

Making Flow Visible

Article from the Special Edition of *Konstruktions Praxis* - Translated by BKL Übersetzungen Claudia Siegert GmbH

For more than 12 months, the process engineering development department at Glatt Ingenieurtechnik in Weimar had been working with the flow simulation software EFD.Lab. Michael Jacob, head of development, praised above all the speed with which the necessary calculations were performed.

"It was exactly the right software to be offered at exactly the right time", said Dipl.-Ing. Michael Jacob, head of technology development at Glatt Ingenieurtechnik in Weimar, talking about using the EFD.Lab in his development department.

Customised And Tailor-Made

Glatt Ingenieurtechnik, Weimar is a development centre performing development, planning and implementation tasks for the pharmaceuticals industry, among others.



Courtesy of Glatt Ingenieurtechnik GmbH

Own workstation: Michael Jacob has flow simulation with EFD.Lab running on a separate PC

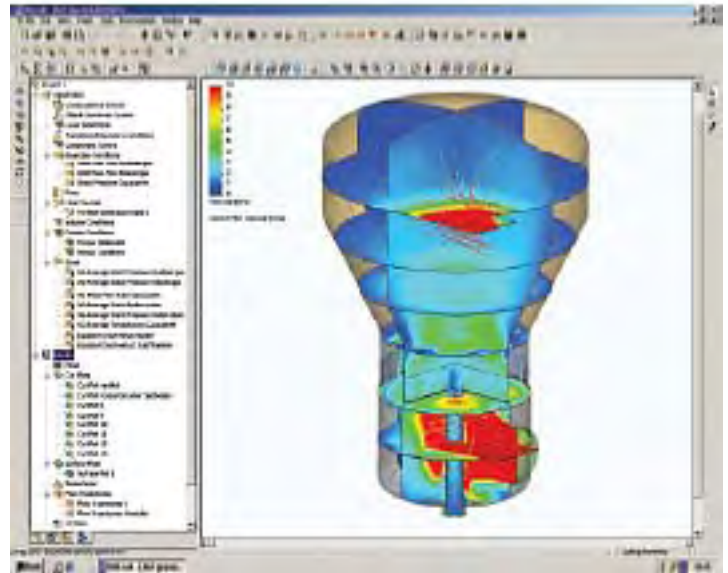
The plant construction division deals with fluidised bed technology, primarily for the food and feed sector and for the fine chemicals industry. Michael Jacob is responsible for process engineering development. He uses many different calculation procedures in order to solve the various problems and tasks involved in prototype development or parameter studies. Up to 2002, flow simulation calculations were outsourced, but Mr. Jacob was constantly on the look-out for a software to simplify the calculation process.

One day by chance he came across a mailing campaign by NIKA which presented the new EFD.Lab. The possibilities available with the new software aroused the development expert's interest. He put his name down for a training course and was also sent a 4-week trial version.

$$\frac{d}{dt}(\rho\phi) + \text{div}(\rho\mathbf{V}\phi - \Gamma_{\phi}\text{grad}\phi) = S_{\phi}$$



Real Machine



Screen shot Fluidised bed machine

Courtesy of Glatt Ingenieurtechnik GmbH

Only Brief Familiarization Period Necessary

"After only just a few days, it transpired that this software is ideal for our purposes", Jacob summarizes. "The results were satisfactory, and the package meanwhile runs 24/7. We have set up a separate workstation, because several licenses would not have been working to capacity, and it was also a case of gaining more experience." Michael Jacob was satisfied above all with the short familiarization period. "This was incredibly fast for software of this kind. All you need is to know the basics; that is completely sufficient. What we really liked was the parameterization functions which make it easy to change dimensions as well." The key argument for purchasing EFD.Lab was the excellent value for money, the user interface and also the speed.

Another advantage was that the software runs on relatively normal PC systems, even though it needs plenty of power and lots of memory capacity. It runs on a 3 GHz Pentium-4 processor with 2 Gbyte RAM under the stable operating system Windows 2000. We have to use DVDs to record the huge volumes of data; a CD-ROM no longer offers sufficient capacity."

Reacting Flexibly To Changes

They like using EFD.Lab at Glatt in Weimar because almost only adapted versions are developed. "We have never made any two machines the same. We have to be able to react flexibly to customer requirements. The machines are relatively large and have to be rated for pressure and temperature. This results in constantly new flow conditions."

The software offers a clear concept. Interface import also works perfectly. "We integrate our tasks by a kind of hybrid modeling, in other words, we calculate the additional data we need with our own software and then integrate them practically as a volume source in the CFD. We already have first applications as well." Following flow simulation and calculation, the values can be used in design and in the strength calculations.

Several Production Steps Omitted

For the Achema 2003, Glatt launched a new product which was completely modeled in the EFD.Lab in advance.

"This is why one of our aims was to purchase this kind of software. First we had the prototype, then we built the models and looked to see whether the already known results were actually produced", explains Jacob. "The prototype has a glass wall so you can see the inner flow profile. This gave us a comparison. The geometry was then modified to eliminate any weak points. This was another positive step. And so we went on to develop the next size, a machine which immediately had the flow profile calculated in advance."

With EFD.Lab it is possible to omit two to three development stages: this, cuts the development time by half. "We're pretty fast", says Michael Jacob. "We have no production facilities of our own so all jobs have to be outsourced. Every omitted stage saves time and money". At Glatt Ingenieurtechnik, they are particularly pleased with the service and support from NIKA. The software house in Frankfurt not only offers the program, it also provides its customers with optimum support for any questions and problems with using the flow simulation programs.