

Summer 2006

AIRFLOW SCIENCES CORPORATION

The Airflow Update

Scale Modeling for the Power Industry

When you have flow modeling performed, do you prefer the look and feel of a physical model? Many of ASC's customers feel that way. That is why we offer over 12,000 square feet of laboratory space for performing physical cold-flow modeling.

Our fabrication shop and technicians have built and tested scale models of virtually all pollution control systems and combustion equipment including: ESPs, SCR's, baghouses, ducts, windboxes, coal pipes, spray towers, and chemical injection systems.

As with any type of simulation, physical models serve several purposes: they help determine internal flow, they help develop design improvements, and they complement and support other analyses such as field testing and CFD modeling by providing input values and correlation data.

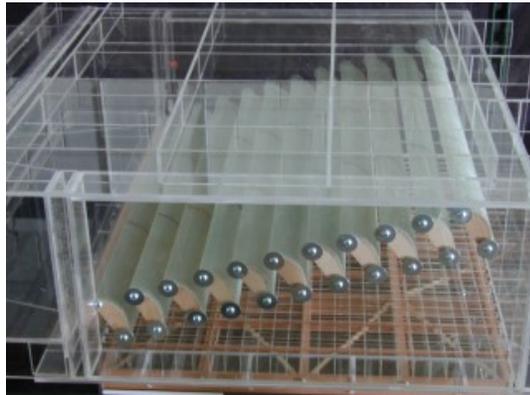


Figure 1: Details of turning vanes

Depending on the size of the original equipment, ASC can produce both full-scale and reduced-scale models. These models, which are typically made of Plexiglas, give

ASC the ability to test and analyze gas flows, liquid flows, and injection systems, as well as particle-laden flows. They also give ASC the ability to characterize flows and give specific information about velocity, pressure and temperature.

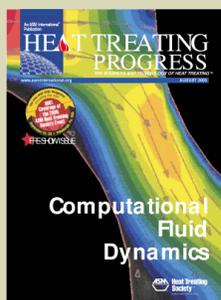


Figure 2: A part of our laboratory

Often clients choose to be on hand to see the final test. "Seeing the test firsthand can really help someone gain a clear understanding of the problem they are trying to solve," explains **Robert Mudry**, V.P. of Engineering. "Physical modeling brings flow to life right before your eyes, and it can be truly invaluable to see that flow in action."

Note that the power industry is not the only one benefiting from physical modeling. ASC has performed physical flow studies in automotive, HVAC, food process, heat treatment, and non-woven material systems.

If you would like more information or a quote on a physical modeling project, please contact us.



Heat Treating Progress

Interested in learning more about how Computational Fluid Dynamics (CFD) simulations can be used to determine the effect of external flow on heat transfer rates? Look no further than the August 2005 issue of *Heat Treating Progress* magazine. Technical Director **Andrew Banka**'s article titled "Practical Applications of CFD in Heat Processing" provides three case histories involving the gas quenching and gas processing of metal parts. Download a copy from our website.

We know heat transfer and fluid flows!

From the Editor

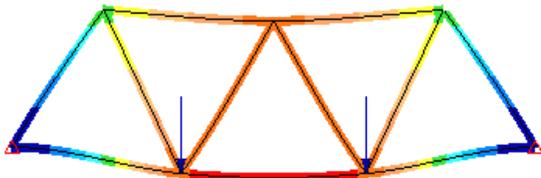
*You may have seen or heard new names at ASC lately. Things have been very busy at Airflow these past months and a busy business means expanding staff again. Since the last newsletter, **Dennis Manning, Douglas Kremer, and Kathleen Yanik** have all joined our team. Please join me in welcoming them to the Airflow Family.*

If you have any flow or heat related issues, please give Airflow Sciences a call.

Combining Flow and Structural Modeling

Although the vast majority of our engineering work involves the analysis of gas and liquid flows, we also offer the value-added service of structural modeling. Whether to determine the forces on a turning vane, the support details of a coating drum, or the required cross section of cantilevered test equipment, ASC can assist our customers by providing state-of-the-art structural modeling.

Using commercial Finite Element Analysis (FEA) software combined with engineering analysis, ASC's structural engineering group can analyze static stress and mechanical event simulation. Interfacing with all popular CAD packages, clients can easily provide their own solid models for analysis, or ASC staff can construct the model from supplied drawings. Results typically include deflections and stresses throughout the domain and reaction forces at support locations.



Structural modeling is comparable to flow modeling in both cost and timing. ASC believes that adding structural modeling to a project can be a cost-effective way of ensuring that all elements of a problem have been considered and resolved. For many projects, the additional analysis can end up saving a lot of time and money down the road.

The structural elements that help move air, particles, or gases are an important part of the equation when it comes to solving problems related to flow. Devices like baffles, turning vanes and perforated plates are critical elements in many projects. Clients have to know that these elements will be able to perform correctly and maintain their structural integrity in the conditions for which they are intended.

In addition to using structural modeling to support flow-related projects, ASC has also completed several stand-alone structural studies. Examples include designing the underlying frame for detachable railcar covers, analyzing the failure of welds, and designing support structure for ASC's in-house wind tunnel.



The railcar covers shown above are used to enclose and protect large steel coils while in transit. The covers are lifted off by crane and then stacked when the coils reach their destination. ASC's analyses ensured that the structure of these covers would hold up under these load conditions.

Contact our structural group for aid with all of your FEA engineering needs.

Contacting ASC:

General Info:
www.airflowsciences.com
asc@airflowsciences.com

Headquarters:
12190 Hubbard Street
Livonia, MI 48150-1737
phone: (734) 525-0300

Western Region Office:
P.O. Box 22637
Carmel, CA 93922-0637
phone: (831) 624-8700

Southeastern Region Office:
3709 Foster Hill Dr. North
St. Petersburg, FL 33704
phone: (727) 526-9805

ASC Quote-of-the-Newsletter:

The easiest way to double your money is to fold it.

Airflow Events

We hope to see you at future trade shows including:

- APC Roundtable & Expo (July 16-18, Columbus, OH)
- Coal Gen 2006 (Aug 16-18, Cincinnati, OH)
- Megasympposium (Aug 28-31, Baltimore, MD)
- World Grains Summit: Foods and Beverages (Sept 17-20, San Francisco, CA)
- Power Gen International (Nov 28-30, Orlando, FL)
- **Your Office:** Looking to host a seminar on modeling, fluid flows, or heat transfer?

We make house calls!



Airflow Sciences Corporation

12190 Hubbard Street
Livonia, MI 48150-1737

AIRFLOW SCIENCES CORPORATION
The Airflow Update

Visit our website at:
www.airflowsciences.com