

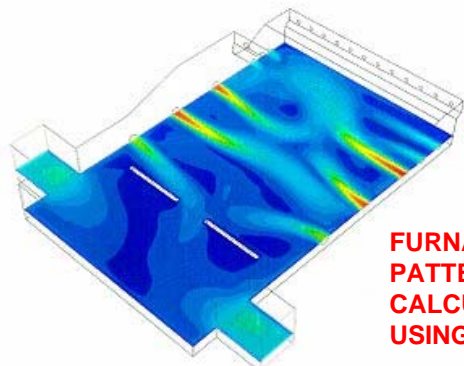
# Reheating & Heat Treatment - Modelling and Design



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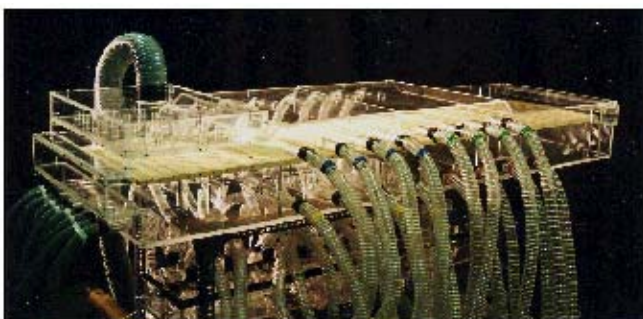
Extensive experience exists within Corus R,D & T in the development of new or modified designs for heating and cooling process plant. This often requires rigorous analysis of fluid flow and heat transfer which may be undertaken using a combination of mathematical and physical modelling techniques, as well as the use of pilot scale experimental facilities.

Expertise is available in the application of computational fluid dynamics (CFD) modelling for the study of fluid flow, combustion and heat transfer problems. This capability is complemented by a suite of in-house mathematical models, typically for the numerical simulation of heating or cooling processes. These provide information about product temperature distribution and productivity and allow assessment of thermal input requirements, burner ratings and efficiencies of furnace designs.

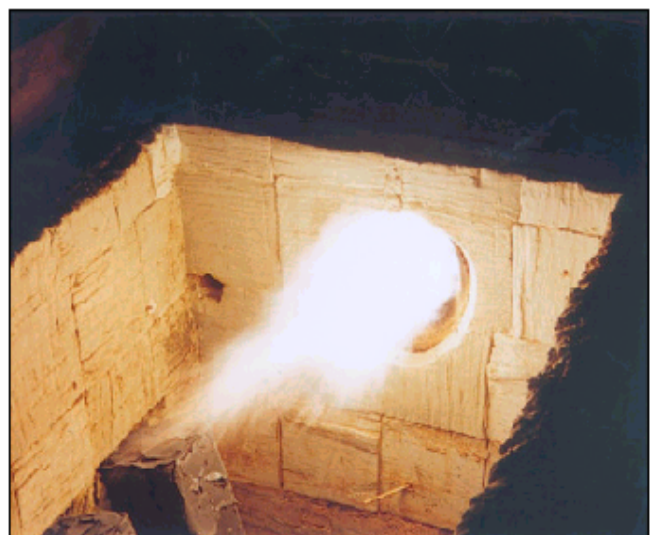


**FURNACE FLOW PATTERNS  
CALCULATED  
USING CFD**

Physical models are designed and constructed in-house using established criteria which ensures operational similarity between model and plant. Use of the models allows information to be gathered quickly, economically and safely, without the need for disruption of on-site production processes. A range of design options can be studied, allowing designs to be optimised, thereby ensuring that specifications are met and that satisfactory operation and control is achieved. In typical projects, physical models have been used to appraise various designs of continuous reheating furnace rated at up to 350 t/h.



A pilot scale combustion rig is used for assessing all aspects of furnace and burner operation, design and control. A range of burner types, including cold air, recuperative and regenerative can be accommodated, at up to 1MW thermal input ,with natural gas or oil.



**PILOT SCALE COMBUSTION TEST RIG**

Studies of burner designs and combustion processes, undertaken in collaboration with other professional bodies, has helped in identifying factors which influence the formation of the oxides of nitrogen ( $\text{NO}_x$ ). Through this work, process and burner design modifications have been suggested which can minimise  $\text{NO}_x$  production and thus reduce environmental emissions.