



Design, rating and performance simulation of plate & frame heat exchangers

Overview

APLE™ is a single solution for the design, checking (rating) and performance simulation of plate heat exchangers, either gasketed plate and frame or welded or brazed plate. In design mode, it can determine the optimum heat exchanger configuration. It can also check or simulate geometrically specified heat exchangers allowing users to troubleshoot or de-bottleneck operating units.

These exchangers are used for general heating and cooling duties, including vaporization and condensation. They are also an alternative to shell and tube in many applications. APLE handles characteristics common to many commercially available plate & frame heat exchangers.

Features

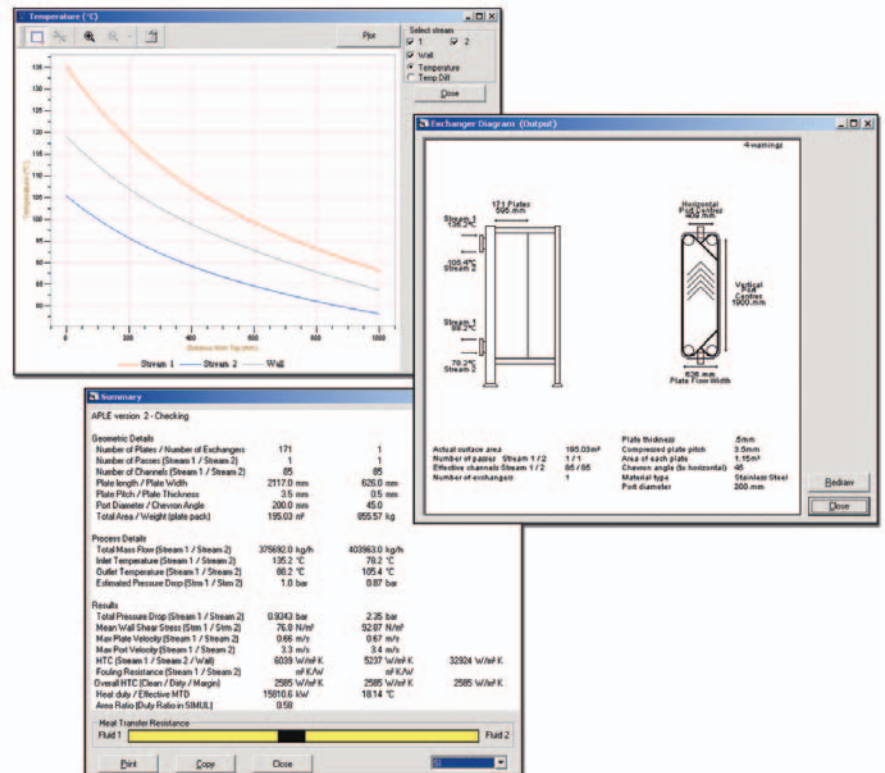
Operating Modes

The following operating modes are available, providing specific capabilities based on the task being performed:

- **Design** – Produces a set of possible designs to meet given thermal duty and pressure drop constraints and recommends the best option. Design calculations select from a set of 120 plate sizes, which are ‘typical’ of what is commercially available. Plate geometry can be specified by the user or obtained from a plate geometry databank, which can also be extended by the user to address plates of any geometry.
- **Checking / Rating** – APLE assesses whether a given geometry of exchanger has adequate surface area to meet thermal duty, and if specified stream pressure drops are exceeded. Plates may be selected from a data bank which includes the full geometry of commercially available plates from international suppliers.
- **Simulation** – APLE calculates the heat load outlet temperatures and pressure drops that will occur for a given design with specified stream inlet conditions. Allowance for non-linear temperature profiles can be made as well as for variation in heat transfer coefficients and pressure gradients. The effect of maldistribution among the plates is also handled.
- **Extend** – In Extend mode APLE can calculate the number of plates of a given geometry required to meet the specified duty.

Outputs

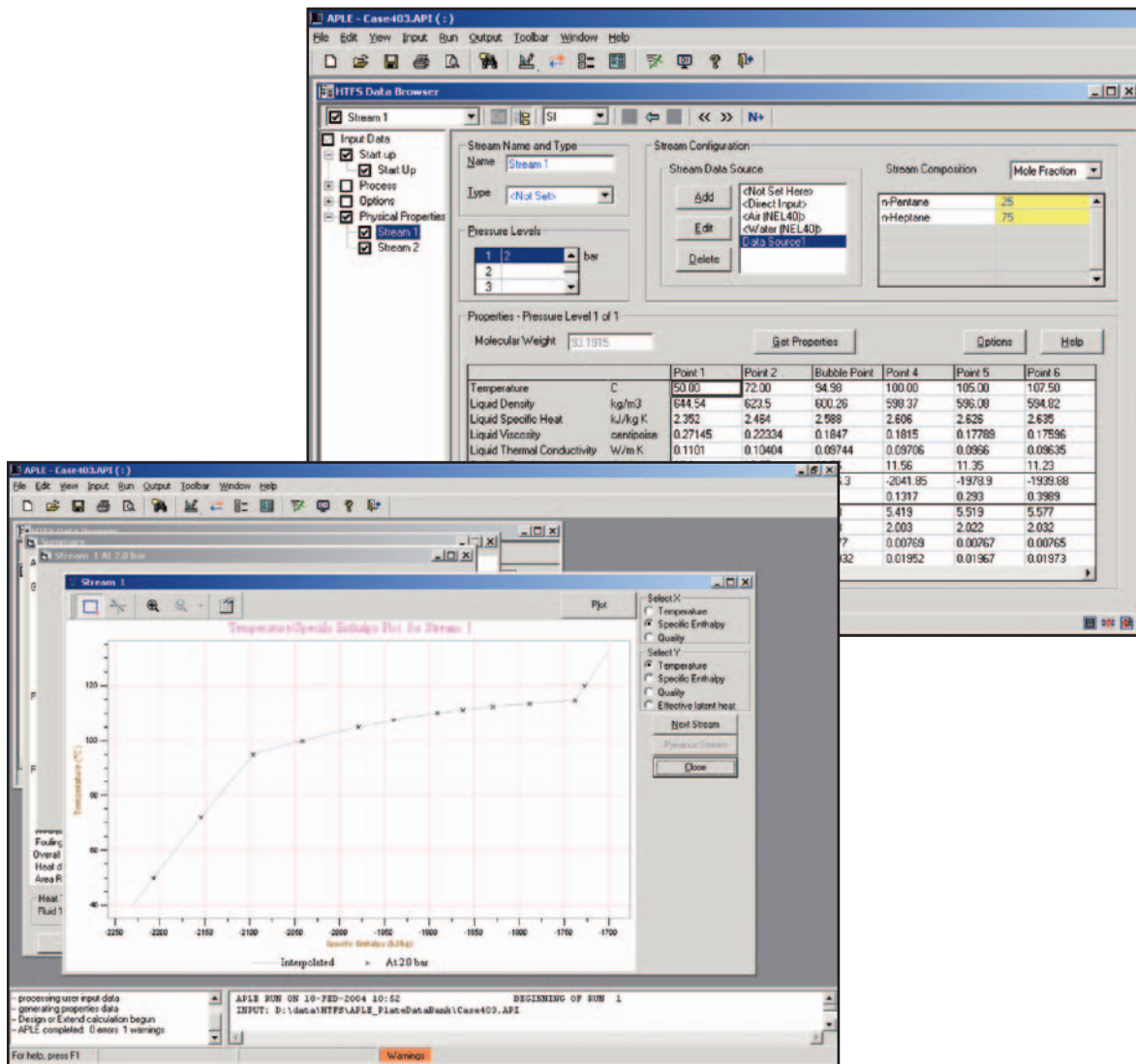
- Recommended design and listing of considered designs
- Exchanger layout drawing
- Summary of exchanger performance
- Details of pressure drops and hold-ups
- Stream conditions at inlet and outlet to each pass
- Stream conditions along the exchanger
- Ratio of actual to required area
- Summary of likely maldistribution effects
- Heat balance for exchanger



Benefits

- **Improved design** – APLE is a flexible and easy-to-use tool for rapid evaluation of plate and frame units as an alternative to shell and tube heat exchangers. It also provides a 'manufacturer independent' tool for design and rating/simulation of plate heat exchangers.
- **Improved process operations** – For batch or chemical processes, APLE enables the verification of viability of heating and cooling for particular process runs with new feedstocks and products.
- **Increased engineering efficiency** – Many plate heat exchanger manufacturers use APLE for design/checking calculations in difficult duties i.e. duties involving two phase heat transfer for multi-component mixtures.

One customer states: "We find APLE software a very useful and powerful tool to provide an independent third-party design check to our customers of both single phase and boiling/condensation duties. In addition, the built-in property databank, COMThermo, is a very handy tool for quick estimates of mixtures' physical properties."



worldwide headquarters

Aspen Technology, Inc.
Ten Canal Park
Cambridge, MA 02141-2201 USA

[phone] + 1 617 949 1000
[fax] + 1 617 949 1030

[world wide web] www.aspentech.com
[e-mail] info@aspentech.com

