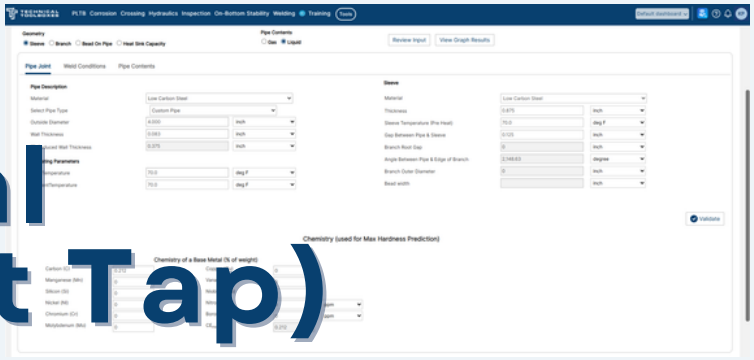
TECHNICAL TOOLBOXES

PRCI Thermal Analysis (Hot Tap)



PRCI-backed guidance for safe welding onto in-service pipelines.

Welding onto a live, pressurized pipeline lets operators connect, repair, or modify a line without a shutdown. While the flowing contents pull heat from the pipe wall, welders still need to balance two opposing risks: burn-through and hydrogen cracking. Technical Toolboxes' Hot Tap software, the PRCI Thermal Analysis Model for Hot-Tap Welding, applies a finite-element thermal model developed by the Edison Welding Institute (EWI) for PRCI to predict inside surface temperature and weld cooling rate before the arc is struck.

Welding engineers use Hot Tap to find a safe heat input window for their specific pipe, chemistry, product, pressure, and flow, instead of relying on rules of thumb or the few people who remember a past job. The result is a defensible, documented starting point for the welding procedure they qualify and send to the field.

KEY FEATURES

- **Model Both Failure Modes**: Predict inside surface temperature for burn-through risk and weld cooling rate for hydrogen cracking risk in a single run.
- **A Safe Heat Input Window:** Heat input selection curves show the minimum and maximum heat input, giving engineers a working range, not just a pass/fail.
- **Standards-Aligned Guidance:** Designed to support API 1104, API 1107, ASME Section IX, BS 4515, BS 6990, and CSA Z662, with a printable report that documents how parameters were chosen.
- **PRCI-Backed and Validated:** Developed by EWI for PRCI and relied on by the industry for over 20 years, backed by Technical Toolboxes support, training, and in-service welding SMEs.

ADVANCED FUNCTIONALITY

Four Weld Geometries

Analyze fillet welds on full-encirclement sleeves, groove welds on branch connections, and bead-on-pipe buttering layers and weld deposition repairs. Predict heat-sink capacity and check it against a simple field measurement.

Input Validation and Reporting

The Check/Correct routine validates every input against built-in limits, and a printable report captures inputs and results to document the basis for your welding parameters.

Flexible Pipe Contents and Weld Inputs

Model gas or liquid contents by product, flow rate, temperature, and pressure. Enter specific weld parameters (electrode, voltage, current, travel speed) or a target heat input, and compare multiple weld records in one case to see how each change affects burn-through and cracking risk.

FIND OUT MORE

Learn more about Hot Tap capabilities and schedule a demo to see it in action.

ABOUT TECHNICAL TOOLBOXES

Technical Toolboxes is the global leader of integrity analytics for pipelines to help solve the growing, complex challenges they face across crossings, corrosion, welding, and more. Our modern software platform provides a simple way to get the most accurate pipeline engineering calculations so that you can increase team productivity and improve compliance while decreasing risk. We enable energy companies to move away from rudimentary calculations and processes to a world of fast, secure, scalable pipeline insights you can trust.

To learn more about Technical Toolboxes and the Pipeline HUB, go to www.technicaltoolboxes.com.