

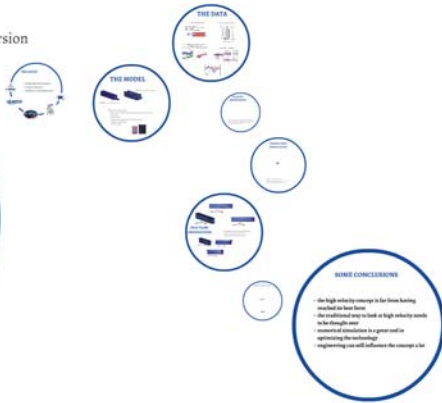
Video of immersion

INTERGALVA
7-12 June 2015 Liverpool

What advanced computerized simulation is showing us about high velocity furnaces.

Mario Ubiali
Marketing & New Trends Manager

GIMECO **ZINCO**



THE SETUP



- 2 high velocity furnaces
- 1 week of history
- 2 different manufacturers



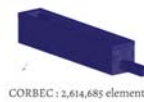
INTERGALVA
7-12 June 2015 Liverpool

What advanced computerized simulation is showing us about high velocity furnaces.

Mario Ubiali
Marketing & New Trends Manager



THE MODEL

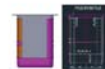


CORBEC : 2,614,685 elements



GIMECO : 1,722,537 elements

- Numerical model includes:
- Flow region inside the furnace including the exhaust tunnel
 - Kettle wall
 - Heat Shields
 - Insulation in all parts of the kettle and furnace
 - Supports (kettle props)
 - Concrete walls



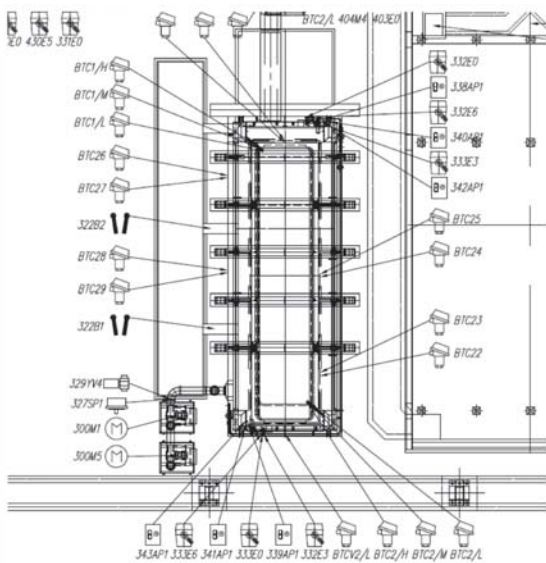
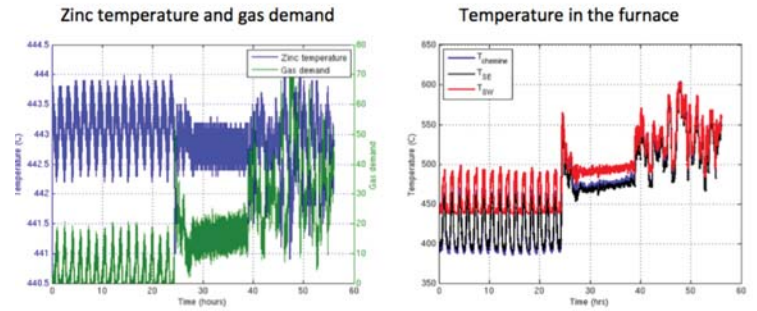
Corbec kettle measured data

- Zinc temperature (channel 2)
- Temperature in the furnace: SW (channel 5) and SW (channel 6) locations
- Temperature in the chimney (channel 9)

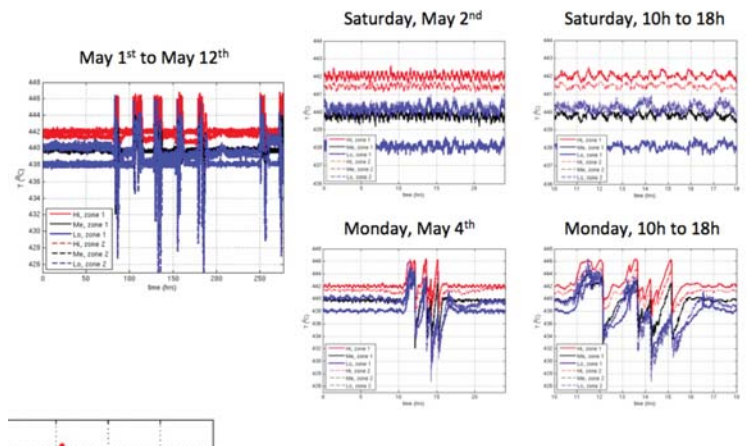


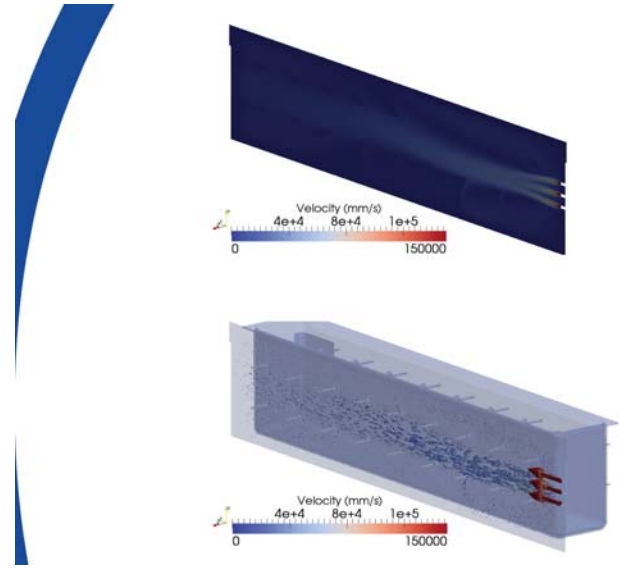
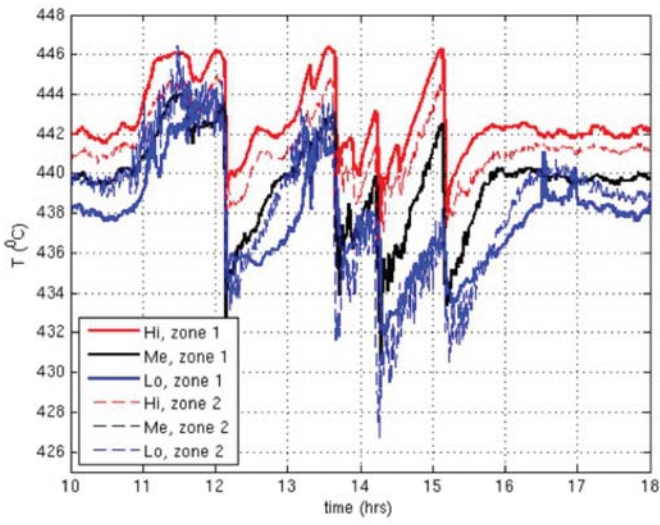
Corbec kettle: Zinc temperature, gas demand and furnace temperature

56 hours period covering idle time with cover, idle time without cover and operation

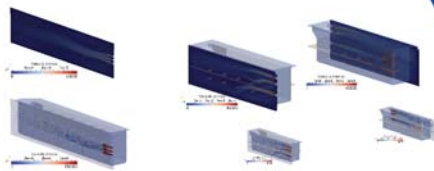


GIMECO kettle: Zinc temperature

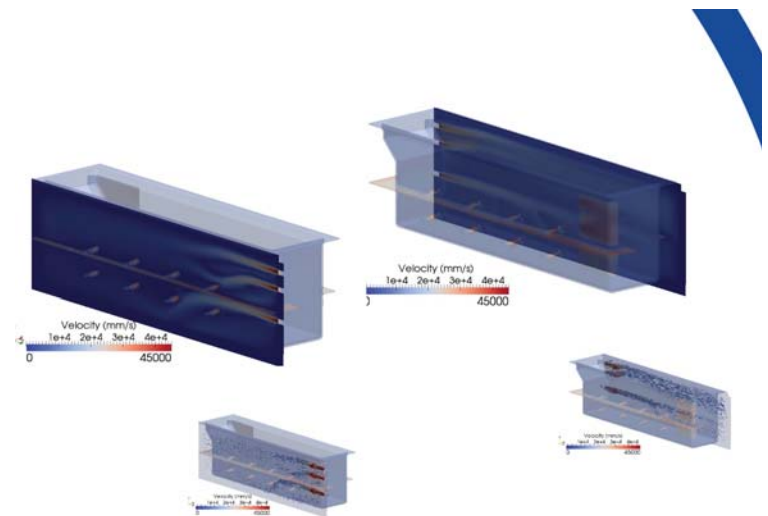


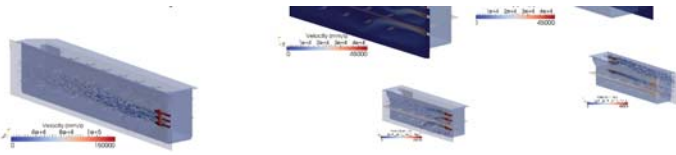


VELOCITY: OBSERVATIONS

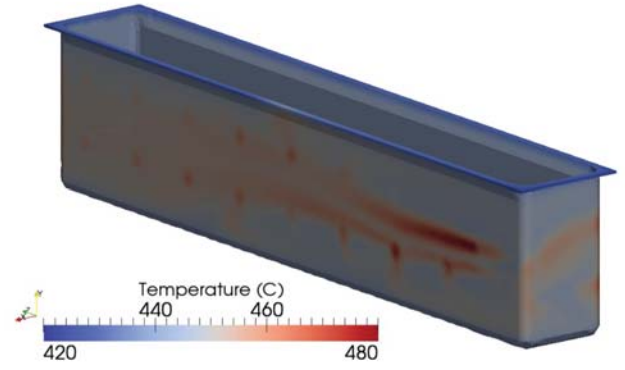


- velocities might greatly vary, but functioning is apparently constant
- velocity (as Blakey said) is not crucial for the reasons we think it is
- velocities and flows are influenced by position of flue exit
- props play a role (to be expanded)





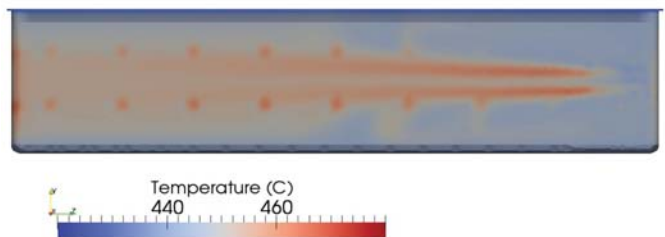
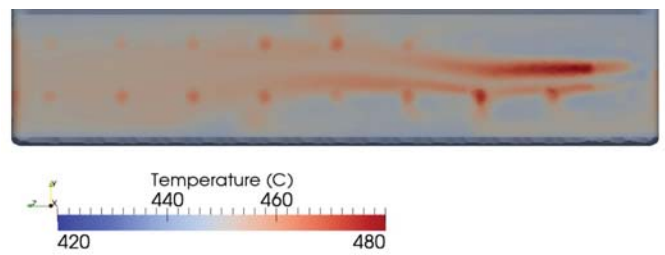
- velocities might greatly vary, but functioning is apparently constant
- velocity (as Blakey said) is not crucial for the reasons we think it is
- velocities and flows are influenced by position of flue exit
- props play a role (to be expanded)

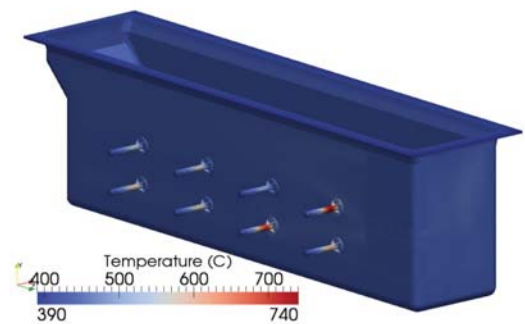
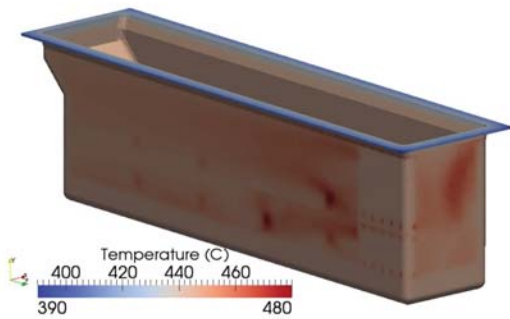
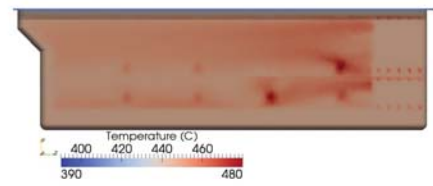
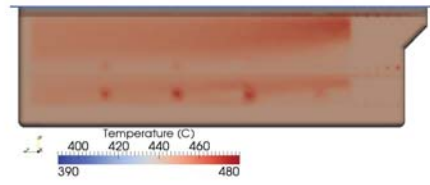
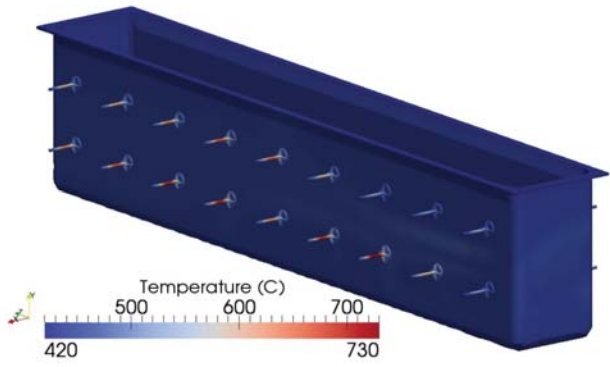


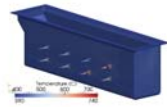
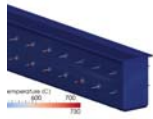
**TEMPERATURE:
OBSERVATIONS**



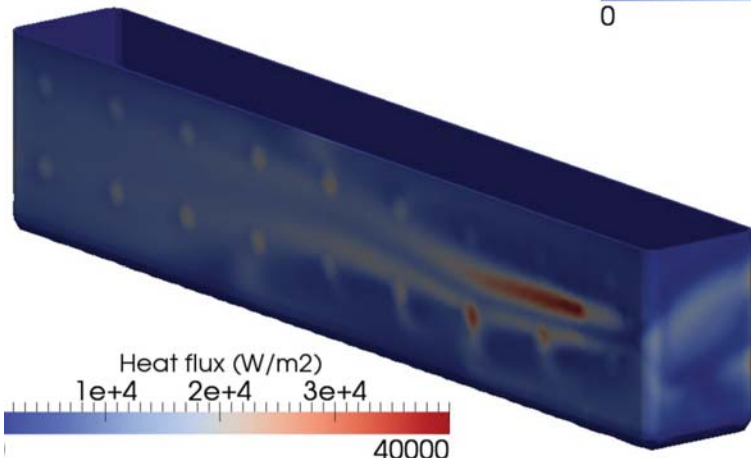
- temperature distribution is affected by spatial variables
- props certainly are of factor, necessary to compare layout
- when only one is also affected and this is interesting when using slant end thermocouple
- the dual flue exit concept is showing some expected results
- heat ability performs differently according to their design (to be expanded)





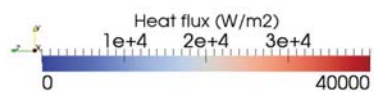


- temperature distribution is affected by spacial variables
- props certainly are a factor, contrary to common belief
- short ends are also affected and this is interesting when using short end thermocouples
- the dual chamber concept is showing some expected results
- heat shields perform differently according to their design (to be expanded!)

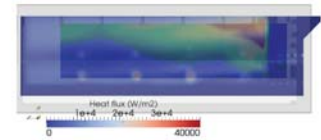
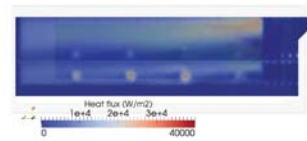
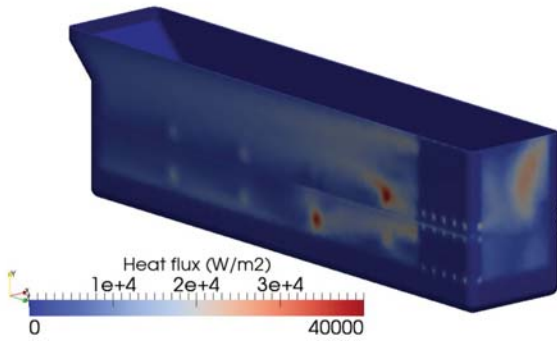
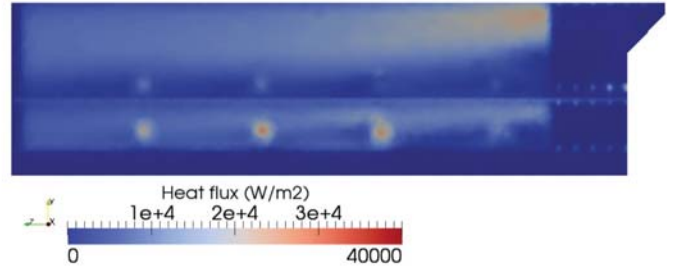
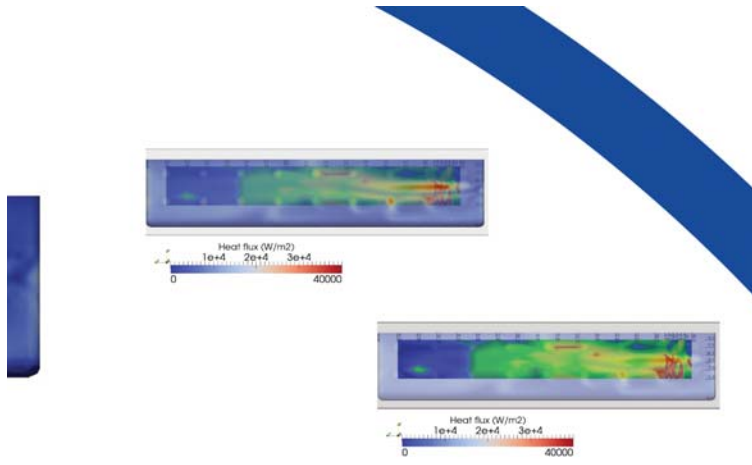


**HEAT FLOW :
OBSERVATIONS**

- obviously connected to local temperatures
- interesting data on heat shields
- good connection with KID results



- interesting w
- good connect



HEAT SHIELDS: OBSERVATIONS



CORBEC



GIMECO

SOME CONCLUSIONS

- the high velocity concept is far from having reached its best form
- the traditional way to look at high velocity needs to be thought over
- numerical simulation is a great tool in optimizing the technology
- engineering can still influence the concept a lot

