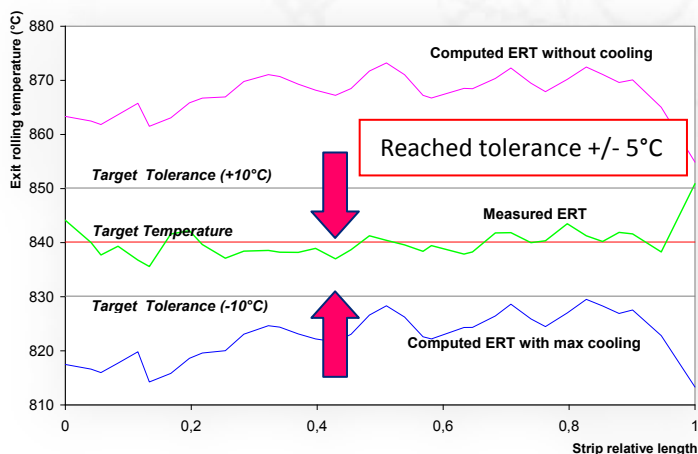
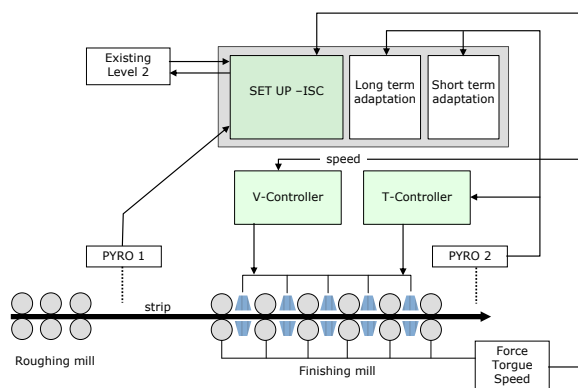


# Cooling Strategies and Temperature Control

Computer simulations and software solutions for temperature control of hot rolled flat and long products and rolls.

Hot strip mill Level 2 subsystem for on-line prediction of cooling strategies and control of the Inter Stand Cooling to reach target exit temperature as uniform as possible along strip length.



## References:

### HSM 2000mm Cherepovets, Russia

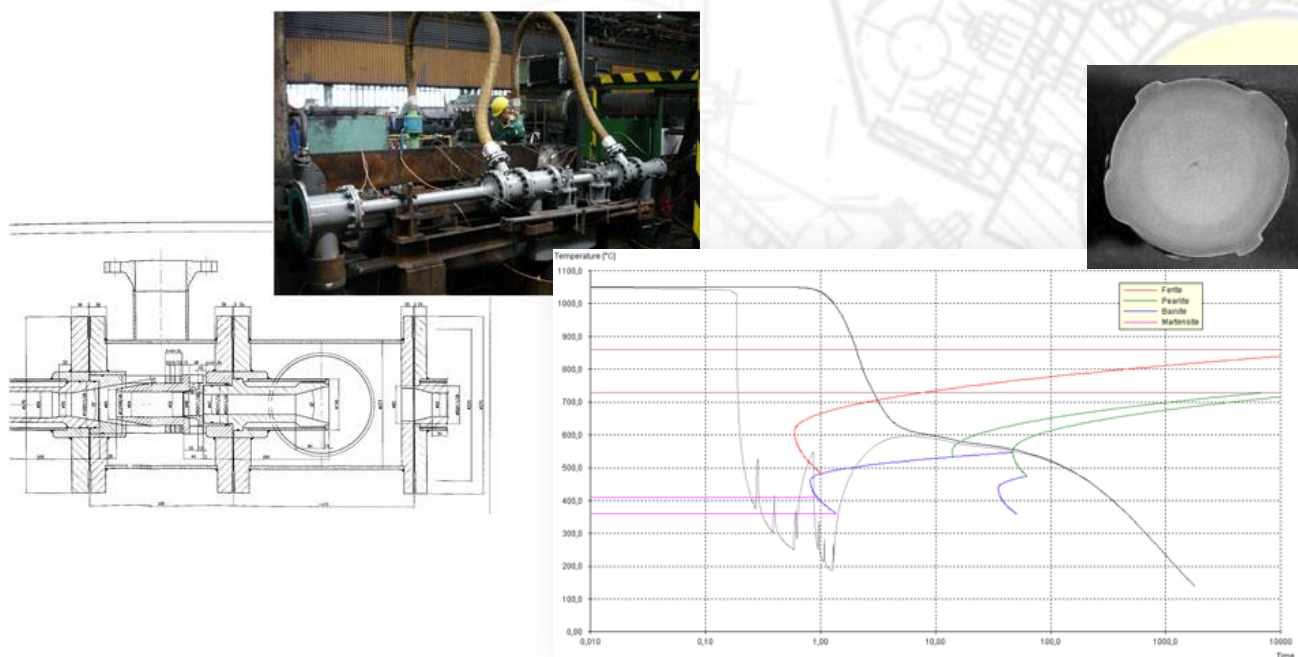
- ➡ thin strips (< 4 mm) - deviation  $\pm 7^{\circ}\text{C}$
- ➡ thick strips (> 10 mm) - deviation  $\pm 12^{\circ}\text{C}$
- ➡ increase of rolling speed - cca 30 %

### HSM 2000mm Arcelor Mittal Vanderbijlpark, South Africa

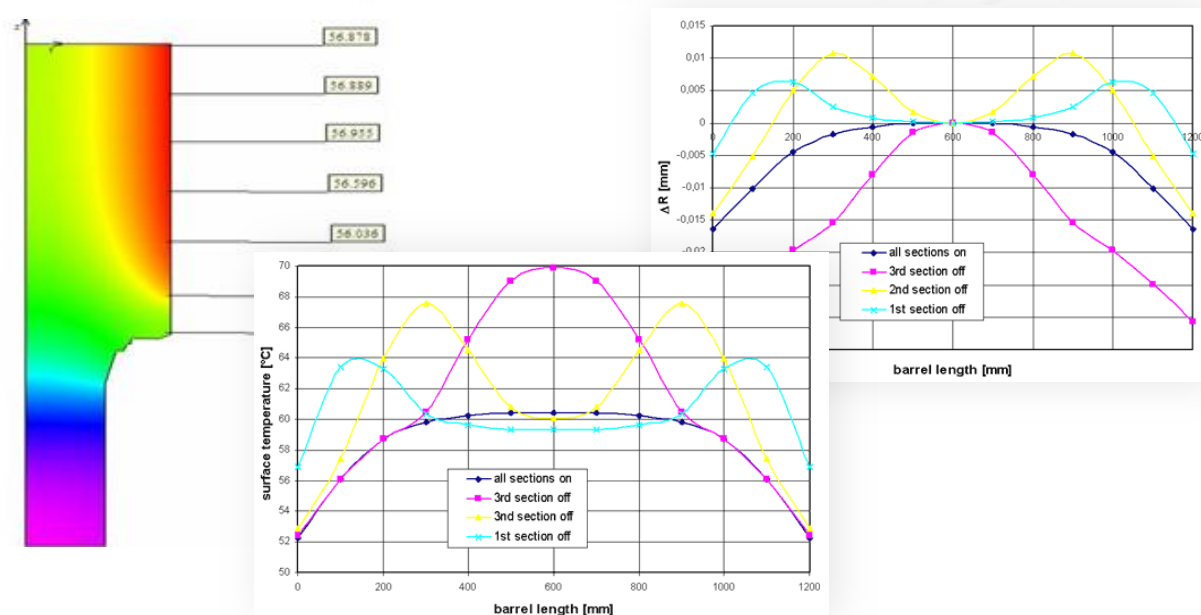
- ➡ deviation  $\pm 10^{\circ}\text{C}$  on the 95% of the strip length



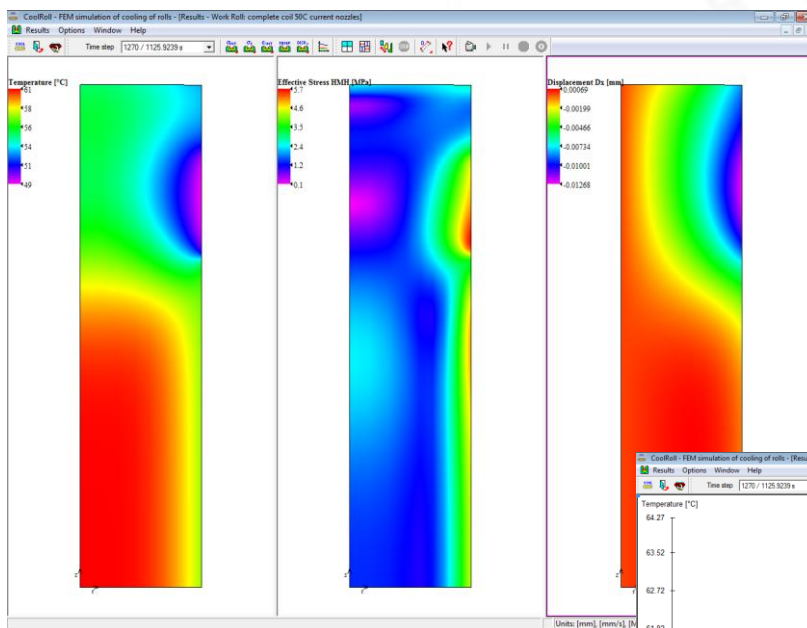
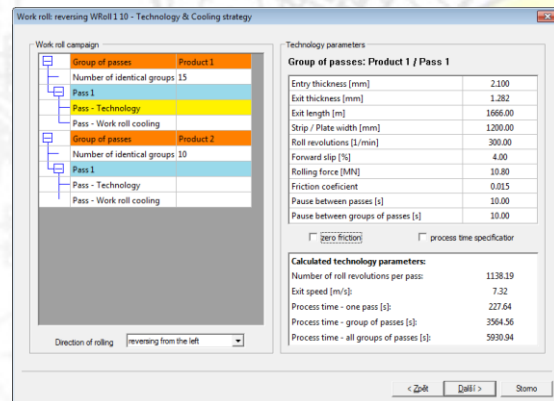
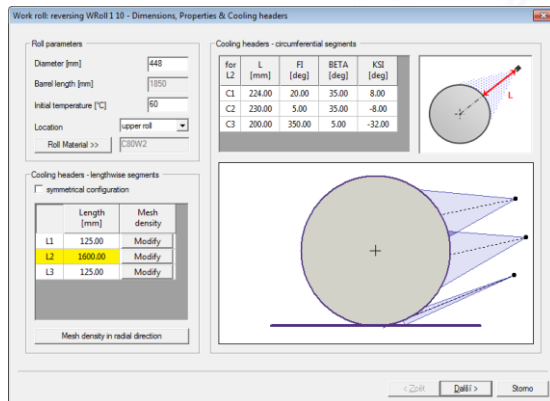
## Design of technology of final cooling of hot rolled reinforcing bars



## Design of sectional cooling of work rolls to reach target strip profile



## **CoolRoll** – FEM based off-line software for computer simulation of cooling of work rolls



### CoolRoll model features

- ➡ fully automatic creation of the FEM model
- ➡ work roll is divided into lengthwise segments
- ➡ each lengthwise segment has its own circumferential distribution of nozzles
- ➡ editor of the roll campaign

### Results of computer simulation

- ➡ temperature profiles across the work roll in specified times
- ➡ time - temperature curves in specified points of the work roll
- ➡ thermal camber of the work roll
- ➡ thermal elastic stresses and strains

