



# **FHinfinity<sup>®</sup>**

## **Advanced Process Heater Simulation Suite**



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[FHinfinity](#)

# FHinfinity<sup>®</sup>

*A Simulation Platform with Unmatched Precision*








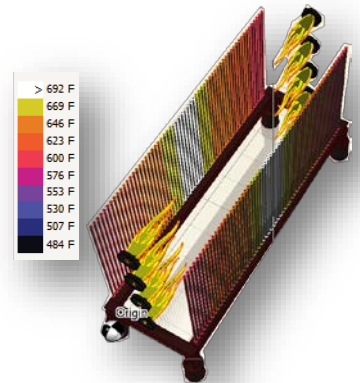
## Introduction

**FHinfinity<sup>®</sup>** is a specialized software for **simulating, analyzing, and optimizing** process heater, combining advanced computational algorithms with an intuitive interface to solve complex challenges in Oil, Gas, and Petrochemical industries. This powerful tool enables engineers to enhance heater performance with high accuracy, reduce energy consumption, and optimize operational costs.







## Key Advantages

-  **Multiphysics Simulation:** Comprehensive modeling of heat transfer (radiation, convection, conduction) and combustion with unprecedented precision.
-  **Wide Furnace Support:**
  - Fired Heaters with different geometries
  - Furnaces (reactive systems)
  - Complex combustion systems (industrial burners)
-  **Seamless Integration:** Compatible with Aspen HYSYS / Petro-SIM for unified process simulation.
-  **Powerful Optimization:** Smart algorithms to reduce fuel consumption and maximize efficiency.
-  **Professional Outputs:** Engineering reports, 3D schematics, interactive charts, and Excel-compatible data.



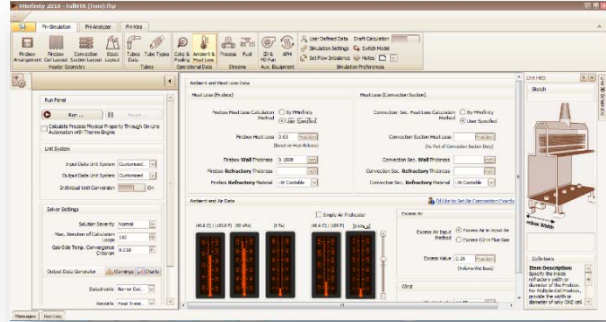
## Core Applications

-  **New Furnace Design** incorporating safety and efficiency parameters.
-  **Existing Furnace Optimization** to reduce emissions and extend equipment life.
-  **Simultaneous Simulation** of chemical reactions and heat transfer under real operational conditions.
-  **Failure Analysis** and hot spot identification.

## ? Why FHinfinity©?

**FHinfinity©** redefines heater simulation by merging cutting-edge analytics with deep thermodynamic intelligence. Our six proprietary analyzers—**Combustion Analyzer, Heat Loss Analyzer, Burner Simulator, Tube Life Predictor, Coke Forecaster,** and **Dr. Heater**—transform raw data into actionable insights for peak efficiency, extended equipment life, and compliance.

Powered by **NAFTPack©**, our exclusive computational engine, the software handles complex fluid characterization and executes rigorous thermodynamics / kinetics calculations with industrial precision. This synergy of specialized tools and scientific core delivers unmatched accuracy in optimization, turning simulation into your most trusted engineering partner.



**BEYOND SIMULATION,**

**TOWARDS INFINITY**



## ⚙️ Target Users

- 🏭 **Oil & Gas Companies:** For energy management and process improvement.
- 🏭 **Process Engineers:** For heater design and troubleshooting.
- 🏭 **Research Centers:** For developing advanced combustion and heat transfer models.
- 🏭 **Universities:** For teaching advanced chemical engineering concepts.

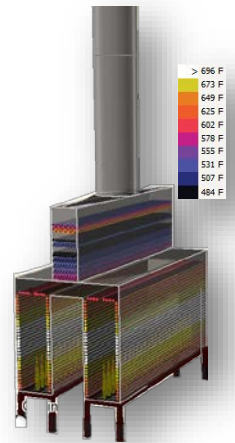
## 🔍 Technical Specifications

- 🏭 **Software Size:** ~500 MB
- 🏭 **OS Requirements:** Windows 7/10/11
- 🏭 **Supported Languages:** English

# Case Study

HEATER GEOMETRY  
 FIREBOX TYPE / NO. OF PATH  
 FIREBOX TUBE LAYOUT  
 CONV. LAYOUT / NO. OF T.B.  
 BURNER LAYOUT  
 STACK

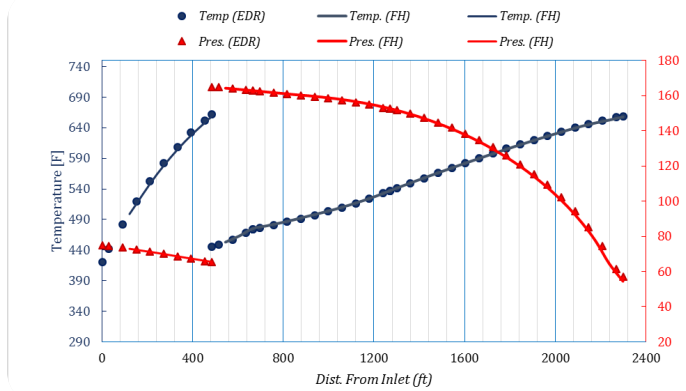
*Radiant (Twin) + Convection*  
*Cubical / Eight (8)*  
*Horizontal, Ref. Back. (+ Roof Tube)*  
*Triangular / Three (3)*  
*Up-Fired*  
*One*



## Results

	<b>FHinfinity<sup>®</sup></b>	<b>ASPEN EDR</b>	<b>% ERR.</b>
Total Heat Absorption [MM Btu/hr]	206.9	207.1	- 0.1
Firebox Duty [MM Btu/hr]	129.3	129.6	- 0.2
Avg. Rad. Sec. Heat Flux Density	10884	10908	- 0.2
Process Outlet Temperature [F]	657.8	659	(- 1.2)
Process Side Pressure Drop [Psi]	110.6 / 9.5	108.1 / 9.8	(2.5 / - 0.3)
Heater Efficiency [%]	79.7	79.9	- 0.3
Flue Gas Temp. Leaving Heater [F]	749	743	(6)
Bridgewall Temperature [F]	1727	1720	(7)
Draft at Arch [in WC]	-0.93	-0.96	(-0.03)
Max. Flue Gas Mass Velocity [lb/ft <sup>2</sup> .s]	0.67	0.66	1.5
Ratio of Peak to Mean Heat Flux [-]	1.90	1.90	~ 0

## HYDRAULICS



## HEAT FLUXES

