

# Burner Simulation

## Advanced Capacity Curve Generator



FHInfinity Analyzers

**Burner Simulation**® is a specialized pre-simulation tool within FHInfinity® designed to generate precise *Capacity Curves* for gas-fired and oil-fired burners. Unlike simple flow-rate inputs, this module calculates the relationship between fuel pressure and heat release using fundamental thermodynamic equations and vendor-specific burner geometry. This enables engineers to simulate realistic field operations where fuel pressure—not just flow rate—is the primary control variable.

### Key Technical Features

**Dual-Fuel Support:** Generates capacity curves for Fuel Gas, Fuel Oil, or Combination Burners.

**Detailed Burner Tip Modeling:** A unique sub-calculator allows users to define complex burner tips with multiple orifice types. Users can specify:

- Number of tips per type.
- Individual tip diameters.
- Partial Fouling/Blockage of Burner Tips

**Customizable Pressure Limits:** Define minimum and maximum burner pressure limits to ensure the generated curve operates within safe mechanical constraints.

**Manual Override Capability:** If vendor-specific performance data is available, users can manually input a custom Heat Release vs. Gauge Pressure curve.

### Operational Workflow & Integration

- **Define Burner Geometry:** Input nozzle areas, Cd, and tip configurations.
- **Generate Capacity Curve:** The solver calculates the heat release profile.
- **Export to Main Model:** The generated curve is exported to the FH-Simulation.
- **Realistic Control Simulation:**
  - **Forward Mode:** Input fuel pressure → Model calculates resulting heat release and process outlet temperature.
  - **Reverse Mode (Temperature Controller):** Set target process outlet temperature → Model calculates required fuel pressure.

