

**INSTITUTE OF INFRASTRUCTURE, TECHNOLOGY, RESEARCH AND
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Speaker: Dr. Prabal Talukdar Associate Professor, Department of Mechanical Engineering, IIT Delhi.

Title: Numerical modelling of heat transfer in a reheating furnace

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Audience: Mtech Ist Sem Mechanical, PhD Mechanical, BTech V Sem Mechanical and three Mechanical Dept. Faculties

Abstract

In steel plants reheating furnaces are used in hot rolling mills to heat the steel stock (Billets, blooms or slabs) to temperatures of around 1200°C which is suitable for plastic deformation of steel and hence for rolling in the mill. Mathematical as well as numerical modelling of a reheating furnace is a difficult task because of the complexity in geometry as well as the involved heat transfer and combustion phenomena. Different models based on the complexity and accuracy are developed in the recent past. The complexity also lies with the type of fuel used. Simplified model considers only radiation heat transfer inside the furnace and diffusion inside the billets. On the other hand, sophisticated numerical model with combustion of coal particles along with fluid flow and heat transfer are developed in the recent time.

The aim of this presentation is to discuss various numerical models for the simulation of a reheating furnace of steel billets. Comparison of the results with the data obtained from a real facility is done to show the performance of these models.