aeropolis.it

AIDAA
ASSOCIAZIONE ITALIANA DI AERONAUTICA E ASTRONAUTICA

EUROAVIA NAPOLI "Umberto Nobile"

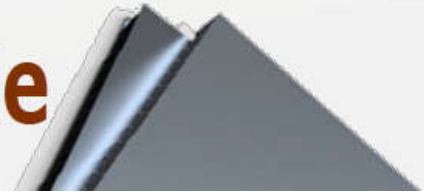
BEST NAPLES

SEMINARI INTERDISCIPLINARI DI CULTURA AERONAUTICA

Napoli
12 maggio 2018

Sviluppo ed applicazioni di Materiali Compositi nell'industria aerospaziale

Aula Scipione Bobbio
Scuola Politecnica e delle Scienze di Base
Napoli Fuorigrotta P.le Tecchio



NUOVE TECNOLOGIE NELLA PROGETTAZIONE DI PARTI IN COMPOSITO E PROCESSI DI PRODUZIONE AUTOMATIZZATA

Leonardo Lecce, Marco Barile e Angelo De Fenza

ACCREDIA

Member of CISQ Federation RINA EN 9100

25 years NOVOTECH SRL AEROSPACE ADVANCED TECHNOLOGY

Partner of CLEANSKY

NOVOTECH s.r.l.

Agenda

1. Introduzione NOVOTECH s.r.l.
   Prof. Leonardo Lecce

2. Design e manufacturing di componenti aeronautici in materiale composito (Progetti *R&I* NOVOTECH)
   Ing. Marco Barile

3. Automazione nei processi di produzione con focus sul processo AFP
   Prof. Leonardo Lecce

4. Introduzione al progetto SEAGULL
   Ing. Angelo De Fenza

NOVOTECH SRL
AEROSPACE ADVANCED TECHNOLOGY

www.novotech.it

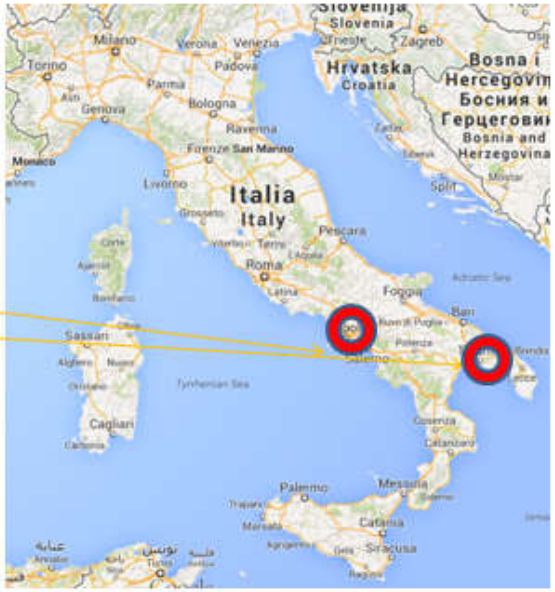
Company Overview

Background and Mission

Novotech s.r.l. *is an engineering innovation partner for companies in the aerospace field and advanced technology industries.*

The Company was founded in 1992 as spinoff consulting engineering company from the Department of Aerospace Engineering of the University of Naples "Federico II". It still maintains roots and backbone with scientific institutions, as Universities and Research Centres, keeping a strong link and continuing relationship, especially, but not exclusively, in the aerospace field.

Novotech s.r.l. is located in Campania (Napoli) and in Puglia (Manduria) It covers a strategic business position in the centre of Mediterranean sea.

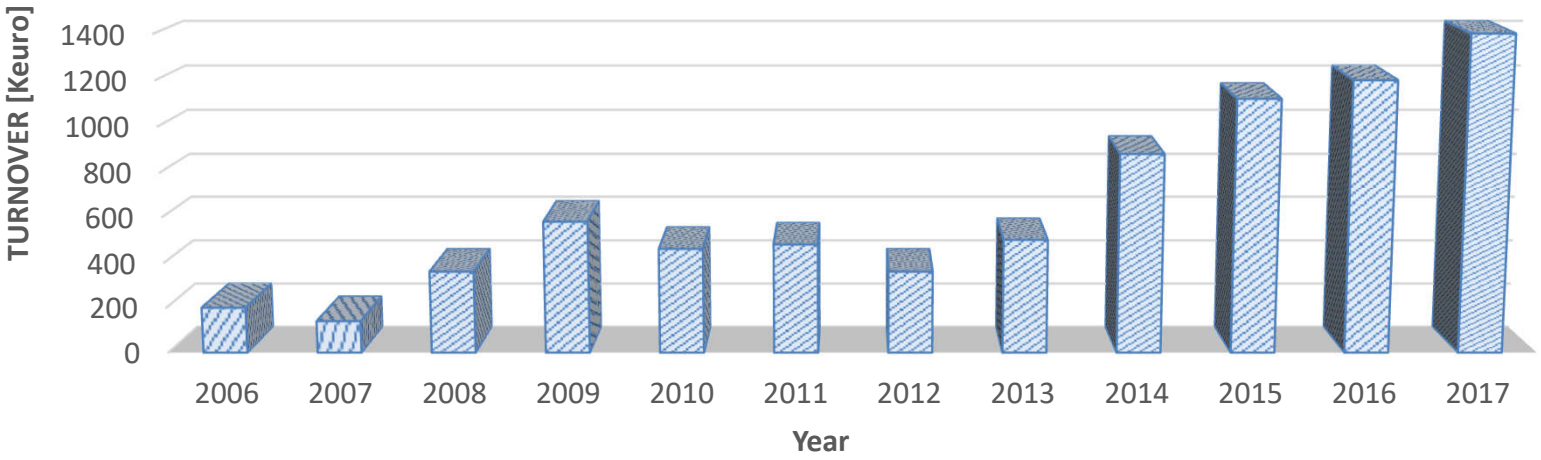


A partner of

Clean Sky

Background and Mission

Main Economical and HR information



Turnover for 2017: 1,4 Milion Euro
Backlog (2018-2020): 3,0 Milion Euro

Employers

Total : 19
PHD : 3 Engineers and Other Gradutate: 8
Technicians : 4 Administrative: 4

Background and Mission

Since 1992 ***Novotech s.r.l.*** *is aimed to*

- *Provide technical-scientific support (Aeroelastic and Acoustics Certification) and advanced testing support (Ground Vibration Tests, Noise Tests, Landing Gear Drop Tests) to SMEs as Partenavia, Generalavia, Sky Arrow, TECNAM, OMA SUD, Vulcanair and others.*

- *Develop technical-scientific partnerships on specific technological tasks with big aerospace industries:*

  Alfa Romeo Avio/Fiat Avio

  F.E.A. on turbine components;

  DEMA

  Aeroelastic calculations for gust loads on Bombardier G-7000;

  LEONARDO Aircraft and LEONARDO Helicopters

  internal noise (ATR), F.E.A. on metal-CFRP structures, EU Research Programs;

  Magnaghi Aeronautica

  Crashworthiness of tanks, F.E.A. on composite structures (Bombardier).

- *Work for the cross-sector technology transfer (Aerospace, Automotive, Railway, Naval and Civil Engineering) for some specific issues within its main competences.*

Markets & Partners

Applications demanding low weight, high stiffness-to-weight and strength-to-weight as well as high productivity rates are the key targets for us.

Markets





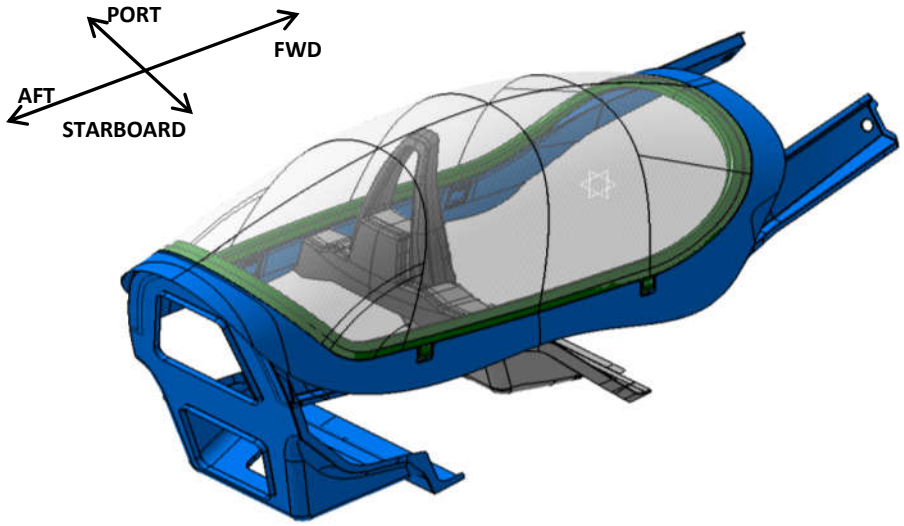
Partners

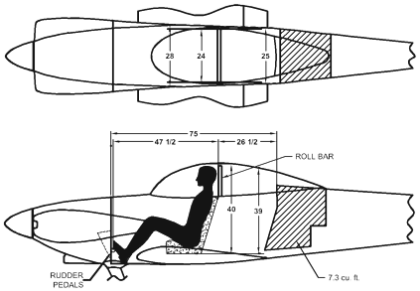
LEONARDO
SOLVAY
CORIOLIS composites
SIEMENS
COSTRUZIONI AERONAUTICHE TECNAM
CIRA
IMAST
东菱振动 DONGLING VIBRATION
pti
MAGNAGHI AERONAUTICA
PIAGGIO AERO
ADVANTECH
vulcanair
ema
Geven
tirrenia
mermec group
FINCANTIERI
OMA SUD SKY TECHNOLOGIES

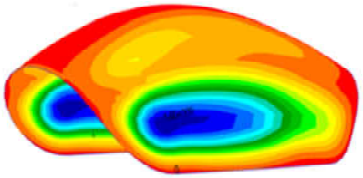
Work Performed for BlackShape

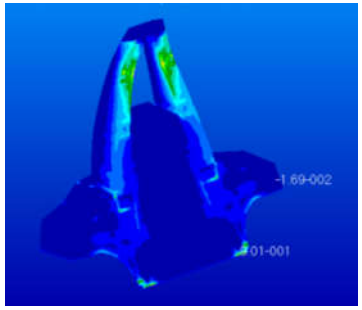
BS-115 Canopy Assembly:

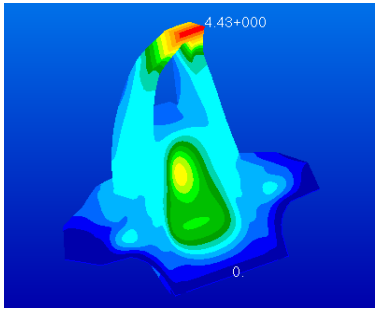
Conceptual and detailed Design, Structural analysis and Multi-body simulation in compliance with CS-VLA requirements.







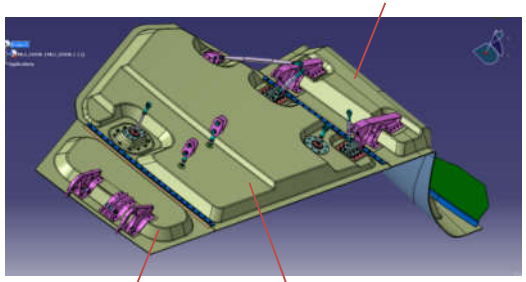


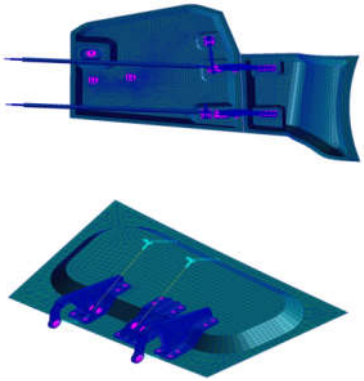


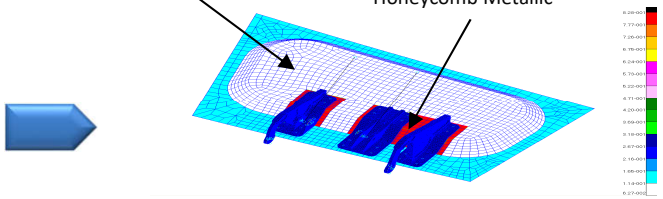
BLACKSHAPE

Work Performed for Magnaghi Aeronautica

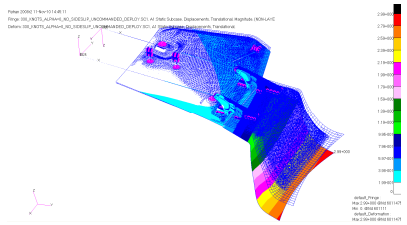
BOMBARDIER: C-SERIES 500 PROGRAM



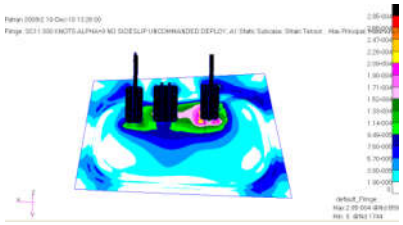




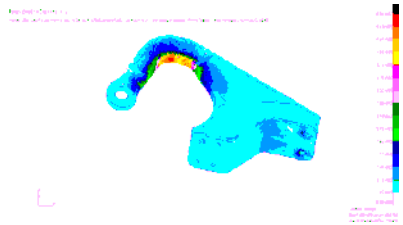
Deformation Middle-Lower door



Strain Max Principal Upper door



Stress Tensor Max Principal in Fitting



MAGNAGHI AERONAUTICA S.p.A.

SALVER

Work Performed for Vulcanair

AIRCRAFT: VIATOR AP 600

GROUND VIBRATION TEST FOR TWO DIFFERENT WEIGHT CONDITIONS:

- MTOW: Max Take-off Weight Condition
- MZFW: Max Weight Zero Fuel Condition

TAIL EXCITATION

WING EXCITATION

ACQUISITION

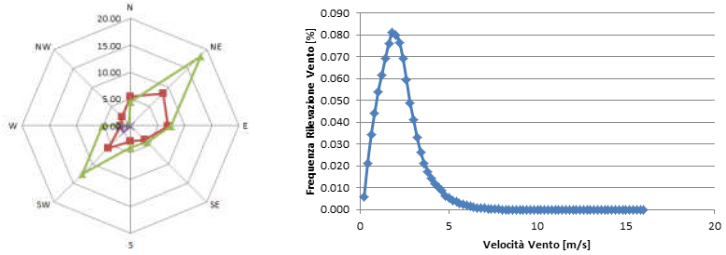
DATA ANALYSIS

vulcanair aircraft

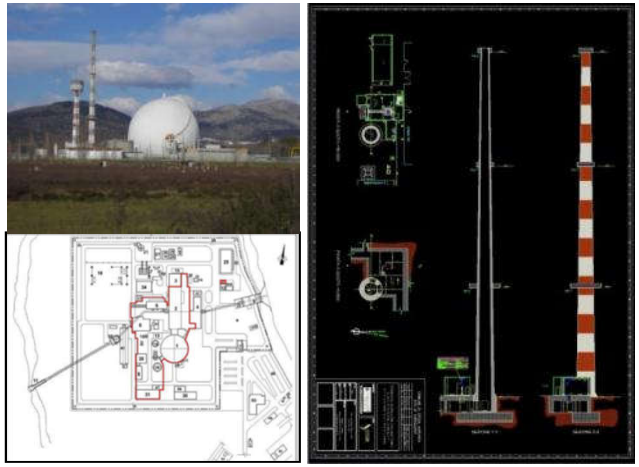
Work Performed: GRIEC.A.M.

Scarifying and demolition of the actual fireplace of the nuclear power plant of Garigliano (Italy) including implementation of a new one

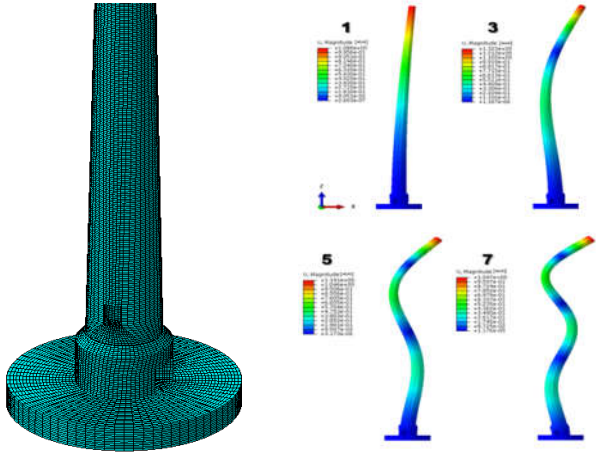
- Statistical analysis of historical wind data recorded by the wind measurement station
- FEA (static and dynamic)
- Wind tunnel tests - 3D Model Design and Prototyping [Measurement and Analysis of aerodynamic forces]



Statistical analysis of historical wind data



Nuclear Power Plant of Garigliano (Sessa Aurunca - Italy)



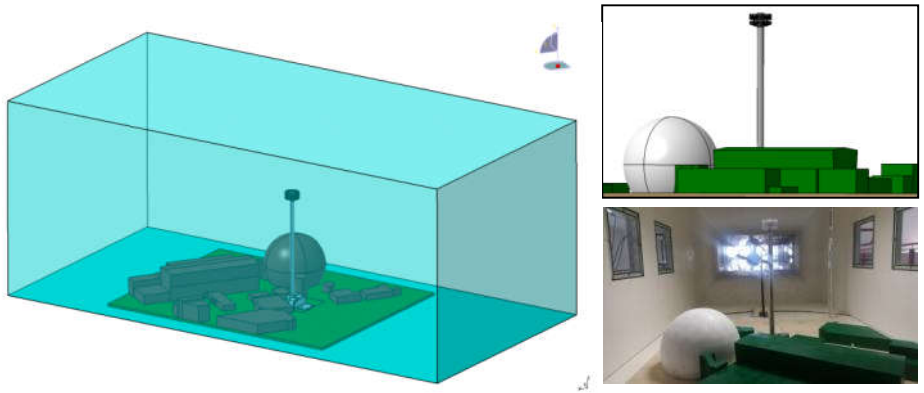
FE model - Chimney

griec.a.m.
SISTEMI DI SOLLEVAMENTO
MOVIMENTAZIONE INDUSTRIALI

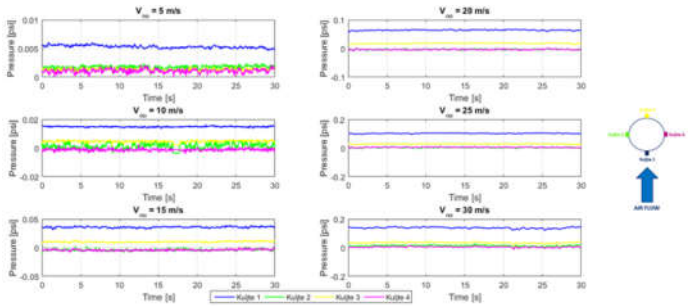
Work Performed: GRIEC.A.M.

Scarifying and demolition of the actual fireplace of the nuclear power plant of Garigliano (Italy) including implementation of a new one

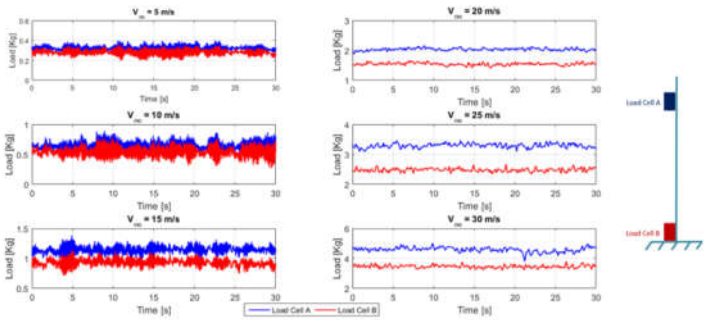
3D CAD Model (Scale 1:12)



3D CAD Model (Scale 1:80)



Pressure Measurement History



Load Measurement History

griec.a.m.
SISTEMI DI SOLLEVAMENTO
MOVIMENTAZIONE INDUSTRIALI

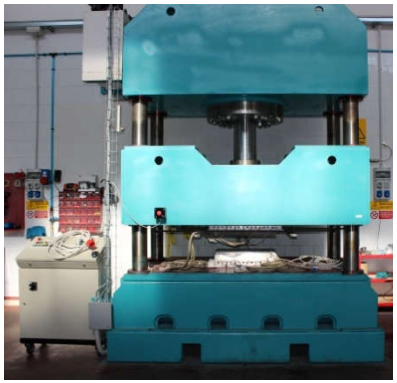
Relevant Equipments and SW

Manufacturing, Curing, Machining and Repair of Composites

AFP Machine
ABB IRB-6640/205/2.75
standard robot 8-fibre placement head, developed by Coriolis Composites s.a.s. (France), mounted on a linear axis with a working length of 3m. Material heating can be performed by a 3kW laser or IR lamp.

Infuser Servo *injector for HP-RTM/VARTM molds, up to 4000cc per shot*

Hypaject MKIII *injection system thermostatted up to 10bar injection pressure for RTM.*



Hot Press for RTM and CM
with plates of [m] 1.2 x 1.8, 400° C Insulated Plates.

Vertical Machine Center
MV 214 P 12B from Quaser (Lathe).

Composite Curing Oven
400° +/-2° C uniformity temperature, size [m] 1.0 x 1.0 x 1.2 with Vacuum Line.

ACR3 Dual Zone Hot Bonder
with SR Blanket kit from BriskHeat Corporation

Virtual Product Development

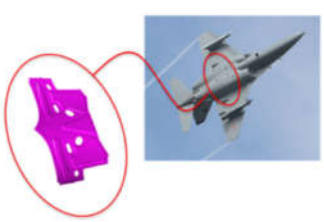
MSC Software · DS CATIA · CORIOLIS software

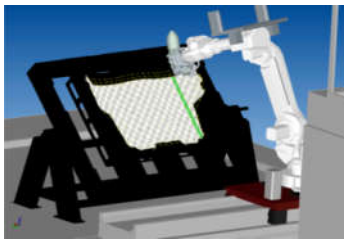
Ongoing R&I projects:

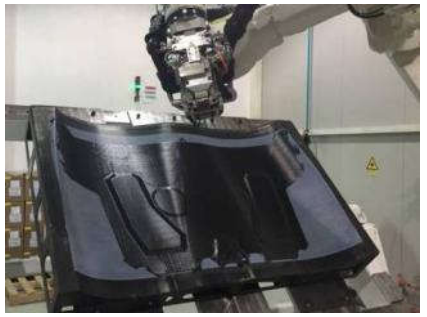
SPIA *- Lifting Aeronautical Innovative Structures*

Investigate and characterize innovative configurations and processes of CFRP multi-layer materials, necessary to perform experimental activities aimed to manufacture components with automated technology, with Coriolis AFPM.

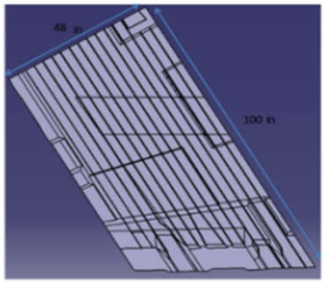
M-346 FUSELAGE PORTION (scale 1:1)

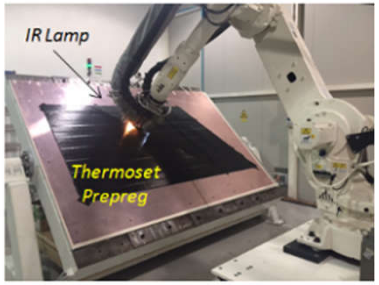


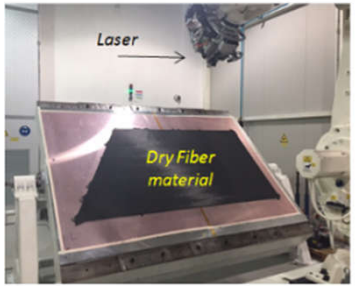




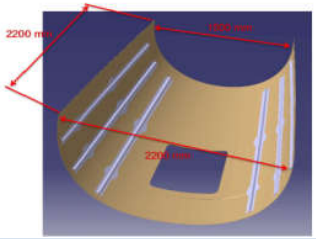
NGTP VERTICAL FIN PORTION (2.5mtx1.5mt)







A/C TAIL CONE PORTION (1/2 & 1/4) including stringers laydown by AFP process



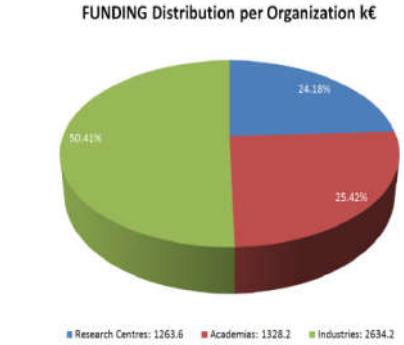
Ongoing R&I Projects:
NHYTE - www.nhyte-h2020.eu

***N**ew **HY**brid **THE**rmoplastic composite aerostructures manufactured by out of autoclave continuous automated technologies*

Topic: MG-1.1-2016 Reducing energy consumption and environmental impact of aviation

✓ **8 Partners from 6 different EU countries** granting the strength of the European aerospace supply chain competitiveness coupled with strong cooperation on RTD;

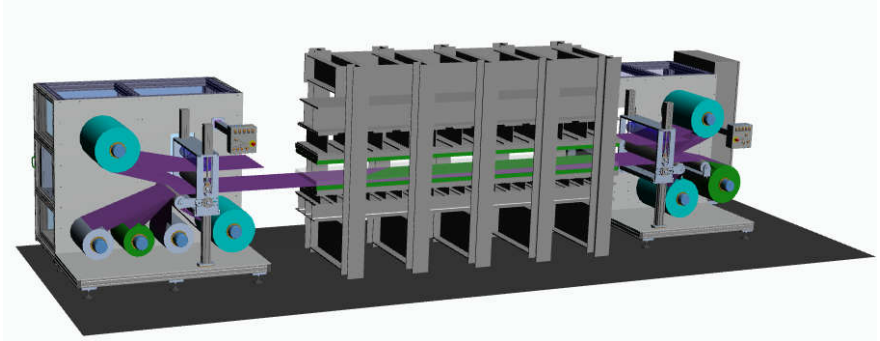
✓ more than the **25%** of the EDCs will be **outsourced to EU** countries.



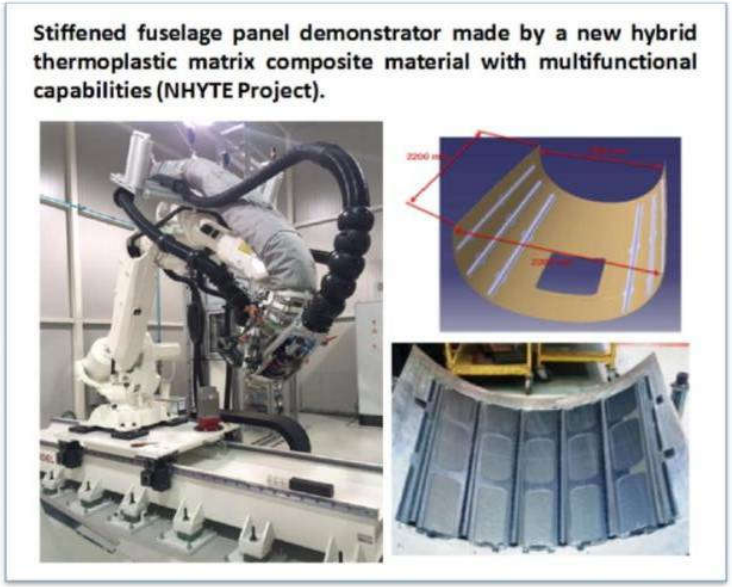
Ongoing R&I Projects:
NHYTE - www.nhyte-h2020.eu

NHYTE project is developing concepts and methodologies enabling the realization of innovative and **green** integrated aero-structures made by a new **recyclable** hybrid thermoplastic composite material with **multifunctional** capabilities (induction welding).

Such new material, fabricated by an innovative machine implementing continuous automated production processes, returns functions of **toughness improvement** (multilayer material) and process simplification, since it **does not require autoclave consolidation** (**improved cycle times** and lower energy consumptions, **greener production**).



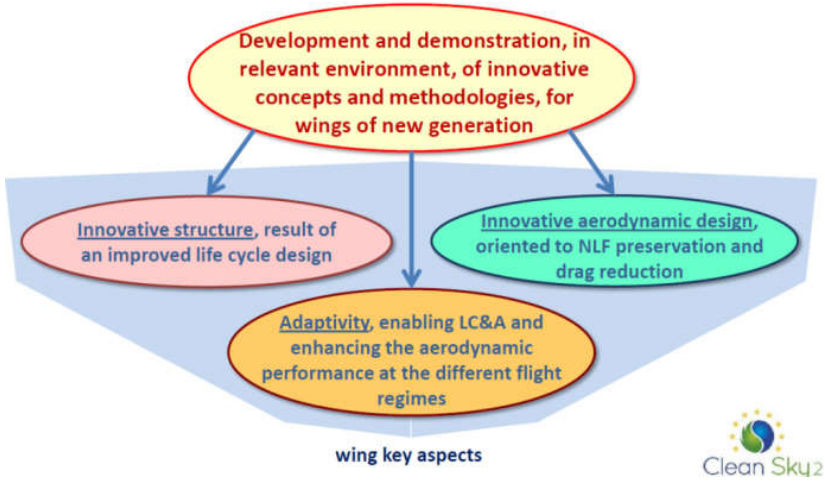
A new equipment for material fabrication is coming (December 2017)

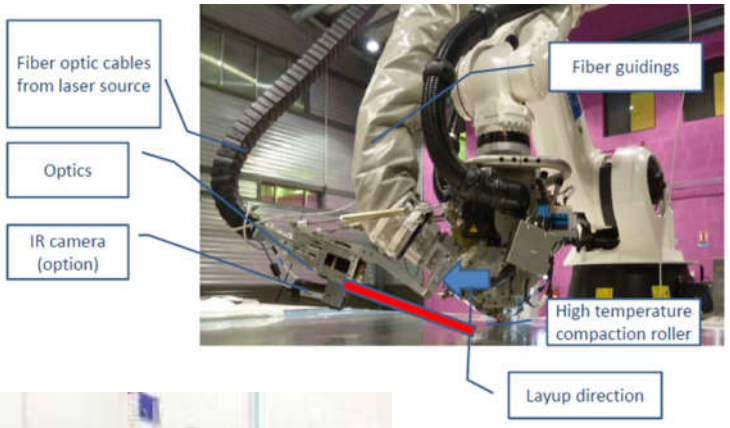


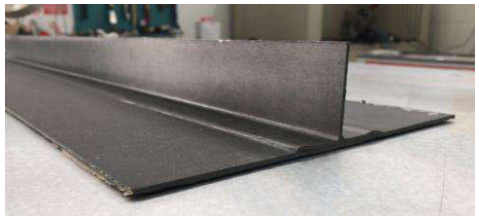
Ongoing R&I Projects:
AIRGREEN 2 - H2020 Clean Sky JU

Novotech s.r.l. is part of **H2020 / Clean Sky JU**, with **AIRGREEN 2** Consortium, 16 partners for a 7-years research program (Call identifier: H2020-CS2-CPW01-2014-01/ Topic: JTI-CS2-CPW-REG-01-02).

TOPIC : Advanced wing for regional A/C - Technologies Development, Design and Manufacturing for FTB#1







25 years

NOVOTECH SRL
AEROSPACE ADVANCED TECHNOLOGY

Thank you

for your attention

If You Want To Go Fast, Go Alone.
If You Want To Go Far, Go Together.

Member of CISQ Federation
RINA
EN 9100 Certified Quality System