

02 luglio 2015

Workshop

## IL VALORE AGGIUNTO DELLA SIMULAZIONE PER L'INDUSTRIA

" Tecniche di simulazione e progettazione per prevedere, garantire e mantenere le performance dei prodotti "



Luciano Moro

# Introduzione



Luciano Moro  
Analisi termo-meccaniche: simulazioni agli elementi finiti

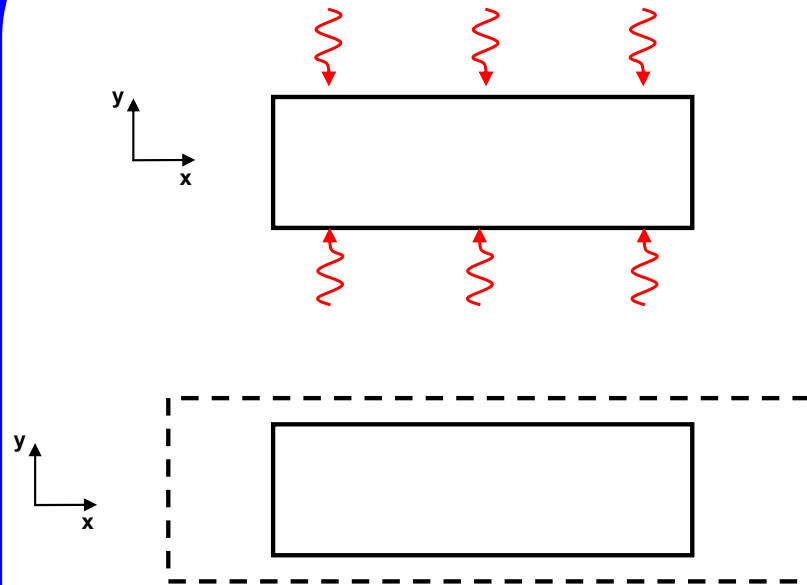
# Introduzione



Luciano Moro  
Analisi termo-meccaniche: simulazioni agli elementi finiti

# Modelli analitici

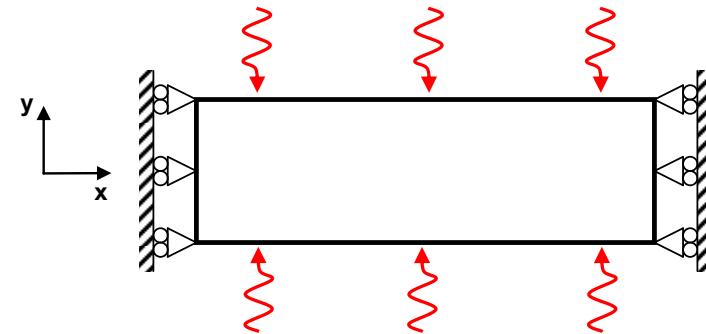
## Espansione libera



$$\Delta T = T_f - T_i$$

Allungamento:  $\alpha \Delta T l$

## Espansione vincolata

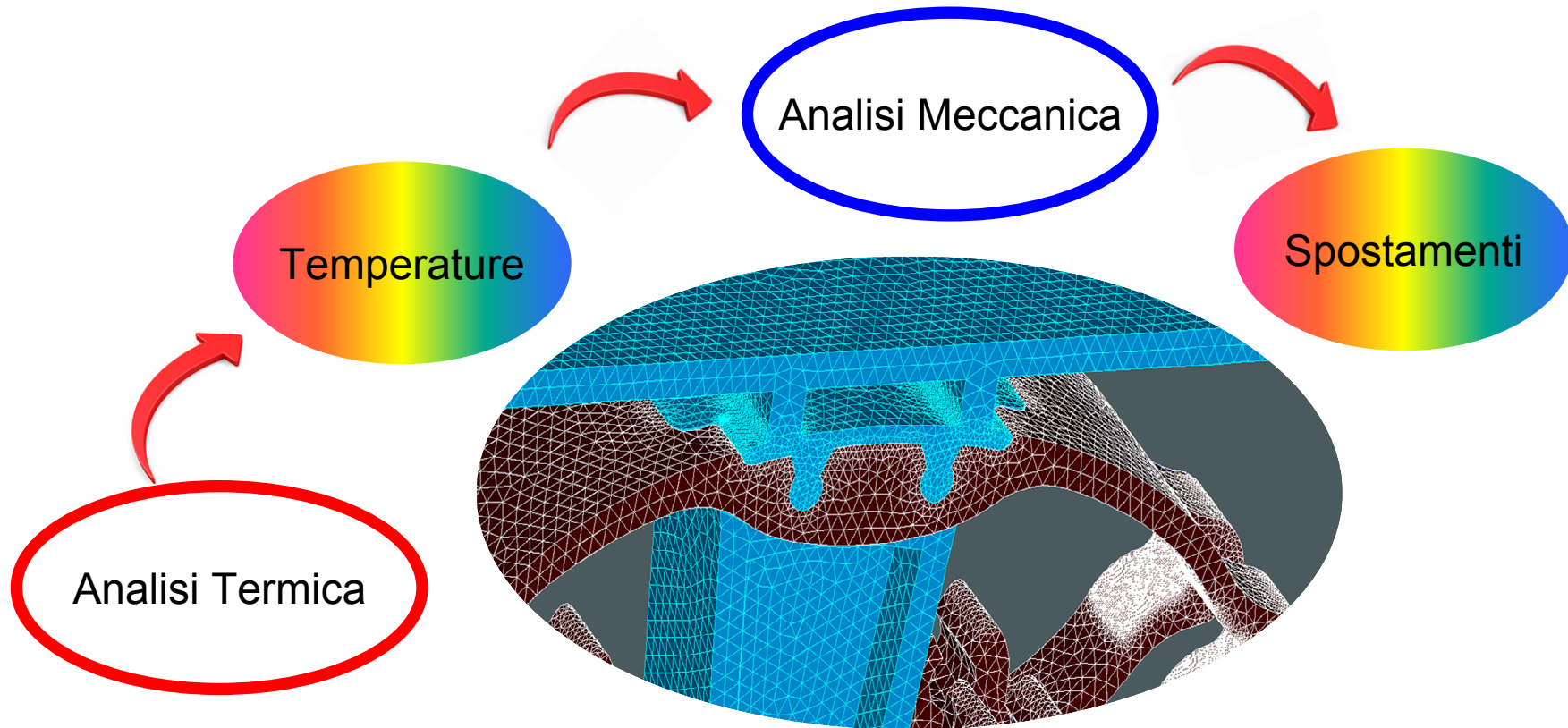


$$\varepsilon_{tot} = \varepsilon_{mec} + \varepsilon_{th} = 0$$

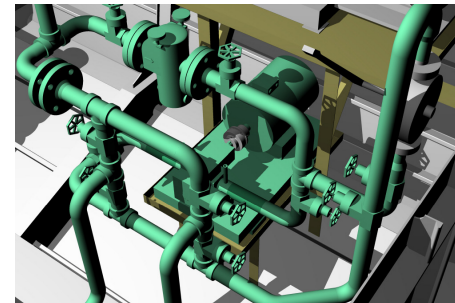
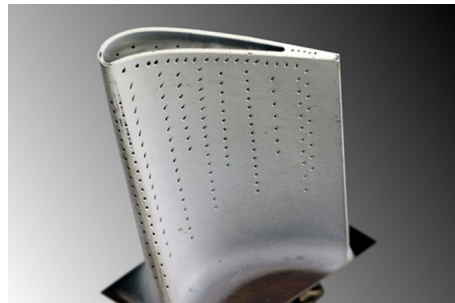
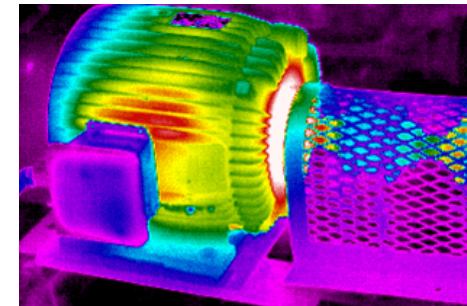
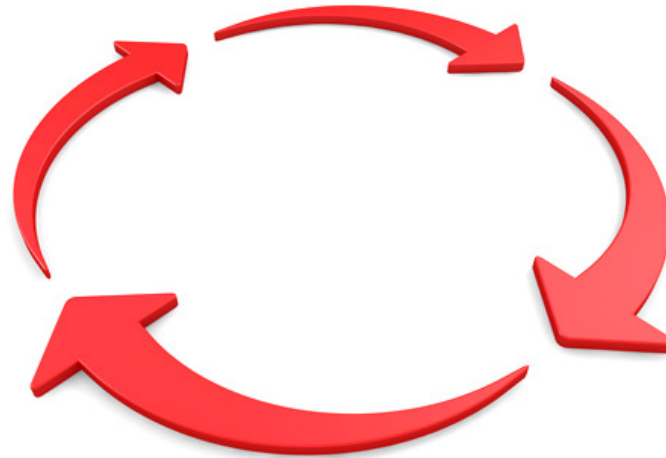
$$-\varepsilon_{th} = -\alpha \Delta T = \varepsilon_{mec} = \varepsilon_{el} + \varepsilon_{pl}$$

$$\sigma_x = E \varepsilon_{mec} = -E \alpha \Delta T$$

# Modellazione a Elementi Finiti

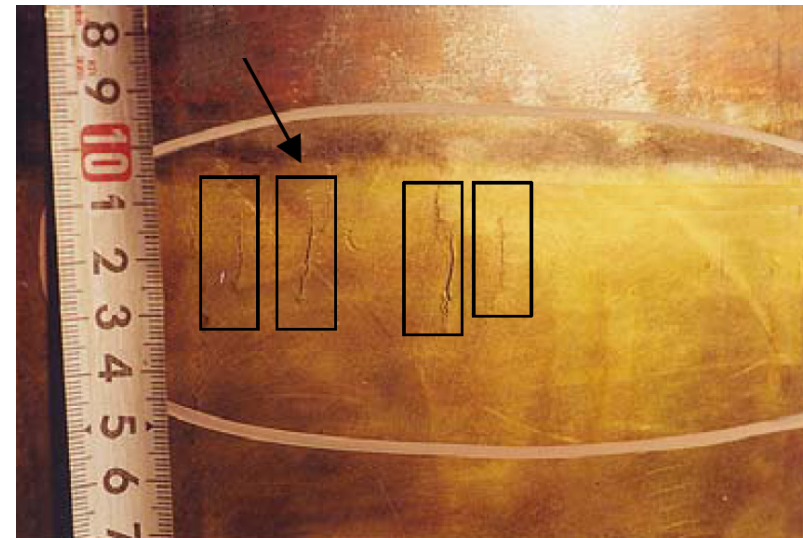
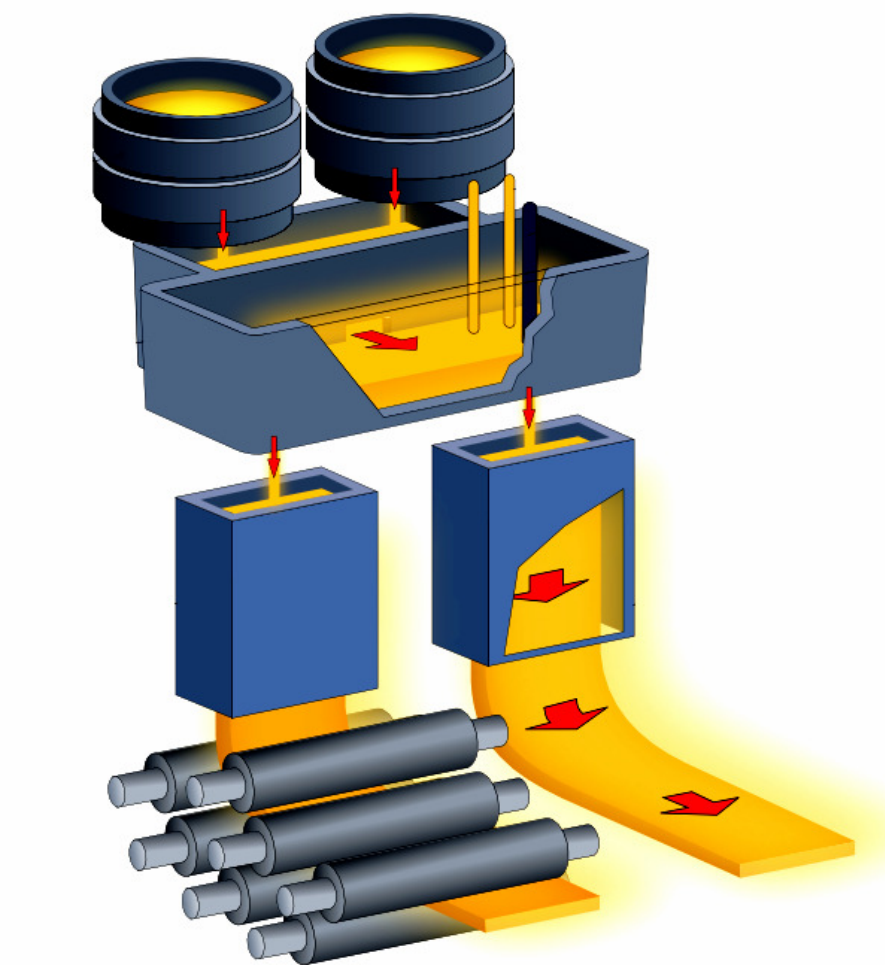


# Ambiti di applicazione



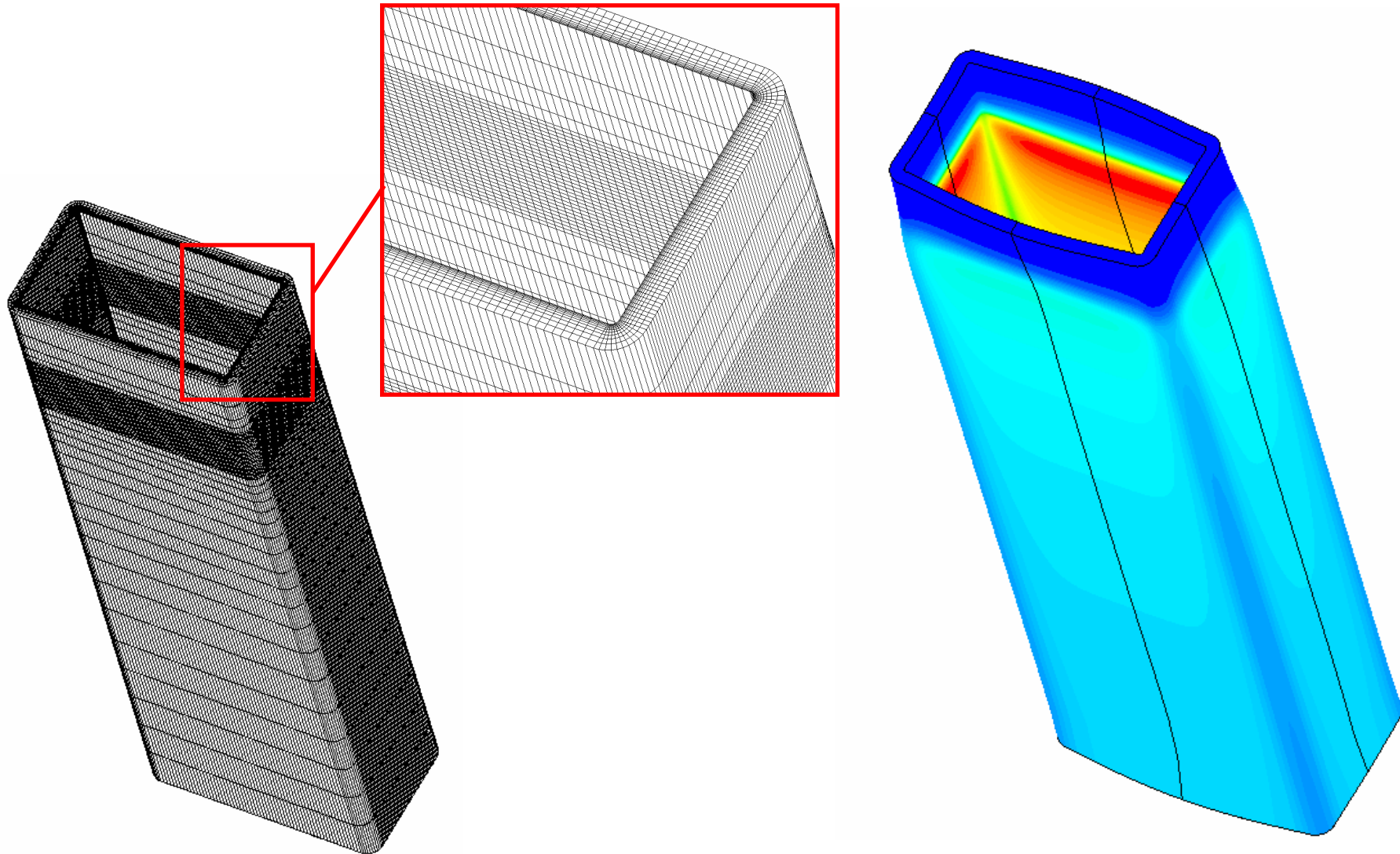
Luciano Moro  
Analisi termo-meccaniche: simulazioni agli elementi finiti

# Applicazione #1



Yoon, U.-S., J.-K. Park, B.G. Thomas, and I.V. Samarasekera  
85th Steelmaking Conference Proceedings, 2002.

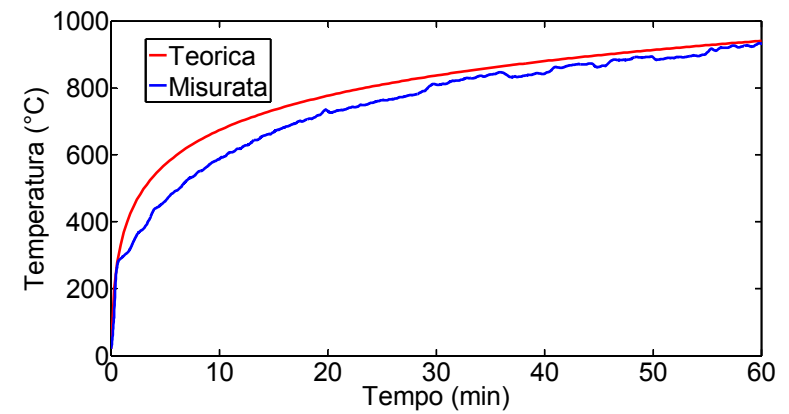
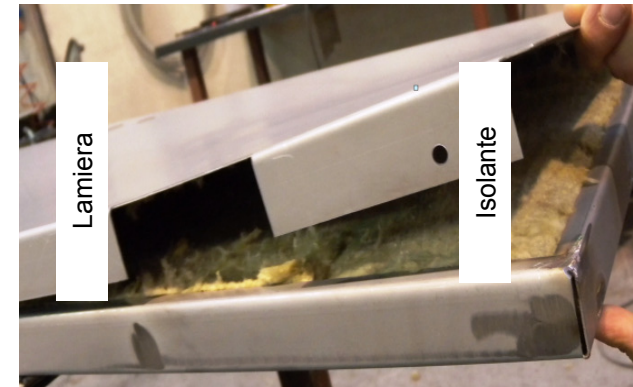
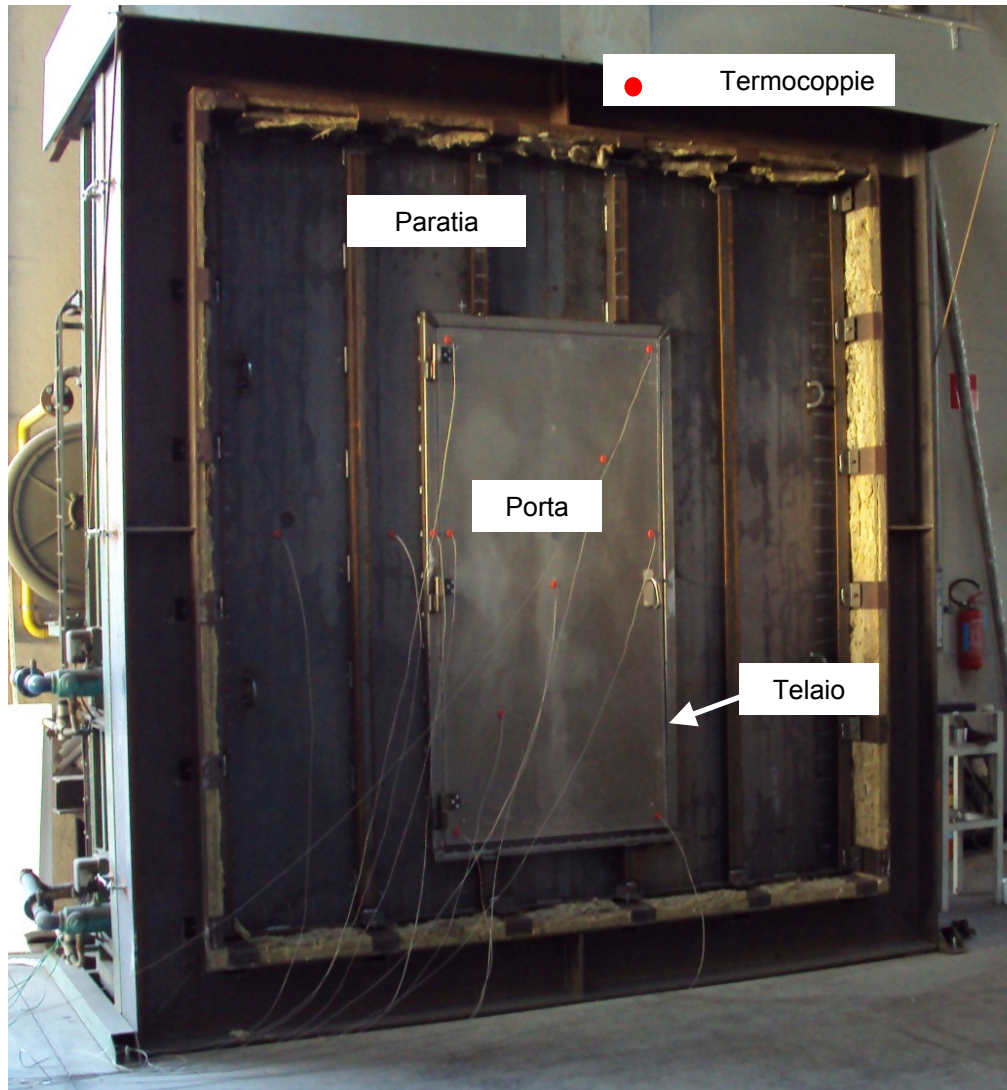
# Applicazione #1



Luciano Moro  
Analisi termo-meccaniche: simulazioni agli elementi finiti

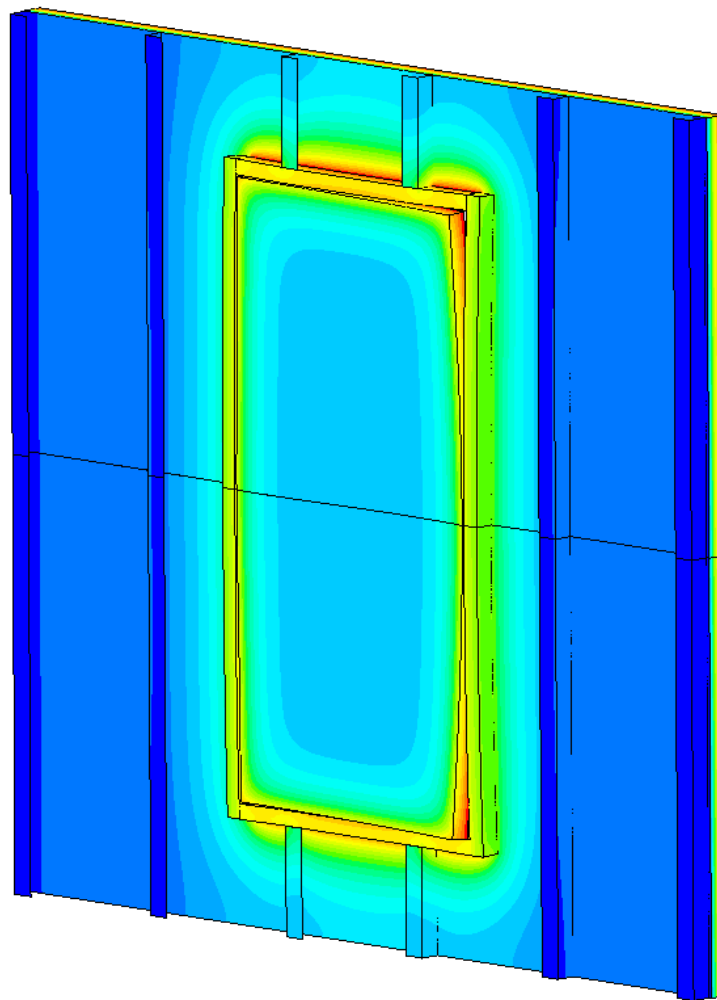
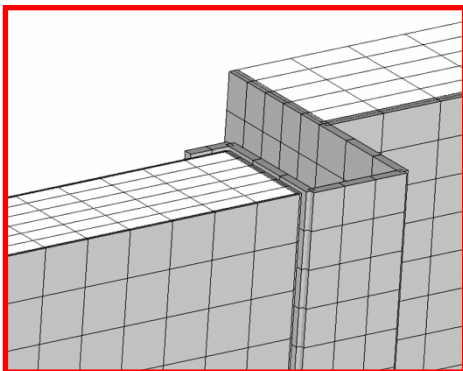
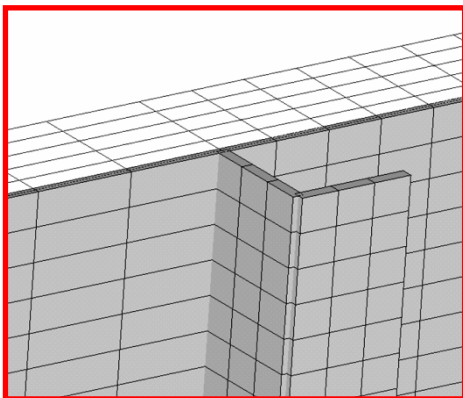


# Applicazione #2

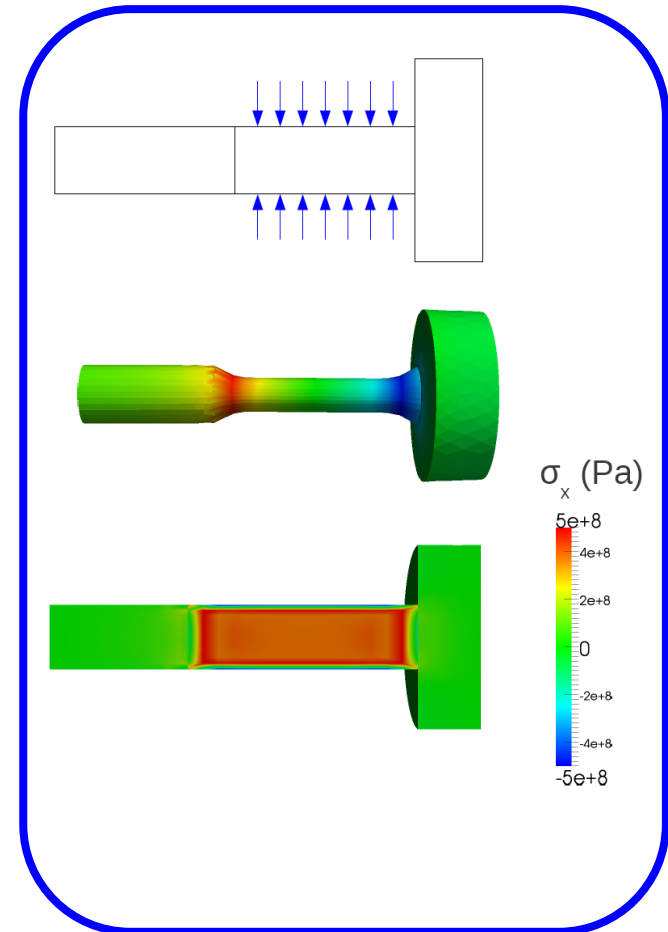
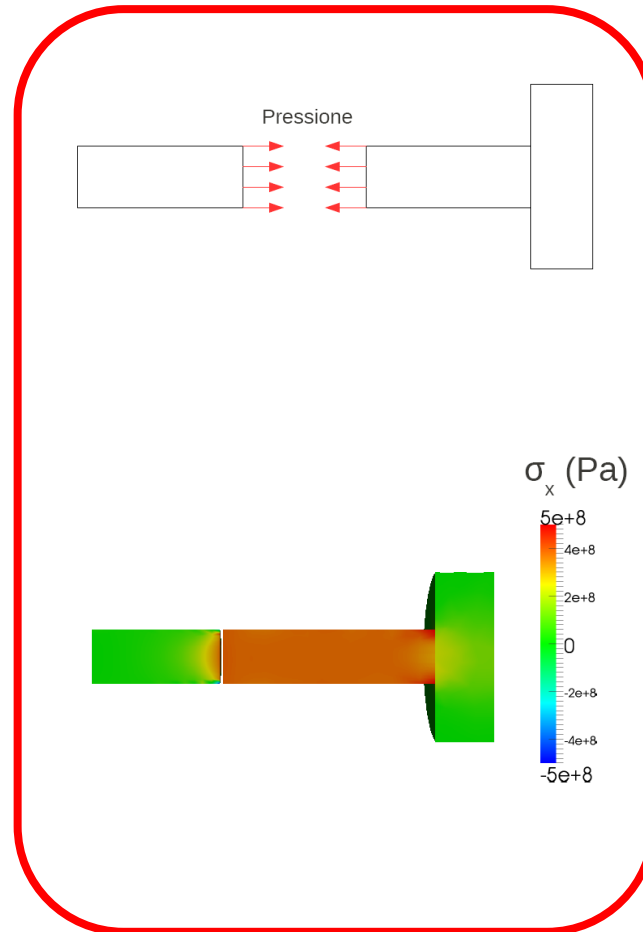


Luciano Moro  
Analisi termo-meccaniche: simulazioni agli elementi finiti

## Applicazione #2



# Applicazione #3



Grazie per l'attenzione



[www.gekoengineering.it](http://www.gekoengineering.it)  
[moro@gekoengineering.it](mailto:moro@gekoengineering.it)