

Hyprotech and HTFS Acquired by Aspen Technology Inc.

On 10 May 2002 it was announced that Aspen Technology had acquired Hyprotech and HTFS from AEA Technology. Aspen Technology are at the forefront of supply chain management and engineering simulation for the process industry. HTFS will become part of Aspentech's Process Engineering Business Unit which will be committed to bringing forward the best process simulation and design solutions.

Combining the best technologies from Hyprotech and Aspentech will offer new levels of modelling precision engineering work process efficiency. Many HTFS customers are already excited about the prospect of integration of HTFS unit operation modelling within the Aspen Plus simulator and other products in the Aspen Engineering Suite in run-time links such as those realised with HYSYS and other Hyprotech products.

We are only just beginning to define all the benefits we can bring to our customers combining world-leading HTFS research-based modelling science with the best of Aspen-BJAC practical engineering solutions. We intend to pursue these goals with vigour whilst maintaining our customer-driven research and product development. Essential to this is continuation of all the close cooperation with our customers which has made HTFS so strong. Thank you for your support in the past. We look forward to serving you even better in the future.

Tom Ralston, HTFS Business Manager, Hyprotech, a subsidiary of Aspen Technology Inc.

HTFS Annual Meeting

14-17 October 2002, Como, Italy

Register now!

Highlights

- Focus on new & improved design methods.
- Enhanced links to leading process simulators.
- Meet the HTFS researchers & software developers to give them your needs and requirements first hand.
- Presentations by HTFS clients illustrating the use of HTFS technology in their environment.

Training courses (running in parallel each day)

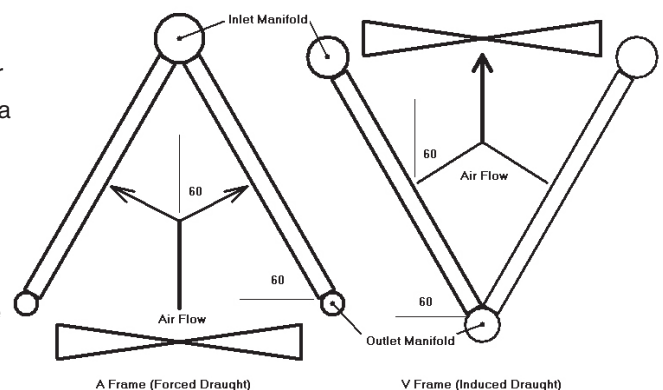
- 14 October: TASC Thermal Workshop
Design of Air Cooled Heat Exchangers using ACOL
- 15 October: Condenser Design using TASC (an advanced course)
TASC Mechanical Workshop

To register or for further information contact us at htfs@aspentech.com

New Features in latest ACOL release

Aspentech announce the release of HTFS ACOL v6.30. The main new features in this significant enhancement of ACOL are:

- **Checking mode:** ACOL v6.30 adds to the current simulation mode by providing a new checking mode in which the program calculates the required surface area for a specified duty. This is then compared with the actual area of the exchanger to obtain the ratio actual/required area.
- **A and V frame units:** can now be simulated. It is also possible to specify oval or flattened tubes which are often used in these exchangers.
- **Two phase separation in tubeside headers:** It is possible to assess the effect on performance of the complete separation of the liquid and vapour in tubeside headers.

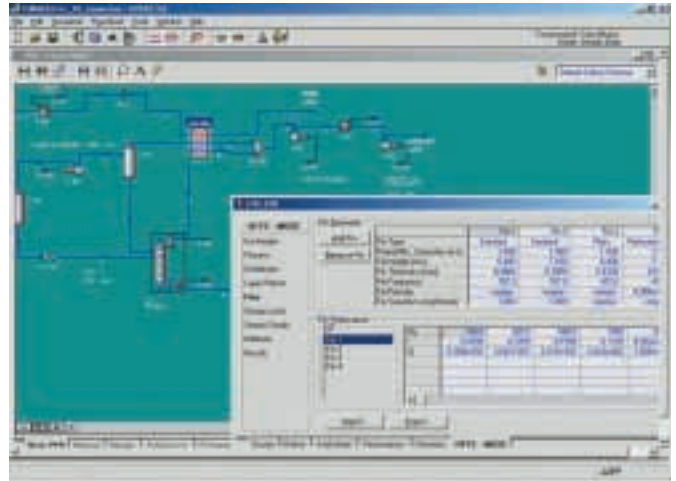


Other additions in ACOL v6.30 are (a) the user inputs the required air face velocity and ACOL calculates the corresponding mass flowrate, (b) also input of airside pressure drop and ACOL converges to the corresponding airside mass flowrate, (c) warning for potential acid and flue gas condensation on the airside and (d) input options for tubeside enhancement devices is now in the same form as the corresponding TASC input forms.

New HYSYS Link for MUSE

MUSE 3.30 for analysing the performance of multi-stream plate-fin heat exchangers now has a full link into the HYSYS process simulator. HYSYS refers to a plate-fin heat exchanger as an LNG-block, and you can now use MUSE to automatically model the performance of any LNG blocks in your HYSYS flowsheet, during the course of a HYSYS solution.

When running HYSYS, if you also have MUSE installed and a License available, then for each LNG block, you will see the option “HTFS-Engine” available as a rating method. The link lets you model the LNG block by using either the MUSE calculation engine, or the more detailed MULE engine for layer-by-layer calculations.



You can specify the plate fin exchanger geometry in two ways. Either import from a MUSE file you have set up previously, or input the geometry in HYSYS, where new screens let you define all the necessary input items. These can also be used to modify a previously imported input, and there is a corresponding “export” facility, to let you regenerate a MUSE file, complete with geometry, process and properties information.

There is no need to register the new generation link. As with any HYSYS method, the link provides colour-coding, to distinguish input and calculated values, and automatically re-

runs the simulation when input values are changed. The full MUSE results can be viewed once the simulation is complete.

As well as the new link for running MUSE within HYSYS, improvements have been made to the existing link that allows the import process and properties information from HYSYS when running MUSE. This enables use of the MUSE outline design facility to generate a potential geometry for each LNG block, ready to import into HYSYS when you need to run a full flowsheet simulation.

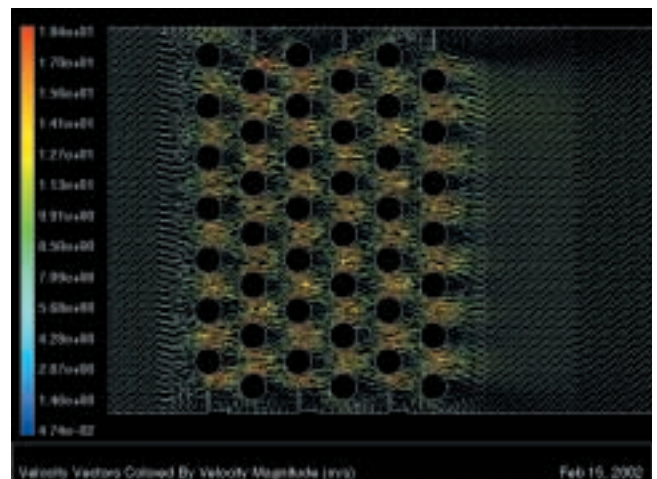
Use of CFD to Model Crossflow Exchangers

HTFS continues to use the most advanced technology to improve our methods by adopting a combined experimental and Computational Fluid Dynamics (CFD) approach to study the flow over bundles of high-finned tubes. Initial attempts at this have demonstrated the cost effectiveness of this approach, using CFD to explore local behaviour where testing is expensive and/or extremely difficult to achieve.

Some of the ongoing research areas in which we plan to utilise CFD calculations include:

- Deployment of the HTFS Multi Purpose Wind Tunnel (MPWT) to study the influence of the shape of sealing devices (corbels) used to prevent air bypassing the tube bundle, on bundle heat transfer and pressure drop performance. Predictions from CFD will first be compared with the measured data and then used to study the effect of different shapes and sizes of corbels as an alternative to an exhaustive programme of experimental measurements. This work will provide information for optimising design of corbel shape.
- To study variation of heat transfer around the finned tubes of staggered and inline tube bundles from one tube row to the next in the flow direction. The results will help to assess tube row effect on the heat transfer.
- To assess the accuracy of the current HTFS methods of heat transfer and pressure drop and indicate areas for improvements.

The results from the above work will improve methods in HTFS programs ACOL and FIHR.



FIHR's Getting Hotter!

The *FIHR-Excel Integration Tool* (aka "FIHR-ExIT") is an application for Microsoft Excel. It extends the use of the FIHR Program for fired process heater configurations by, for example, allowing analysis of multiple, dissimilar fireboxes feeding into a common convection bank (see diagram right).

It is simple to use; parts of your configuration (firebox or convection section) are initially created in the FIHR Program as usual. You then import the HTFS input files into FIHR-ExIT's "configuration" worksheet, which displays the layout diagram and basic data (temperatures, pressures, flowrates etc.).

Each part is solved using direct access to the FIHR calculation engine. Results are retrieved from the FIHR files and flue gas mixing calculations are performed.

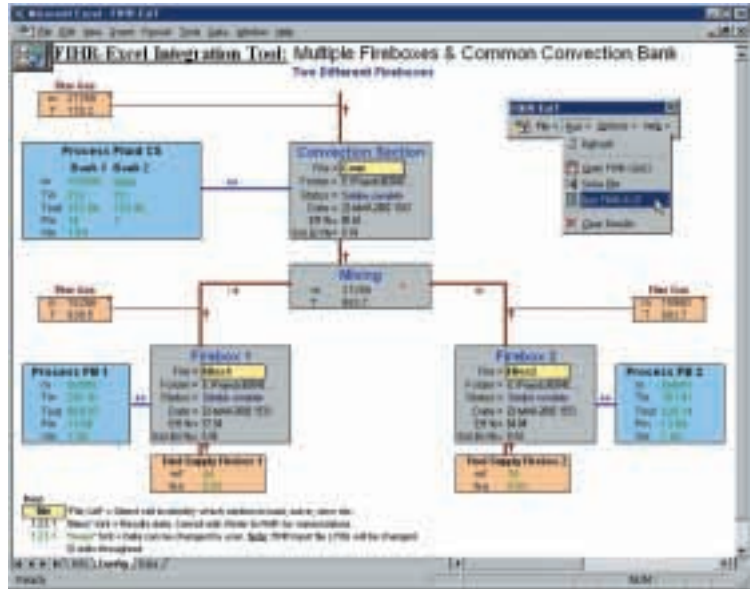
Any dependent parts (the final convection section in this example) are then processed and the overall results displayed. Alternatively you can select an individual part and perform its own solution, view files, or "fire up" the FIHR program to study it in more detail.

Further developments of FIHR-ExIT will allow iteration control for firebox process fluid preheating in the convection section. A greater choice of complex arrangements is also planned.

The program structure behind FIHR-ExIT has been designed for general application to HTFS Programs. For instance: a train of multiple *different* shell and tube heat exchangers can be solved using TExAS (the *TASC-Excel Adapter System*).

After final testing, FIHR-ExIT and TExAS will be distributed with other tools on the HTFS Release CD and our web site. Alternatively please contact Hyprotech Technical Support for more information.

(Yes, it's true: the demonstration of FIHR-ExIT at the 2001 HTFS Annual Meeting happened to coincide with the testing of the hotel fire alarm! Please move to your nearest "fire exit" ...?).



HTFS CHE Rig relocated

The Compact Heat Exchanger (CHE) rig at Harwell has been very productive since it was commissioned in the mid 90s. Originally, it contained only the plate-fin test section for boiling studies, to which a plate-frame heat exchanger for condensation studies was soon added, hence the name the CHE rig. A crossflow boiling test-section was added later but the name CHE rig still remained.

It was announced at the Annual Meeting in Manchester last year that the CHE rig needs to be relocated. The reason for the relocation stems from enormous difficulties involved in operating a potentially hazardous hydrocarbon experimental facility on a nuclear licensed site such as Harwell. In the past few months, therefore, a number of options were investigated for relocating the CHE rig and the decision was taken to relocate the rig to the Technical University of Valencia, Spain. The work of systematically labelling various electrical and mechanical components of the rig, along with dismantling of the rig, was completed; the photograph on the right shows 'all hands to the pump' during the process.

The rig components have now reached the Valencia University and, as the photograph on the left shows, they are stored there safely. The final and important task in the process of relocation will be re-assembly of the CHE rig at Valencia. It is expected that this step will happen soon, to be followed by the recommissioning of the rig. Once recommissioned, the CHE rig is expected to be as productive as it has been in the past. Professor Corberan of University of Valencia thanked HTFS for the decision of relocating the rig at Valencia. He and his team are now looking forward to working with the HTFS research team and generating more unique experimental data for the development of improved HTFS methods.





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HTFS solutions

shell & tube heat exchangers

TASC <i>Thermal</i>	A powerful, internationally recognised program for design and performance simulation of all your shell and tube heat exchangers requirements, including thermosyphons	5.01
TASC <i>Mechanical</i>	Mechanical design of shell and tube heat exchangers to ASME VIII, either standalone or linked with TASC	5.01

air cooled heat exchangers

ACOL	Software for design and performance simulation of air cooled heat exchangers and simulation of heat recovery units, air conditioning and refrigeration exchangers	6.30
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compact heat exchangers

APLE	A single package for design, rating and performance simulation of gasketed plate and frame heat exchangers	2.10
MUSE	Performance simulation layer by layer, crossflow calculation and 'first-shot' thermal design of multistream plate-fin heat exchangers	3.30

fired heaters & furnaces

FIHR	Simulation of fired process heaters	2.00
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other equipment

FRAN	Rating and performance simulation of power plant feedwater heaters	2.01
PIPE	Single phase and two phase flashing flow calculations in unbranched pipeline systems	5.20
TICP	Thermal insulation calculation	1.00

research network

The research network provides access to all our knowledge base and expertise developed over the past 30 years. Electronic versions of the Handbook, a selection of design reports, and the most recent research reports are available on-line via the web www.htfs.com. In addition, users can run the heat exchanger selection program 'HEAD', download our basic shell & tube design program 'DEVIZE' and search for papers on heat transfer in the open literature using HTFS - HEATFLO. Customers can also have a close involvement in directing our research and the evolution of our products through participation on Review Panels.

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training

Check out our training web site at:

www.hyprotech.com/training

Full course descriptions can be viewed and you can register online.