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Biomechanical characterization of porcine trachea

First investigations towards the development of an individual tracheal implant

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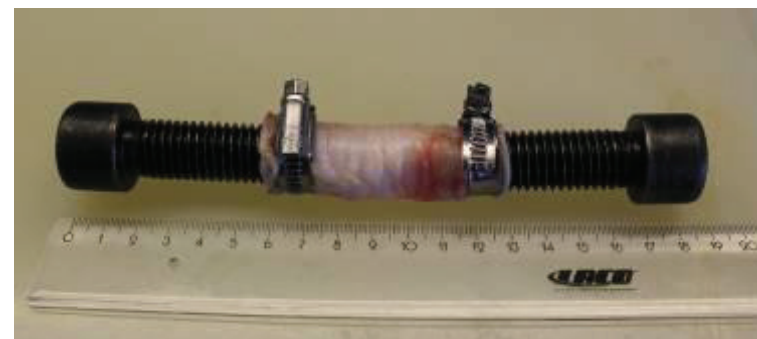
² Fraunhofer Institute for Machine Tools and Forming Technology Dresden

Task

- (bio-)mechanical characterization of porcine tracheal preparations by using a traction-pressure testing machine
- Investigation of tracheal parts in longitudinal direction
 - Traction from 5% to 30% (100%) stretching, 3 traction cycles

Material

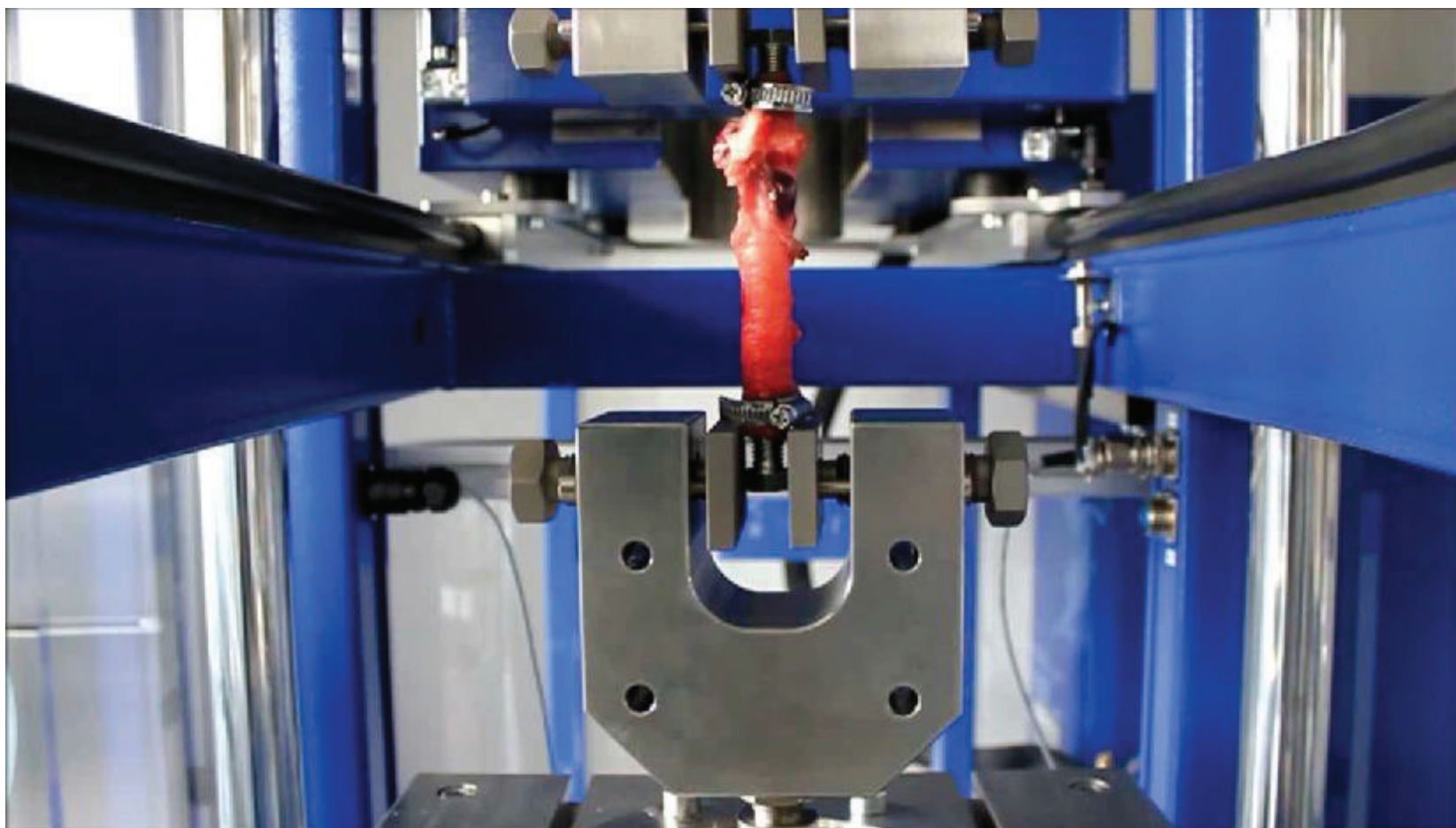
- Porcine trachea
- Porcine trachea with clamping elements



Method

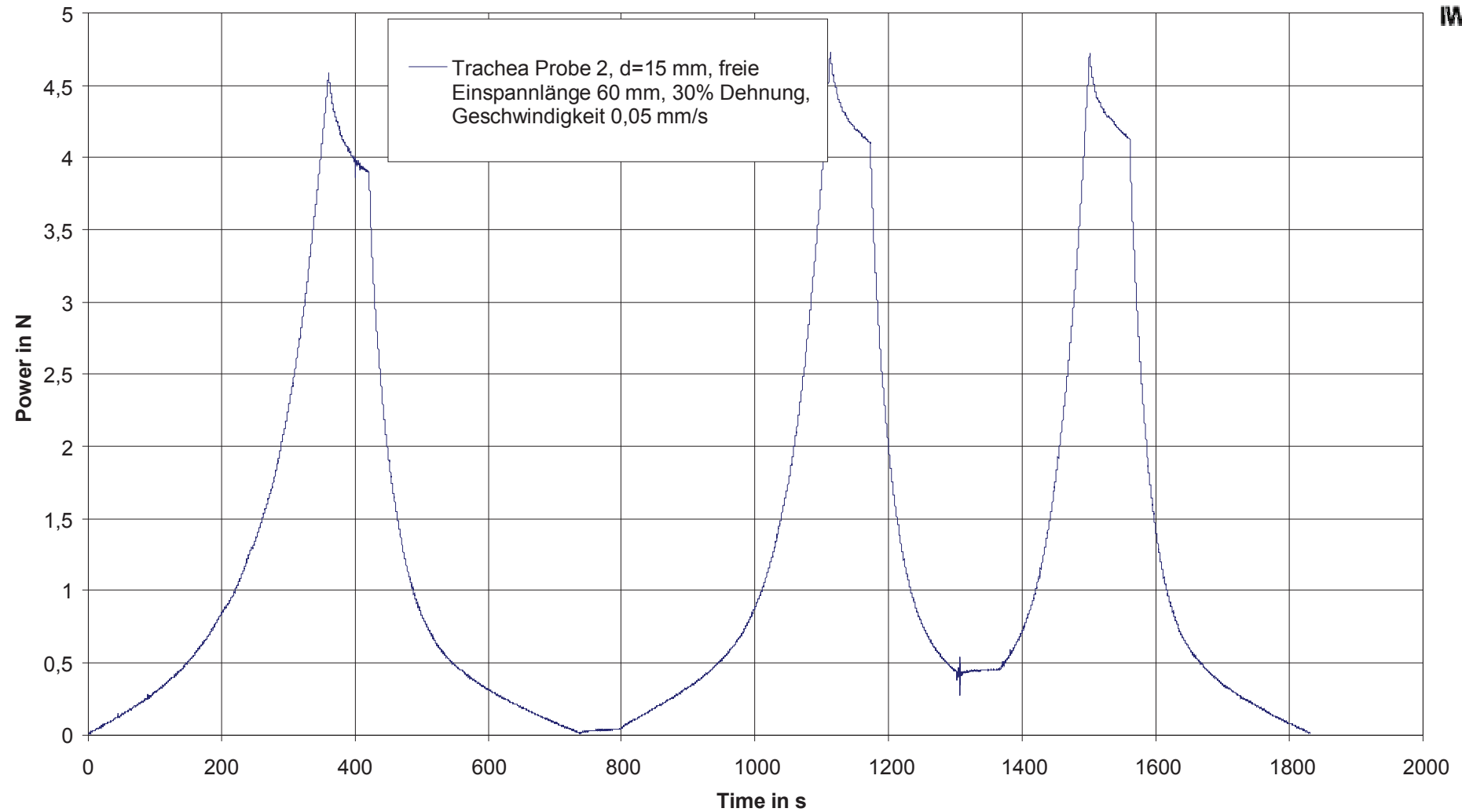
- Tool: Traction-Pressure testing machine
- Cadaver dissection just before begin of the experiments
- Environment of 22°C and air humidity of 50 %





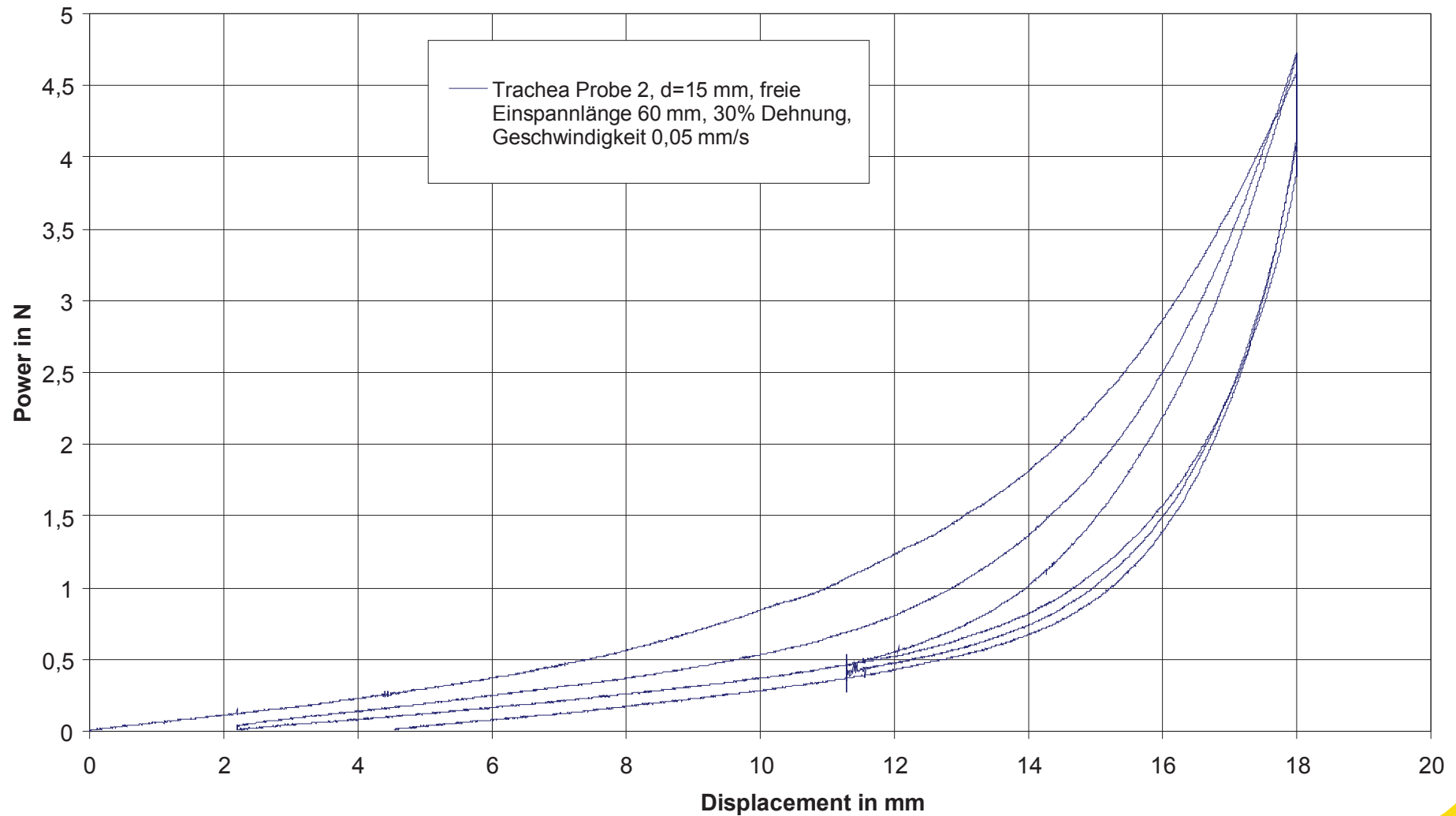
Results

Traction experiment: Power-Time diagram



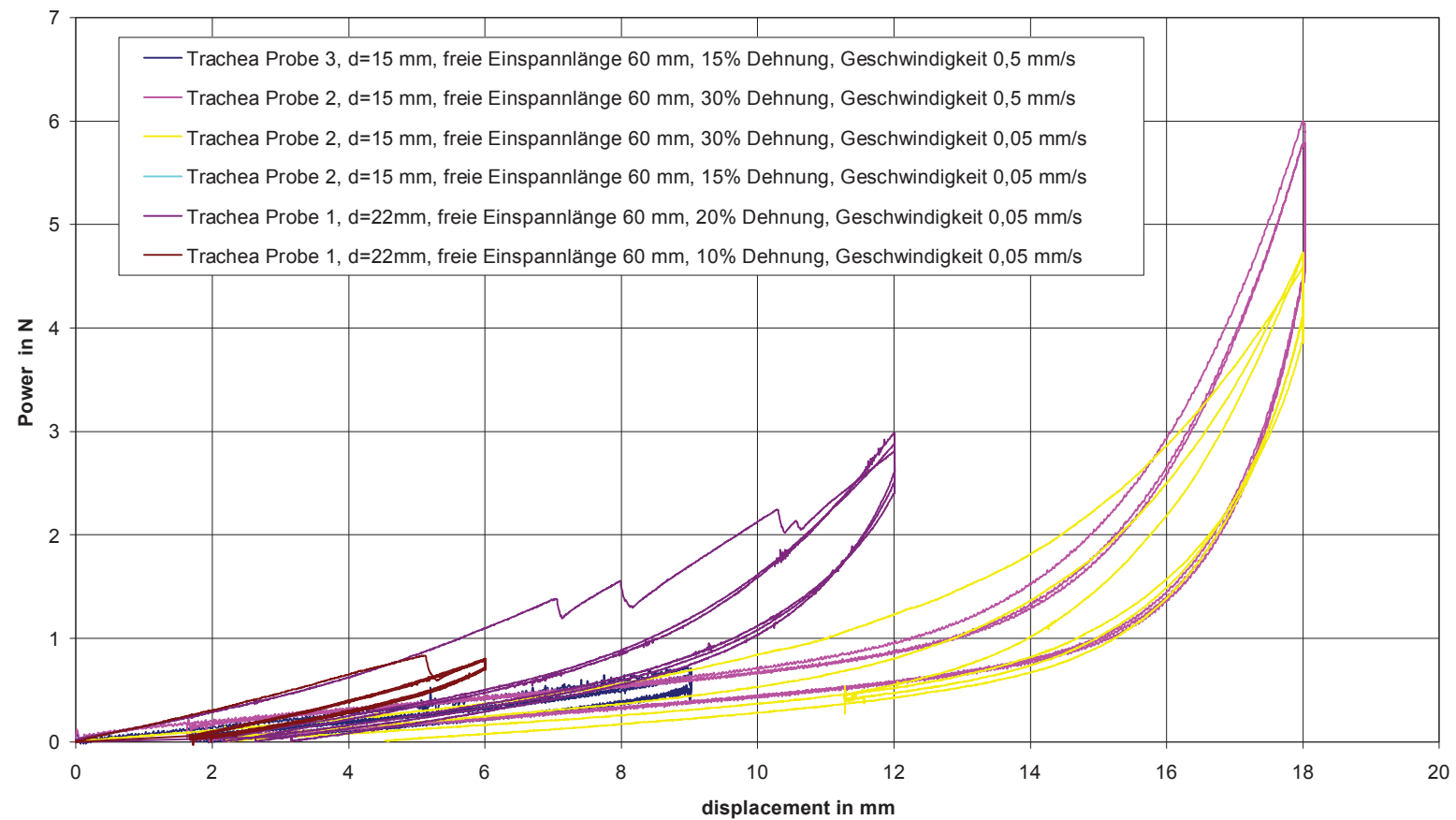
Results

Traction experiment: Power-displacement diagram



Results

Traction experiment: Power-Displacement diagram



Results

- Typical non-linear behavior
- Reversible stretching up to 100%
- Relaxation of material during holding phase