Flowing Success

Flow simulation in industrial use

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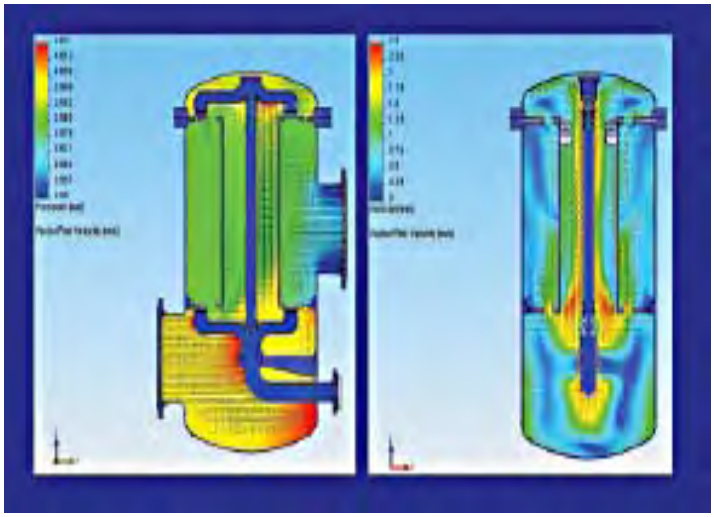
The research and development department at BOLL & KIRCH Filterbau in Kerpen has been working with the EFD.Lab flow simulation software for about six months. Dipl.-Ing. (FH) (Graduate engineer at University of Applied Science) Karsten Cartarius, the Research and Development Team Manager, above all praises the precision and speed at which the calculations that are now necessary can be carried out.
"That was precisely the right software offer at the right point in time", according to Catarius, when he reported about the use of EFD.Lab in the development department.



Courtesy of Boll & Kirch Filterbau

Efficient flow: Flow simulation with EFD.Lab of the filter represented.

Tailor made based on customer requirements

The ancient Greeks already knew that "everything flows". If solid and liquid substances are mixed in this process it is important to filter out the undesired impurities from the most diverse media. It is the task of the filter technology to carry out this process effectively. The more complex, powerful and capital intensive the systems, engines and machines become, the more important it is that the right filter system is used.

BOLL & KIRCH filters (Boll-Filters) protect the investment against excessively rapid wear and tear by consistently filtering out the dirt from the fluid and supplying the cleaned fluid to the process once again. This helps to secure operational dependability continuously and in the long term.

Dipl.-Ing. (FH) Karsten Cartarius said: "The company was founded in 1950 in Cologne by Mr Boll and Mr Kirch; in 1974 the company moved to Kerpen. Now we have specialized in filter technology for the ship building and engine construction sector amongst other things."

BOLL & KIRCH is now ranked as the industry leader, in particular with respect to its extremely reliable automatic filters. Single and dual filters play a major role in the industry in addition to automatic filters. In this case it is rather a classic solution: filter housing with inserts.

"Here too the demands placed upon filters are constantly increasing – we have to deal with the most diverse media, e.g. lubricating oil, water, gases, fuels and many more things besides – and our designs must tally right down to the last decimal point. Our filters for gas applications in particular (which we have been constructing for about two years) are genuine "high-end products".

Courtesy of Boll & Kirch Filterbau

The right filter helps to secure the operational reliability of the systems both constantly and in the long term.

Earlier It Was Testing, Now It Is Simulation

One of the most important design questions when filters are offered at BOLL & KIRCH, is the pressure loss. Cartarius the R&D team manager had this to say: "There is an American standard that we base our work on, which stipulates for instance, that an oil filter in a clean state may generate a pressure loss of 0.35 bar. In the gas sector it is indeed as little as 0.05 bar, i.e. an extremely low pressure loss. In the past these values were not so critical as the systems were generally larger than they are today. Thus somewhat larger pumps were used. It was also very difficult to measure whether a filter really generates 0.35 bar or even 0.5 bar. The trend is moving towards more compact, small and economical constructions. For this reason we really do have to stipulate values to ourselves. If we say 0.35 bar then it must also be verifiable. Up to now we had theoretically determined this value so we could then test these values in trials. However, it has emerged that we no longer have the capacities to verify all these measurements. Nowadays you can simulate this kind of thing, and this is also astonishingly precise and rapid. We still have to make precise statements despite this. And this is now only achieved by flow simulation, particularly in view of the fact that these statements are already important at a very early stage in the development process if it is to be achieved not only precisely but also quickly."

People have taken a look around them in order to meet these high requirements and they have come across NIKA and the EFD.Lab product in this process. The possibilities which availed themselves with these new software offers, awoke the company's interest.

Very Simple Simulation Now

The company took a year to reach a decision in favor of EFD.Lab. Cartarius stated: "Everything went very quickly when we decided to take EFD.Lab. We had the first results within two weeks. To begin with we verified it all with respect to our applications once again, this means we really carried out measurement curves and these curves were modeled and compared with the simulation."

Courtesy of Boll & Kirch Filterbau

Simulation on the spot: Karsten Cartarius runs the flow simulation with EFD.Lab on his normal PC.

"It emerged after just a short period that this software is best suited for our purposes", as Cartarius concluded. "The results were very satisfactory." Karsten Cartarius was satisfied above all with the very brief initiation period: "That was extremely quick for this kind of software. People who know the fundamentals very quickly arrive at realistic simulations. What we particularly liked was the high precision of the values gained from the simulation. If the flow simulation and calculation have been carried out the values can flow into the construction and into the offer." An additional advantage was the fact that EFD.Lab still runs on relatively normal PC technology, albeit you need a high performance PC with a lot of memory. You work with a 3.2-GHz-Intel Pentium-4 processor and retrofitted RAM.

EFD.Lab Is An Open System , …

… that communicates via interfaces with all the standard CAD programs. However, data can also be generated in EFD.Lab itself via the parametric volume modeler. NIKA's software tool is mainly used as a calculation program for fluidic and thermodynamic processes.
At BOLL & KIRCH EFD.Lab has now been used for approximately six months. Karsten Cartarius stated: "We have now already simulated a great deal because it works so fast and produces such precise values. Everyone is very enthusiastic about how simple it is to work with.

Due to the fact that the flow simulation is now astonishingly easy to use and is thus also accessible for non-specialists, we have each result determined with the simulation checked by an experienced user to rule out any flops."

Cartarius continued: "The major benefits for us are the precise results that can now be obtained by us at an early point in time. We are expected to complete designs and development within a certain period of time. The risk we ultimately face as developers is that the result must really correspond to the specifications without, however, being able to allow for generous margins of error. This is sometimes a tightrope walk. The option that we now have with EFD.Lab provides us with a great increase in levels of security at the development stage".

But people at BOLL & KIRCH are also satisfied in terms of the service and support provided by NIKA in particular. Dipl.-Ing. Karsten Cartarius: "I would purchase EFD.Lab for my part. Our experiences with it have been very good. It is the right product for us, and this also applies to the support. The Frankfurt-based software company NIKA does not just offer the program but also optimally supports its clients in the event of questions and problems relating to the use of the flow simulation programs."