

INSTITUT de SOUDURE

Composite platform

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Summary

01 Composite platform presentation

02 Thermoset activities

03 Thermoplastic activities

Composite Platform

The Composites platform of INSTITUT de SOUDURE is specialized in the processing and assembly of continuous fiber-reinforced composites.



Composite Plateform (SAINT AVOLD 57)



10
Employees



2000m²

Of laboratory with the R&D center of SAINT-AVOLD (57) fully dedicated to composite materials



5
activities

Composite platform



Thermosets

Equipment sales

RTM and infusion processes

Audit and expertise

Formation

TP welding

Thermoplastics

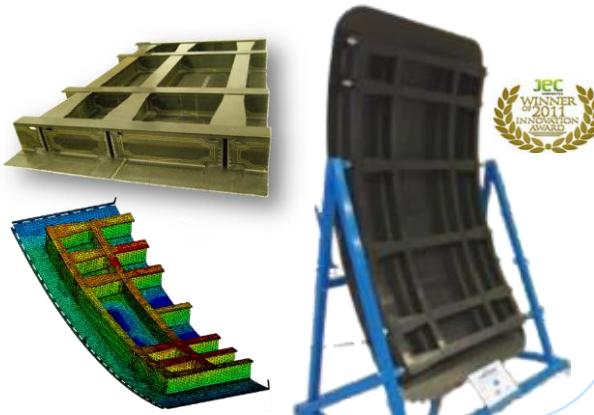
Thermoset activities



Thermoset activities

RTM/INFUSION

- Simulation and study
- Prototyping
- Technology transfer



AUDIT/EXPERTISE/FORMATION

- Expertise in materials and identification of causes of failure
- On-site process audit / supervision
- Composites training, training courses on request



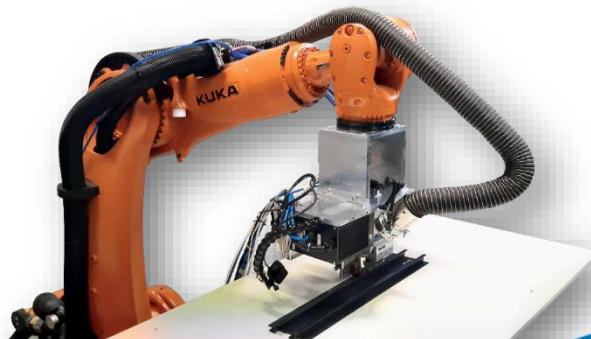
Equipment sales

- Sale of a permeability bench
- Kx, Ky, Kz measurements



Specimen characterization: non-destructive testing (thermography, US, etc.), mechanical and physico-chemical characterization

Thermoplastic activities



03 Thermoplastic activities

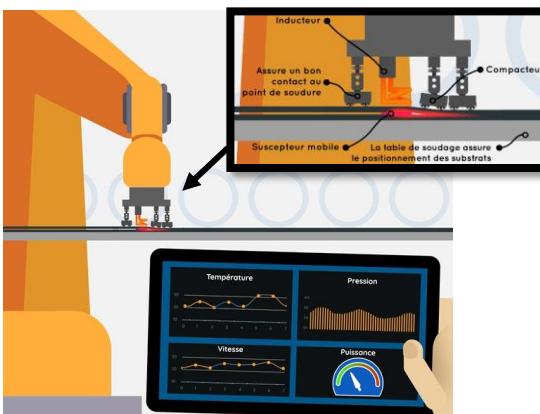
Presentation of ISW technology



ARKEMA



- Patented technology; developed jointly with ARKEMA
- **Innovative solution**, based on induction
- **Indirect induction heating**



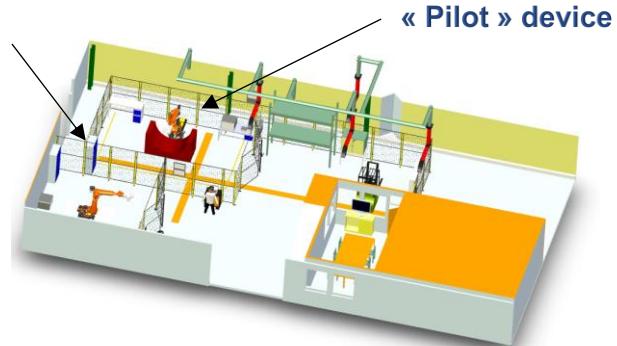
Principle

ISW in few words :

- Interfaces heating by mobile susceptor.
- Dynamic/continuous welding process.
- Optimized/Functionalized interface layer possible (i.e. Resin ratio, melting Temp, Viscosity,...).
- Continuous process monitoring and control
- Welding of all thermoplastic materials (with or without reinforcement).
- Welding of Glass Fiber reinforced composite possible.
- Low input electrical power vs. Standard Induction Welding



« Laboratory » device

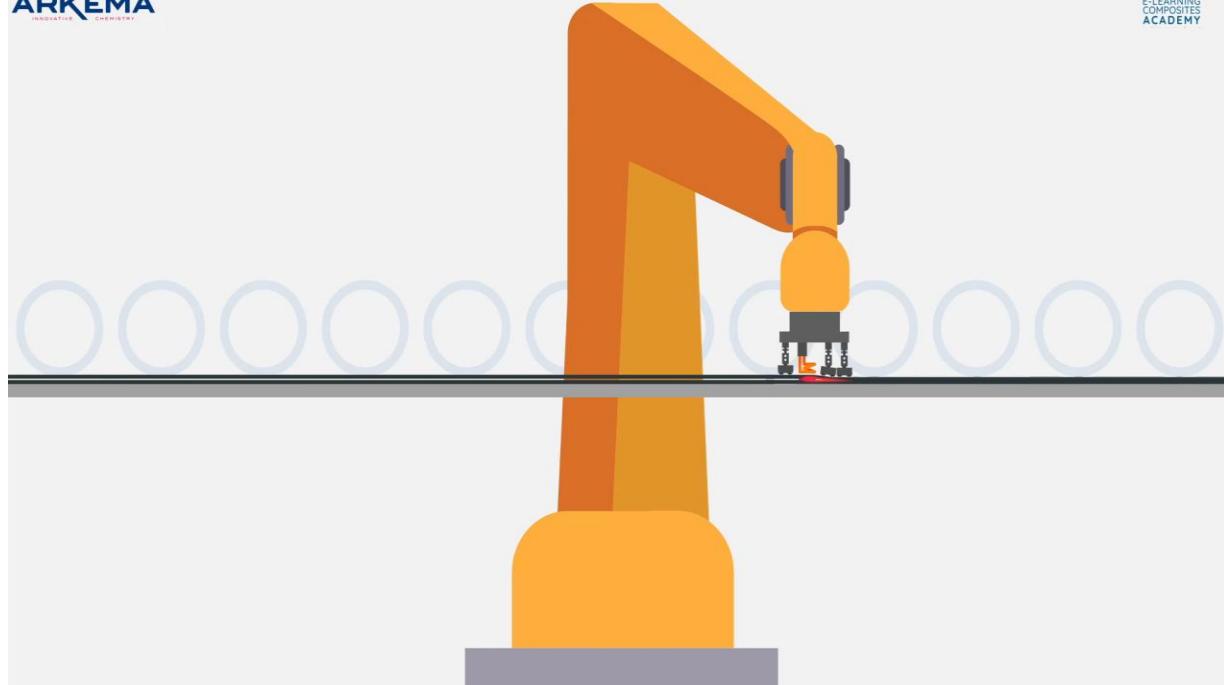
1000m²

Of laboratory dedicated to thermoplastic welding with two welding devices





What is the ISW technology ?



03 Thermoplastic activities

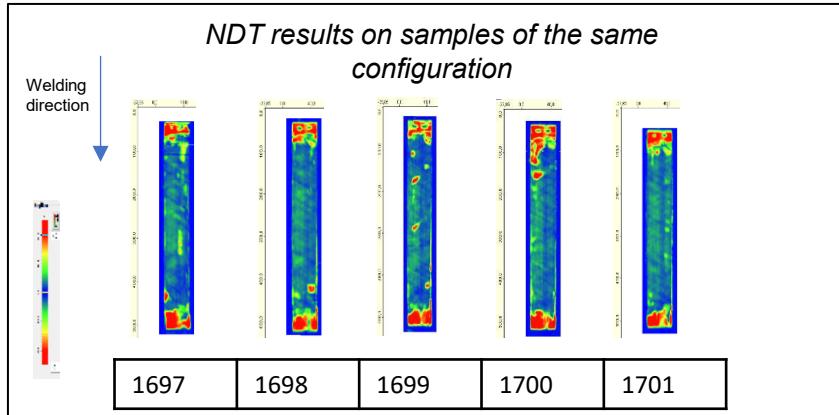
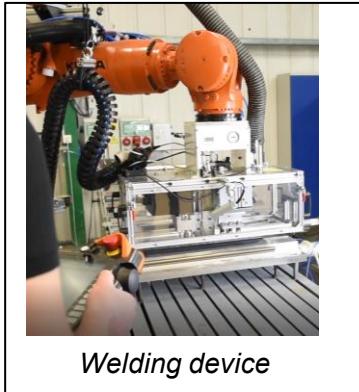
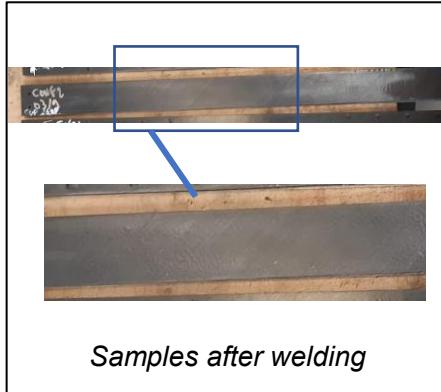
Welding trials

Analysis

- Visual inspection
- Non Destructive test (UT) after welding

Results

- Welding of all the specimen width
- No degradation of the substracts
- Repetability
- NDT methodology to attest the welding quality





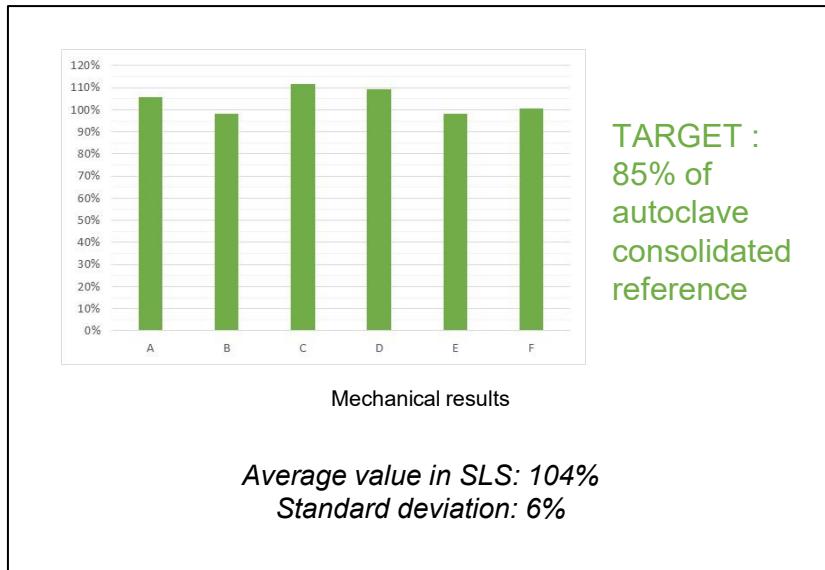
03 Thermoplastic activities



Welding trials

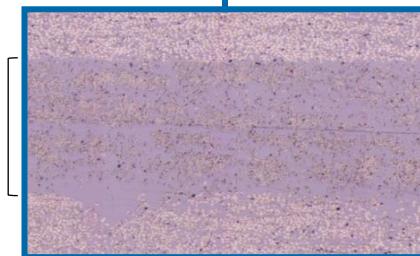
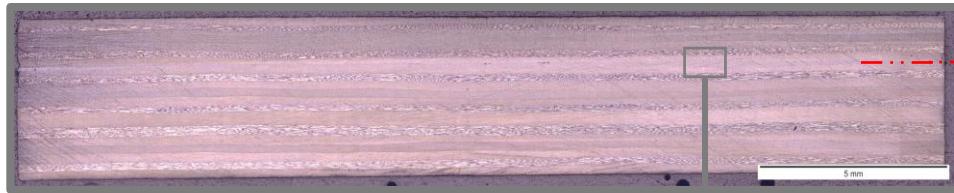
Welding trials and characterization

- **Analysis**
 - Mechanical characterization by SLS
 - Micrographic observations
- **Results**
 - Above 100% of the mechanical performances of the consolidated reference
 - Repetability

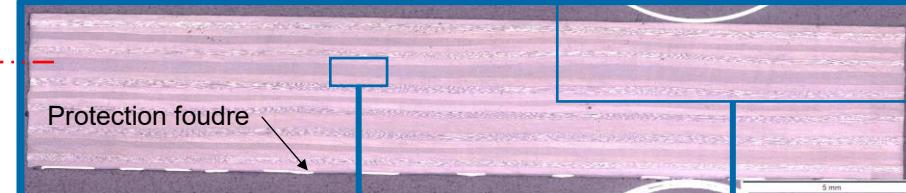


Welding trials: micrographic analyses

Interface type 2 - OF 260

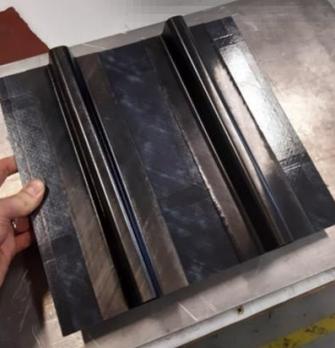


Interface type 1 - OF 255



- No decompaction
- Good interface quality
- No degradation on the integrated LSP

Toward Welding of Fuselage Panels: awards an demonstrators

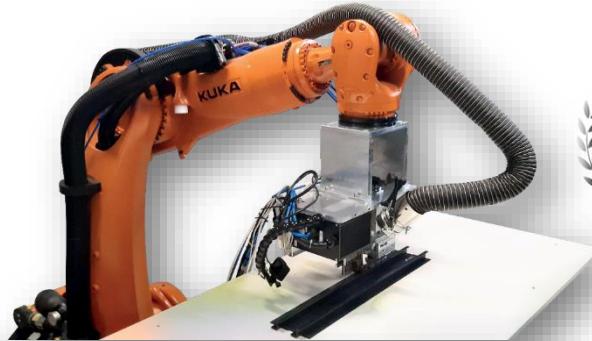


Demonstrators

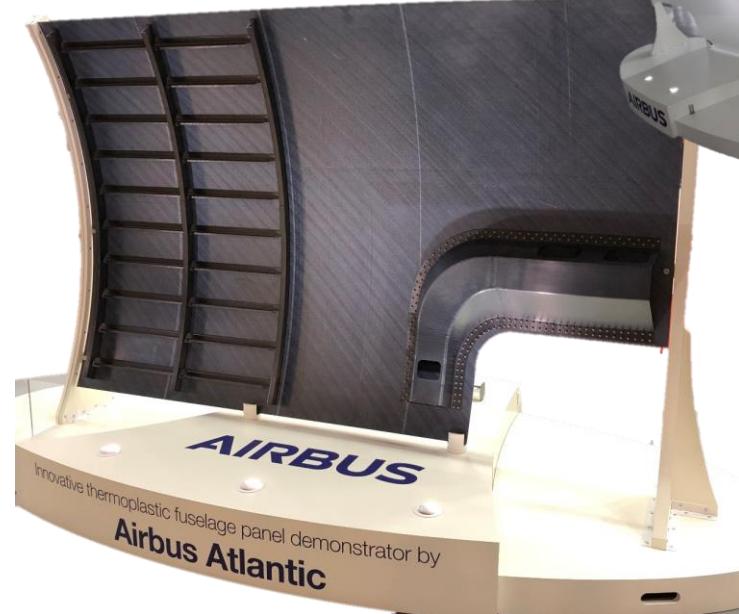
JEC AWARD 2020

06/01/2026

(STELIA AEROSPACE, ARKEMA, HEXCEL, LATECOERE)



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Welding of Z stiffeners on representative fuselage skin

Welding study + demonstrator
(Airbus Atlantic)

Toward Welding of Fuselage Panels: awards an demonstrators

HAICoPAS Aerospace Demonstrator made of HexPly® PEKK/AS7 and PEKK/IM7 thermoplastic materials, developed by:

- HAICoPAS consortium partners



- Supported by

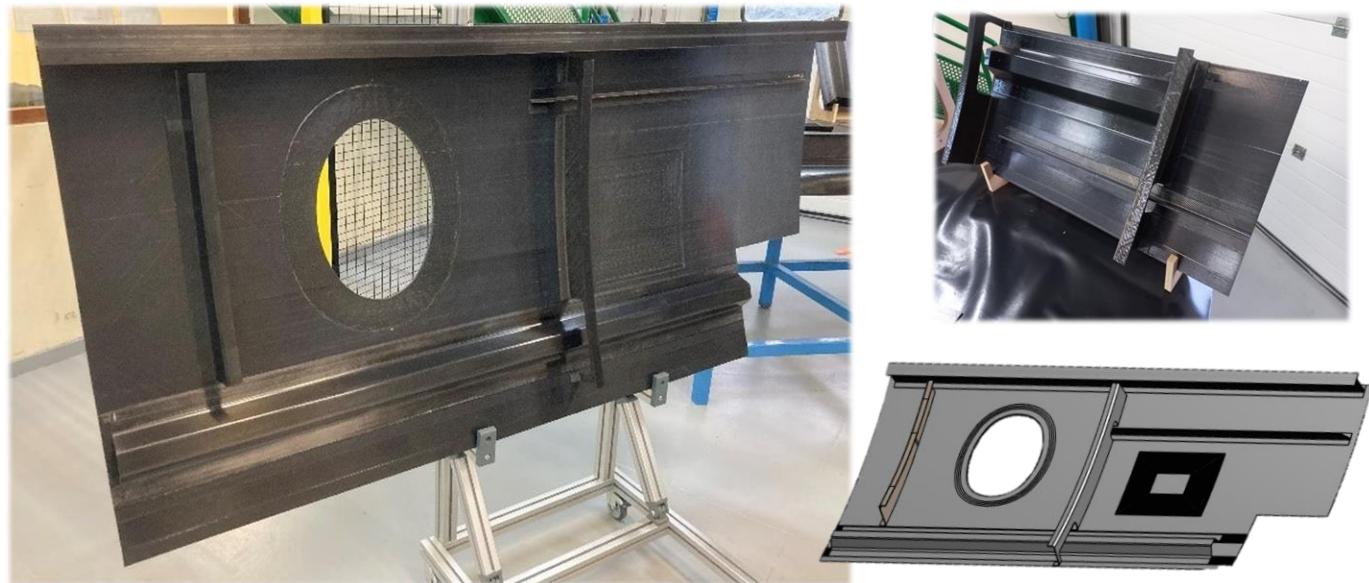


- And supported by the industrial advisory board



- Manufactured by

ATC by CCM Continuous Compression Molding process, for the omega stringer
Hutchinson by Pullforming process, for I and T stiffeners
Daher by press stamping process, for the Z frame
Hexcel by OoA process, for the fuselage skin and the C frame
Institut de Soudure and Arkema by ISW welding process for the omega to skin assembly



Welding of Z stiffeners PA11-CF
(ARKEMA, HAICOPAS project)

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EXPERTISE | TESTING

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WHAT LINKS US
MAKES US STRONGER