



PROMECON

Student / Bachelor Thesis (Experimental & Design)

Development and Implementation of a Test Rig to evaluate Flow-Rates of Elastomeric Infusion Pumps

We are

PROMECON is a family-owned company based in Hamburg, who manufactures and distributes single use medical devices. With more than 10 years of experience, we are a leading provider of elastomeric infusion pumps on the German market.

Outline

Elastomeric Pumps are used as medical infusion pumps. Compared to mechanical pumps, elastomeric pumps are operated without an external source of energy. The work of the pump is performed during the deflation of a prefilled elastomeric balloon. Attached to the balloon is an infusion line, including a pressure reducer. The pressure reducer, also called restrictor, defines the basal flow-rate of the pump.

To guarantee the patient's safety, an over or under dosage has to be prevented, by safeguarding a flow-rate deviation of max. $\pm 10\%$ of the basal flow. As elastomeric infusion pumps have no active control technology, the flow-rate is mainly driven by the engineering design, choice of material and production tolerances of the single components.

The approach of this student thesis is the design and installation of a test rig to evaluate the influence of material and production technology of several pump parts on the final flow-accuracy of the pump.

The results of this thesis shall support the development of follow up pump generations.

Tasks

- Test Rig
 - Draft of a test rig layout and selection of the needed measurement devices
 - Installation and launch of the test rig
- Methodical evaluation of different pump components effecting the basal flow-rate
 - Pressure characteristic of the balloon depending on its geometry, elastomeric material and production technology
 - Comparison of the flow accuracy between glass and resin restrictors
 - Loss in pressure caused by optional equipment installed in the infusion line like air and bacterial filter
- Documentation and interpretation of the test result

Your Profile

- Mechanical engineering student or similar field of education
- Basic experience in fluid mechanics of advantage
- Prior knowledge in design and/or simulation of advantage
- Work in autonomous and target orientated manner

We offer

- Interdisciplinary, open minded and dynamic team
- Family owned business with short decision-making processes
- Individual support of the thesis

Contact

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