Thermoflux Technologies SA

A Groupe MAPE company

On-line cure monitoring of composite parts without direct contact in real production environment.

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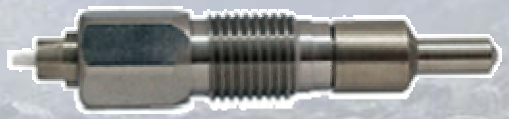
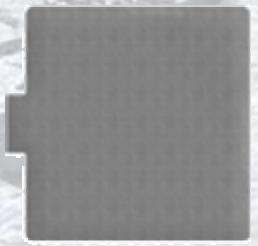
Thermoflux Technologies SA

- Technological breakthrough in thermal measurements : direct heat flux measurements.
- Specialized in process monitoring and engineering solutions for process control
- Distributed by Hy-Line Sensor Tec in Germany.

HY-LINE® SENSOR-TEC

Elektronische Bauelemente und Systeme

Heat flux measurements

- Heat flux is the thermal power exchanged between 2 media at different temperatures measured in W/m²
- In most cases, this information is more sensitive than the temperature itself. This allows measurements without direct contact with the reactive material.
  - Tfx-144 for metallic tool applications 
  - Tfx-161 for composite tools and thin walls 
  - Tfx-Aeroflux for applications with convection 

Main interests

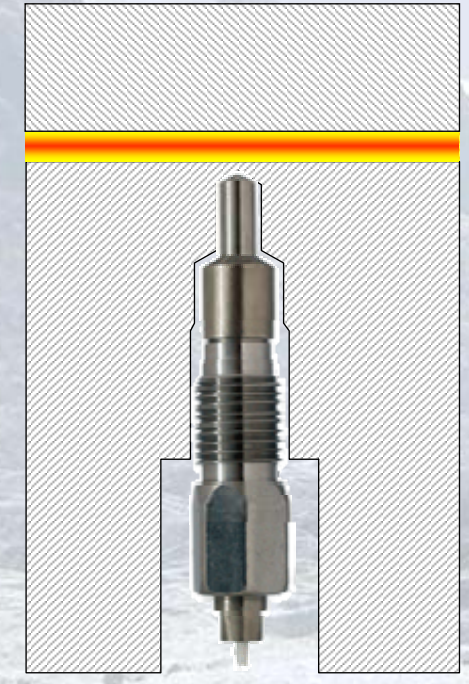
- Real-time cure monitoring made possible without the disadvantages of direct contact sensors
- Ensure quality and repeatability controls in subcontracting businesses
- Introducing real-time process control (intelligent feedback signals)

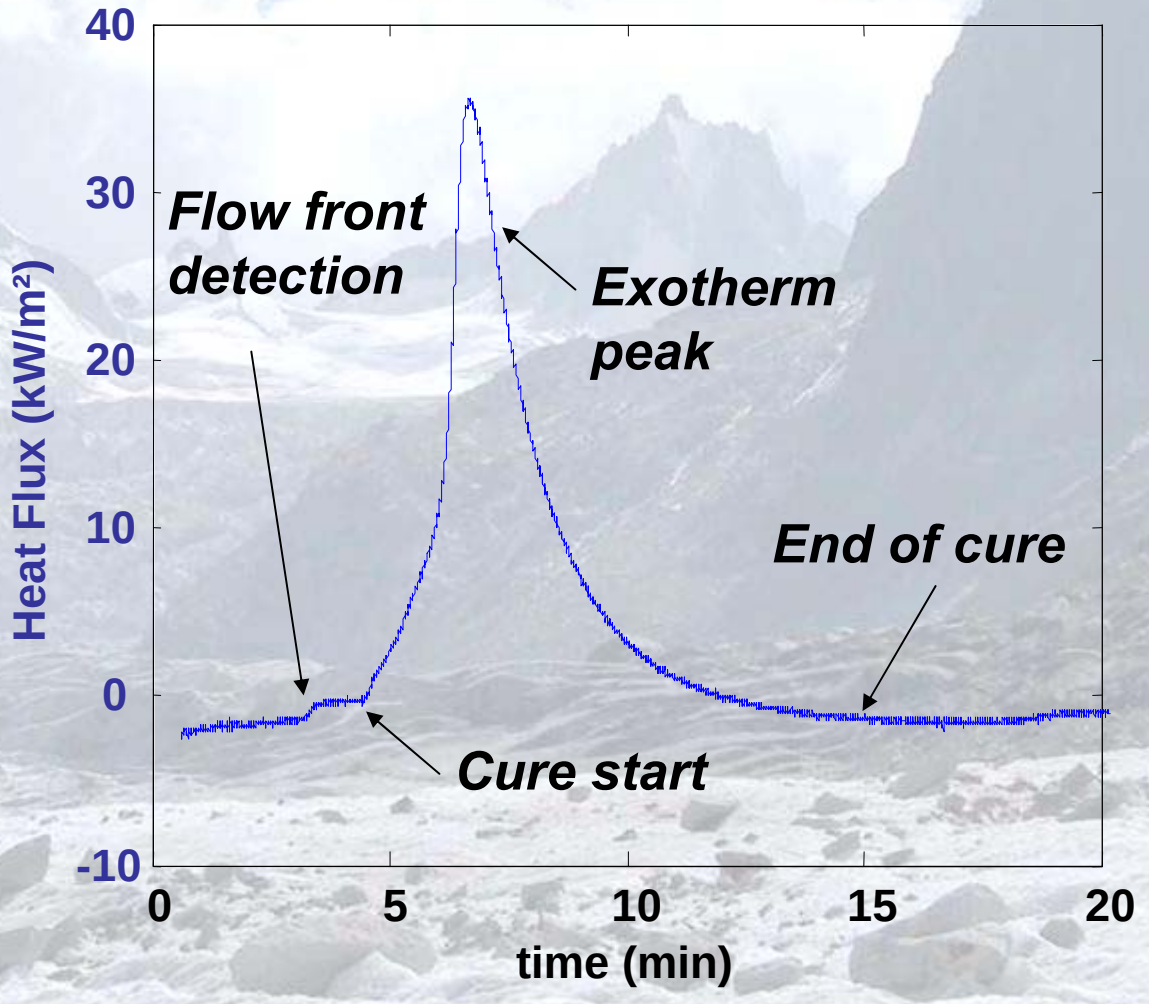
Applications examples

- RTM
  - Typical measurements
  - Applications
- Autoclave & prepreg

RTM

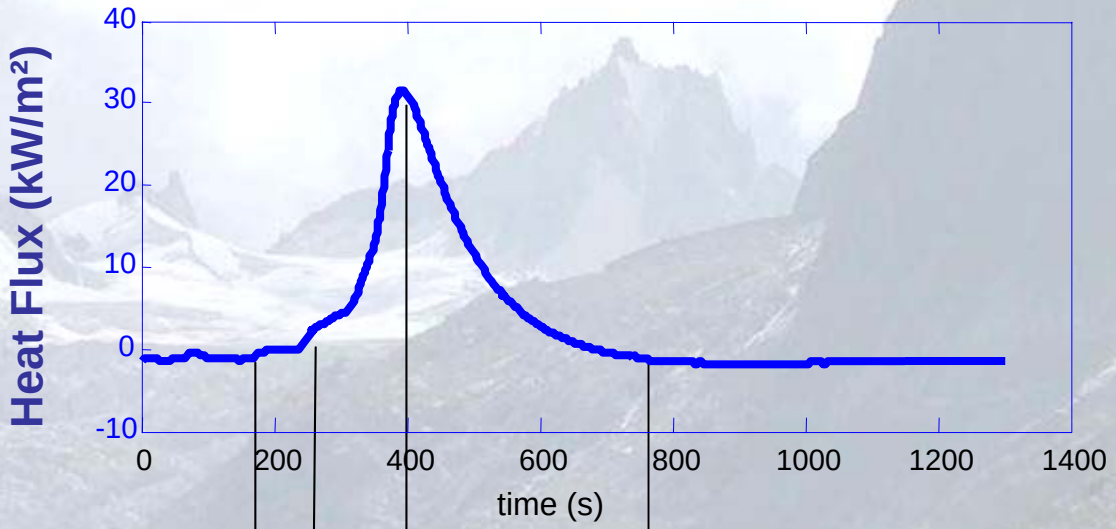
Typical measurement





RTM – Application - 1

Embedded programmable output in order to automatically feedback the process

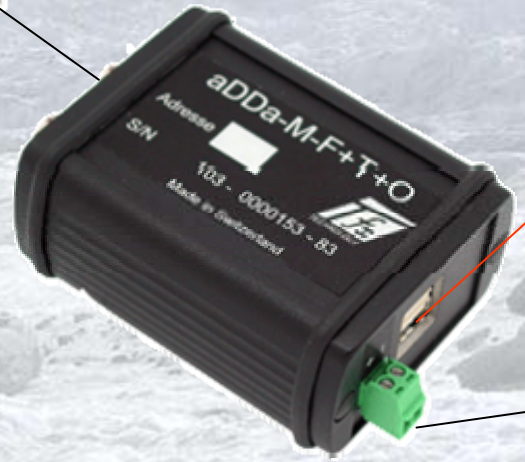


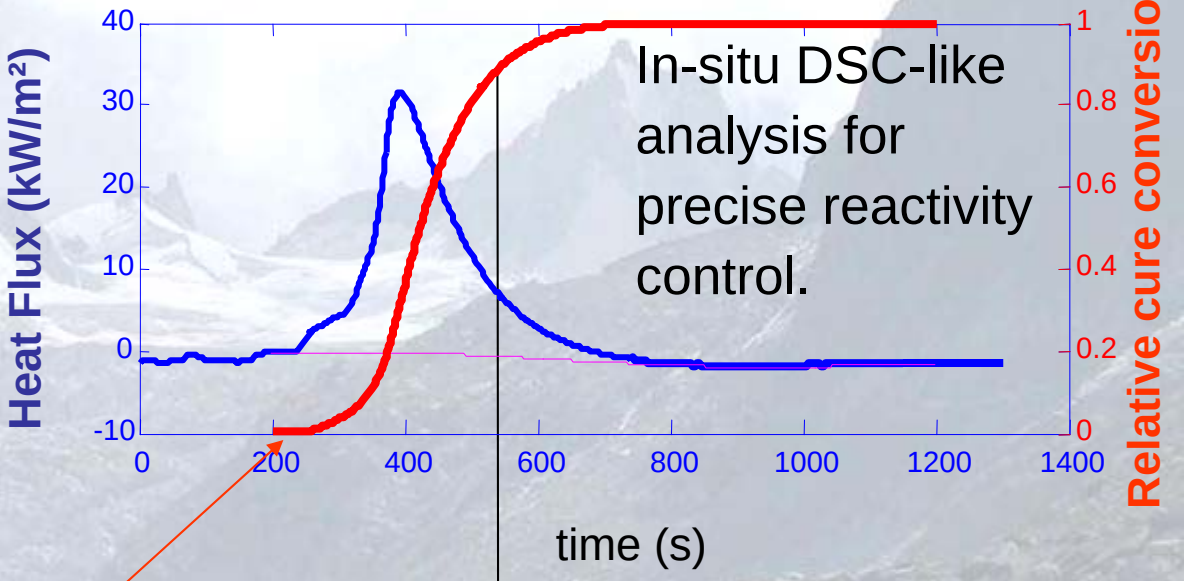
Different possibilities :

- Flow front
- Reaction start
- Reaction peak
- End of cure

RTM – Application - 2

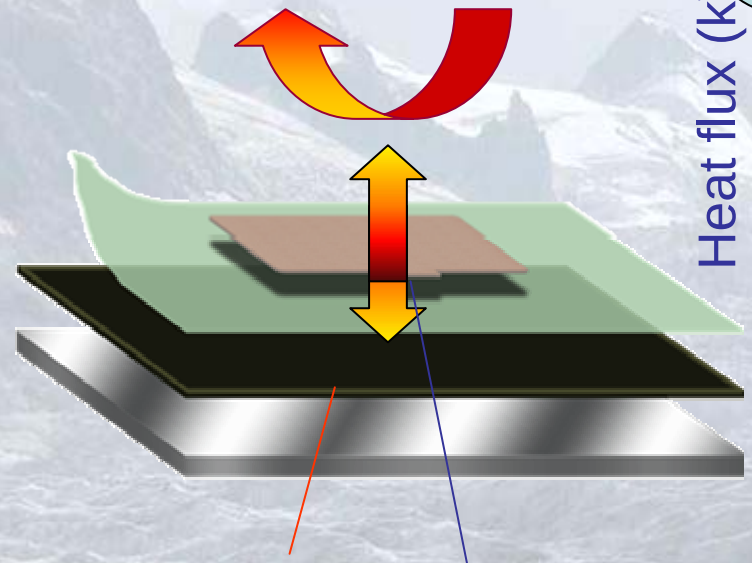
Real-time relative conversion monitoring





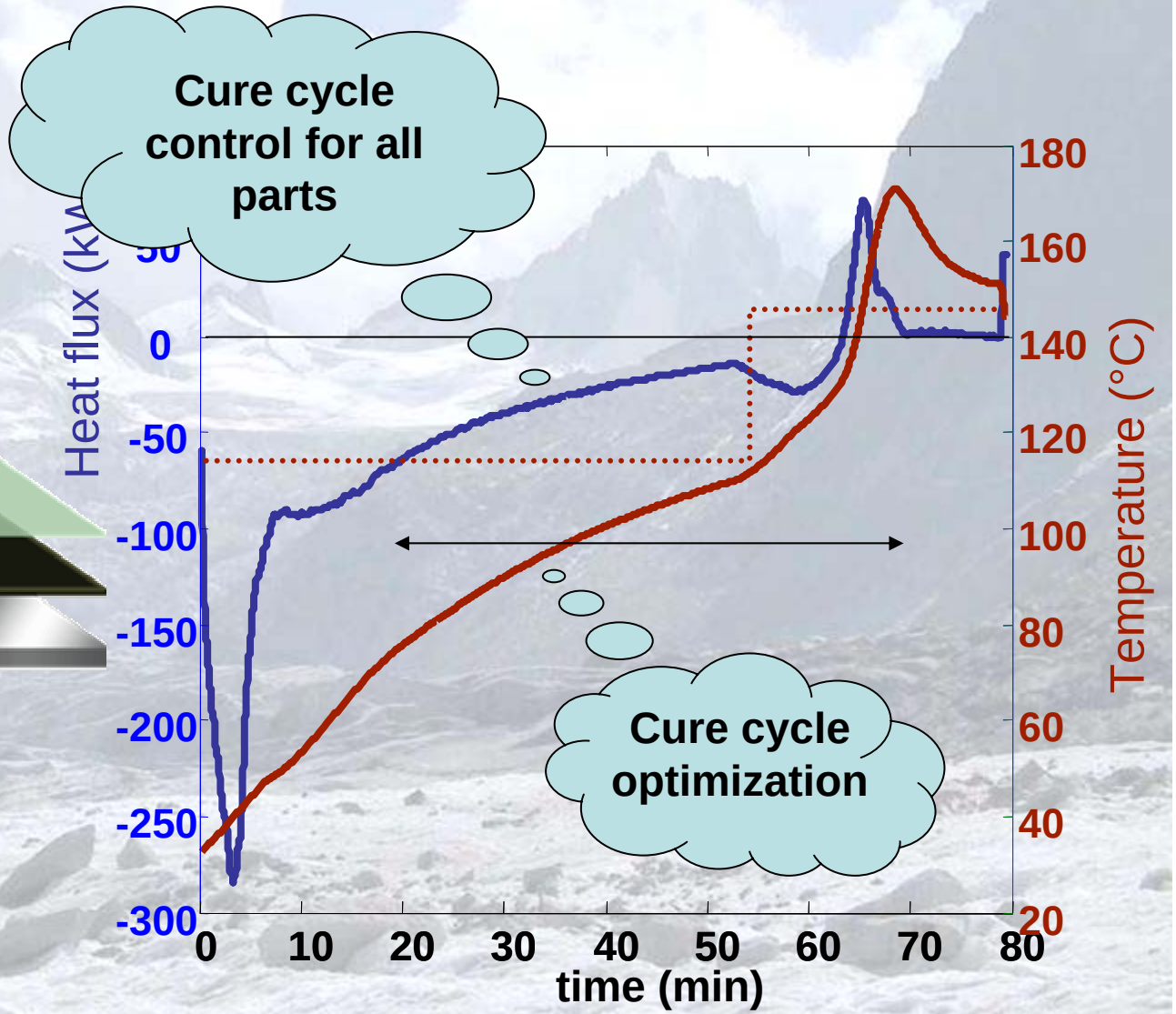
Real-time cure level detection

Autoclave – prepreg cure



Thermocouple

Tfx-Aeroflux sensor



Conclusion

Thermoflux Technologies provides :

- Real-time cure monitoring without direct contact
- Traceability without traces on the parts
- Fast optimization of cure cycles
- Efficient real-time control of processes
- For :
  - **Applied studies**
  - **Productivity increase**
  - **Quality management**

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Thank you for your attention