

# Heat Loss Analyzer

Refractory Optimization & Air Infiltration Modeling



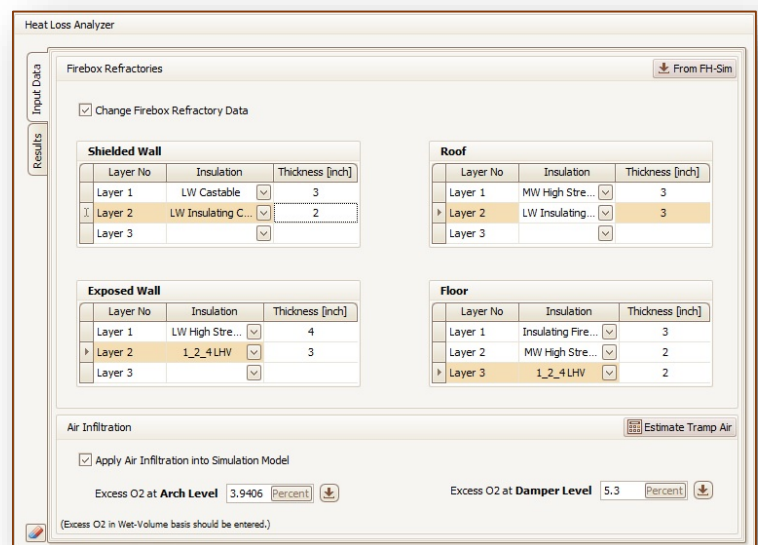
FHinfinity Analyzers

**Heat Loss Analyzer**® is a specialized pre-simulation tool within FHinfinity® designed to optimize heater efficiency by accurately modeling heat losses through refractory walls and air infiltration paths. Unlike standard simulations that assume uniform excess air and single-layer insulation, this module allows engineers to define complex, multi-layer refractory structures and realistic air leakage gradients, providing a true-to-field assessment of thermal performance.

## Key Technical Features

### Multi-Layer Refractory Optimization:

- Define up to three distinct layers of refractory materials for each structural component: Shielded Walls, Exposed Walls, Roof, and Floor.
- Select from a comprehensive library of industrial materials (e.g., LW Castable, MW High Strength, Insulating Firebrick) with temperature-dependent properties.



### Realistic Air Infiltration Modeling:

- Dual-Zone Excess Air:** Uniquely models the reality of natural draft heaters by allowing separate definition of Excess O<sub>2</sub> at Arch Level and Excess O<sub>2</sub> at Damper Level.
- Tramp Air Estimator:** Includes a built-in sub-calculator to estimate mass flow rate of infiltrating air based on user-defined gap/crack areas in the heater structure.
- Impact Assessment:** Quantifies how infiltration gradients affect efficiency.

### Automated Reporting:

- Generates a standardized Refractory Design Datasheet (API-compliant format) upon execution, detailing hot-face temperatures and casing temperatures.
- Provides comparative reports showing changes in fuel consumption, total heat loss, and efficiency shifts between the base case and optimized design.

## Operational Workflow

- Define Refractory Structure
- Set Infiltration Parameters.
- Run Optimization
- Review Results & Override the main simulation model