

# MG 200

## Instructional kit: threaded fasteners and lock washers



### Learning objectives/experiments

- tightening a threaded joint to a preset torque
- measuring the breakaway torque as a function of the bolt length, property class, bolt locking type and tightening torque
- familiarisation with the relevant standard designations and terms, including graphical representation

### Specification

- [1] set of material for workshop exercises relating to threaded joints
- [2] brace with drill holes, 5 flat bars
- [3] bolts to ISO 4014 and ISO 4017
- [4] nuts to ISO 4032 and ISO 7040
- [5] measurement of the tightening torque using a torque wrench with dial indicator
- [6] all parts clearly laid out on a tray
- [7] multiple trays stackable

### Technical data

Bolts M10

- property classes 5.6 and 8.8
- lengths: 35, 55, 75mm

Nuts M10, some self-locking

Various bolt locks

- spring ring, toothed washer, strain washer

Torque wrench: 0...50Nm

Joined workpieces (flat bar and brace) made from steel, some with gunmetal finish

LxWxH: 500x350x110mm (tray)

Weight: approx. 9kg

### Description

- practical workshop training relating to threaded joints
- familiarisation with the key influencing factors

The material, including the torque wrench, is clearly laid out on a plastic tray.

This training kit provides the necessary material for joining workpieces with threaded joints. In the process, specific influencing factors (e.g. type of bolt locking, bolt length) can be analysed independently of each other. Bolt tightening and breakaway torques are measured using a torque wrench. The workpieces are held securely in a vice during the experiments.

### Required for operation

1 vice

### Scope of delivery

- 1 complete set of material, laid out on a tray
- 1 set of instructional material