each material, by heating and cooling specimens before testing, students can investigate the brittle-ductile transition in steel.

Note: Separate heating and cooling vessels (not included) are required for tests at different temperatures. A pair of specimen tongs is included for safe handling of hot or cold specimens.

The equipment is supplied with a comprehensive user guide which includes equipment description and technical specification, installation and assembly, background theory, experiment procedures with results, and maintenance instructions.

Experiments

- Introduction to the principles of common impact testing methods, such as Izod and Charpy tests
- Investigations into the resistance of materials to crack propagation
- Influence of temperature on the fracture properties of materials

Recommended Ancillaries

- Heating vessel and cooling vessel for specimens (not supplied by TecQuipment)

Standard Features

- Supplied with comprehensive user guide
- Two-year warranty
- Manufactured in accordance with the latest European Union directives

Operating Conditions

Operating environment:
laboratory environment

Storage temperature range:
–25°C to +55°C (when packed for transport)

Operating temperature range:
+5°C to +40°C

Operating relative humidity range:
80% at temperatures < 31°C decreasing linearly to 50% at 40°C

Essential Services

Electrical supply:
110/240 V 50/60 Hz single-phase electrical supply

Siting:
Approximately 670 mm x 230 mm of solid, level work bench, firmly secured.

Specification

Dimensions:
- Main unit: 660 mm x 230 mm x 480 mm,
- Instrumentation unit: 260 mm x 210 mm x 120 mm,
- Equipment packed for export: 0.38 m^3

Weight:
- Main unit: 24 kg
- Instrumentation unit: 1.5 kg
- Equipment packed for export: 36 kg

Maximum impact energy:
2.75 J

Specimens:
Cut from 3.2 mm diameter rod, supplied as:
- 1 m aluminium alloy
- 1 m copper
- 1 m brass
- 1 m mild steel

Accessories (included):
- Hacksaw and 10 hacksaw blades
- Stainless steel tongs
- Cutting jig
- Two specimen holders
- Allen keys

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