

SE 200.04

MEC - Friction on the inclined plane



Description

- wireless setup of an inclined plane with smart, communication-enabled components
- measured values for angle, force and distance travelled directly on the inclined plane and in the GUNT software
- experiments with different material pairings
- click system for easy setup and reconfiguration

Frictional forces are essential for machines. This applies to static friction in static applications and dynamic friction in dynamic applications.

SE 200.04 contains an inclined plane equipped with an electronic module for data acquisition and measured value display. The experimental arrangement is set up in the SE 200 mounting frame. The stainless steel mounting frame provides direct and wireless data transmission and power supply for the smart components. The click system ensures the components easily snap into place.

The angle of the inclined plane can be changed. An applied mass as a friction body is connected to a cable via a deflection pulley with a further mass as a tensile force. The force acting on the deflection pulley in the direction of the

inclined plane is measured. The distance travelled by the applied mass is recorded via the rotary movement of the deflection pulley. The time is used to determine the speed and acceleration. Two additional flywheels slow down the experiment in order to illustrate the dynamic processes. Another friction body with ball bearings enables dynamic experiments without friction.

The dynamic and static friction coefficients of two material pairings and two friction surfaces of different sizes are determined in experiments. Variable loads are available for the two friction bodies. The measured forces, angles and distances travelled are displayed both directly on the inclined plane and in the GUNT software. The static and dynamic friction coefficients can be determined in the GUNT software.

The GUNT software reacts dynamically to changes. The visualisation in the software corresponds to the actual inclined plane. The measured values are analysed in real time.

Learning objectives/experiments

- measurement of the coefficients for
 - ▶ adhesion
 - ▶ friction
- determination of angular dependence
- determination of material dependence
- measurement of distance travelled and time passed
- determination of velocity and acceleration
- accessories of the modular MEC Line can be combined for any setup and extension of the experiments

GUNT Media Center, develop digital skills

- retrieve information from digital networks
- E-Learning course with fundamental knowledge and detailed presentation of the experiment procedure and engaging animations
- assured learning success through digital worksheets

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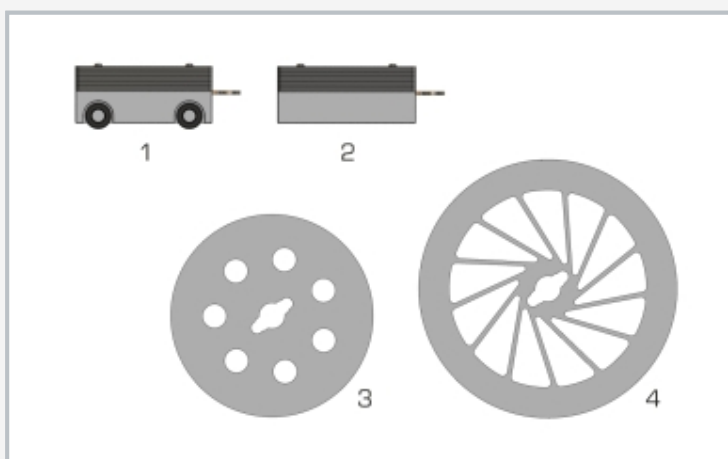
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1 mounting frame SE 200, 2 friction body II, 3 inclined plane, 4 inclination adjustment, 5 counterweight, 6 measurement of the cable force, 7 flywheel to slow down the experiment



GUNT software screenshot: Display of forces and inclination angle, selection of friction surface and flywheels possible



1 friction body I with wheels, 2 friction body II without wheels, 3 flywheel, 4 flywheel

Specification

- [1] measurement of the static and dynamic friction coefficient on an inclined plane
- [2] setup of the entire experiment arrangement in the SE 200 mounting frame
- [3] click system for simple, fast experimental setup without cabling
- [4] inclined plane with electronic module for data acquisition and measured value display
- [5] angle of the inclined plane manually adjustable
- [6] friction body: 1x with wheels, 1x without wheels
- [7] variable load for friction bodies: 5x 1N
- [8] different material pairings possible
- [9] slow experiment sequence by using optional flywheels
- [10] all components clearly laid out and well protected in a storage system
- [11] display of measured values for force, angle and displacement directly on the inclined plane and in the GUNT software
- [12] GUNT software via USB under Windows 11
- [13] digital multimedia teaching material online in the GUNT Media Center: E-Learning course, worksheets

Technical data

Inclined plane, length: 870mm

- wood (Multiplex birch)
- 2x PE-UHMW (full and half friction surface)

Friction bodies, steel, LxWxH: 100x50x50mm

- with wheels: 7N, without wheels: 7N
- variable load for friction bodies: 5x 1N

Cable force max.: 0,5...6,5N

Counterweight: 1x weight hanger: 1N, 12x mass: 1N each

2 flywheels

- 1x moment of inertia: 1250kgmm²
- 1x moment of inertia: 2500kgmm²

Measuring ranges

- force: 0...200N
- angle: 0...180°
- travel: 0...870mm

LxWxH: 800x600x200mm (storage system)

Weight: approx. 20kg (total)

Required for operation

Accessories from the GUNT MEC Line series, PC with Windows recommended

Scope of delivery

Inclined plane, 1 set of masses, 2 flywheels, 2 friction bodies, GUNT software, 1 set of instructional material, online access to the GUNT Media Center, storage system with foam inlay

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Required accessories

SE 200

MEC - Frame digital & smart