SimBurn™: Optimize Burner Efficiency with Advanced Cloud-Based Simulation Technology

Burner Simulation and Design with SimBurn™

Experience a powerful and accessible simulation platform for regenerative burners—directly in your web browser.
SimBurn™ is built to transform how regenerative burners are designed, tested, and optimized.

With approximately **80% of new aluminum melting furnaces** now adopting regenerative burner technology, the demand for efficient, low-emission solutions is higher than ever. SimBurn™ enables engineers to simulate the heating and cooling cycles of ceramic beds before a burner is ordered, retrofitted, or installed—ensuring performance, **maximum efficiency**, **lower emissions** and **sustainability** from the start.

Customer needs: Operational Issue

Traditional burner design methods rely heavily on outdated empirical tools and simplified assumptions, leading to performance gaps. SimBurn™ eliminates these limitations by providing:

- Accurate, high-speed simulation of regenerative burner behavior
- Exploration of multiple configurations and fuel types (H_2, oxy-fuel, enriched air)
- Deeper control over pressure, cycling parameters, and thermal performance

Customer Benefits: For Burner Manufacturers and End Users

Design with Confidence: Gain a **deep understanding of burner behavior**, heat transfer dynamics, pressure drops, and cycle impacts.

Simulation-Based Optimization: Virtually test burner designs and fuel options (H_2, oxy-fuel, enriched air) before building physical prototypes.

Clear Targets for Innovation: Define design parameters that can unlock **up to 15% more energy efficiency** and significant **emissions reduction**, supporting sustainable product development.

Reduce Testing Costs and Time: Cut down on physical testing and speed up the development-to-market timeline with accurate virtual prototypes.

Shorten design-to-delivery timelines using virtual prototypes.

Maximize ROI on Burner Investments: Use BurnerSim™ to **evaluate retrofit potential**, identify the best cycle parameters, and select the most efficient burner before ordering.

Operational Optimization: Achieve **up to 15% reduction in CO_2 emissions and energy consumption**.

Boost Productivity: Reduce unplanned downtime and ensure optimal burner performance, resulting in up to **10% gain in process reliability and throughput**.

Fuel Flexibility Planning: Simulate alternative fuel strategies (hydrogen, enriched oxygen, etc.) and prepare for the future decarbonization goals.

R&D Support: A powerful tool for engineering teams and process R&D to conduct **sensitivity analysis**, test various configurations, and explore "what-if" scenarios.

Data-Driven Decisions: Empower technical and commercial teams with clear performance metrics and efficiency KPIs to support investment and upgrade decisions.

A Cutting-Edge Numerical Model

SimBurn™ is powered by advanced physical models and real-time data calibration, enabling **high-speed, precise simulation** without requiring high-performance computing.
It is cloud-native—accessible anytime, anywhere, with no software installation or maintenance.

Key Features

- Customizable simulations for various scenarios
- Sensitivity analysis on key parameters
- User-friendly interface
- Design optimization for new installations, retrofits, and fuel testing (e.g., hydrogen, oxygen, oxy-fuel)
- Up to **15% improvement** in energy efficiency
- No capital cost for high-end computing hardware

Contact us

Novamet team includes highly professional members with several years of successful experience in industrial thermal processes, ad-hoc software development:
https://www.novamet.ch/
E-mail info@novamet.ch
+41 79 960 48 42