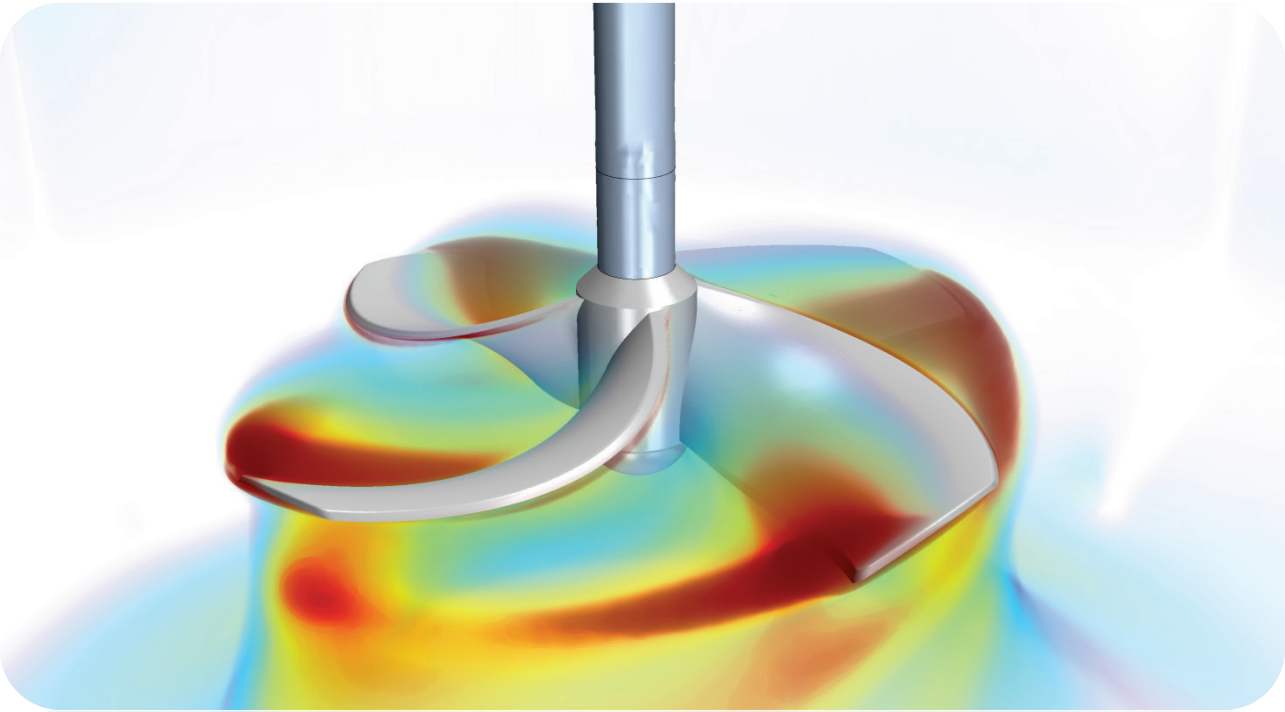


THINK Fluid Dynamix®

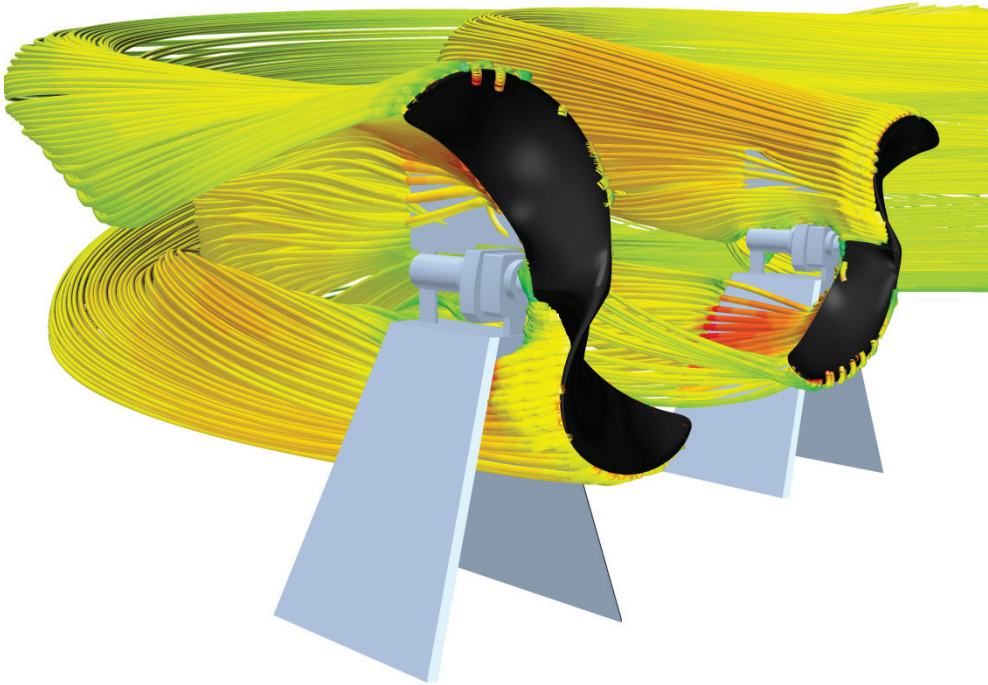
Advanced Fluid Simulations for the Water & Process Industry

THINK Fluid Dynamix®

The next generation CFD*

High resolution, realistic, real-time fluid simulations open a whole new world of possibilities, for both developing products and designing solutions in the water and process industry.

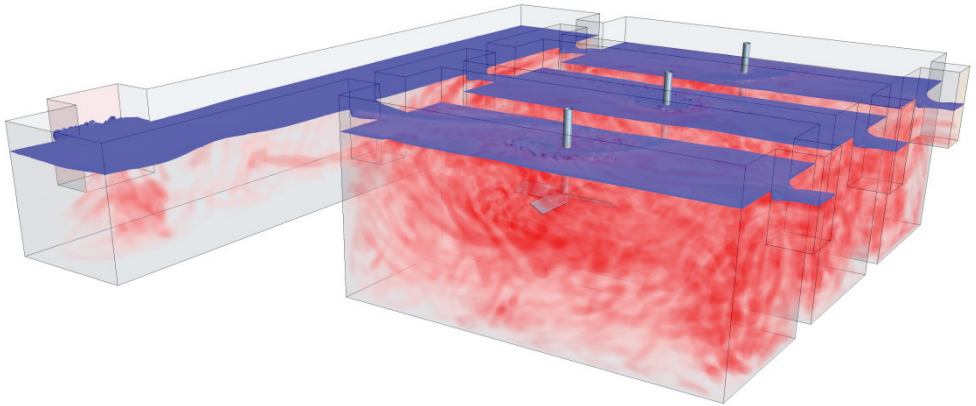
Today it is possible to reliably calculate all relevant process parameters, even before the design stage is complete. **THINK Fluid Dynamix®** is the consulting services division of **INVENT-UV AG** that specializes in advanced numerical technologies, such as CFD and automatic optimization, and counts with a large team of experts in many fields of water and process engineering and numerical science.

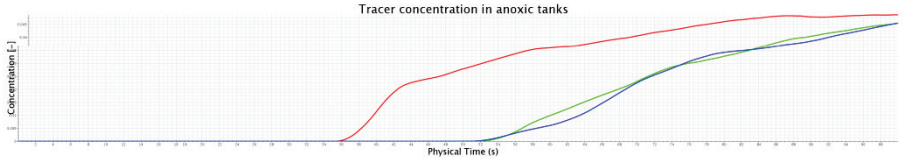


Streamlines of the flow generated by propellers

*Computational Fluid Dynamics

THINK Fluid Dynamix®





Real time analysis of tracer dispersion in a distributor and anoxic tanks

YouTube Video Link

Presentation

THINK Fluid Dynamix® offers support and assistance with the design, optimization, and modernization of Hydraulic structures and components of the water and process industry.

More than 25 years innovating and developing revolutionary solutions allow us to provide unique and in-depth analysis and solutions. We have a comprehensive functional and industrial expertise, and are passionate about taking on challenges that matter to our clients and the environment.

Insight - design - efficiency

Even the best products can only show their full potential with a well designed, integral layout. Suboptimal or poorly designed solutions lead directly to underperforming systems. Hydrodynamic underperformance is one of the major sources of wasted energy in many applications.

Over the lifespan of the facility, operational costs can be dramatically reduced with a proper design. Energy consumption can be reduced by optimizing the performance of every component. Maintenance requirements and the rate of unexpected failures can be minimized with equipment working in the right conditions.

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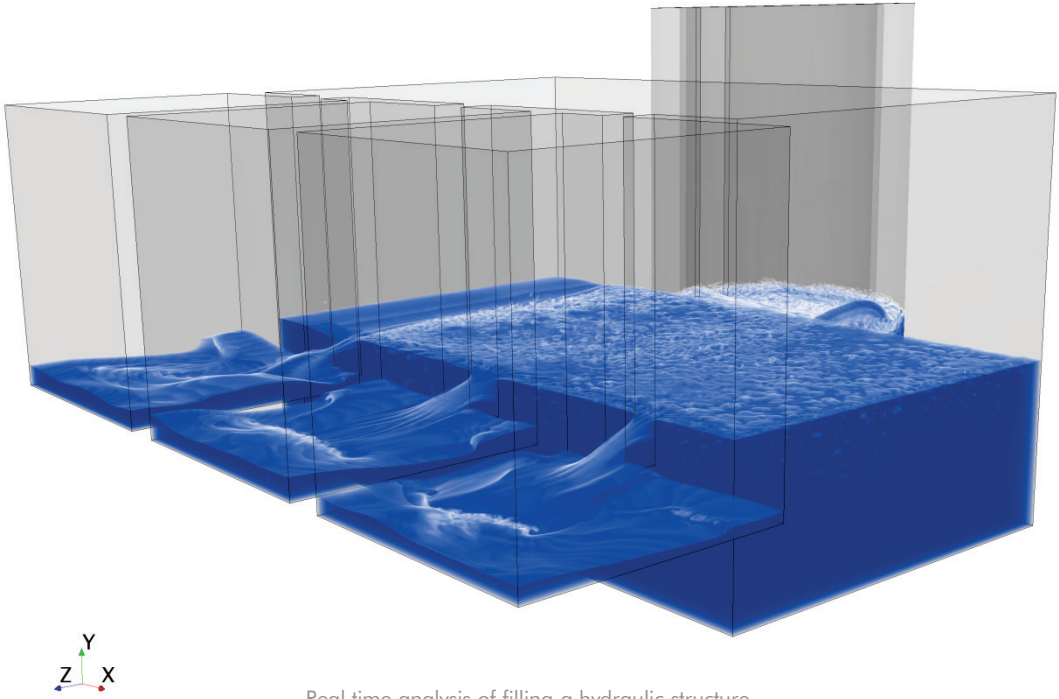
Computational Fluid Dynamics

CFD is an advanced computer-based technique which uses numerical procedures to solve and analyze problems that involve fluid flow. Through CFD we can create a virtual environment supported by real world data to reconstruct phenomena, test different study cases, and solve problems before construction even begins.

Our CFD simulations provide our customers with realistic operational results which helps them to ensure the performance and reliability of their plants in order to avoid costly design mistakes.

Process plants dynamically change their operating conditions. We can simulate this kind of process change in real time and show the effects of time dependent variations, such as fluctuating water levels, mixing processes, changing volume flows, or settling of particles.



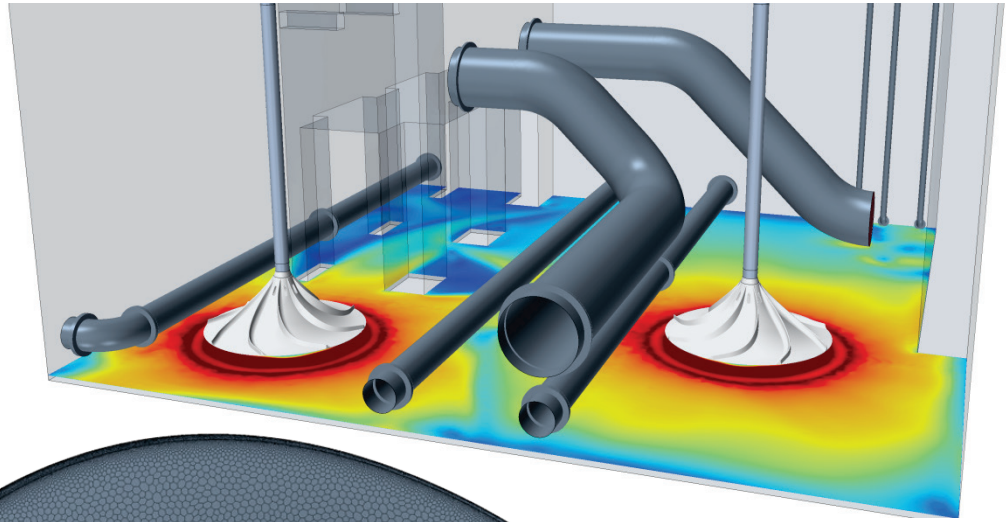
Real time analysis of filling a hydraulic structure

YouTube Video Link

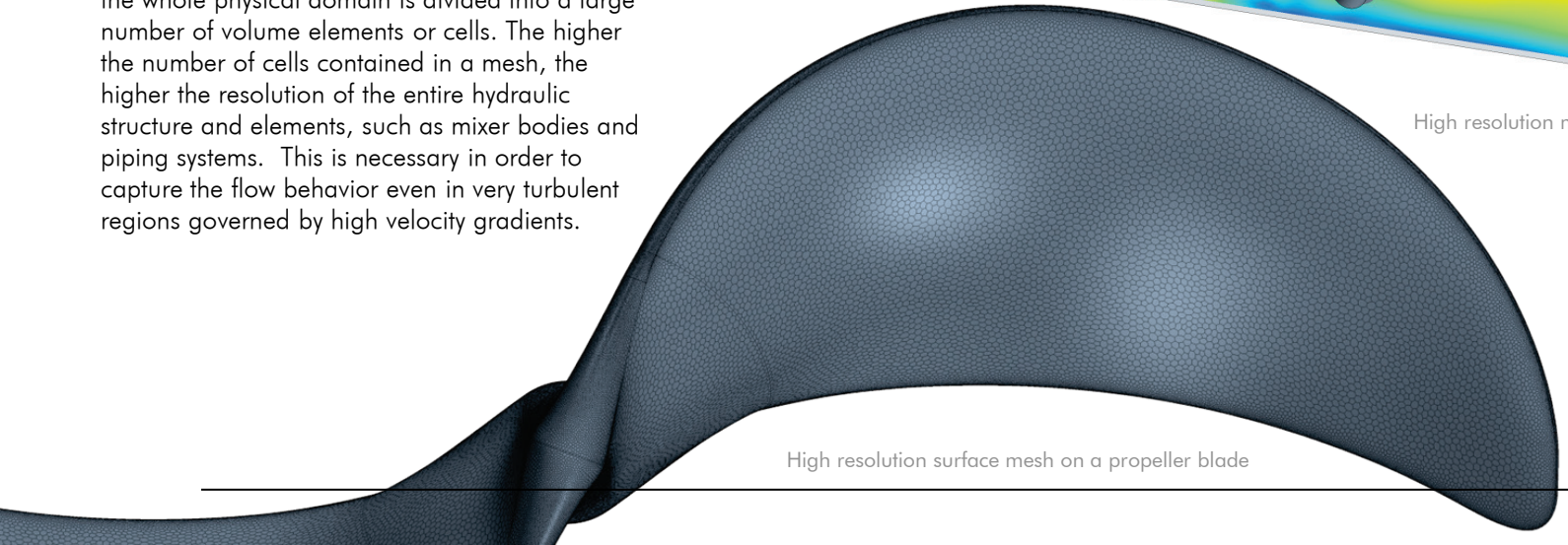
THINK Fluid Dynamix®

High resolution modeling

High quality and reliable results are obtained when accurate models are used. Accurate modelling starts with capturing the initial CAD data with a high resolution mesh. A mesh is the numerical formulation of the physical domain of interest and consists on a spatial discretization of this domain: the whole physical domain is divided into a large number of volume elements or cells. The higher the number of cells contained in a mesh, the higher the resolution of the entire hydraulic structure and elements, such as mixer bodies and piping systems. This is necessary in order to capture the flow behavior even in very turbulent regions governed by high velocity gradients.



High resolution model of stirred tank reactor



High resolution surface mesh on a propeller blade

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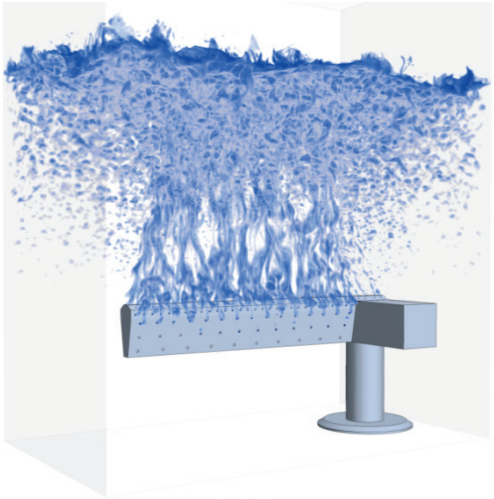
Beyond fluid simulation: innovating solutions, optimizing designs

Real time simulations open up a whole new range of possibilities. Being able to predict the real-life performance of the operating condition of a reactor, the installed equipment or an entire system, is the cornerstone for delivering reliable solutions and true improvements. We use automatically generated CAD models combined with automatic optimization methods and artificial intelligence to develop better solutions and more efficient products in the shortest amount of time. This new approach has saved our clients significant amount of capital investment.

Typical applications are:

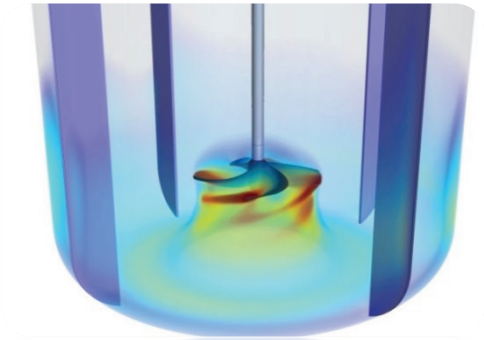
- Pipe systems
- Flow splitters
- Pump stations
- Hydraulic structures
- Sludge treatment plants
- Mixing and equalization tanks
- Water and wastewater treatment plants
- And many more…

YouTube Video Link

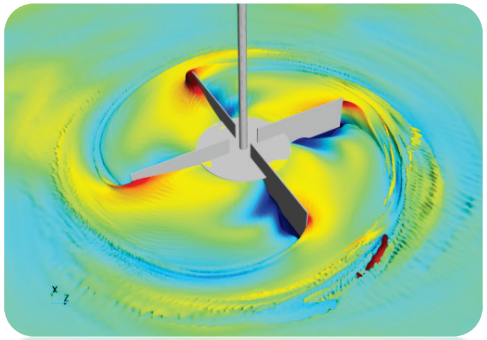


Coarse bubble aerator

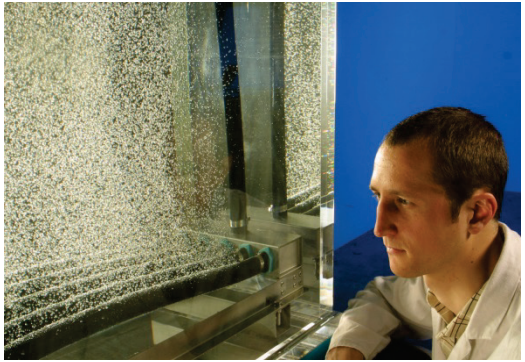
YouTube Video Link



Mixer in stirred tank reactor



Study of mixer on water surface



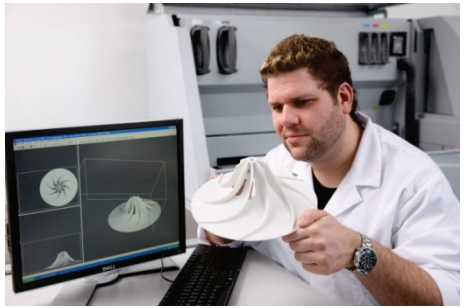
Fine bubble diffuser in the laboratory

Experimental research & rapid prototyping

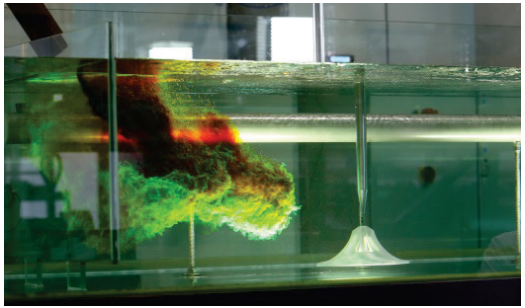
The foundation of all serious scientific or engineering work is precise experimental results. Physical experiments form the basis of reliable technical knowledge. Our Research and Development team employs a number of both large and model test scale facilities specifically designed to carry out experimental testing and research.

Using rapid prototyping and high precision measuring devices, our R&D Team is capable of conducting physical tests and analysis of specific design configurations of both basin and layouts designs and also mixer prototypes. Through these physical experiments, CFD Simulations can be reliably validated. This procedure also drastically reduces development time and costs, increases effectiveness and results in superior finished products.

Experiments in the mixing laboratory



Just printed 3D-prototype



Analysis of turbulent dispersion in a pilot scale model

THINK Fluid Dynamix®

Our team at brainstorming!

This is THINK Fluid Dynamix® !

We are a team of experts in different fields working together in a highly multidisciplinary environment with a simple vision which defines us: to be satisfied with nothing but the best.

THINK Fluid Dynamix® will help you improve your plant, your product or help you visualize and test your design in advance to minimize risks. Doing all this will help you reduce your overall project costs.

Let us to contribute to your success

Watch our presentation video on YouTube !