



Technical Paper

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Investigations on a semi open Impeller using Stereo-Particle-Image-Velocimetry and Computational Fluid Dynamics

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Summary

Due to their easy assembly, semi open impellers are widely used where large runs are needed. They can be found in sewage pumps and cooling water pumps for automotive industry as well as in pumps for heaters. The bigger the gap is, the simpler is the assembly, but the worse is the efficiency. A cooling water pump of a car uses up to 2 kW of the engine's power. On the other side, a pump for a heating circuit is running permanently. So about 3 % of the electric power consumed in whole Germany during the period of one year is spent on pumps in heating circuits. Regarding rising energy costs, it becomes necessary to improve the efficiency of those semi-open pumps. Therefore, it is necessary to understand the very complex and three dimensional flow field in the impeller of such a pump. So Stereo-Particle-Image-Velocimetry was carried out on semi-open Impellers, to get a better understanding of the flow field and to see how CFD¹ calculations with Ansys CFX can predict this flow field.

¹ Computational Fluid Dynamics