

MSc Thesis PROJECT PROPOSAL

GTC – Sensors for Applications and Processes

GTC - Advanced Mechanics

Project Title Design and implementation of a system to monitor and control a lab hydraulic loop emulating in-line process conditions of interest in appliances
Background <p>Water quality is one of the main topics of interest in household appliances. The monitoring of properties, such as hardness to turbidity and to surface tension, is a key factor to be able to optimise the operational working conditions with respect to appliance performances and end-user perception (reliability, efficiency, efficacy, etc.).</p> <p>The aim of this work is to create a lab setup enabling to investigate key water properties associated to home appliances' operational conditions. This thesis work shall include:</p> <ul style="list-style-type: none"> - design of a system to control a laboratory hydraulic loop emulating washing process conditions occurring in appliances - define control sequences to recreate both typical and customised operational conditions along tests - develop a data-logger capable of acquiring data of relevance along tests - provide guidelines on tests type/number to be carried out to ensure reliability of results <p>Electrolux references Project steering team: Michele Toppiano, Cristina Bertoni, Carlo Urbanet, Jean-Yves Noel MSc thesis industrial supervisor: Cristina Bertoni, Jean-Yves Noel <i>(1 needed, to check if 2 is feasible)</i></p> <p>Objectives The MSc thesis project proposes to focus on delivering a control system to drive a laboratory hydraulic loop enabling to emulate a selected set of washing process conditions occurring in appliances.</p> <p>Key contents</p> <ul style="list-style-type: none"> • Select sensors components on the basis of provided specifications to monitor both the hydraulic circuit setup response (e.g., temperature, flow rate, etc.) and water parameters of interest (e.g., conductivity, turbidity, etc.) • Develop a data-logger which can monitor/measure process parameters • Build a control system including <ul style="list-style-type: none"> ○ a user-interface where control sequences, test's time, acquisition speed, etc. can be set ○ an electronic board enabling to actuate valves, heater, pumps, etc. • Use an internal design of experiments (DoE) tool to plan/optimize the number/type of tests needed to guarantee reliability of results <p>KEY WORDS: Home Appliances, water process monitoring, hydraulic system setup, data-logger, user interface</p>
Additional information and requirements A period of time to be agreed will have to be spent at Electrolux GTC in Porcia to carry out laboratory activities and have access to resources. Funding is available to cover T&S costs.