

CFD MODELING

CFD analyses, including fluid flow, heat and mass transfer, chemical reactions and other associated phenomena, are becoming the tool, which can improve both parameters of devices and proper understanding of their function. The combination of numerical methods, conventional analytical calculations and experiments is very effective, and in many cases also indispensable. In certain cases these analyses can reduce frequency of experiments or can even substitute such experiments for cases where any experiment or measurement is problematic or impossible

CFD analysis specifically includes following steps (some of them repeatedly):

- definition and creation/adaptation of the computational domain geometry;
- mesh generation;
- selection of simulated physical and chemical processes;
- definition of operating media and their properties;
- specification of boundary conditions;
- setting-up of solver;
- calculation;
- visualization and analysis of the results

We are able to prepare numerical studies either completely internally or, alternatively, we will prepare some parts and the rest will be outsourced. That always depends on size, type and comprehensiveness of task and capacities of the company within a given time. Calculations made within the framework of

own purchase orders, prepared as the part of complete delivery of the equipment, always take priority.

Within the framework of numerical studies we primarily concentrate on the following areas:

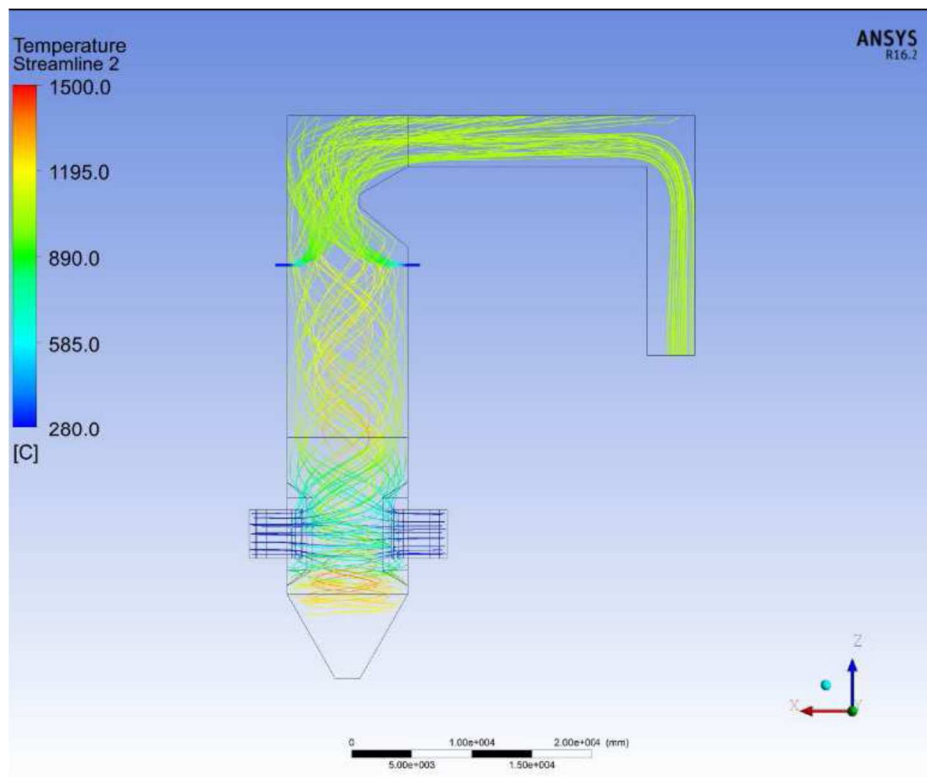
- single phase flow in ducts:
- flue gas ducts and their components (bends with internals, flow distribution etc.);
- air ducts and their components (bends with internals, flow distribution etc.);
- two phase flow gas - pulverized coal in the mill circuits:
- flow in pulverized coal ducts;
- mixing of gases or liquids;
- processes in the combustion chamber of pulverized coal boilers;
- other applications.

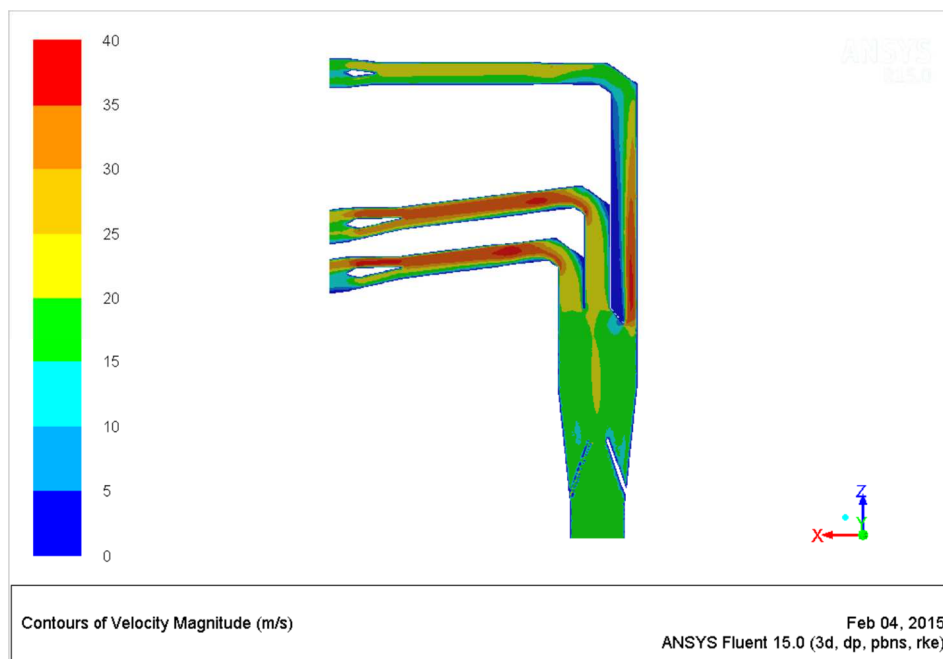
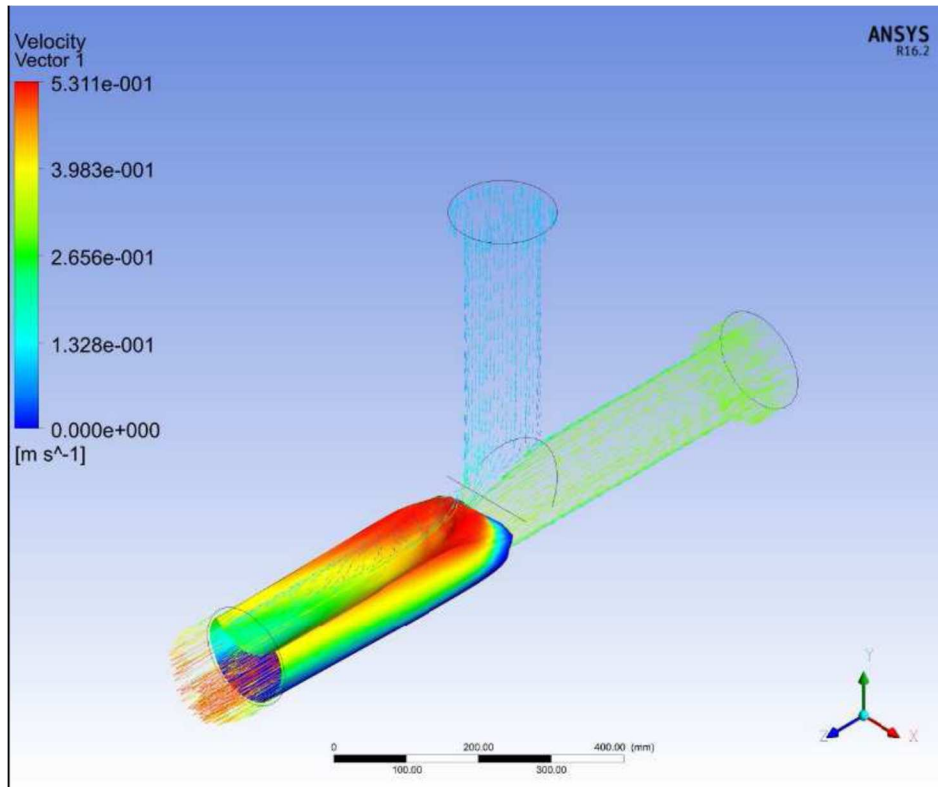
Time necessary to finalized task can vary considerably: ranging from several days to weeks for simple tasks to several months for comprehensive studies. Moreover, many times some boundary conditions can not be assigned directly; consequently, additional analytical calculations or experiments are necessary.

Furthermore, an active role of the customer from the point of relevant data to define geometry of computational domain (drawings), specification of boundary conditions such as temperature, pressures, flows (measurement data), operating media (composition of gases, pulverized coal quality and

quantity) etc. is also essential to prepare CFD analysis of the existing devices and verify its results. All too often delivered data are not consistent with each other, either based on the fact that measuring instruments have not been calibrated or have been installed in an inappropriate points, or not all quantities have been measured at one time or operational regime. Quality and quantity of measured operational values significantly influence quality of results.

Examples of models:

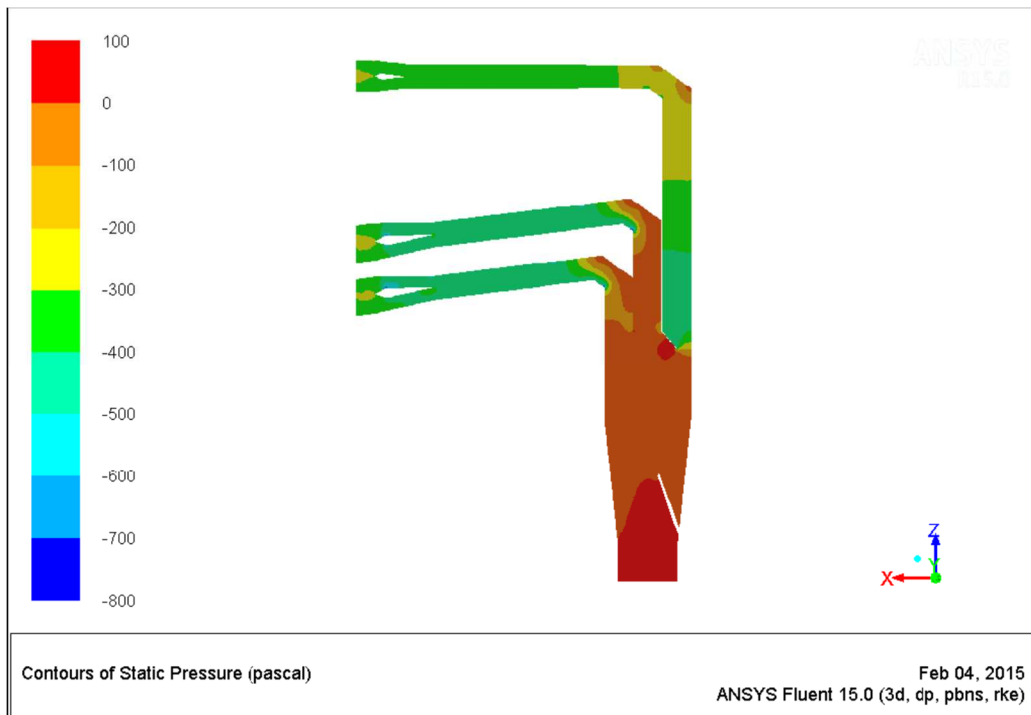




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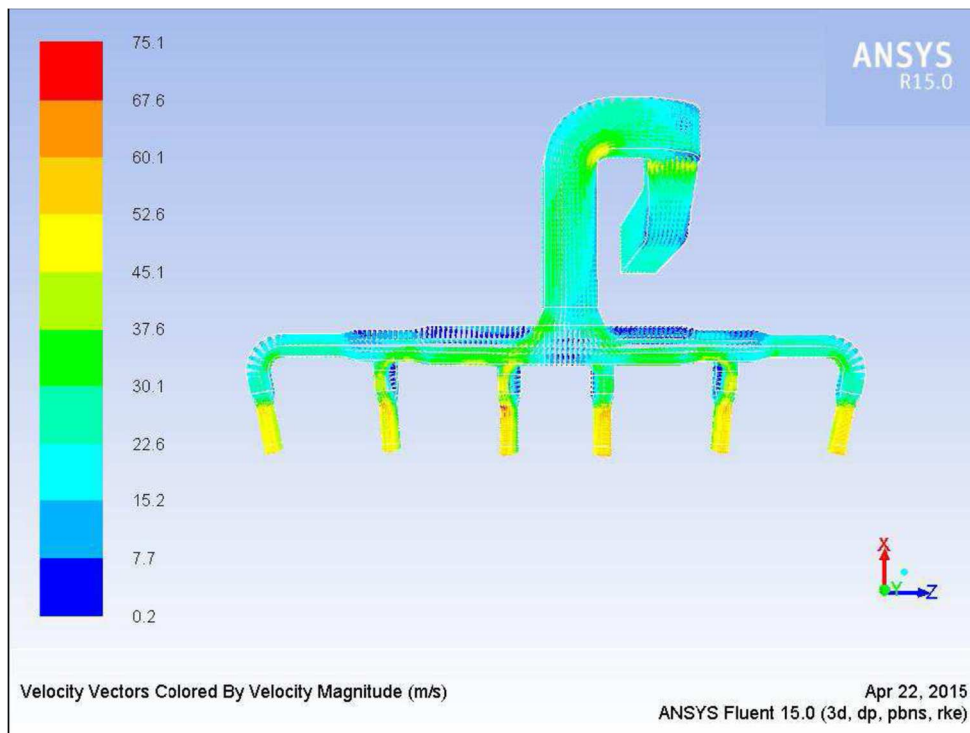
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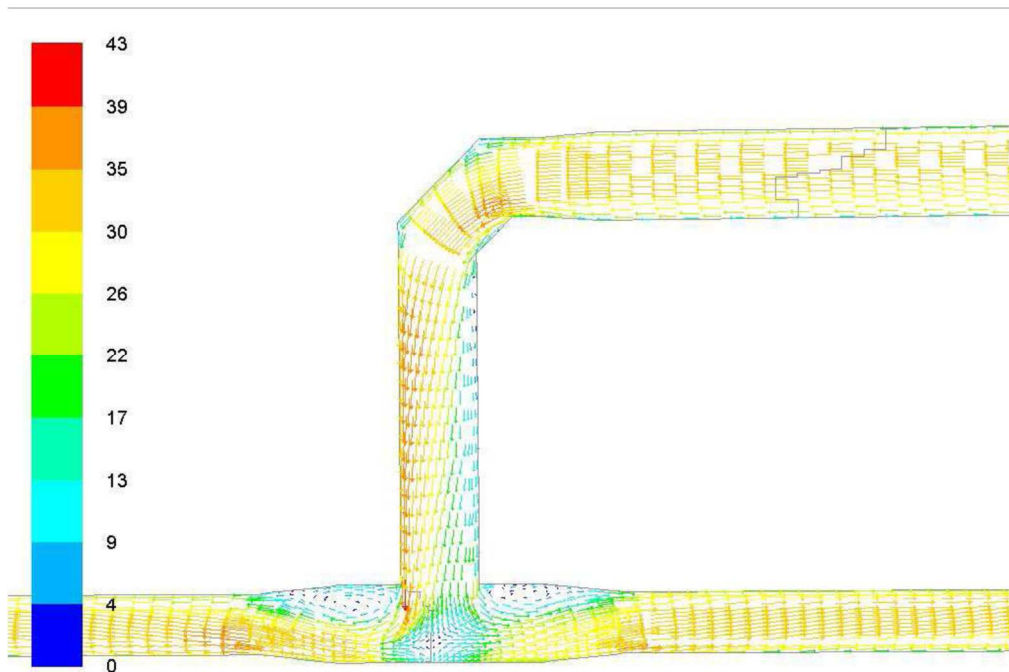
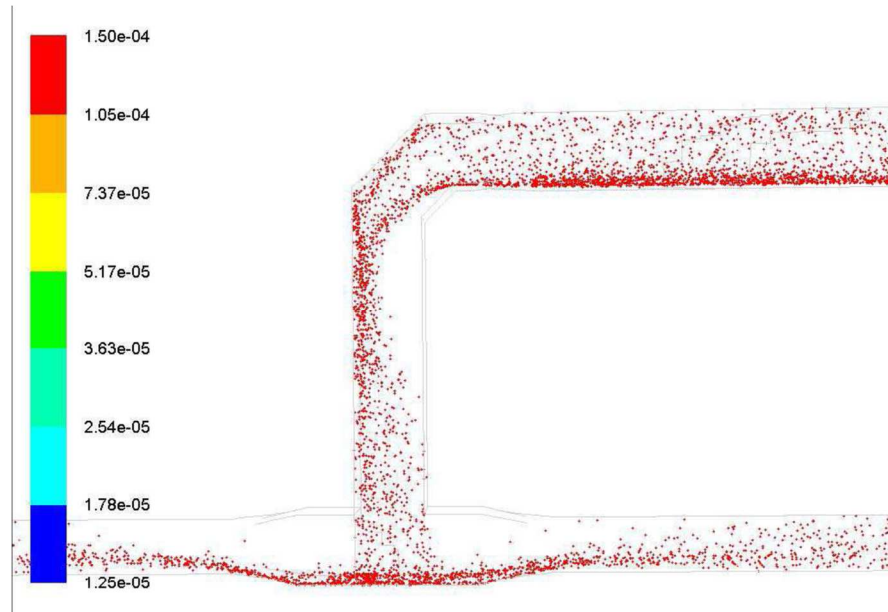


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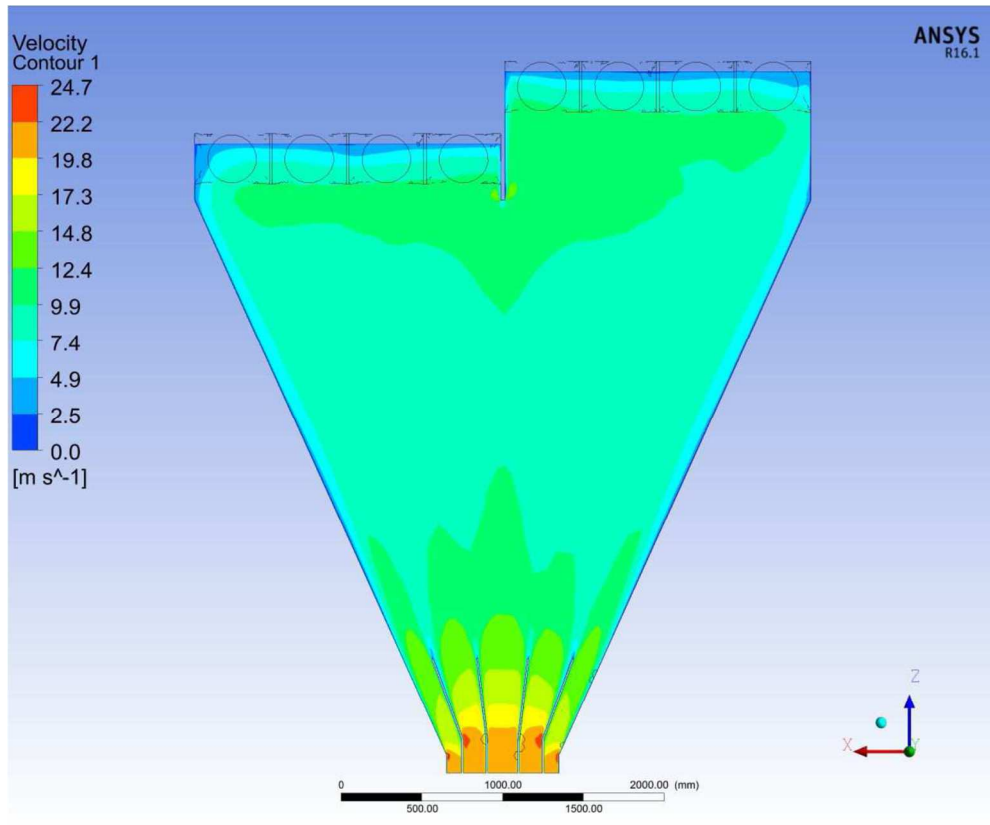


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