spare project – improvement of continuous compression moulding process for the production of thermoplastic composite beams

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ORGANIZZATION

Applied research, experimental development and technology transfer in the field of **advanced materials**, **ICT** and **product development**.

105 Research projects

20 Advanced Education Projects

930 Service Contracts

ORGANIZZATION

S.S. 7 Appia – Km 706+030 – 72100 Brindisi
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65 Employees: Researchers, engineers, designer & manager

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2. 3D printers, prototyping, ergonomics
3. Electronics and robotics
4. Visual Tech Lab
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8. Composite lamination
9. Composite welding
10. Smart Materials and Structural Monitoring
11. Building materials
12. Molding of polymers and composites
13. Physical thermal analysis
14. Chemical Analysis
15. Mechanical characterization

CONTENTS

- ❑ spare project
- ❑ Background
- ❑ Improvement of CCM process
- ❑ Next steps
- ❑ Conclusion

SPARE PROJECT

Full scale innovative composite pax and cargo floor grids for regional Aircraft Fuselage barrel on ground demonstrators

- Manufacturing of 2 full shipsets of pax and cargo floor grids
- Use of thermoplastic resin reinforced with carbon fiber.
- Manufactoring technologies with a lot of potential for automation

weight saving + recurring cost reduction.

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Topic Manager

Project Coordinator

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BACKGROUND

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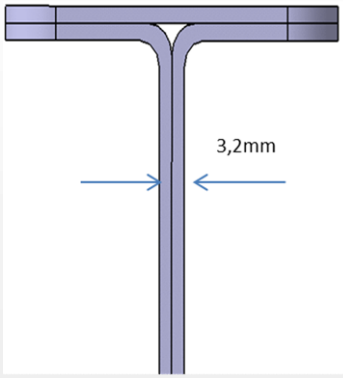
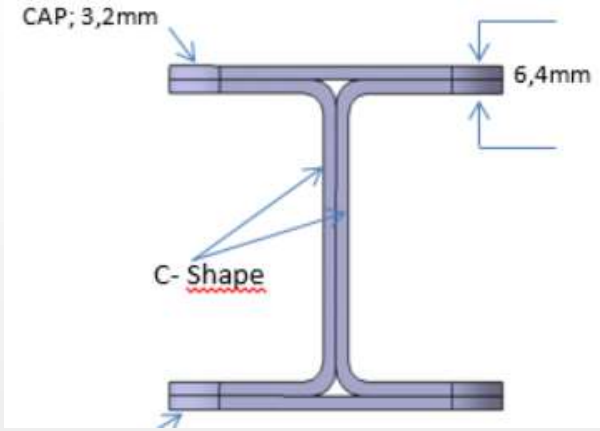
Induction Welding

- high degree of automation
- high control of process parameters
- low plant costs





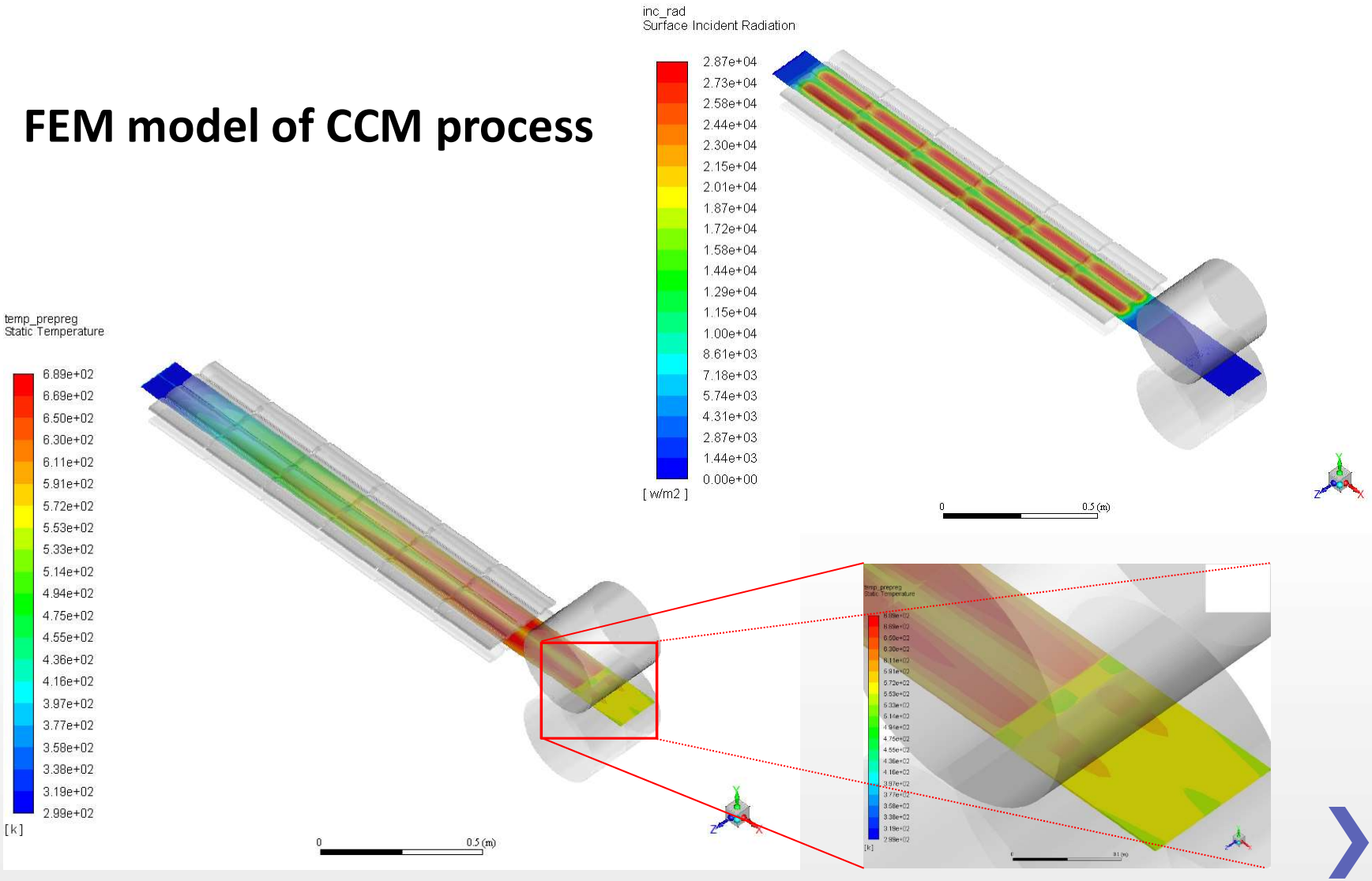
IMPROVEMENT OF CCM PROCESS

Limits of the CCM process

- ❑ Unknown temperature on material
- ❑ The weight of the process parameters on the temperature is unknown
- ❑ Uncertainty about product quality

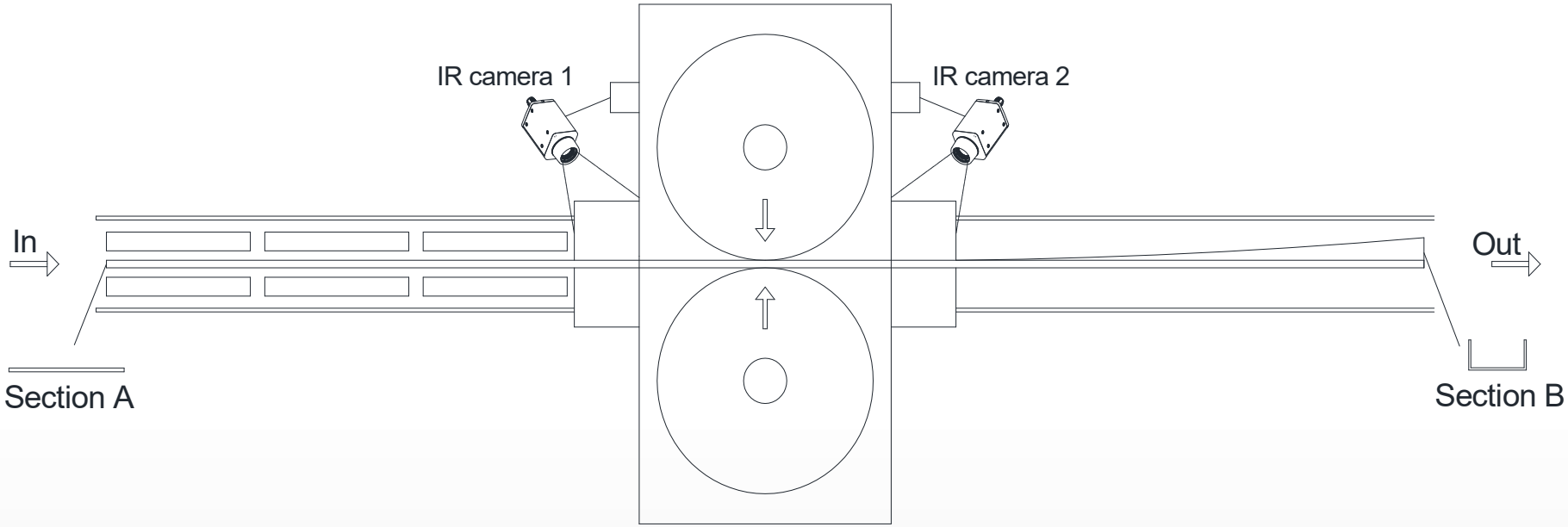
IMPROVEMENT OF CCM PROCESS

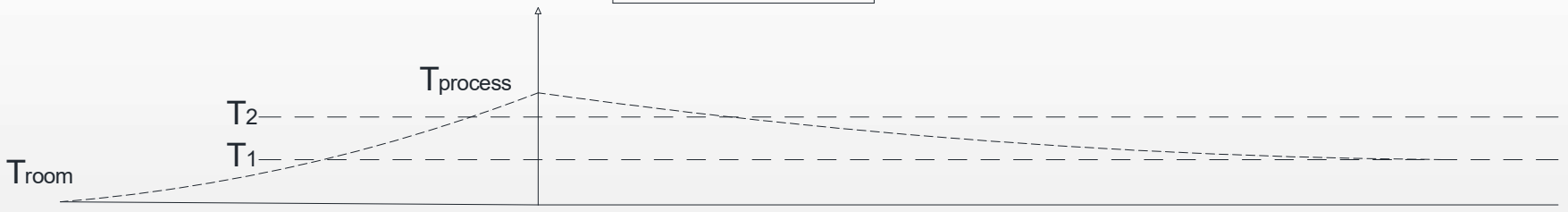
FEM model of CCM process



IMPROVEMENT OF CCM PROCESS

IRT monitoring system





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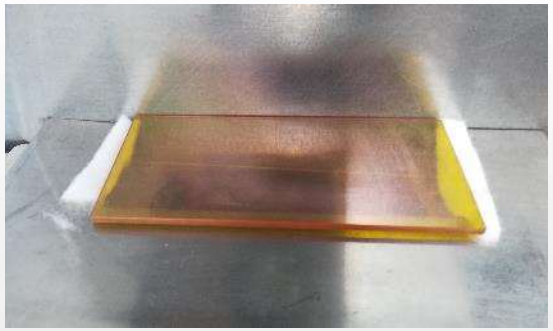

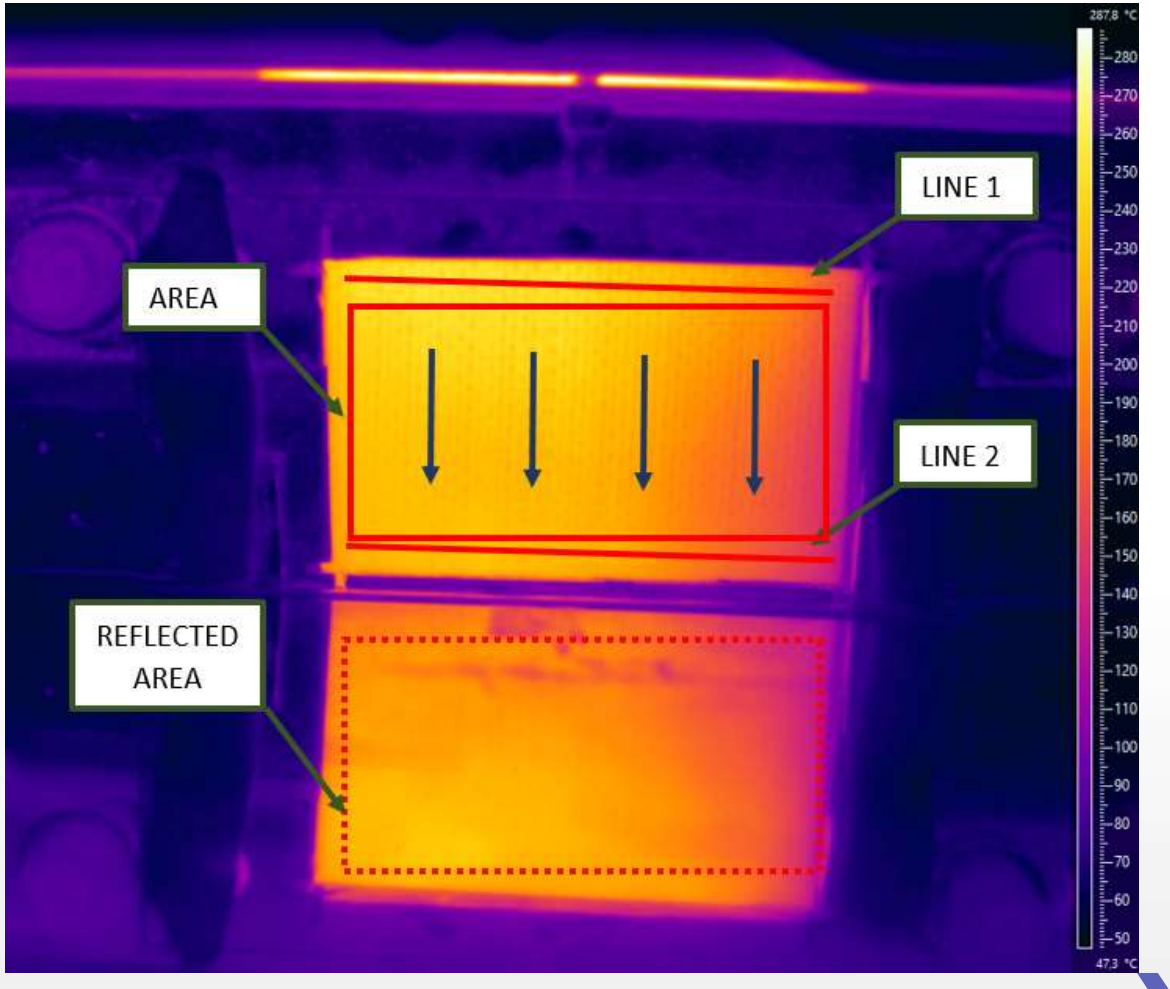

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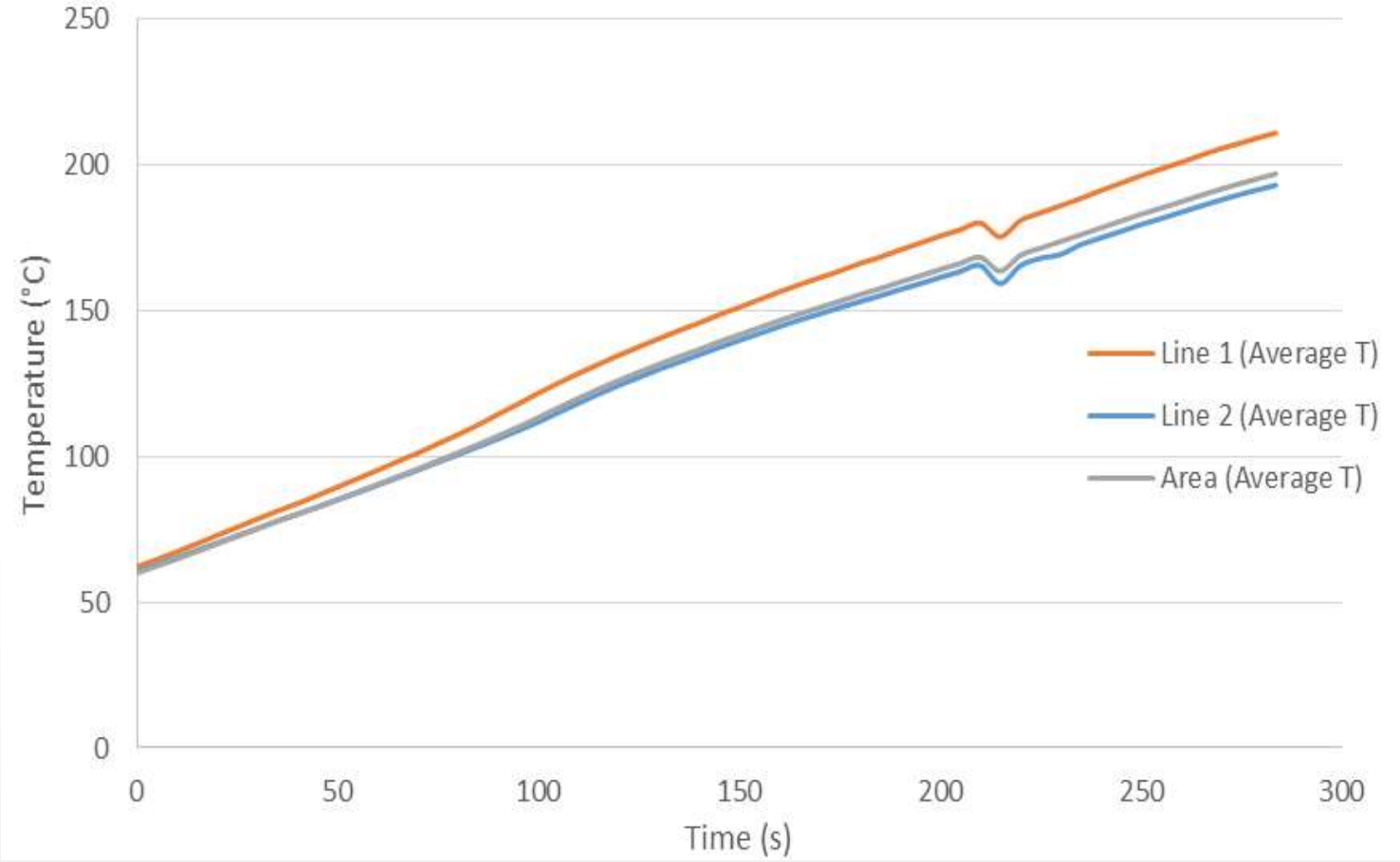
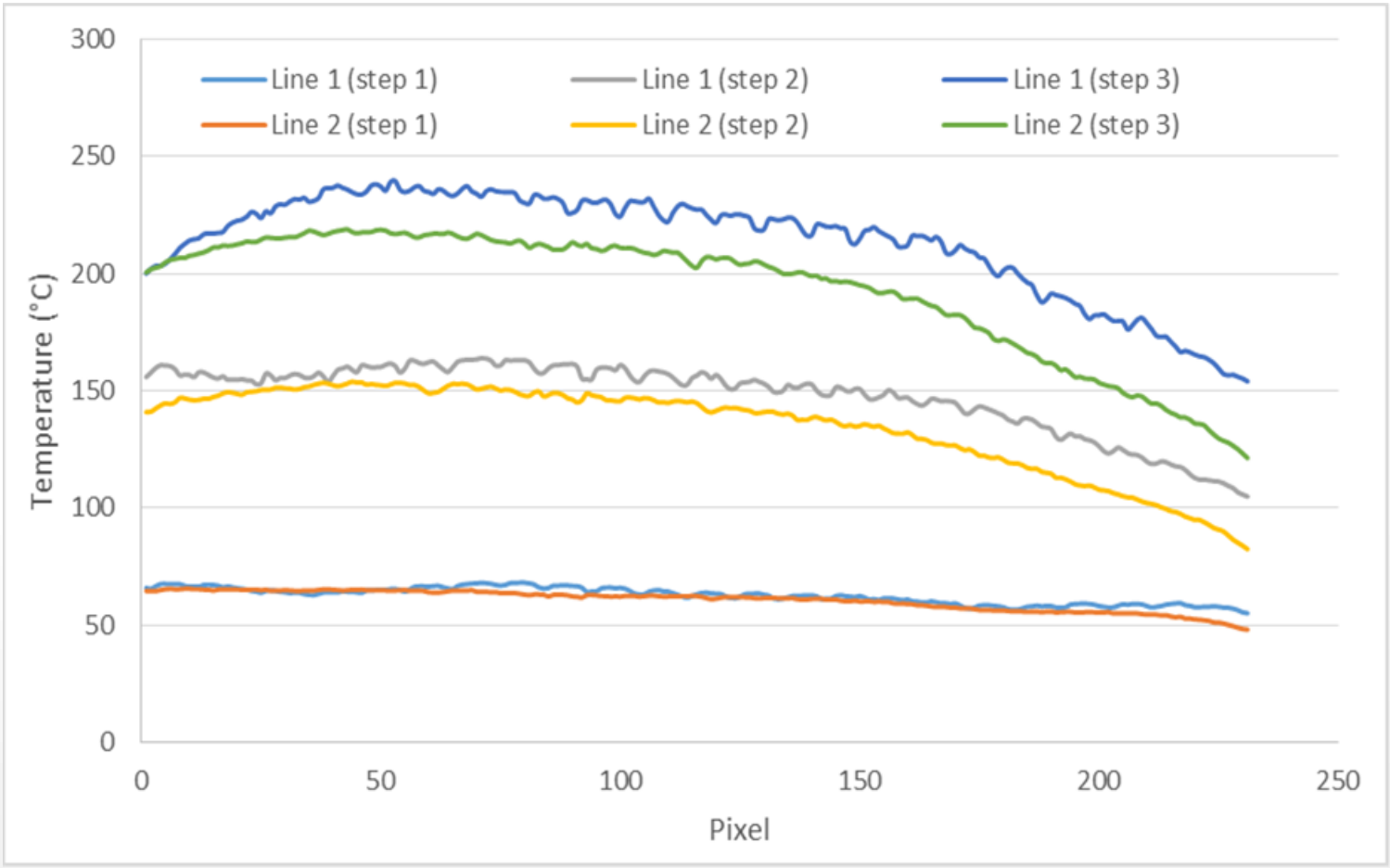


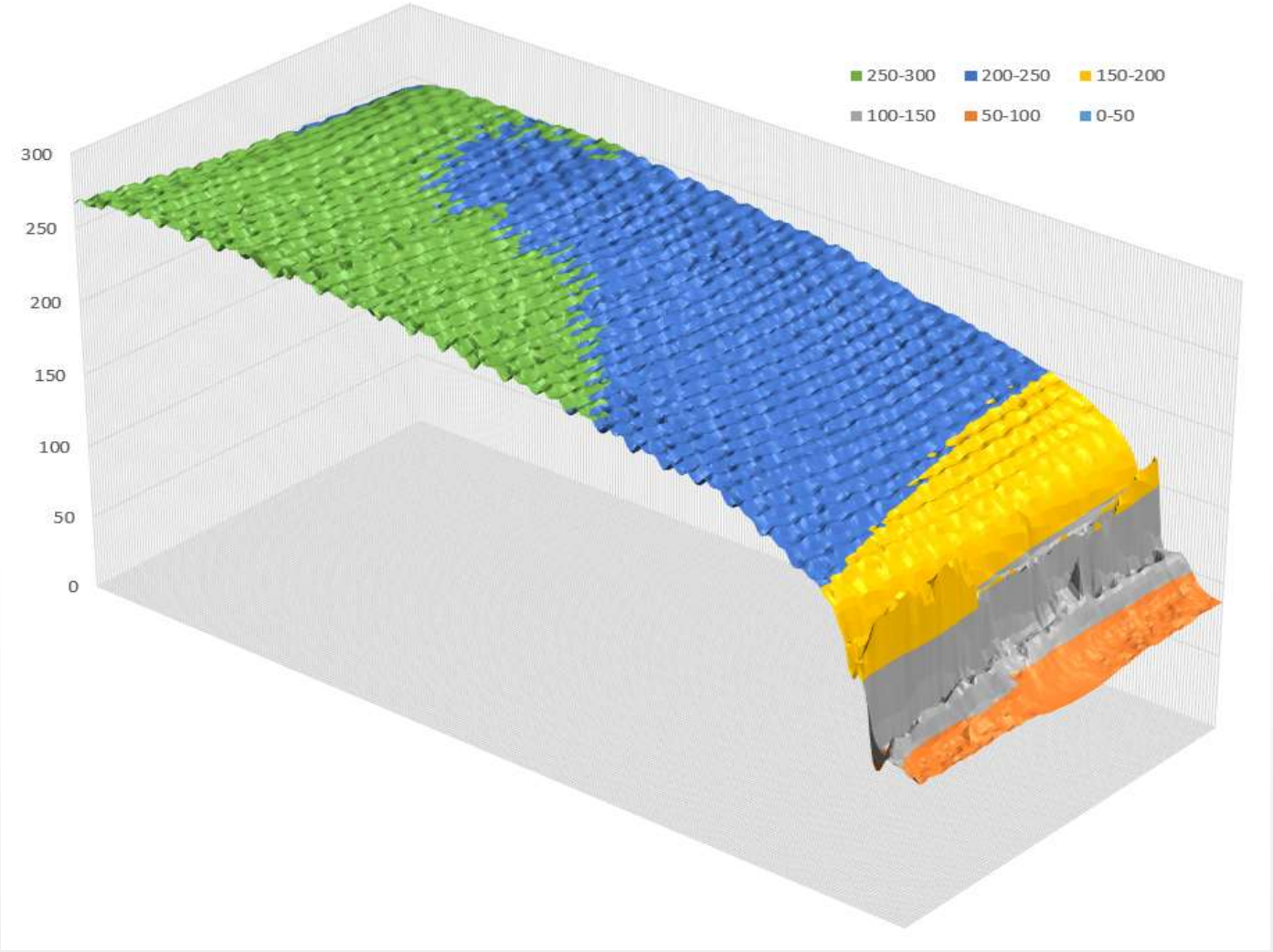
Warm-up step

IMPROVEMENT OF CCM PROCESS



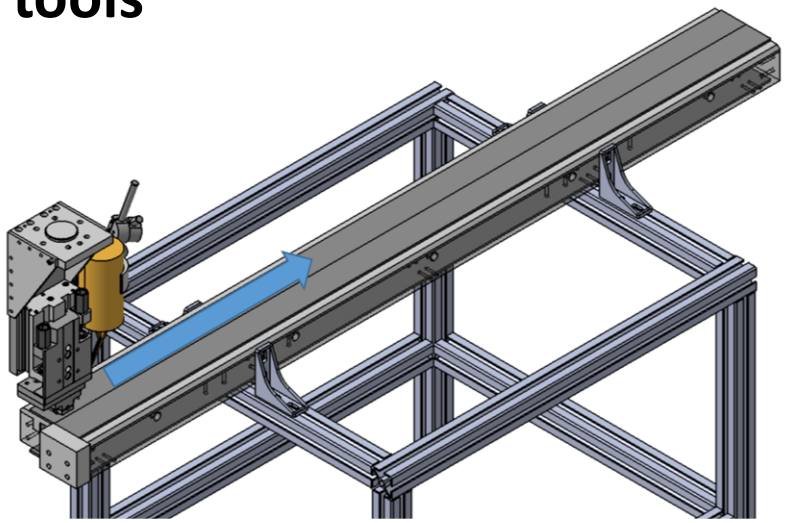
Temperature profiles for 3 different steps

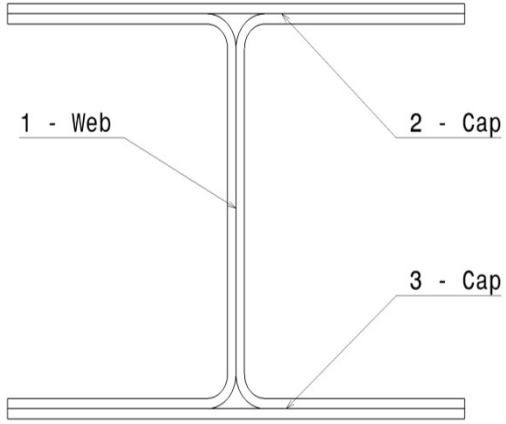
IMPROVEMENT OF CCM PROCESS

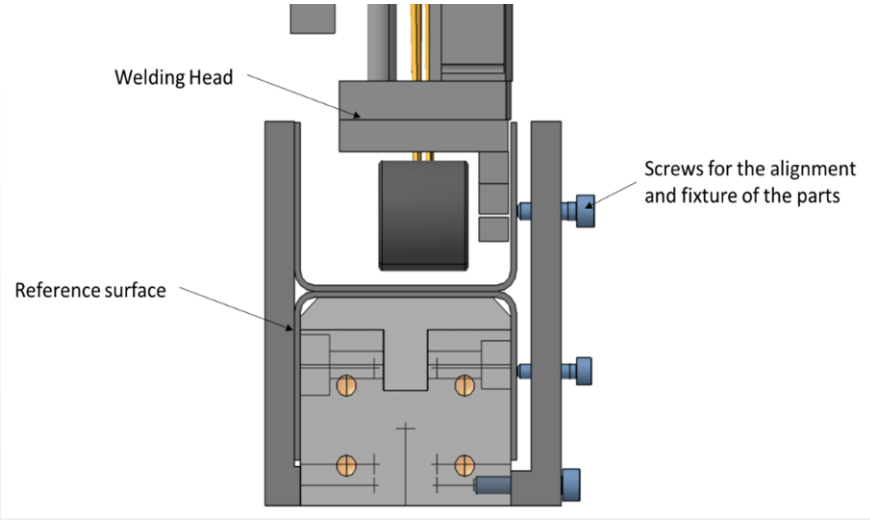


IMPROVEMENT OF CCM PROCESS

IW tools







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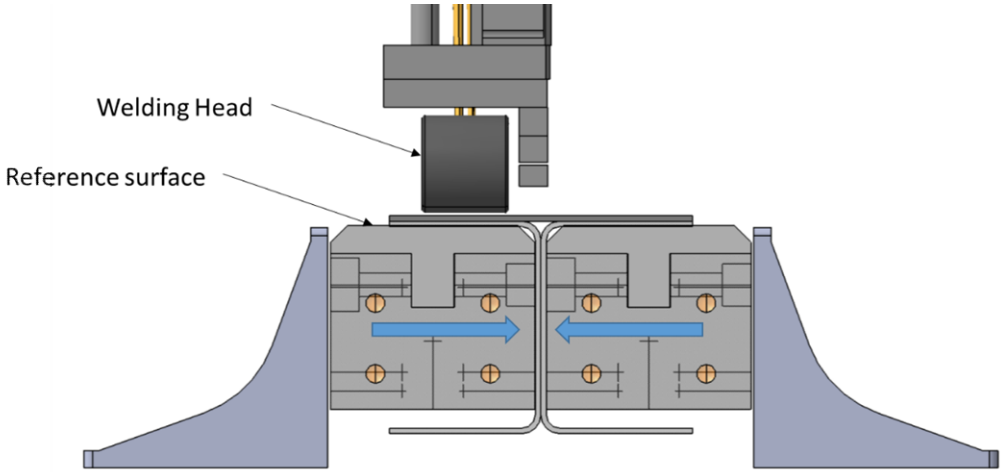

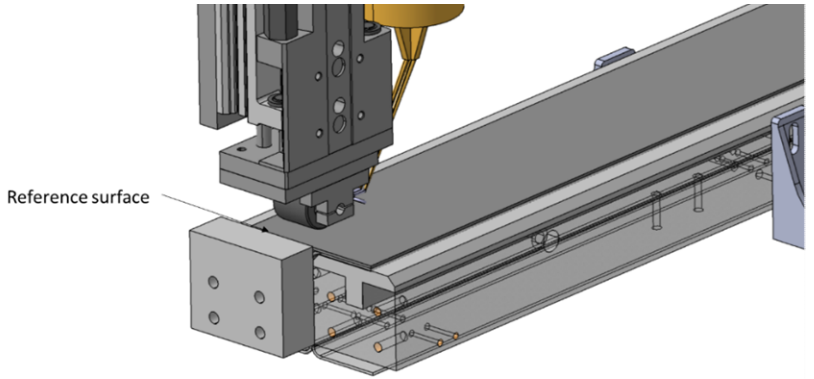

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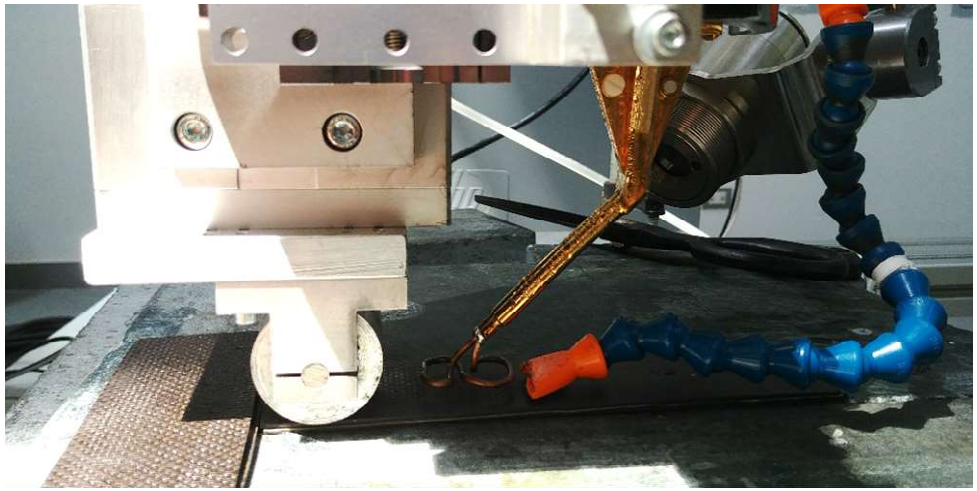

IW parameters

- welding power
- speed of the welding head
- pressure to apply

NEXT STEPS

- Validation of the temperature monitoring system
- Induction welding on the components for the construction of the beams for the two floors
- Assembly and assembly of the two floors
- Technical-economic analysis of the solutions developed

CONCLUSION

- SPARE project will lead to a optimized and innovative production process
- Effectiveness of thermoplastic composite
- IRT and FEM can improve the production processes

THANKS FOR YOUR ATTENTION

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