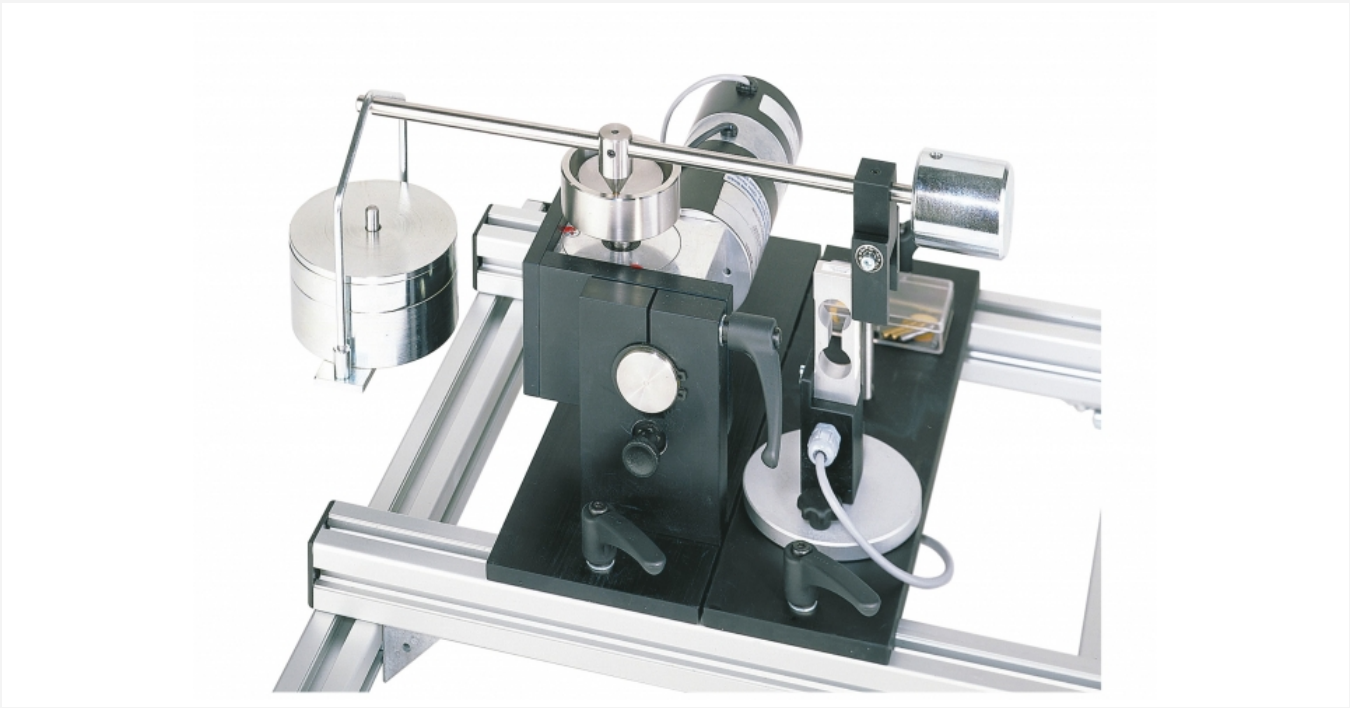
# TM 260.03
## Dynamic friction in pin - disk



## Description

- **frictional forces between two sliding friction pairs**
- **investigation of wear**
- **use of different lubricants possible**

In bearing and drive technology, dynamic friction occurs at the sliding and rolling points, which leads to power losses in the technical systems. Dynamic friction is differentiated into sliding, rolling and spinning friction. In dynamic friction, there is relative translation between the two bodies.

The tribological system in TM 260.03 allows a clear representation of the dynamic friction and an analysis of the frictional forces. The experimental unit contains a fixed pin that is pressed axially against a rotating disk as the friction pair. The contact force between the friction partners can be adjusted gradually up to a maximum of 80 N by means of a lever. The rotating disk is enclosed by an open cup that can be filled with different lubricants for the experiments.

Different lubrication conditions can be studied, such as dry friction, water or oil lubrication. Pins made of different materials are included in the scope of delivery to study different friction pairings.

The TM 260 drive unit is required in order to conduct experiments. The experimental unit is mounted quickly and easily on the frame of the drive unit with quick-action chucks. The disk is driven by a clampable coupling between drive unit and gear unit. The display and control unit of the drive unit shows frictional force and speed and allows the continuous adjustment of the speed.

The frictional force and the coefficient of friction can be determined in experiments. The frictional forces are measured by a force sensor. The wear can be determined precisely by measuring the change (reduction) in length of the pin.

## Learning objectives/experiments

- together with the drive unit
  - frictional forces in different friction pairs and loads
  - frictional forces with different lubrication
  - frictional forces at different relative speeds of the friction partners
  - wear under different friction parameters and lubrication conditions

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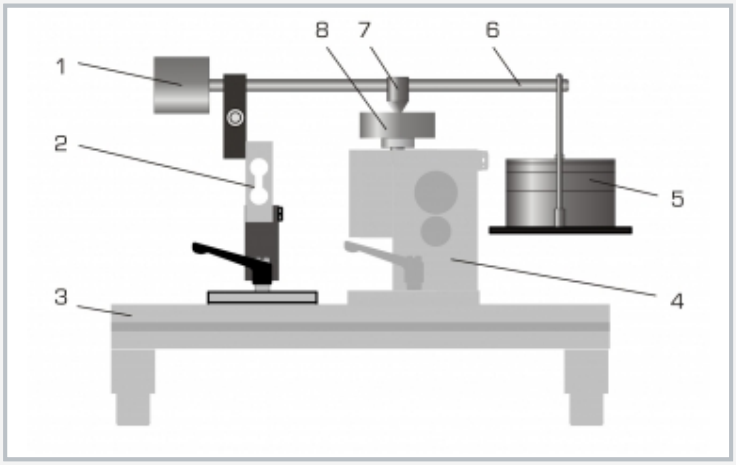
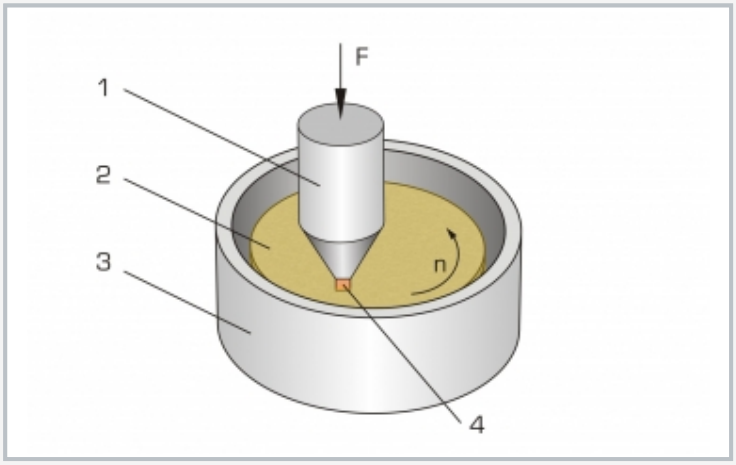
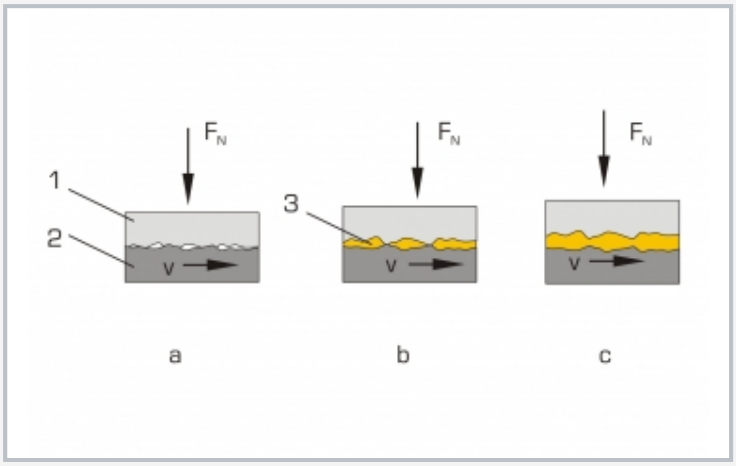



1 counterweight, 2 force sensor, 3 frame of TM 260, 4 drive unit from TM 260, 5 weight, 6 load application device lever, 7 pin, 8 disk




Tribological system pin and disk: 1 pin as counter body, 2 rotating disk as main body, 3 cup with lubricant as intermediate substance, 4 contact area; F force, n speed




Effect of the lubricating film on friction: 1 pin, 2 disk, 3 lubricant; a dry friction, b mixed friction, c fluid friction; $F_N$ force, v velocity

## Specification

[1] frictional forces in pin and disk, which slide against each other, disk subjected to axial load
[2] quick and easy assembly of the experimental unit on the frame of the drive unit
[3] disk is driven by a clampable coupling between drive unit and gear unit
[4] fixed pin made of different materials: aluminium, brass or steel
[5] rotating disk made of hardened and ground stainless steel
[6] load on the pin via lever arm and stepped weights
[7] use of different lubricants, e.g. water or oil
[8] frictional force measured by force sensor
[9] displays of force and speed and speed adjustment on the drive unit

## Technical data

Load application device
- max. load: 80N
- lever arm ratio: 2:1

Disk
- Ø=50mm
- hardened stainless steel, ground

Pin, ØxH: 4x25mm
- 3x aluminium
- 6x brass
- 6x steel

Force sensor for frictional force
- 0...50N

Weights
- 1x 5N (hanger)
- 1x 20N
- 1x 10N
- 1x 5N

LxWxH: 350x430x230mm
Weight: approx. 8kg

## Scope of delivery

1 experimental unit
1 disk
1 set of pins
1 set of weights
1 set of instructional material

# TM 260.03
## Dynamic friction in pin - disk

Required accessories

| | | |
|---|---|---|
| 040.26000 | TM 260 | Drive unit for tribological investigations |