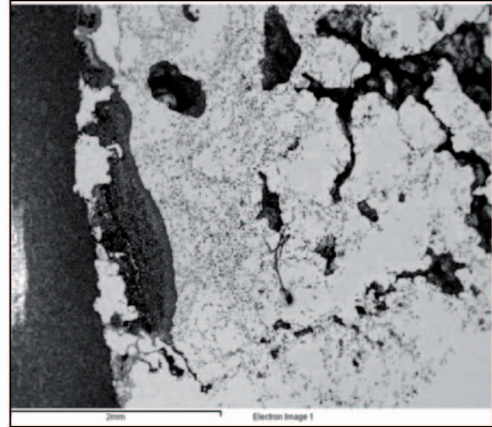
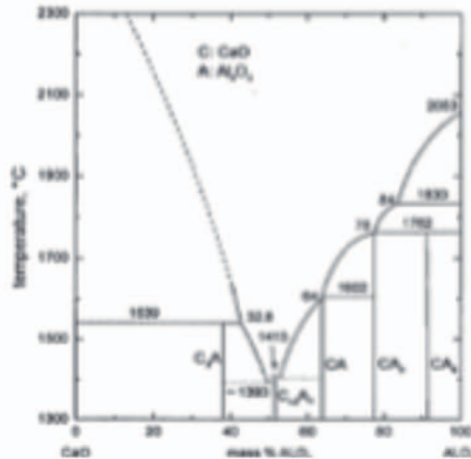




# Inclusion engineering

## Problem:

During steelmaking, oxide inclusions can be entrapped in solidifying steel. Inclusions during rolling transform in defect.



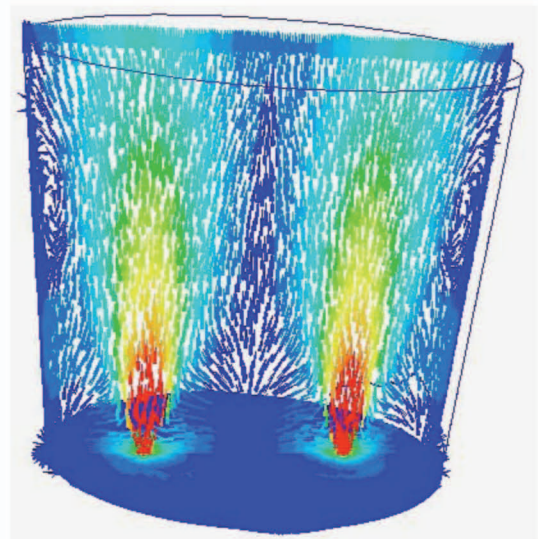
## Solutions:

Through process analysis:

- identification of defect
- defect generation mechanism
- identification of process responsible of inclusion generation
- CFD and water modelling of ladle stirring and tundish
- analysis and modification of operative practices

## Benefits:

- higher quality production
- minimisation of customers claims
- improved process understanding





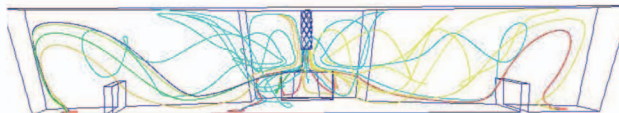
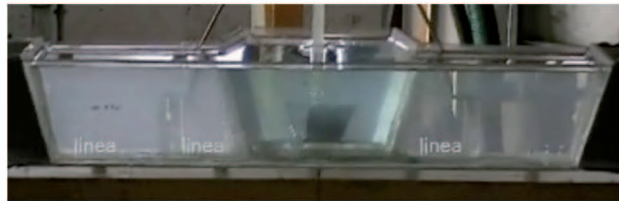
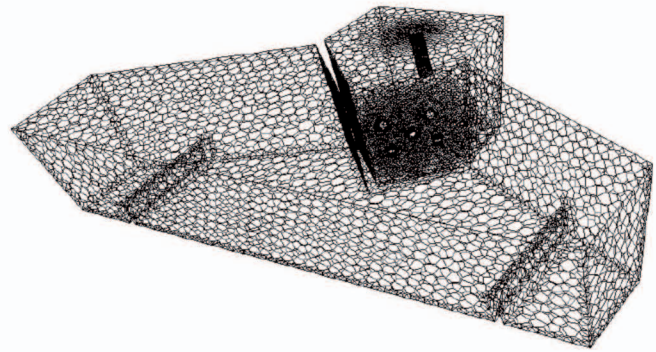
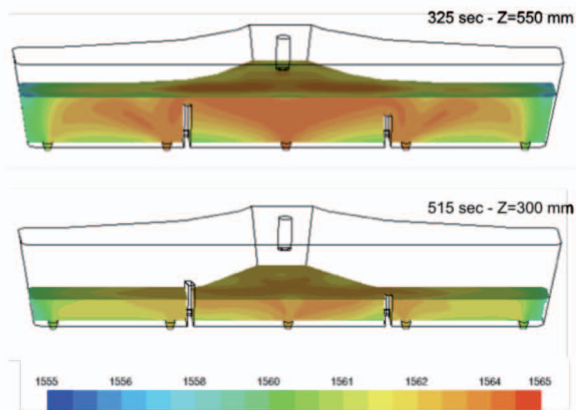
## Inclusion engineering

### Sample request:

Samples of defects on final products (coil, bar, wire, tube etc.) must be collected for analysis.

Sample of liquid steel during steelmaking could also be collected.

Modelling helps to identify critical conditions during casting (e.g. transient operations) and countermeasures



Availability of hystorical defect data from quality and L2 data are helpful.

Further to Standard Operational Practices availability, a survey of plants and processes could be helpful.

### contact:

Centro Sviluppo Materiali SpA

[www.c-s-m.it](http://www.c-s-m.it)

[marketing.steel@c-s-m.it](mailto:marketing.steel@c-s-m.it)