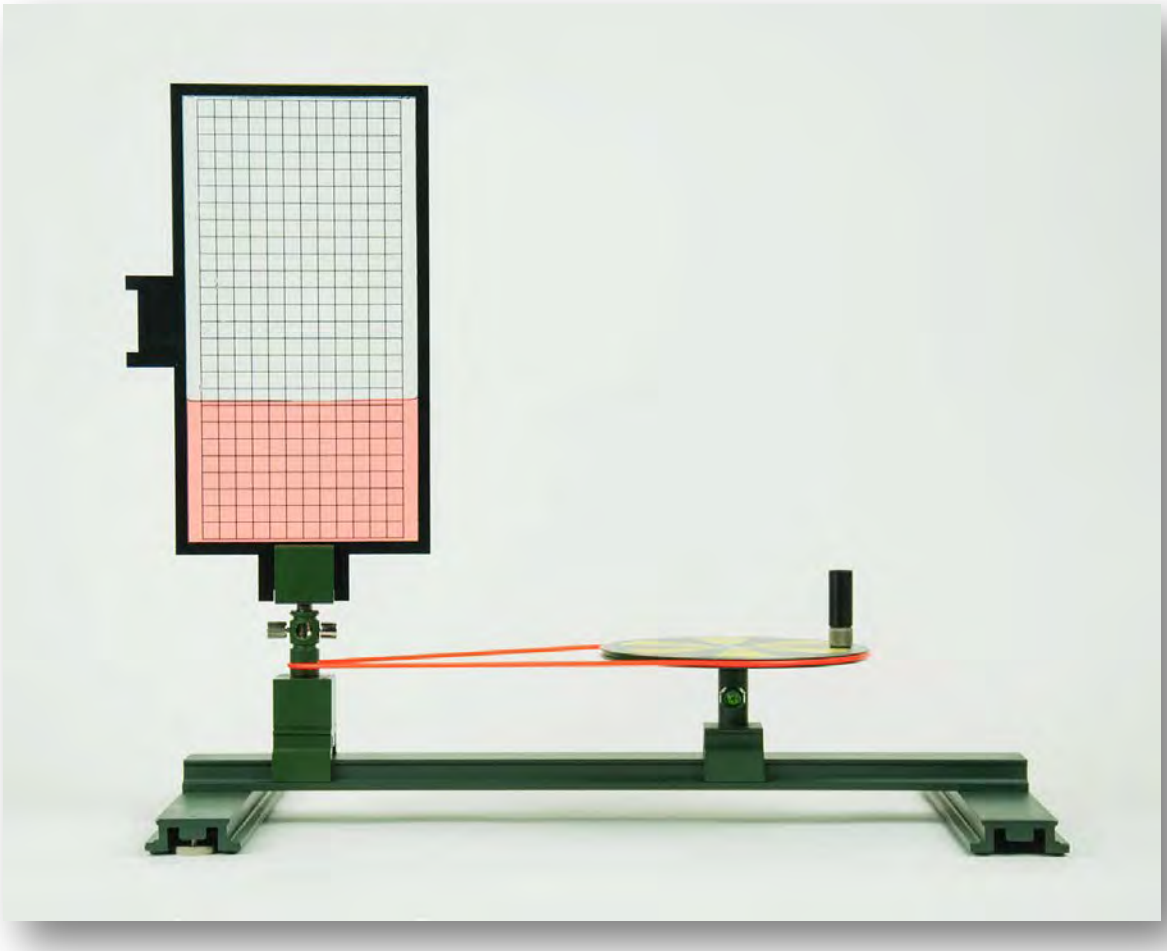
ROTATING FLUID AND ITS ANGULAR VELOCITY

MED 09.09



Material

Item-no.	Qty.	Description
DS101-1G	1	Support base, large, L=500 mm
DS103-3G	1	Sliding saddle, H=34 mm
DS402-2G	1	Clamp on support
DS402-3B	1	Pivot bearing with transverse hole,
DS402-3S	1	Drive pulley demo, with ball bearing
DS402-2N	1	Crank pin, L=50 mm
DS401-1A	1	Drive belts, set of 2
DM353-1K	1	Accelerometer

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Purpose
To show the relation between the shape of a surface and the angular velocity of a rotating liquid

Preparation
Mount the pivot bearing and the sliding saddle on the support base as shown on the image; afterwards screw the crank pin on the drive pulley.

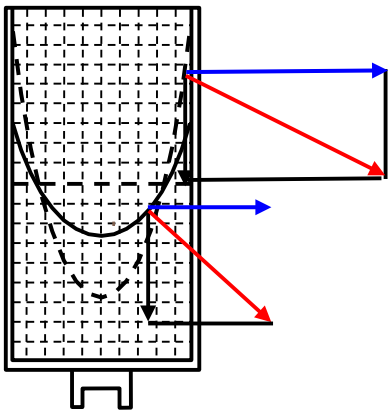
Insert the drive pulley into the sliding saddle; afterwards fix the Accelerometer to the clamp on support and mount it on the pivot bearing.

As shown on the image below taut the long drive belt between the sliding saddle and the pivot bearing.

Experiment
Pour coloured water into the accelerometer until you have filled up 8 rows of the grid.

Turn the accelerometer at various speed levels (number of turns) for some seconds and observe the shape of the water surface.

Result
The water surface is shaped like a parabola.



Note
The surface shape is caused by the interaction of gravity and centrifugal force (the molecular forces are neglected here). The resultant of these two individual forces acts on each liquid particle.

The rotational speed can be determined with a light gate and a counter.

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