# TE99 Michell Pad Apparatus

***Shows the pressure distribution across the film of oil in a Michell tilting pad slider bearing. Helps to prove Reynold's equation for pressure gradient in fluid film.***

- Proven design, based on a machine created by the Department of Mechanical Engineering, Imperial College, London
- Accurately mimics a Michell tilting pad, fluid-lubricated slider bearing
- Helps to prove Reynold's equation for pressure gradient in a fluid film
- Includes a variable speed motor control
- Fully adjustable pad (tilt) angle
- Includes oil and a viscometer

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# TE99 Michell Pad Apparatus

## Description

The Department of Mechanical Engineering (Imperial College, London), created the original design for this apparatus. It mimics a tilting pad fluid-lubricated slider bearing, invented by A G M Michell.

The bench-mounting unit has an aluminium plate (pad) mounted above a continuous loop flat belt. The belt runs in an oil reservoir to provide a continuous supply of oil under the pad. This creates a pressurised film of oil between the pad and the belt.

A set of thirteen graduated tubes show the oil pressure across and along the film under the pad.

Included is a variable speed control to control the speed of the motor that turns the belt. Students vary the belt speed to find the relationship between sliding speed, oil viscosity and pressure distribution.

Two eccentric shafts hold the pad so students can adjust the angle of tilt of the pad. This helps students to find the relationship between pressure distribution and film thickness. Micrometers measure the leading and trailing edge positions of the pad.

Included with the apparatus is a container of oil and a viscometer to measure the viscosity of the oil.

## Standard Features

- Supplied with comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives

## Experiments

Study of:

- Pressure distributions in a tilting pad bearing.
- Influence of sliding speed and viscosity on the pressure distribution in the bearing and comparison with calculations based on Reynold's equation.
- The relationship between pressure and the film thickness at the trailing edge of the pad.

## Essential Services

*Bench space needed:*
1 m x 500 mm

*Electrical supply:*
Single-phase 230 VAC 50 Hz or 110 VAC 60 Hz

The speed control uses approximately 600 W maximum power.

## Operating Conditions

*Operating environment:*
Laboratory

*Storage temperature range:*
–25°C to +55°C (when packed for transport)

*Operating temperature range:*
+5°C to +40°C

*Operating relative humidity range:*
80% at temperatures < 31°C decreasing linearly to 50% at 40°C

## Sound Levels

Less than 70 dB(A)

## Specifications

*Nett dimensions and weights:*
Main Unit: 650 mm x 650 mm x 400 mm and 20 kg

Motor Speed Control: 90 mm x 260 mm x 300 mm and 4.2 kg

*Packed dimensions and weight (total):*
0.3 $m^3$ and 30 kg

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