



Features

- Equilibrium conditions and support reactions of a leaning ladder

The principle of “freeing” in engineering mechanics allows forces and moments acting on a body to be made visible. In this process, a body or a system such as a bar are virtually removed from the environment. All forces acting on the body or on the system are replaced by standardized symbols.

This results in a simplified model of the body or system, which clearly demonstrates the relationships between forces and moments.

Tesca Equilibrium in a Single Plane, demonstrates the principle of “freeing”, which refers to establishing static equilibrium. The experiment uses a model of a ladder with a sliding clamp weight.

The top support is designed as a movable support and the bottom one as a fixed support. The real effective support forces can be fully compensated by applying cable forces in the x and y directions. The ladder is in a state of equilibrium without changing the angular position and without the need for structural support. The ladder is “free”. For students, the result is a convincing example for the principle of “freeing” in statics.

The parts of the experiment are clearly laid out and securely housed in a storage system.

Specifications

- Development of the static principle of “freeing”
- Full compensation of the support forces by cable forces
- Sliding clamp weight

Note: Specifications are subject to change.

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- Determine the position of the clamp weight via built-in rule with millimetre scale
- 2 supports (1x fixed support, 1x movable support)
- 3 guide pulleys
- Storage system for parts

Technical Specifications

- Ladder
 - Length: 650mm
 - Weight: 2N
 - Built-in rule, graduation: 1mm
- Clamp weight: 20N
- Weights
 - 3x 1N (hanger)
 - 9x 5N
 - 12x 1N
- Supports
 - 2, clamped to mounting frame
- Tape measure
 - Length: 3000mm, graduation:

Experiment Capabilities

- Experimental development of the core principle of “freeing” in statics
- Calculation of the support forces for a given position of the clamp weight and for a known angle of inclination
- Application of the 1st and 2nd equilibrium conditions in statics
- And full compensation of the support forces by cable forces
- How does the clamp weight position affect the support forces
- How the angle of inclination affects the support forces

Manuals

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manual.