ASCENTRA
CFD SOFTWARE

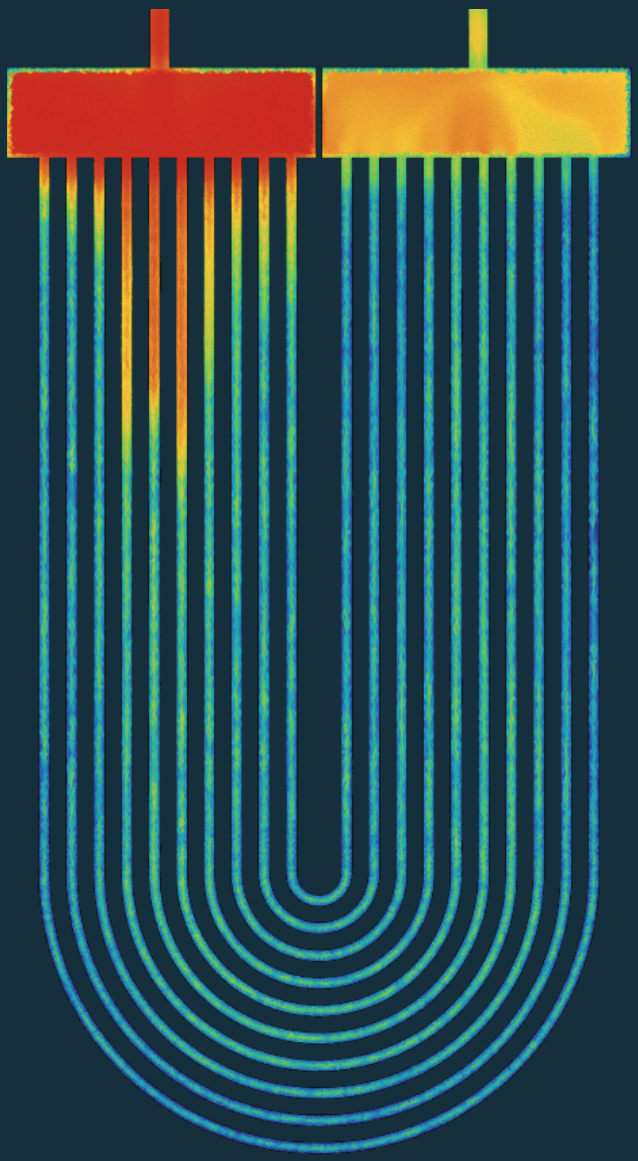
U-TUBE BOX COOLERS / ENGINEERING SOFTWARE

BoxCooler Analyst

Understand the flow. Explore the heat transfer.

Configure the bundle.
Define the operating point.
Examine the response.

A dedicated environment for thermal and hydraulic investigation of U-tube box coolers.



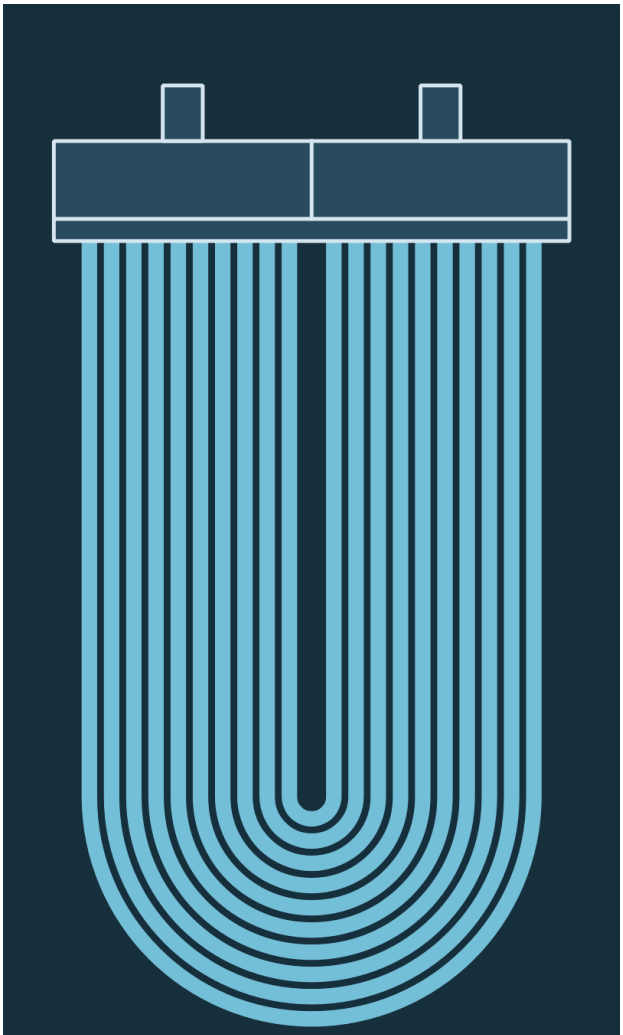
TEMPERATURE FIELD

Example supplied by ASCENTRA

01 / PARAMETRIC GEOMETRY

Build the bundle.
Control the details.

Configure tubes, rows, the common tube sheet and the divided header in one dedicated geometry workspace.



U-TUBE GEOMETRY

Front view from the geometry creator

Tube arrangement

Set tubes per row, row count, tube pitch and the innermost bend radius.

Tube dimensions

Define bore, wall thickness and straight length. Outer diameter follows from bore and wall.

Header and tube sheet

Configure the common tube sheet, divided chamber and main connections.

Geometry review

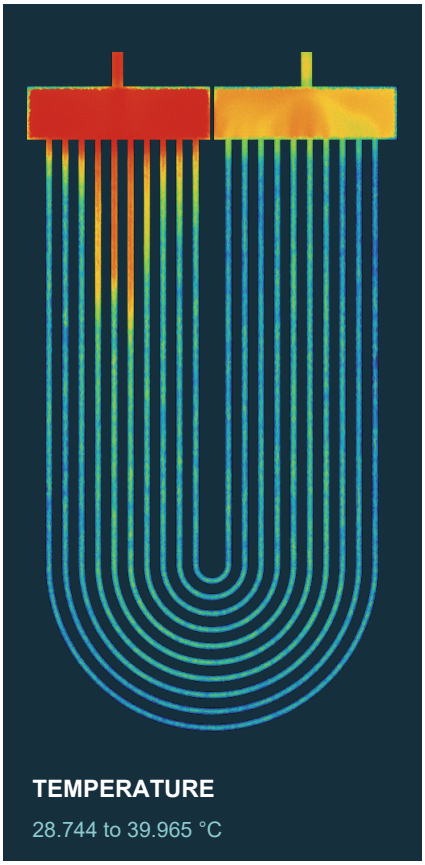
Inspect the 3D model, assign inlet and outlet surfaces and retain versioned STEP geometry.

02 / THERMAL AND HYDRAULIC STUDY

See the fields.

Understand the behaviour.

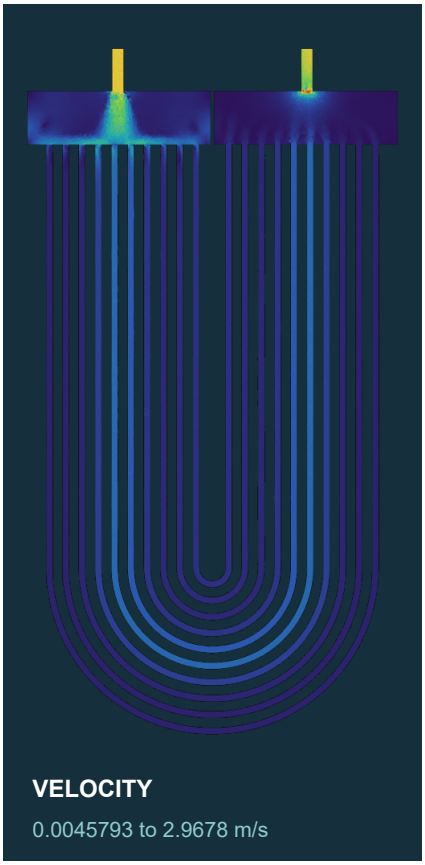
Explore temperature, velocity and pressure across the header and U-tubes. Connect local flow patterns with the engineering question.



TEMPERATURE

28.744 to 39.965 °C

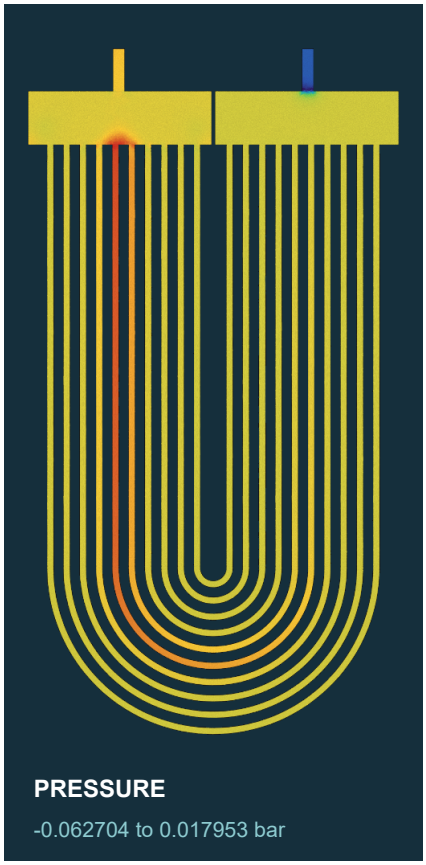
Inspect thermal variation along the flow path.



VELOCITY

0.0045793 to 2.9678 m/s

Examine flow distribution between tubes.



PRESSURE

-0.062704 to 0.017953 bar

Review the local pressure distribution.

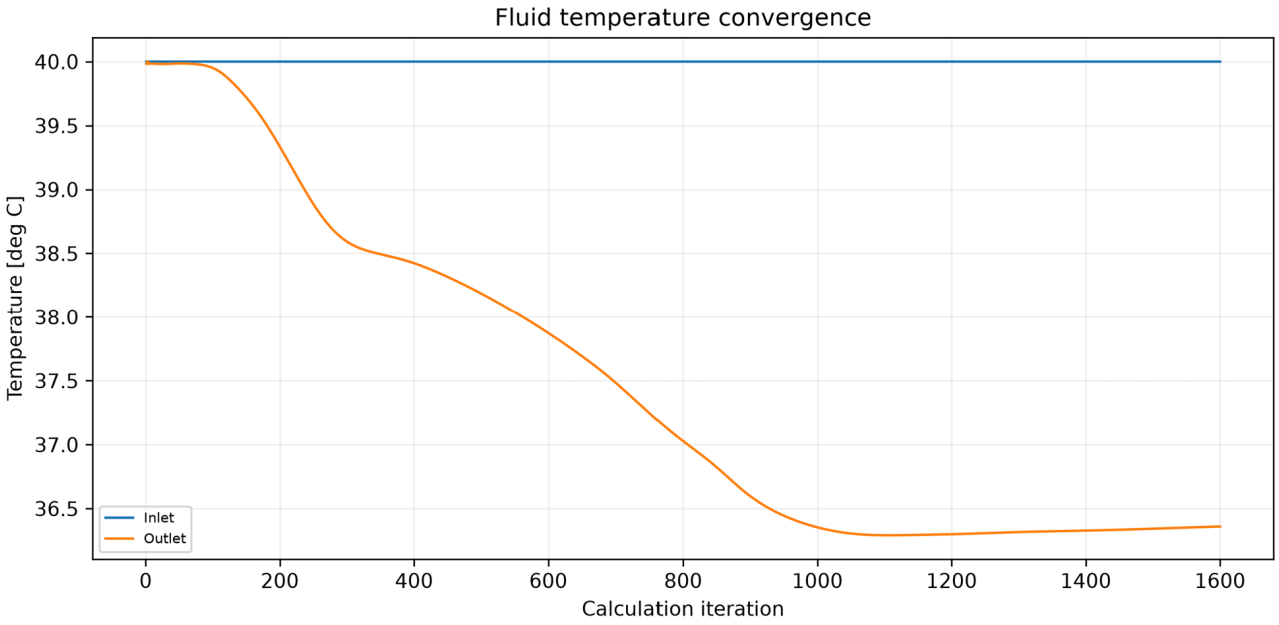
Example fields from the supplied screenshots. Ranges describe the displayed fields, not guaranteed performance. Local pressure range is not inlet-to-outlet pressure drop. Design use requires convergence and balance checks.

03 / CALCULATION MONITORING

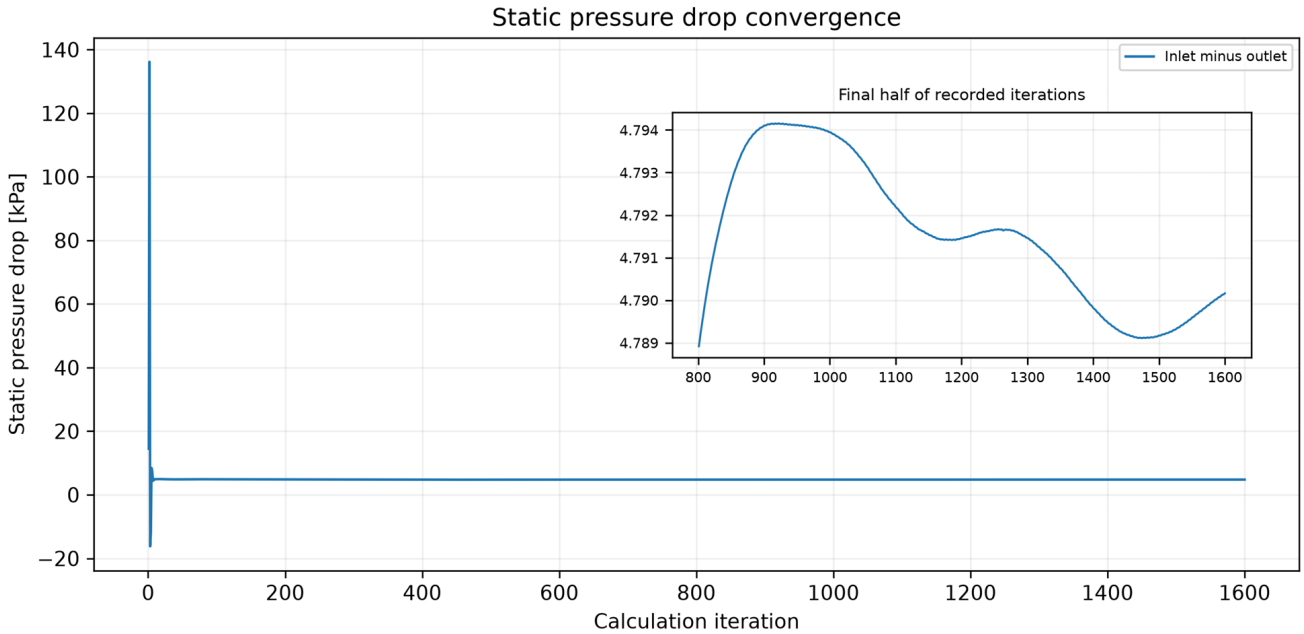
Track the engineering response.

Review temperature and static pressure difference over the recorded calculation history.

01 FLUID TEMPERATURE



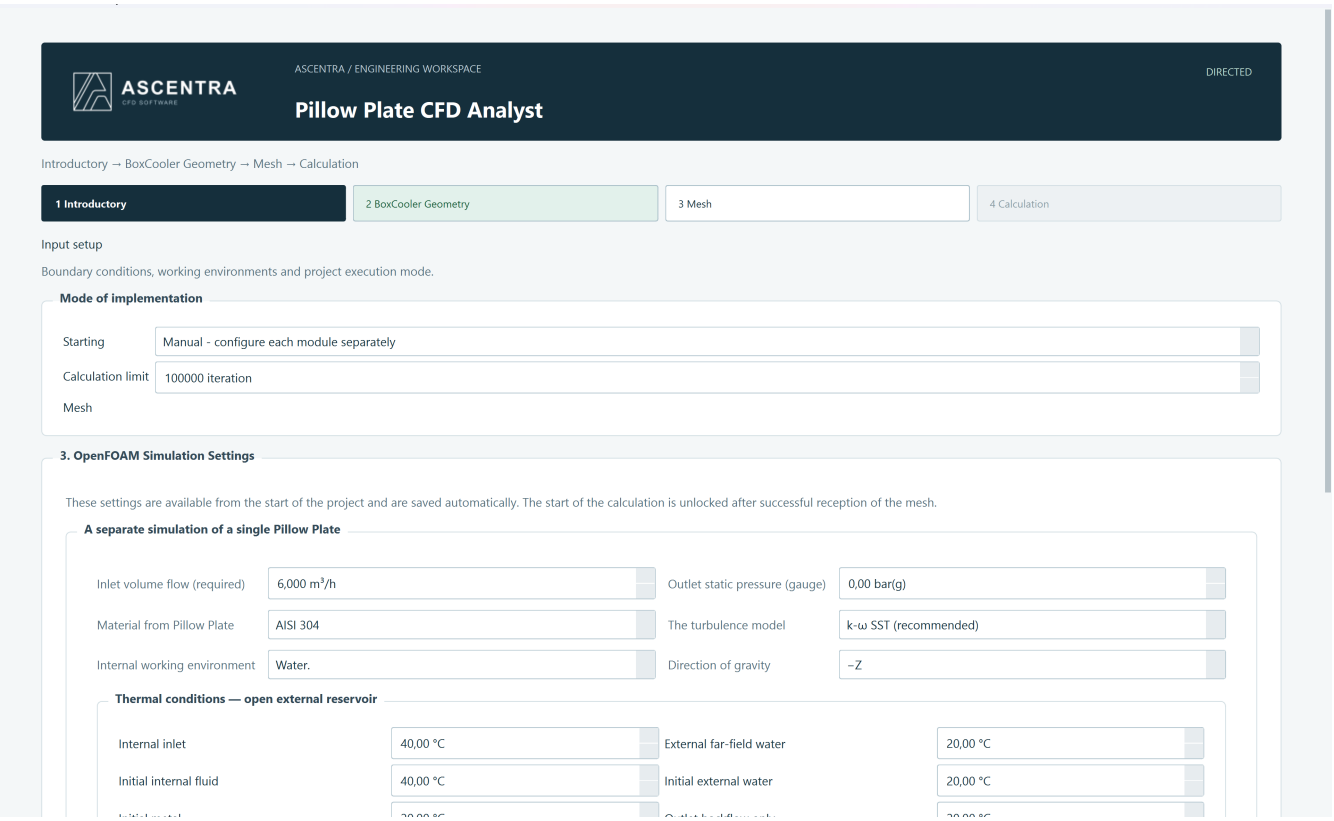
02 STATIC PRESSURE DIFFERENCE



04 / INSIDE THE WORKSPACE

From inputs to mesh.

Define operating conditions and inspect the geometry in the project workspace.



01 INPUT SETUP

Set the inlet flow, outlet pressure, working fluid and thermal conditions before proceeding through geometry, mesh and calculation.

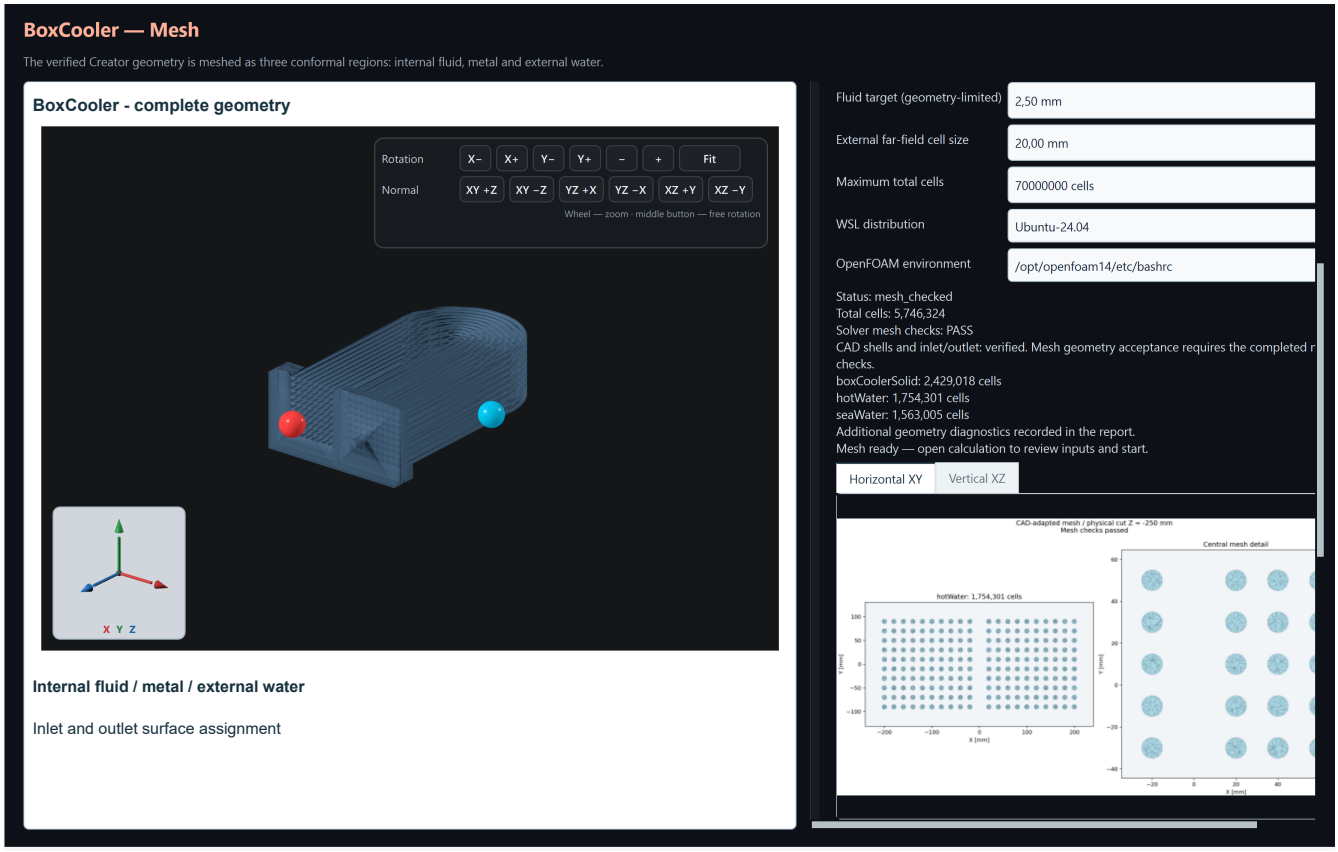
OPERATING POINT

The example screen shows the inputs used to define one case. Values are illustrative and must be selected for the actual equipment and operating conditions.

05 / MESH WORKSPACE

Inspect the complete bundle.

Review the 3D geometry, inlet and outlet assignments, mesh settings and section views.



02 GEOMETRY AND MESH REVIEW

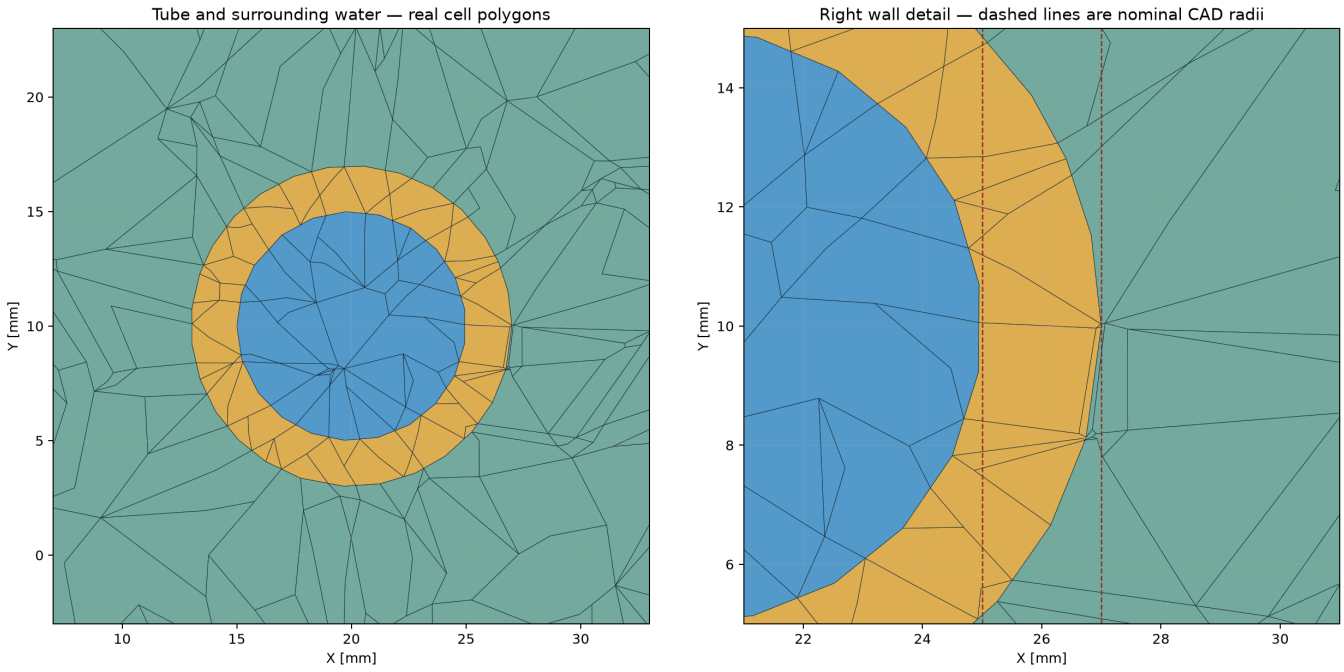
The supplied view combines the full tube bundle with mesh information and a cross-section preview. It shows how the model can be inspected before calculation.

Interface examples from the supplied development version. Some shared workspace labels still refer to Pillow Plate; the selected workflow is BoxCooler.

06 / TUBE WALL DETAIL

A closer look at the tube mesh.

An example of the mesh around a single tube, showing the internal fluid, metal wall and surrounding water.



Internal fluid Tube wall External water

From the section to the wall detail

The left view shows the tube cross-section and adjacent fluid cells. The right view enlarges the wall region; dashed lines mark the nominal CAD radii.

Example mesh only. Cell distribution depends on geometry and mesh settings. Refinement and solution checks remain necessary.

ASCENTRA
CFD SOFTWARE

Your workspace.
Your engineering decisions.

Configure, calculate and inspect U-tube box coolers in a dedicated engineering application.

01 Build your models

Configure the tube bundle, header and connections. Keep geometry and operating conditions together in your project.

02 Run and review calculations

Prepare the mesh, set the operating point and examine thermal and hydraulic fields alongside calculation histories.

03 Get product support

Contact ASCENTRA for software availability, access information and technical support.

support@ascentra.pl **ascentra.pl**

Software availability and access arrangements are confirmed by ASCENTRA. Results require appropriate numerical checks and validation for their intended use.