SAMPLE CASE · MODEL AUDIT

Cold plate: datasheet matched within 2.5%, and a 45% hot spot it doesn't show

Commercial tubed liquid cold plate · Built from the public drawing and datasheet only · 1000 W, 24 °C inlet

Truepath™

MODEL Full conjugate heat transfer: water flowing through a stainless tube pressed into an aluminum plate.

THE RISK YOU ALREADY CARRY

A datasheet match can still miss your hot spot.

THE CHALLENGE

A clean-looking contour is easy; a correct one takes inputs rarely handed to anyone: press-fit contact, tube wall, mesh, and what the datasheet number measures.
We find what your number measures.

YOUR QUESTIONS, OUR EXPERTISE

1. Is my datasheet number a hot spot, an average, or one sensor?
2. Will my loop hit target if I size it from the datasheet?
3. What is my model hiding: contact, tube wall, mesh?
4. Why doesn't my test data match my simulation?
5. Is my model ready to size the loop, or will I buy the wrong pump?

Which of these can you answer with confidence today?

RESULTS (SIMULATED)

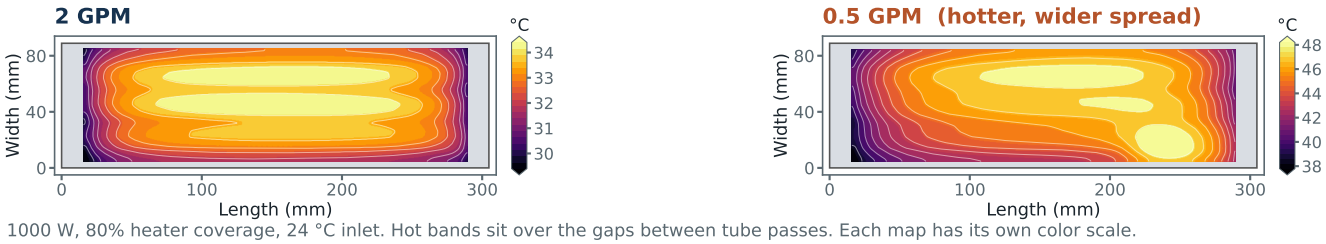
Within 2.5%

model vs datasheet at all 4 flow rates, single-point sensor

+45%

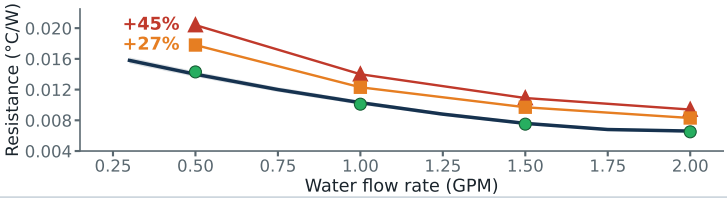
hot spot above the datasheet value, 0.5 GPM

MOUNTING-SURFACE TEMPERATURE (SIMULATED)



1000 W, 80% heater coverage, 24 °C inlet. Hot bands sit over the gaps between tube passes. Each map has its own color scale.

MODEL VS PUBLISHED CURVE



% labels: model above the datasheet value at 0.5 GPM.

KEY INSIGHT

Multiple simulations placed the sensor at one edge, where the model matches the published curve within 2.5% at all 4 flow rates. A datasheet "match" depends on where that sensor sits: the footprint average runs 19–27% higher and the hot spot up to 45% higher.

KNOWN ASSUMPTIONS

Contact resistance, tube wall, press-fit: pinned down from the drawing, checked at 4 flow rates.
Mesh: refined until results stopped changing.
Your mounting and interface material: not modeled.

DECISION GATE

Size the loop now, or check the model first?

The model matches the published curve; the hot spot is what your parts are likely to see.
Two open risks remain: your mounting and interface material, and flow split across plates in your loop. Both can be checked in simulation.
A **Model Audit, from $5,000 fixed,** recalibrates your model to your test data before you buy the pump.

Book a 20-minute scope call at truepathcfd.com

Smaller first steps start there too.

david@truepathcfd.com