NUMERICAL SIMULATION OF HEAT CONVECTION FOR A WASHING MACHINE HEATING SYSTEM FUNTION OF THE THICKNESS OF LIMESTONE LAYER

Goal of the project

The project goal is investigate by numerical simulation the limestone accumulation on electrical heating elements for domestic and industrial applications.

Short description of the project

Many industrial applications require the use of electrical heating elements with wires arrangements, to functioning as heating device for industrial and domestic applications. Such devices have to be designed according to the availability of space in the device containing them. A measure of the evolution of such equipment, therefore, is the reduction in size, or in occupied volume, accompanied by the maintenance or improvement of its performance. When the heaters accumulates a lot of limestone, part the heat generated by the heating wire is transferred to the thermal fuse, which opens the heating circuit. Thermal fuse acts as safety device by interrupting the current in case that the heater is energized when it is not completely immersed in water.

Project implemented by

Politehnica University of Timisoara, Research Centre for Engineering of Systems with Complex Fluids

Implementation period

20.08.2014 - 04.09.2014

Main activities

The main activities consisted in:

- heat transfer simulation at imposed operating conditions using geometry reconstruction of the heat exchanger,
- computational domain discretization,
- problem setup for flow simulation with heat transfer,
- post processing and data analysis .

Results

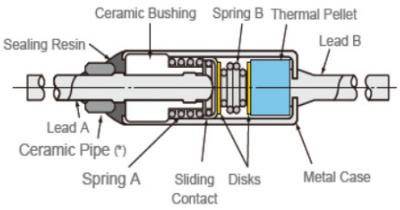
The results will help to design new heating elements, increasing the performance and lifetime.

Applicability and transferability of the results

Knowledge transfer and increase the database of the company at different operating conditions which may appear in reality.

Financed through/by

- Zoppas Industries Romania SRL
- IRCA - Italy



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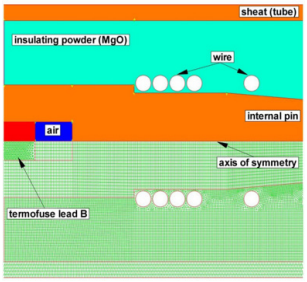
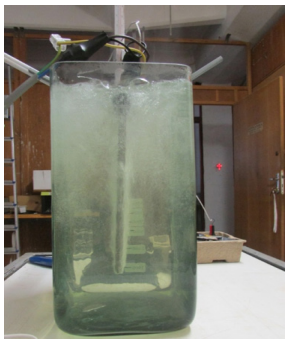


Computational domain mesh. Both structured and unstructured mesh is used in order to obtain the optimal mesh size for a accurate results.

Experimental measurements of the heat exchanger



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