

# DIRECT-FIRED PROCESS HEATERS



## OVERVIEW

Struthers Wells™, a TEI line of products, is a recognized name in process heater technology. Struthers Wells™ started designing and supplying fired heater products in 1927 followed by the development of the first forced-circulation Dowtherm® vaporizer in 1942. Struthers Wells™ list of successful firsts continued from there including the first ethylene dichloride (EDC) thermal cracking furnace in 1955 and the first once-through steam generator (OTSG) for enhanced oil recovery (EOR) in 1960. Struthers Wells™ sold over 2,500 direct-fired process heaters throughout its history. Struthers Wells™ Intellectual Property (IP) was purchased by Babcock Power Inc.® in 2005.

Today, the tradition of superior products and services continues with a full-service engineering design and project management staff ready to assist with your fired heater needs. Fired heater products include:

- Thermal Fluid Heaters (liquid and vapor services)
- Regeneration Gas Heaters
- Natural Gas Heaters
- Refinery Heaters/Furnaces
- Steam Superheaters
- Process Gas Heaters

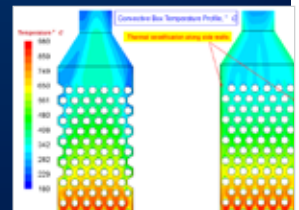


## FEATURES/BENEFITS

Struthers Wells™ uses state-of-the-art design tools including both in-house proprietary, commercial and advanced computer-aided engineering (CAE) tools and applications to ensure technically sound heater design in a timely manner.

Capabilities include:

- Detailed thermal-hydraulic design and analysis of fired heaters and process furnaces.
- Engineering study to evaluate and assess revamp opportunities to maximize heater performance including: (a) emissions reduction through upgraded low NO<sub>x</sub> burners, or the addition of flue-gas-recirculation (FGR), (b) thermal efficiency upgrades via addition of combustion air pre-heater, (c) fuel switches, and much more. Let us help you with your heater needs!



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## PROCESS HEATERS FOR EVERY APPLICATION

The core of the Struthers Wells™ fired heater product line is the cylindrical radiant/convective style heater in either a horizontal or vertical arrangement with either helical or serpentine radiant coils. We can also provide cabin/box style arrangements with wall- or floor-firing for more specialized applications where size or process requirements warrant this arrangement.

### RADIANT COIL CONFIGURATION

The most common radiant coil type is the serpentine (hairpin). This is the most rugged and flexible coil design for cylindrical fired heaters and is also easily maintainable. A helical coil is inherently drainable but limited by shipping size since it can't be broken into smaller segments.

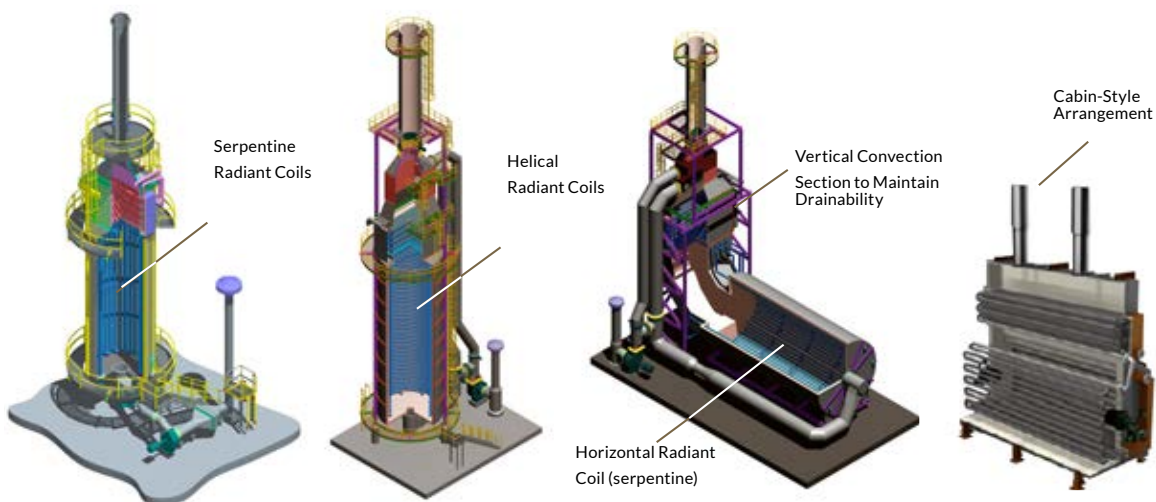
Horizontal arrangements typically employ a serpentine radiant coil and offer the advantage of inherent drainability and most serviceable items are accessible from ground level making maintenance simpler.

### COMBUSTION AIR PRE-HEATING

Preheating the combustion air recovers more heat from the flue gases prior to heading out the stack, thereby boosting thermal efficiency to near 90%. Air heaters can be either a plate-style heat exchanger or a tubular heat exchanger depending on the application.

## RESULTS

- Structural analysis and mechanical design.
- ASME code capabilities include ASME BPVC Section I or Section VIII, ASME B31.1
- API 560
- Complete fuel system design and analysis including burner design and selection, fuel delivery valve trains and Burner Management Systems (BMS) and heater controls.
- Capability to engineer a heater with all necessary auxiliaries for a circulating fluid system such as expansion tanks, circulation pumps, piping, valves, etc.



SAFETY<sup>3</sup> PEOPLE. POWER. PROJECTS.

We're giving safety the third degree.

Babcock Power Inc. and its subsidiaries place the safety, health and security of our people at the core of our company values. Our team is our most valuable resource, generating solutions everyday to deliver safe, clean, reliable energy globally. With a keen focus on safety, Babcock Power Inc. conducts business in a manner that protects our people, our customers and the environment. From innovation to generation, we are proud of our award-winning safety record and are committed to operating with integrity and excellence.

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