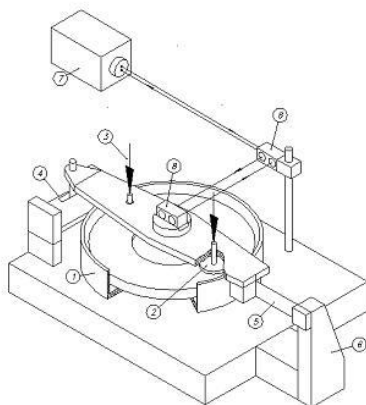
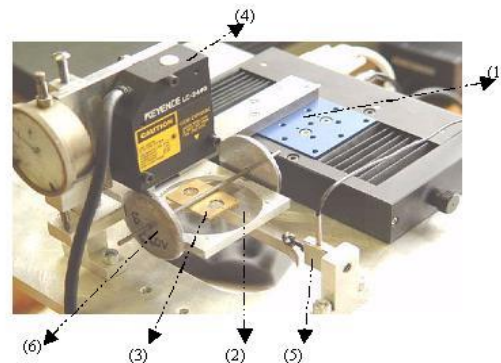


**Rotating:** With the rotating stick-slip tester two sliding shoes (2) are pushed against a rotating ring (1). The rotating ring is placed in a bath, which if need be, can be filled with a lubricating medium. The bath is driven by an electric motor through a V-belt and a gearbox, which allows a wide variation of speeds. The normal load (3) on both sliding shoes is applied by means of weights (not shown). The sliding shoes are fixed in a rotating arm, which is connected via a spring leaf (5) to the frame of the test-rig (6). Also the test-rig allows the use of an oil-damper (4) to be placed between the rotating arm and the frame. The displacement of the arm is measured using a HP 5529A optical interferometric system (7) and two prisms (8).

**Bidirectional flat-on-flat mesoscopic tribotester:** A circular glass plate used as a moving specimen (2) is driven by the driving unit (1) in a smooth, linear, and accurate motion while it is rigidly connected to it by a clamping mechanism. A rectangular glass plate used as a stationary specimen (3) on which a static normal load is manually applied by the loading system mechanism (6) is connected to the load cell by two thin metallic wires. In the middle of the stationary specimen a rectangular channel of few millimeter wide and 100 nm deep (nano-channel) is etched. The nano-gap between both surfaces is filled with the molecule to be analyzed (DNA- and protein screening). The friction force is monitored by a loadcell (5) and recorded throughout the experiment by means of a data-acquisition card device. The normal displacement and the intensity of the reflected laser beam are monitored by a non-contact displacement sensor (4) and recorded throughout the test by means of a data-acquisition card device.



Rotating



(1) Driving unit, (2) Moving specimen, (3) Stationary specimen, (4) Non-contact displacement sensor, (5) Load cell, (6) Loading system

Bidirectional

## TEST RIG CHARACTERISTICS

Property	Rotating	Bidirectional
Sliding speed	0.15 mm/s to 2 m/s	0 – 50 mm/s
Normal load/sliding shoe	50 N to 1000 N (increments of 50 N)	0 – 8 N
Stroke		(20 mm) max. 50 mm
Friction force		Max. 2 N
Dimension moving plate		Ø 63 mm
Slider dimension (stationary plate)		15 x 20 mm, 20 x 30 mm
Spring stiffness	4.8 N/mm, 63.7 N/mm or 434 N/mm	
Inertia of the arm	Dependent of the normal load	