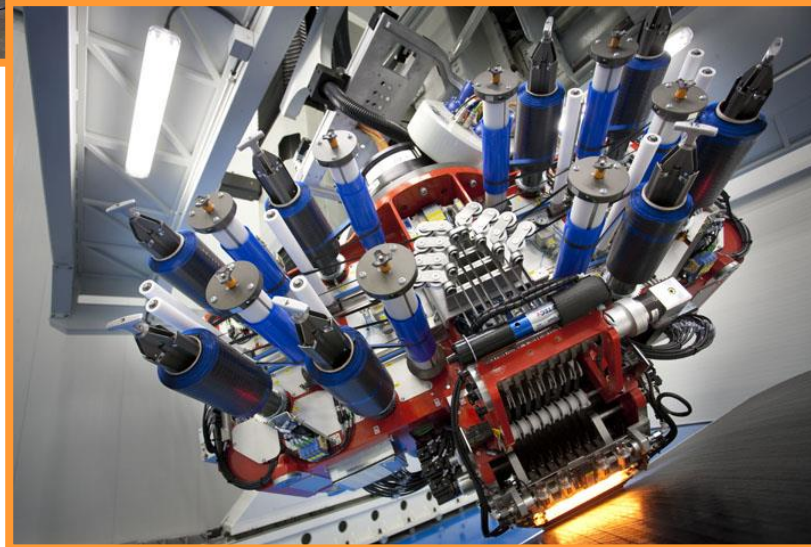




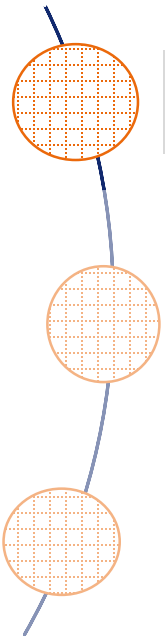
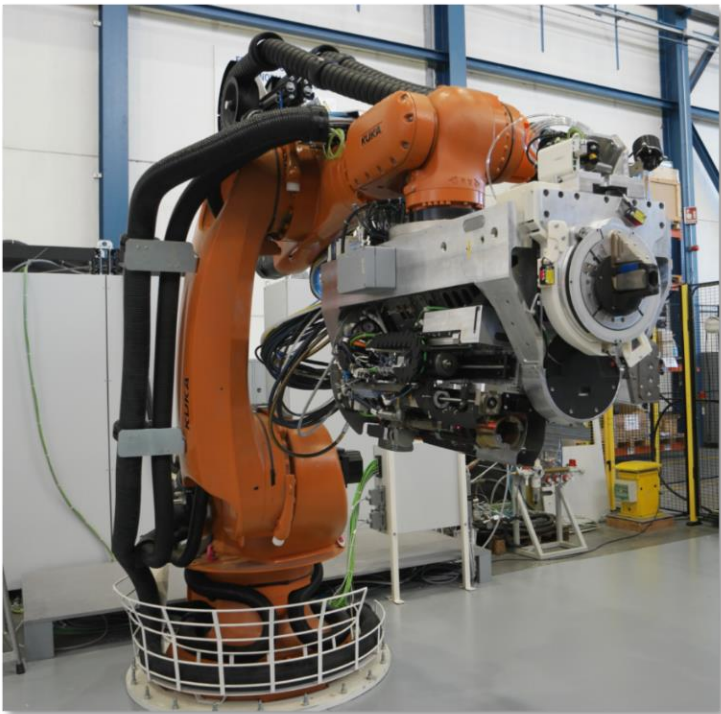
At the forefront of technology



June, 2019



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ABOUT M.TORRES

FRP&CFRP MANUFACTURING EQUIPMENT

NEW PROCESSES FOR SHIP MANUFACTURING



## Company background



• Aerospace Industry Activity

• MTorres starts Wind Turbines Industry activities

• Foundation of MTorres Deutschland

• Foundation of MTorres Brasil

• Establishment of new facilities in Everett, USA

1975

1986

1997

1998

2000

2003

2012

2013

2017

• Foundation of MTorres

• Establishment in Murcia, Spain

• Foundation of MTorres USA

• Foundation of MTorres America

• Foundation of MTorres Tissue (Lucca, Italy)



## Strategy



Know How

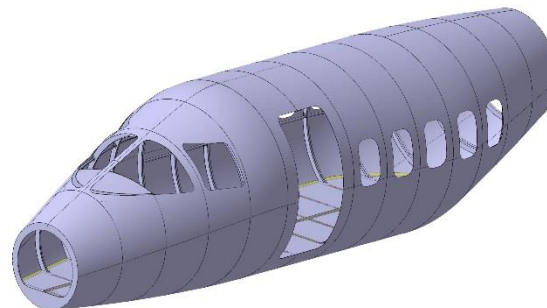
Highly qualified employees



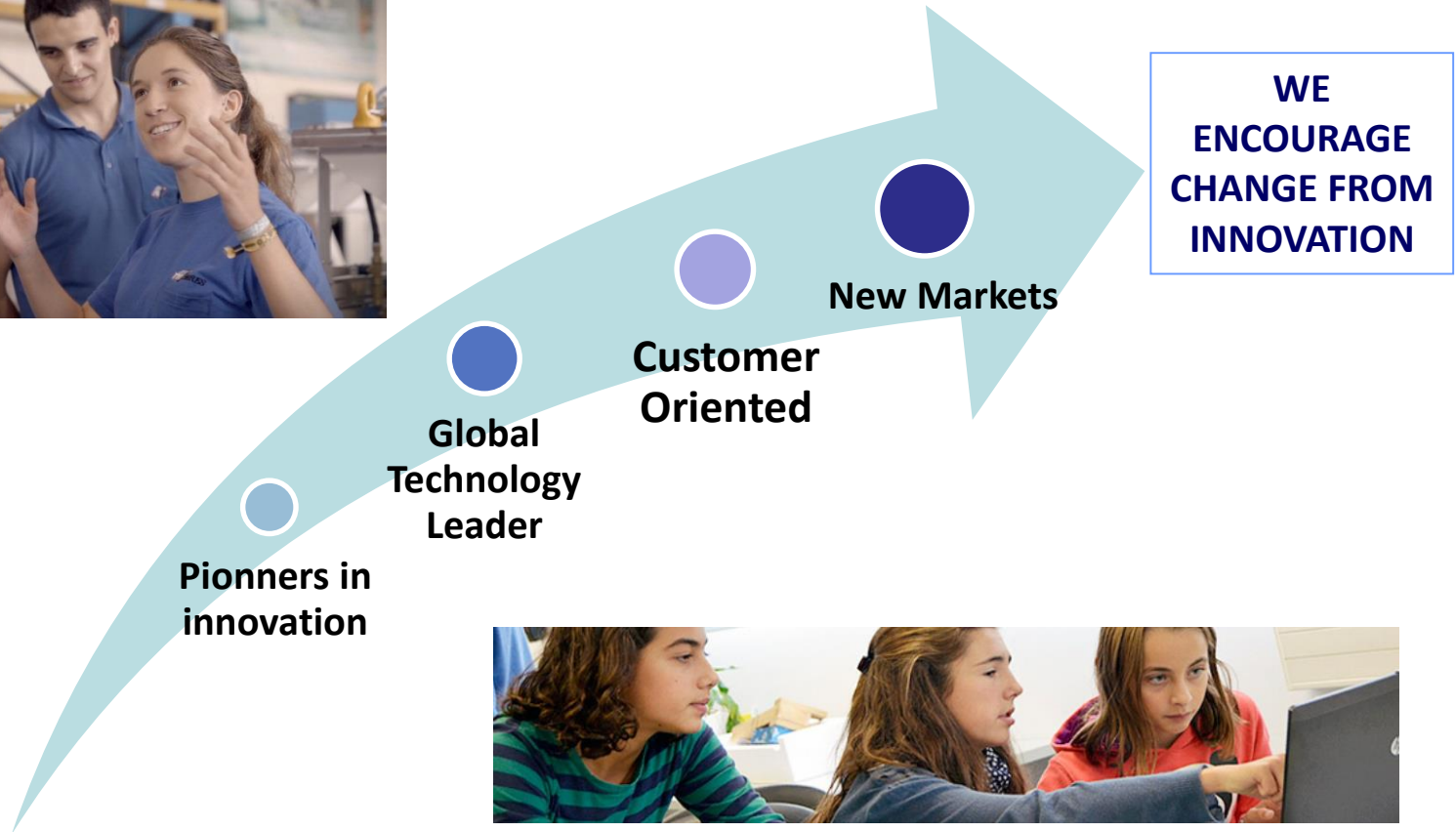
Reinvesting the generated cash-flow

Academy of Creativity, Innovation and Thinking

High R&D investment



## Mission & Vision





## Values

- MTorres “DNA”
- Creativity
- Tech. Challenges

Innovation

- Professional excellence
- Integrity
- Customer orientation

Commitment



Environmentally Friendly

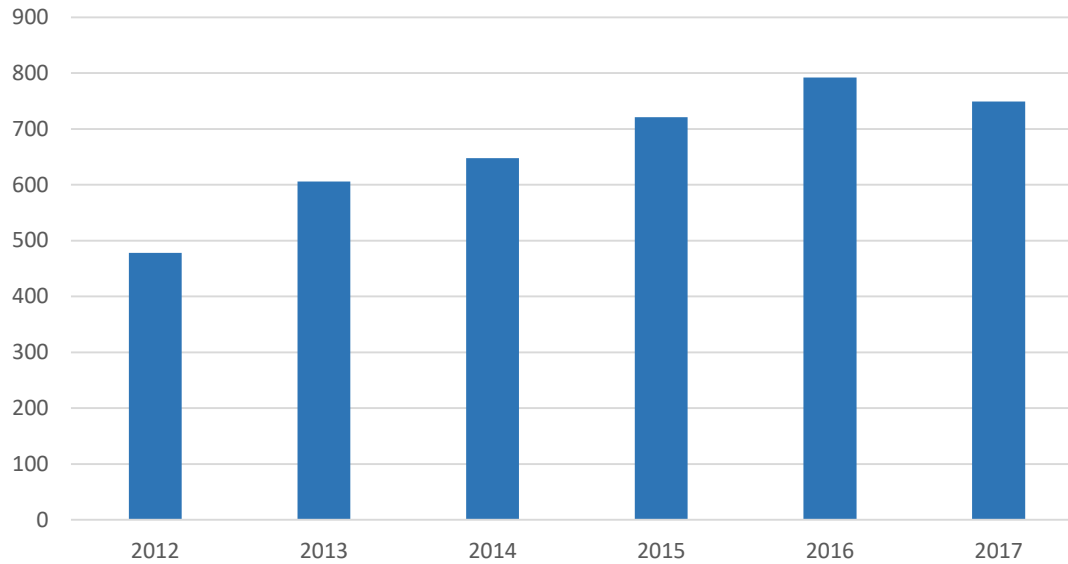
Team

- Team building
- Talent development
- Common goals

Corporate  
Social  
Responsibility

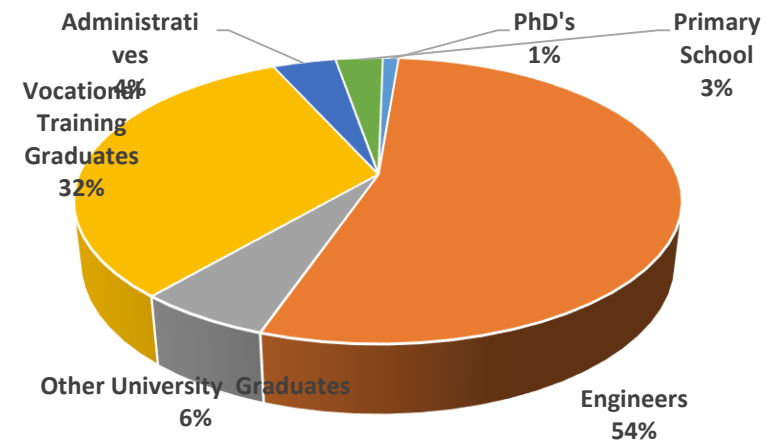
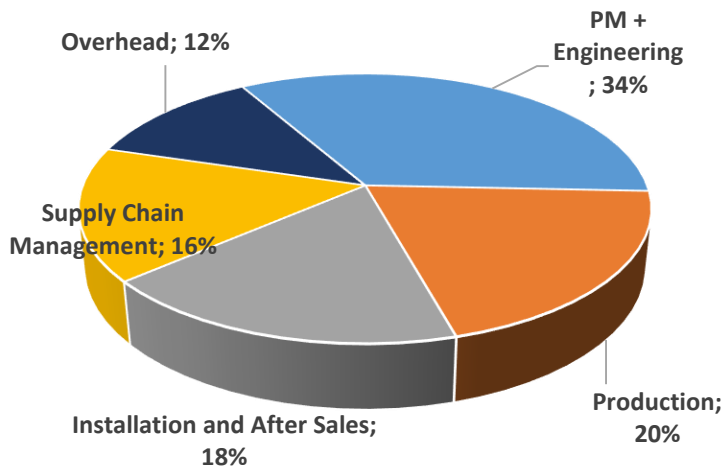
- Creating value
- Prosperity and progress
- Sustainable growth

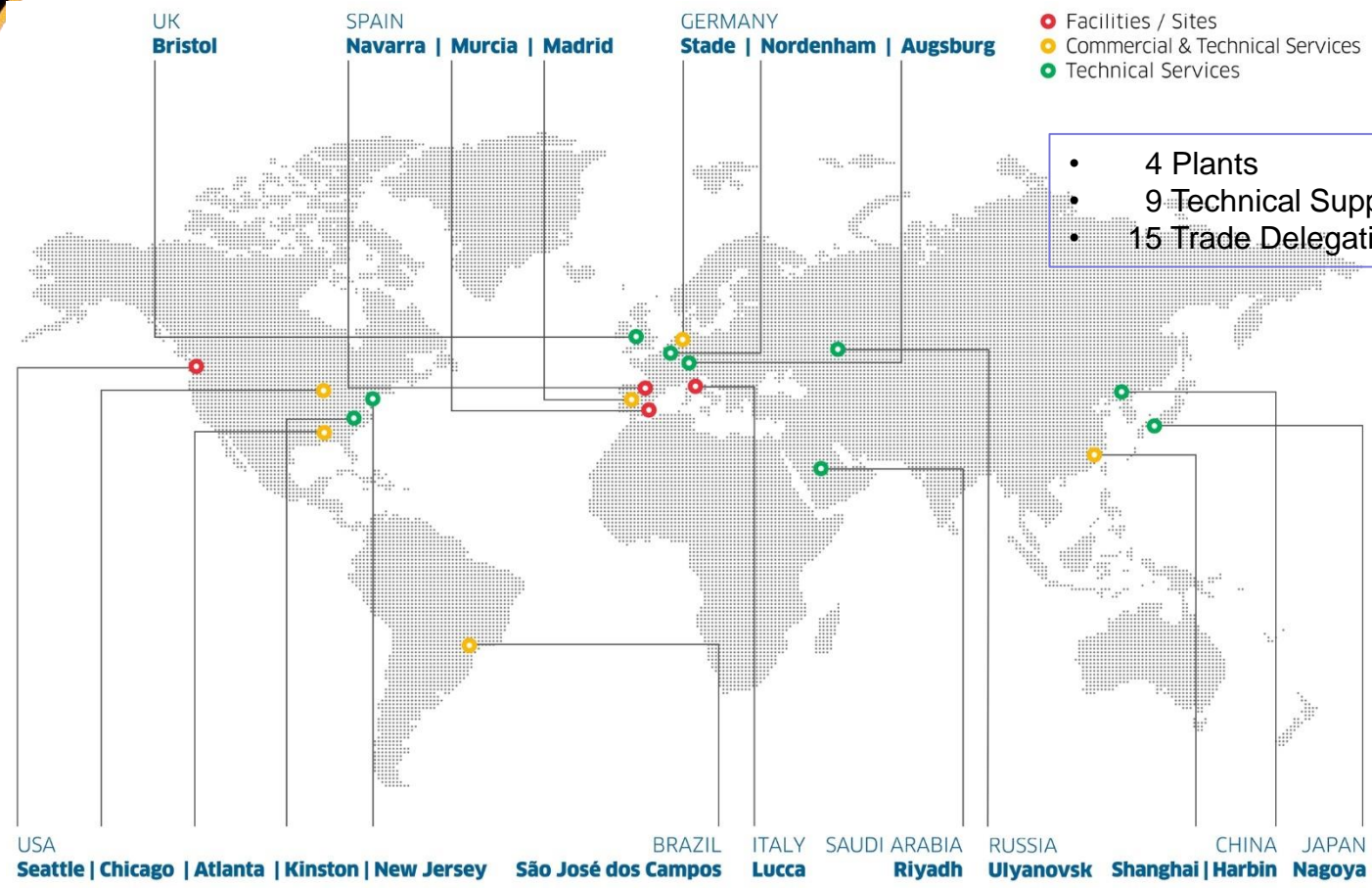
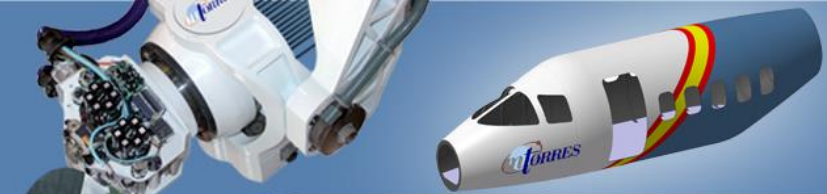
## Staff Evolution



Average age->40  
Average length of service->10

\* Year 2017









## Corporate Social Responsibility

**HUMANITARIAN & COMMUNITY**

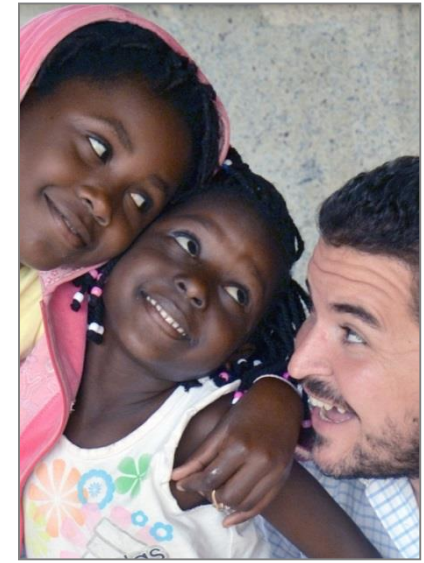
- Employee Associations
- Solidarity Program
- Family Plan
- CEE Agreements
- Cuba Support
- Other Donations

**TECHNOLOGICAL DEVELOPMENT**

- MTorres Foundation
- Youth & Development Projects
- First Lego League
- Cotec Foundation
- Entrepreneurs Grant

**EDUCATION & TRAINING**

- Engineering Lecture
- Dual FP
- Grants/ Practices
- Ilundain Foundation
- Amateur Sports Sponsorships



## First Lego League



Early Education in VALUES such as **teamwork, commitment, hard work or active curiosity**

- 2012 3<sup>rd</sup> world position: Robot programming
- 2013 1<sup>st</sup> world position: Scientific project
- 2014 1<sup>st</sup> European Open position: Champions Award
- 2015 1<sup>st</sup> World position: Champions Award
- 2016 1<sup>st</sup> World position: Champions Award
- 2018







# MTorres Group

+600 customers

+80 Customers

+30 research areas

## Paper Converting Division

## Aerospace Division

## Innovations Division



Design, Manufacturing and Service of Complete Automatic Tissue Converting Lines and Equipment for Converting Applications.

Design, Manufacturing and Installation of machines Special Tools for manufacturing aircraft components as well as assembly systems.

Development of innovative manufacturing processes in composite materials for the aeronautics, automotive and energy sectors.

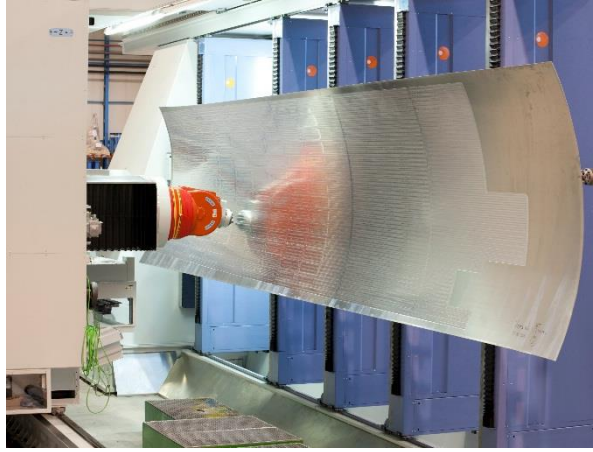




## Aerospace Division



Composite Manufacturing  
Equipment



Metallic parts Manufacturing  
Equipment



Assembly Equipment

## Our customers – Aerospace Division


..+75

## Summary

### Innovation

- +10% Turnover
- European programmes

### Customer Oriented

- Global company with local presence (+70 countries)
- Joint development programmes

### Process Improvements

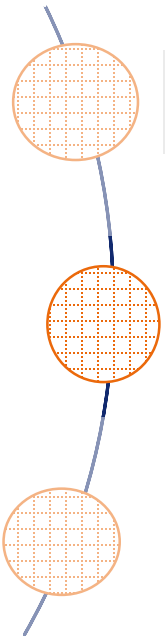
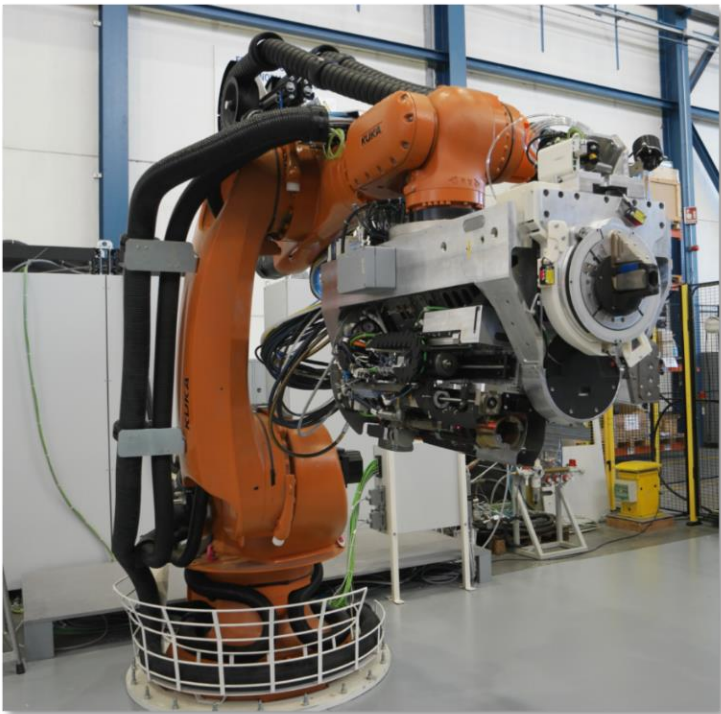
- Quality improvement
- Cost reduction
- Productivity increases







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ABOUT M.TORRES

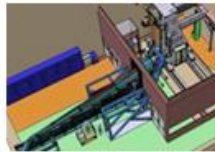
FRP&CFRP MANUFACTURING EQUIPMENT

NEW PROCESSES FOR SHIP MANUFACTURING

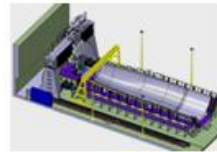
## MTorres implication in the A-350 XWB program



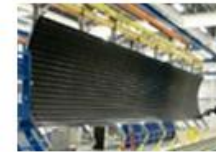
Fiberlayup Tailcone



VTP Continuous Joint



AFP S13/14-16/18



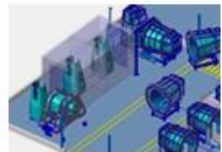
NDI S15



Trim & Drill S15



AFP Wing Spars



Assembly S19



AFP Wing Spars



HTP Integration



NDI Wing Spars



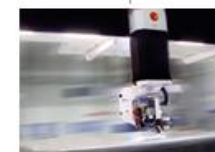
ATL HTP / VTP Skins



Fiberlayup stringers  
S15 y wings



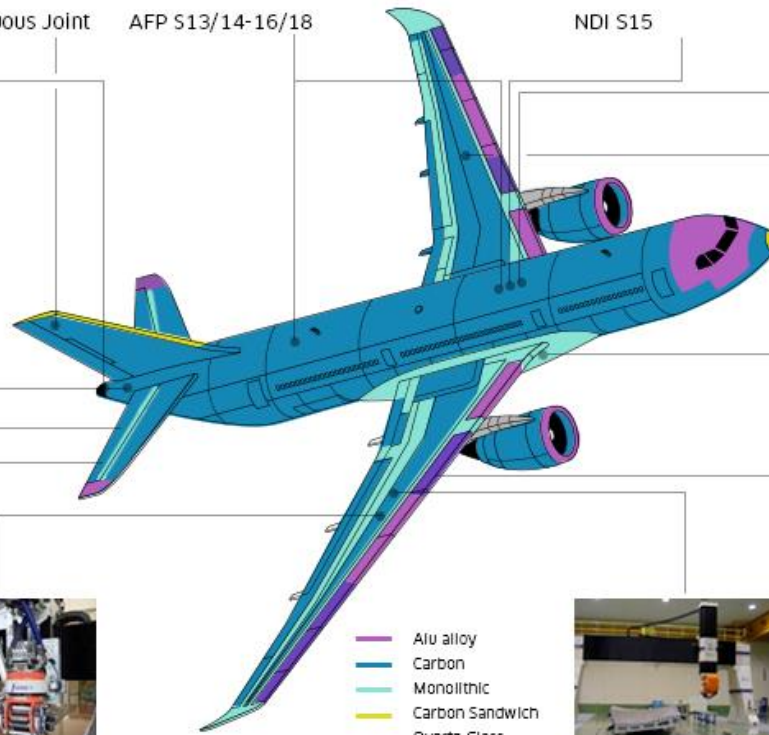
ATL Wings



ATL CWB



Trim & Drill and  
Fiberlayup Spars

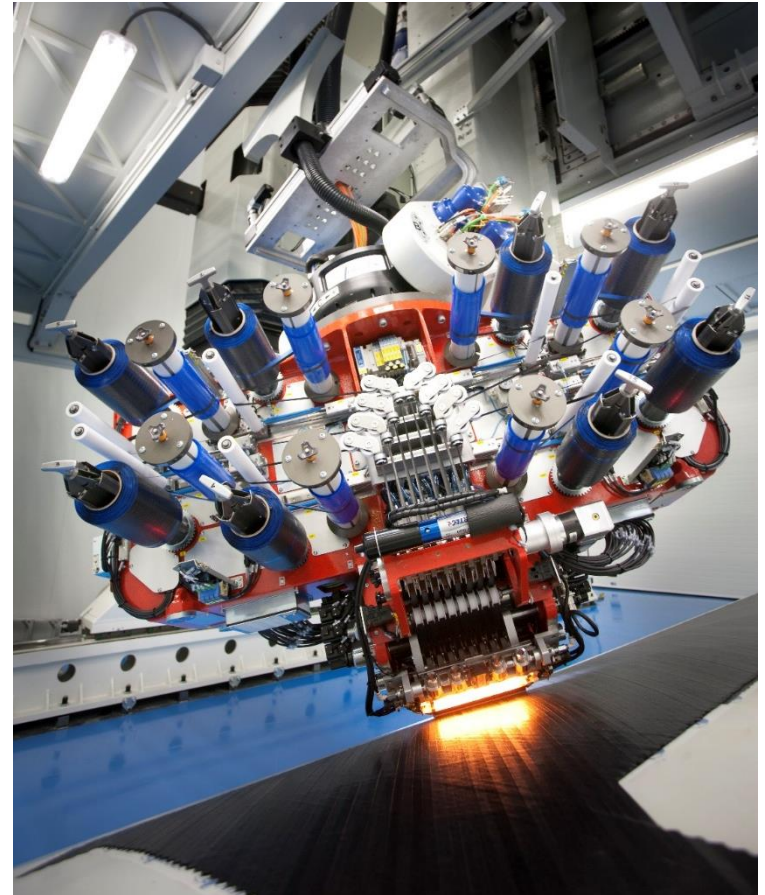


- Alu alloy
- Carbon
- Monolithic
- Carbon Sandwich
- Quartz Glass





Automatic Tape Laying machine, Torreslayup, for the Embraer programs E175 and E190 installed in Sonaca (Belgium)



Automatic Fiber Placement machine, Torresfiberlayup MTorres (Spain)





AFP, Torresfiberlayup column in GKN (Filton, UK)





Hybrid ATL /AFP machine for A350XWB wings skins fabrication in Airbus Stade plant (Germany)





Milling and drilling Machine for fuselages of BOEING 787 program. SPIRIT AEROSYSTEMS (USA)

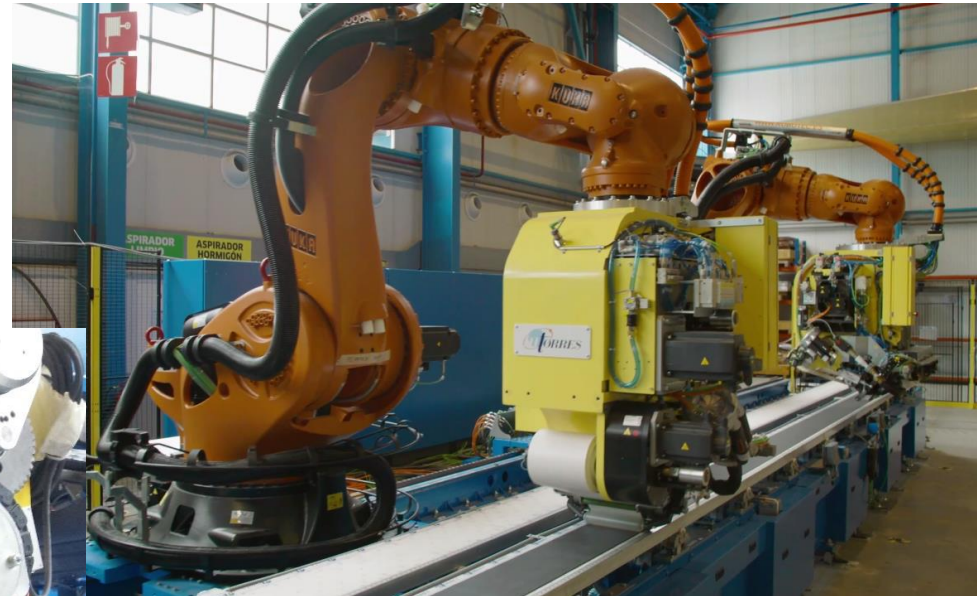




Torresmill and Torrestool machines for high speed milling and drilling of aircraft Carbon Fiber structural components for the A380 program installed in Airbus Illescas plant (Spain)



6-Axes Machine for ultrasonic cutting composite components



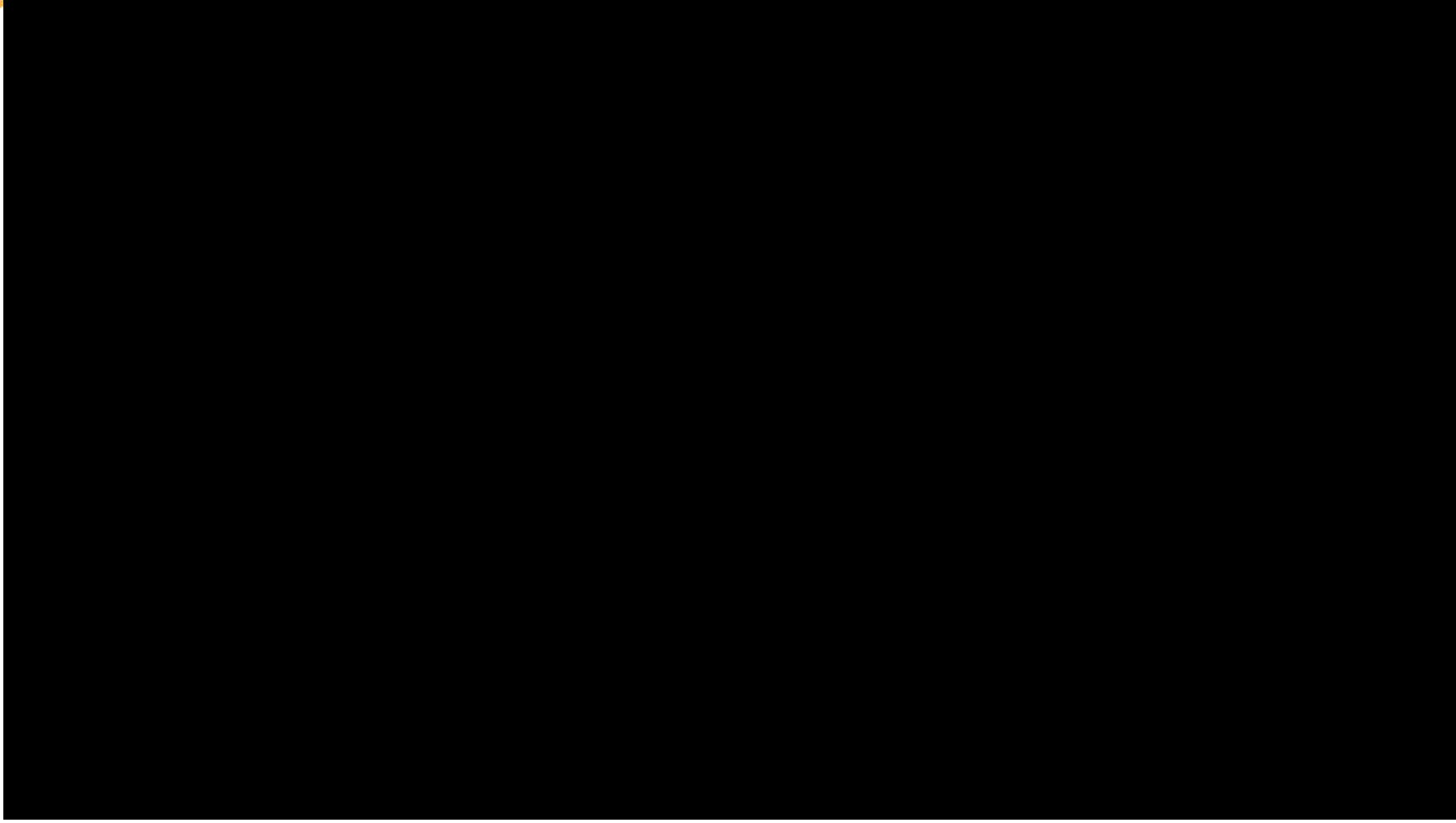
Robot Machine - Automatic Tape Laying





Ultrasonic inspection machine installed at Spirit Kinston ( USA) for the A-350 program







A400 M assembly line installed in Airbus Military (Seville)



A380 assembly line installed in Airbus Hamburgo (Germany)



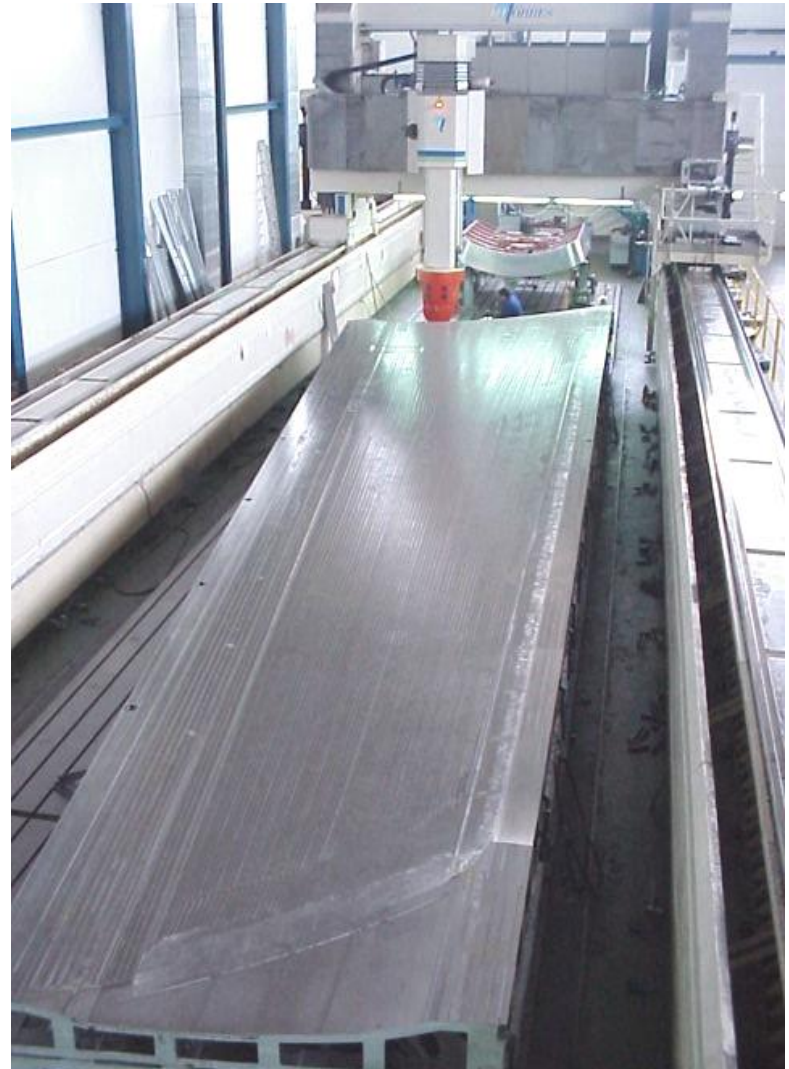


Final assembly line for the Russian MS21 wings installed in Aerocomposite (Ulyanovsk, Russia)





Assembly line for Fuselage section 19 at Airbus Getafe ( Spain) for A350 program

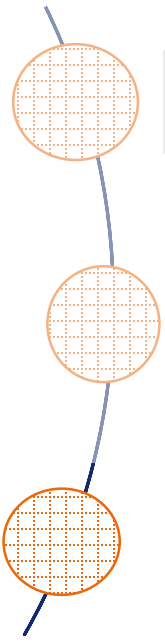
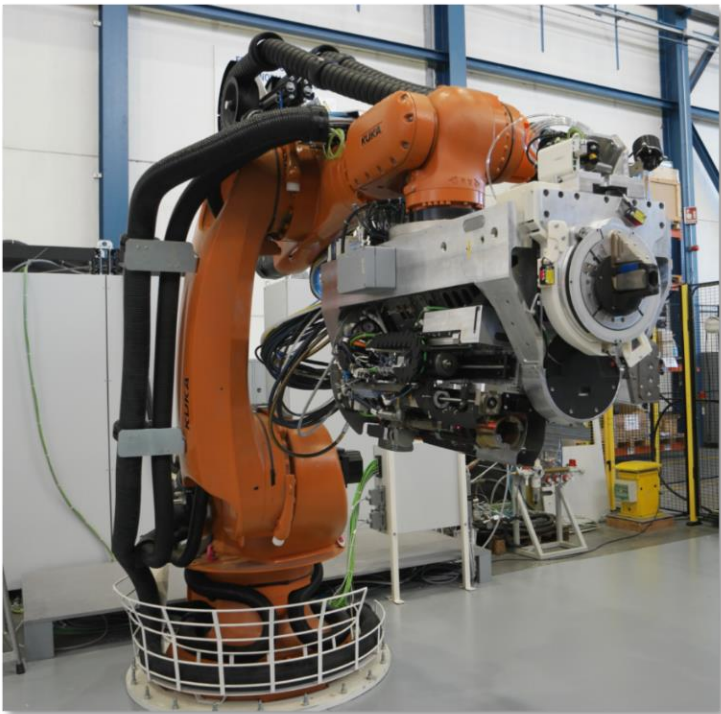


MOULDS MANUFACTURING





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## **MTorres Composite Material State-of-the-art**

Raw material cost (PAN):	2-3€/kg
Dry carbon fiber cost:	13-25€/kg
Certified prepreg cost for aeronautics:	50-120€/kg

### Very high process cost

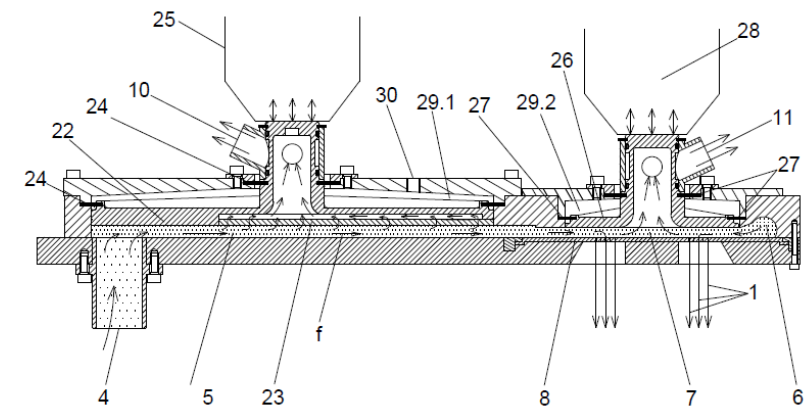
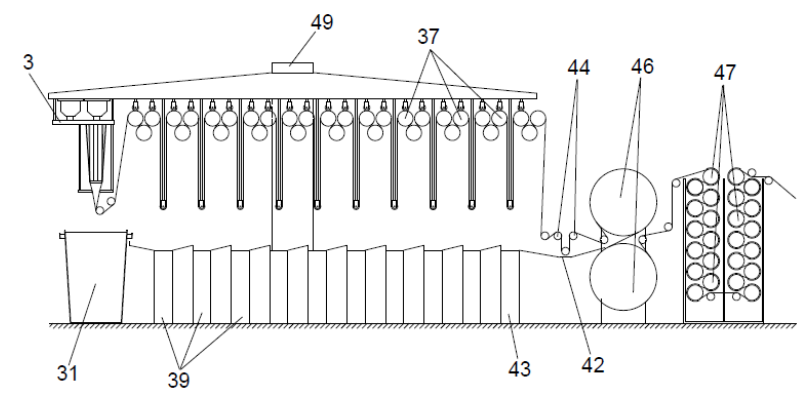
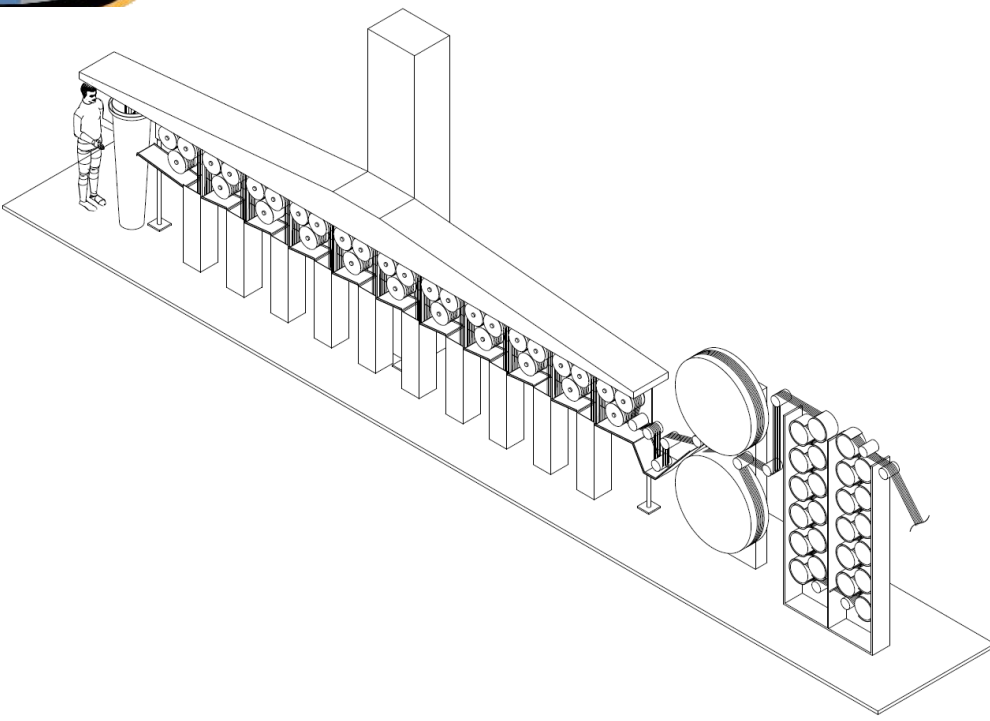
MTorres cost estimation for dry fiber:

8-10€/kg

- High speed and productivity lines
- Process design driven by cost reduction



# Mtorres NewSpinning

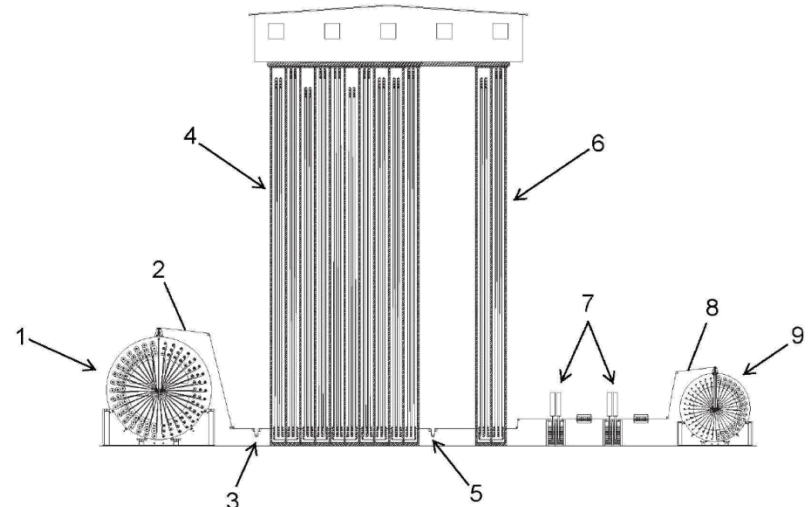
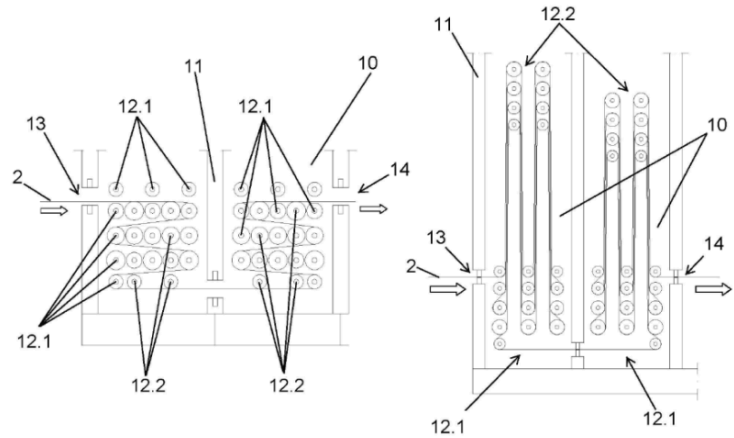
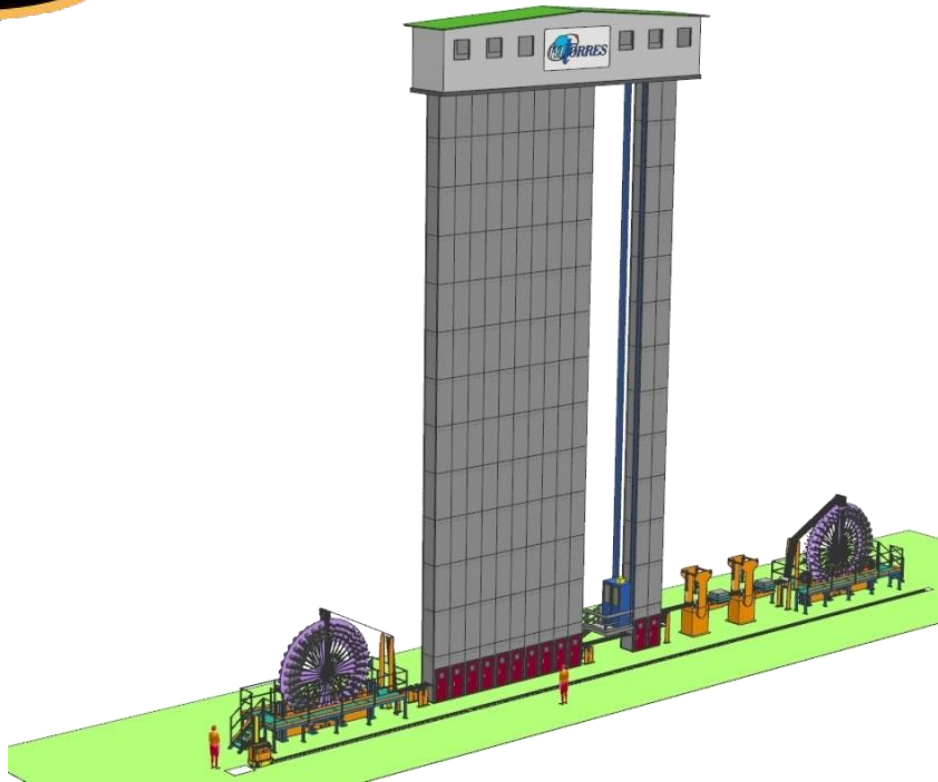


Patents filed:  
 P201530911-2015/06/25: Extrusion head for manufacturing filaments, extrusion installation and extrusion procedure that employ such extrusion head.  
 P201431881-2014/12/19: Procedure for manufacturing acrylonitrile filaments.





# MTorres ThermalTreatments



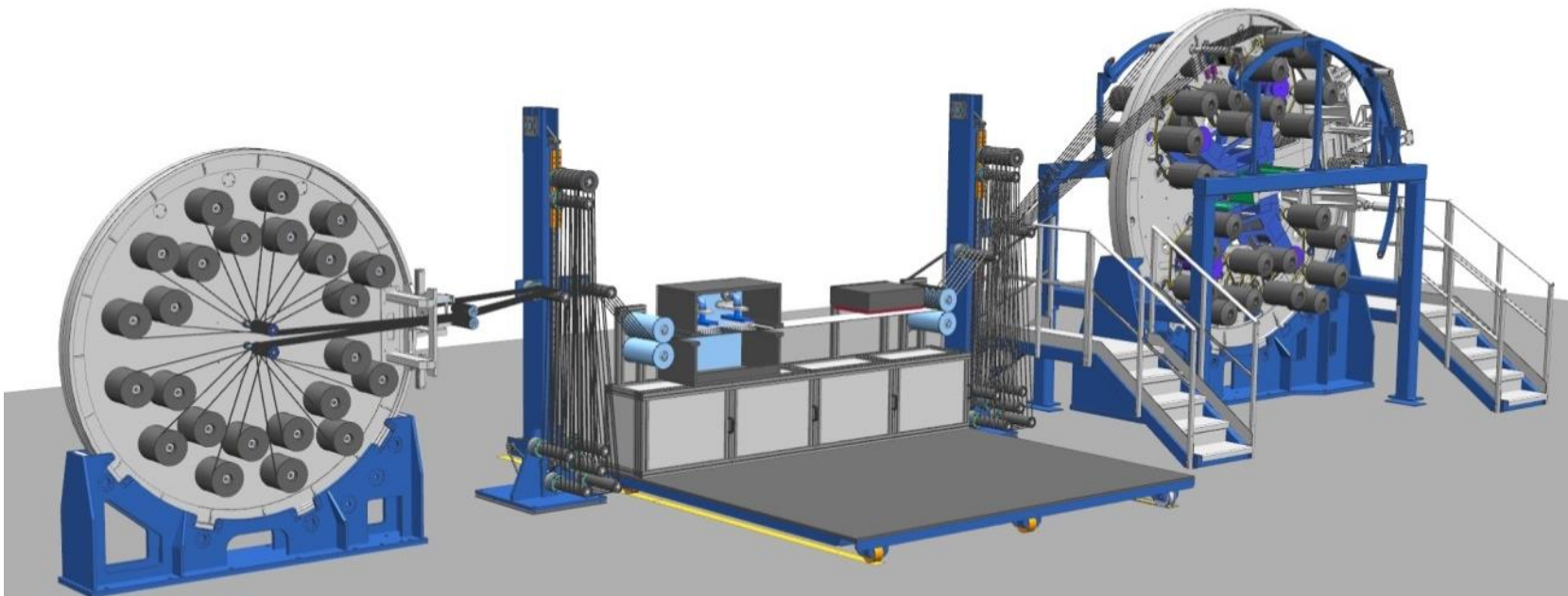
Patents filed:

ES2528068-2014/12/19: Oven for continuous carbon fiber manufacturing, and installation to manufacture carbon fiber with said oven.



## **MTorresConditioningDryFiber**

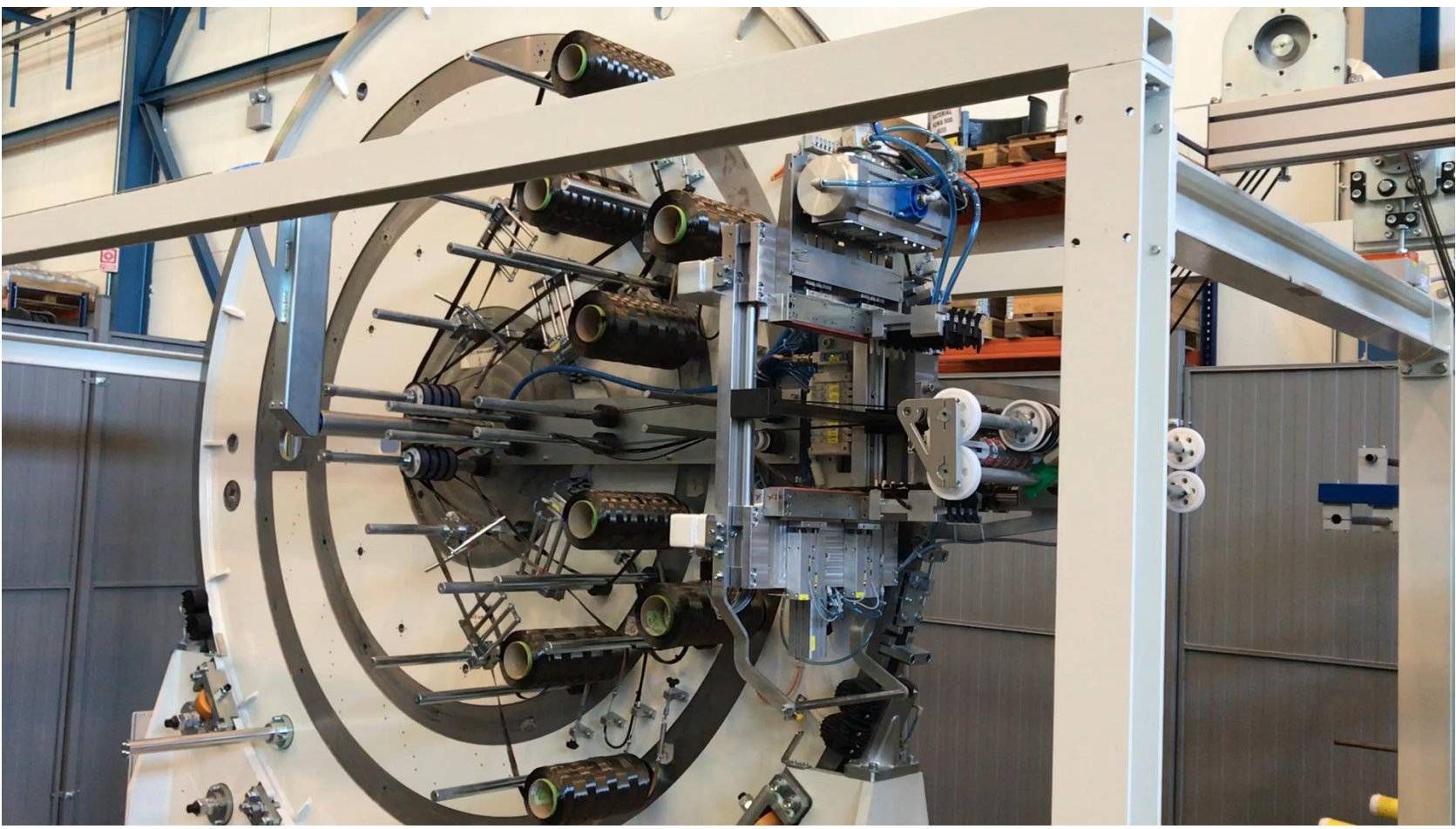
- High-speed & low-cost
- Customized products for different applications
- Automated undwinding-rewinding stages from the Paper Converting Industry know-how







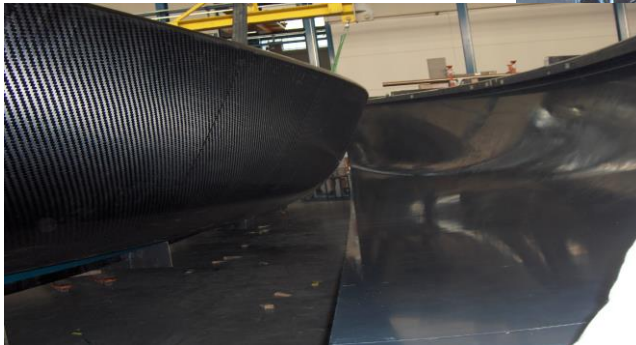
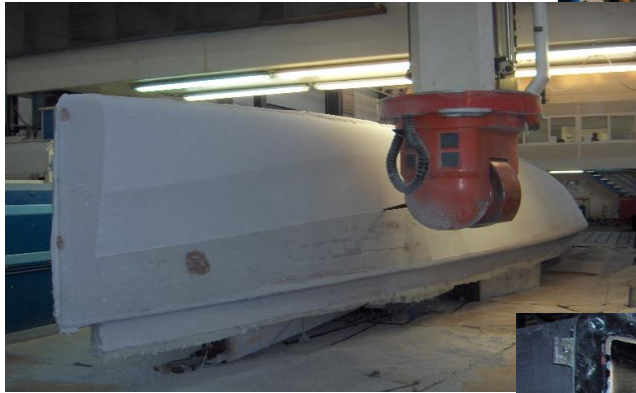
**CONDITIONING SYSTEM AT WORK**







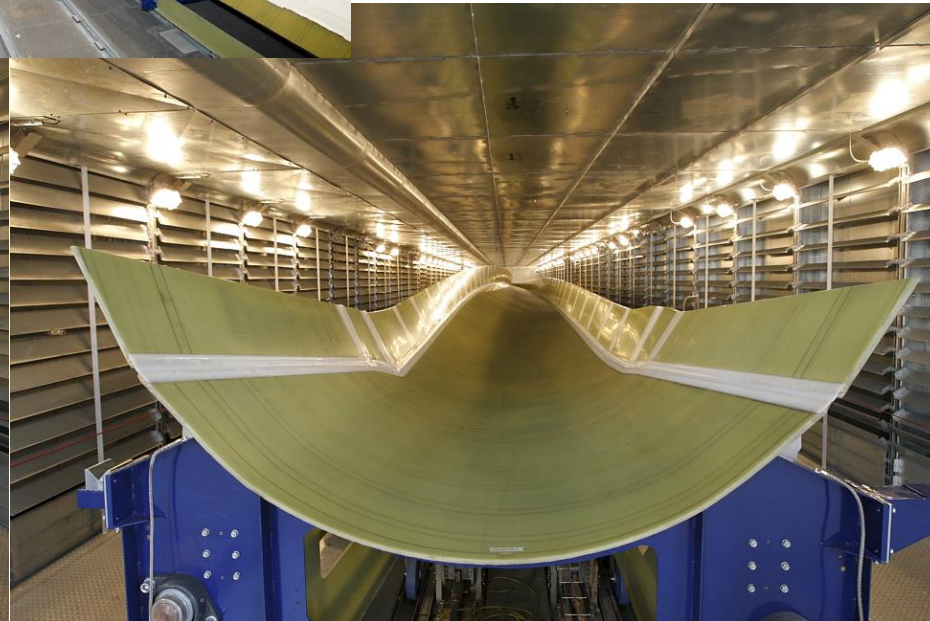
## MONOCOQUE DRY FIBER RESIN INFUSION SHIP MANUFACTURING

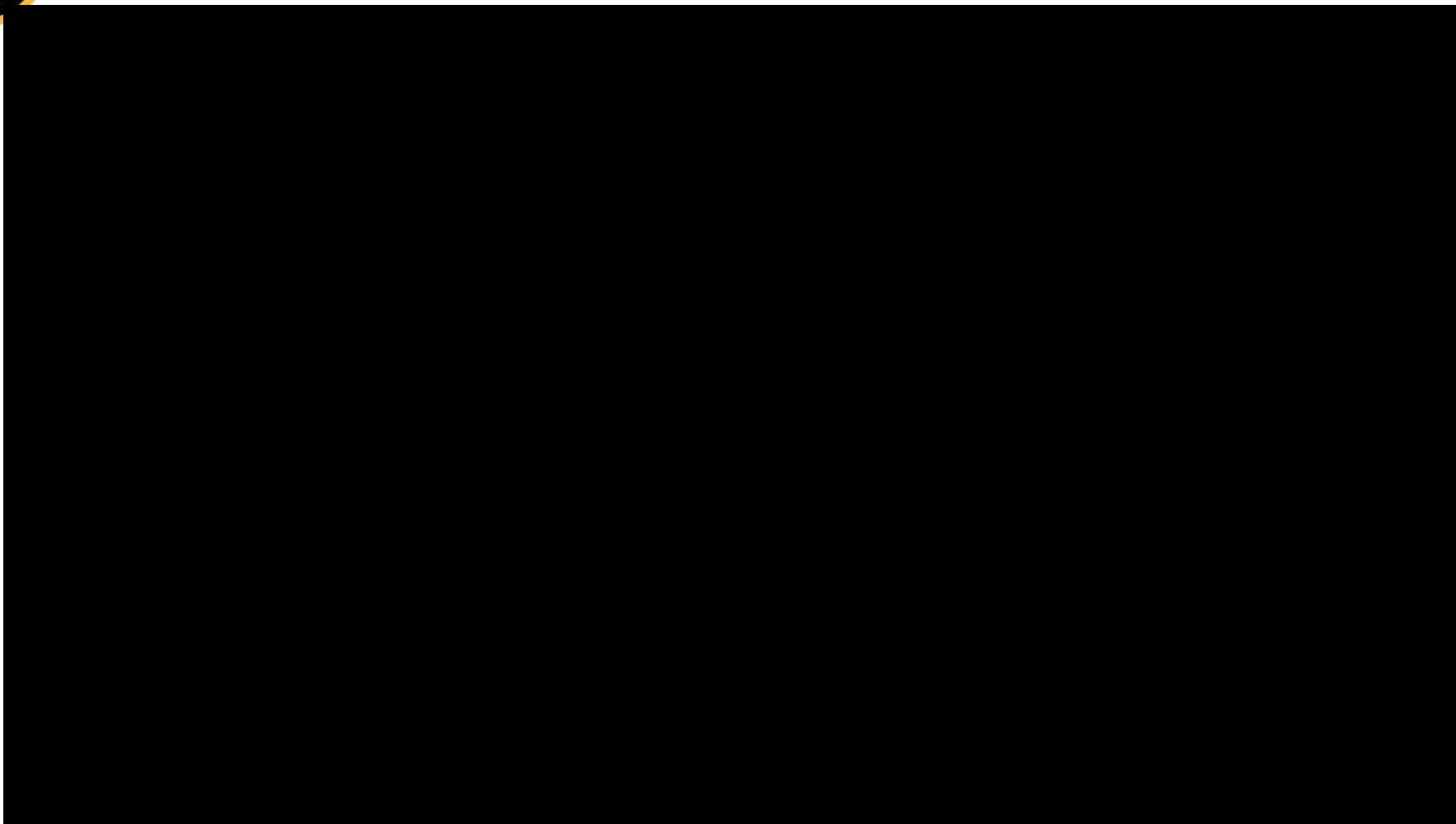






## GLASS FIBER HI PERFORMANCE MANUFACTURING PROCESS ON FLEXIBLE MOULDS

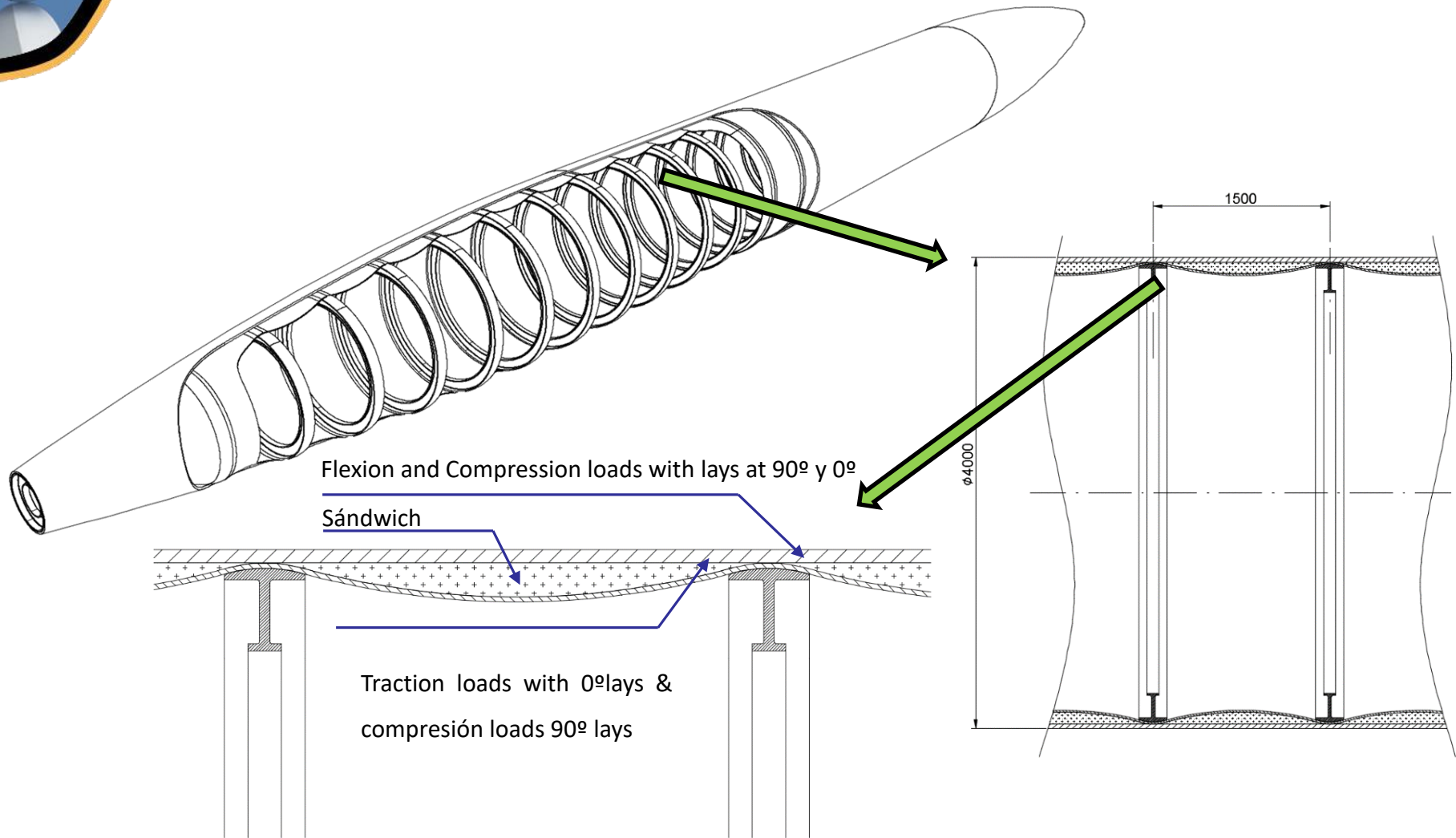






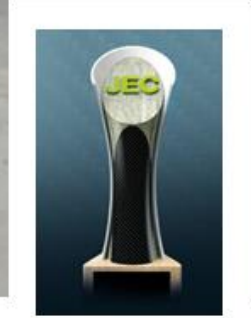


## SUBMARINE CARBON FIBER MANUFACTURING CONCEPT





# MOLD-LESS    MONOCOQUE    FUSELAGE



JEC innovation award  
- Aerospace Process -  
Co-winner with Airbus

Patent Pending





**MOLD-LESS**

**MONOCOQUE**

**FUSELAGE**



# TORRESWING

Mold-Less Monocoque Fuselage