

IDEC

Albert Einstein, 29-50
Parque Tecnológico de Álava
01510 VITORIA-GASTEIZ (SPAIN)

www.idec.aero

/ INTRODUCTION

EXPERIENCE

- ✓ MORE than 28 years of experience in development and manufacturing composite RTM structures.
- ✓ Strong Engineering, R&T capacity & Industrial Capacity.
- ✓ Technology Driven: Own Injection Systems & Tooling Design .



COMPANY ACTIVITY

Advanced Composite Structures →
Design, Development and Manufacturing by
RTM
(out-of-autoclave).

/ INTRODUCTION.

COMPETITIVE ADVANTAGE OF THE 'LIQUID WAY' COMPOSITES

Advanced Solutions

- New structural concepts, weight improving and with more efficient shapes.
- PERFORMANCE DRIVEN composite materials:
 - Radiotransparency (Radomes).
 - ECM.
 - Impact Resistant, Armouring & Ballistic.
 - Corrosion Resistant.
- Advanced manufacturing processes.

The Liquid Way technology (RTM, RFI,...) :

- High integration level.
- High Tolerances unachievable. Automation-Hole to Hole.
- Complex geometries.
- Reduce Development Lead Times.



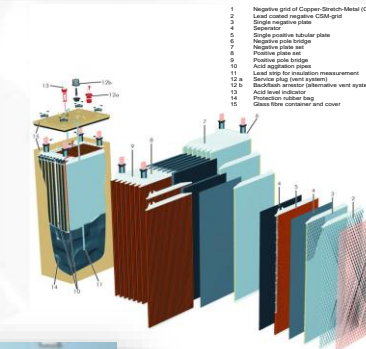
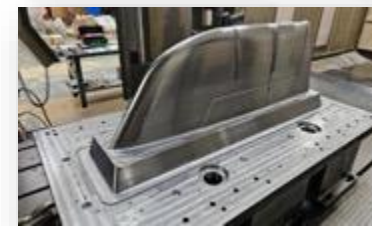
TRADITIONAL DOOR STRUCTURE	
PARTS	STANDARDS
610	~10.000



CF RTM DOOR STRUCTURE	
PARTS	STANDARDS
1	~100



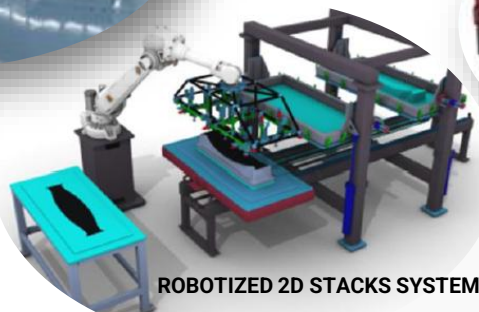
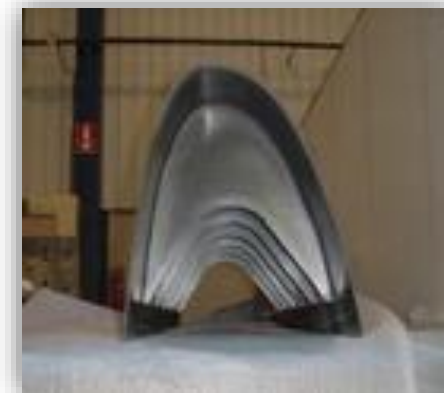
**Integrated SKIN & GRID
ONE SHOT PART**



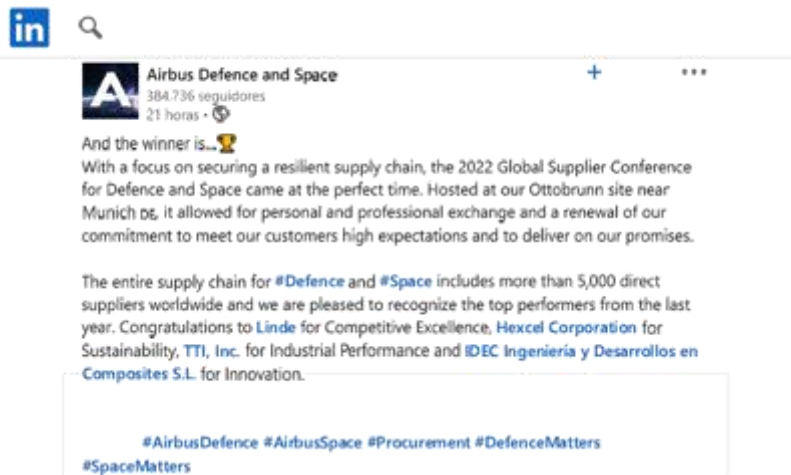
/ RTM EFFICIENT TECHNOLOGIES.



AUTOMATED
LAY-UP
CYCLE



/ AIRBUS DEFENCE & SPACE INNOVATION AWARD 2022



/ CUSTOMER PORTFOLIO

AEROSPACE

AIRBUS

AIRBUS
DEFENCE & SPACE

AIRBUS
HELICOPTERS

GKN
GKN AEROSPACE

Fokker

GKN
GKN AEROSPACE

Aerospace Engine Systems

DEFENCE

EXIDE
TECHNOLOGIES



NDLO

indra

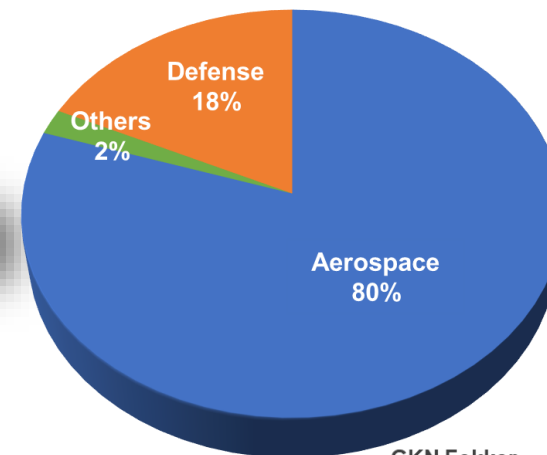
PMB
DEFENCE

EnerSys
Power/Full Solutions

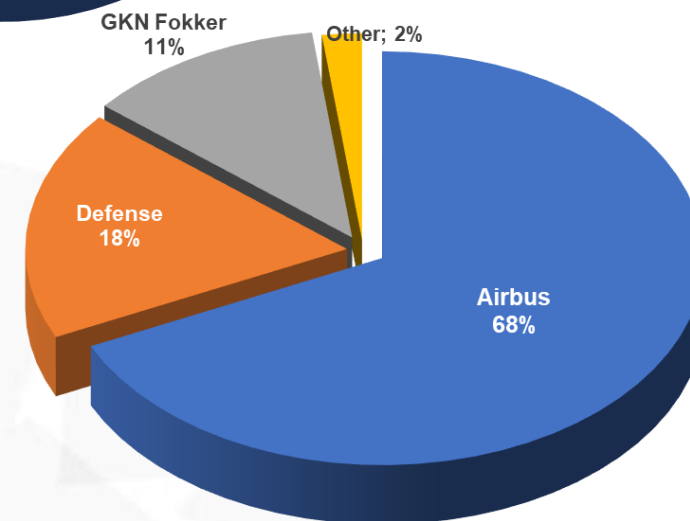
INDUSTRIAL

Navantia

ORBEA



2024 Customer Portfolio



- DIVERSIFIED CUSTOMER PORTFOLIO
- LONG TERM PARTNERSHIP as RTM specialist
- TECHNOLOGICAL TRADE OFF
- PRODUCT DEVELOPMENT COOPERATION

/ OUR SITES

RTM TECHNOLOGY & PRODUCT SPECIALIZATION SITES



E29 PLANT
Parque Tecnológico de Álava
Miñano Menor (Álava)



E50 PLANT
Parque Tecnológico de Álava
Miñano Menor (Álava)



PSM PLANT
Parque Tecnológico de Tecnobahía
El Puerto de Santa María (Cádiz)



/ EXPERIENCE & CAPABILITIES – INDUSTRIAL MEANS

BENCHMARK CUSTOMIZED EQUIPMENT



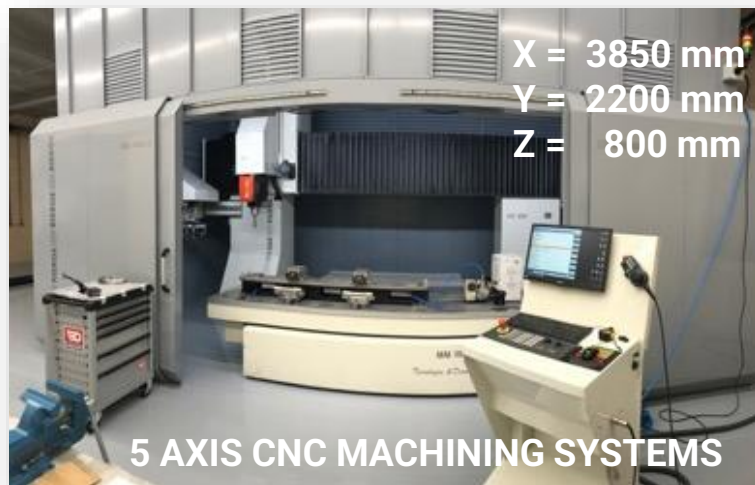
PLY CUTTING



H/F SYSTEMS



INJECTION SYSTEMS



5 AXIS CNC MACHINING SYSTEMS

X = 3850 mm
Y = 2200 mm
Z = 800 mm



CMM MACHINES



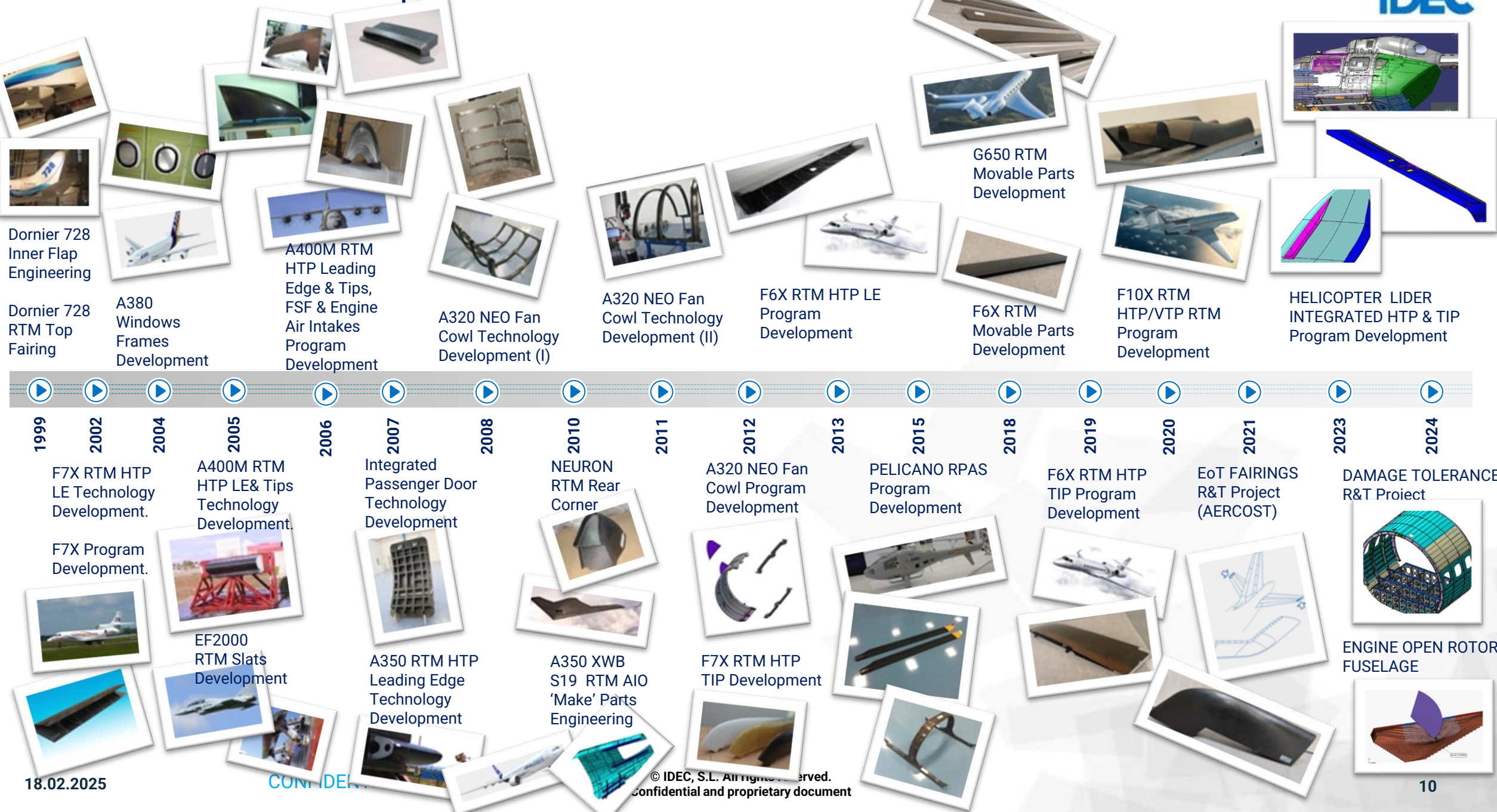
NDI (US INSPECTION)

/ EXPERIENCE & CAPABILITIES – INDUSTRIAL MEANS

LEAN LAY OUT DESIGN



Presentation of IDEC activities and experience



/ AEROSTRUCTURES

Development & Series Production

AIRBUS A400M:

- HTP LE & TIP
- VTP Fittings
- PWP Air Inlets
- FSF Rear Cones



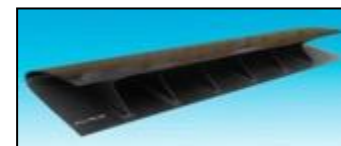
AIRBUS A320 NEO:

- Fan Cowl Stiffeners
- Strakes



FALCON F8X (AIRBUS D&S):

- HTP LE & TIP



FALCON F6X (GKN-FOKKER):

- HTP LE & TE & TIP
- VTP TE



FALCON F10X (AIRBUS D&S):

- HTP LE & TE & TIP
- VTP LE



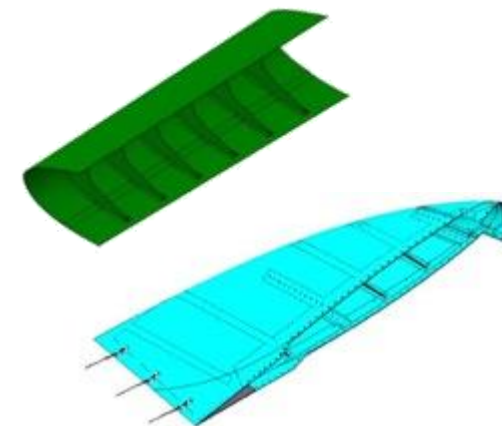
G650 (GKN-FOKKER):

- HTP TE

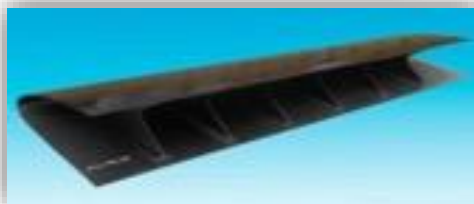


/ LEADING EDGES & TIPS

IDEC supported our customers to develop integrated Leading Edges & Tips Structures, as One-Shot-Injection with no need for assembly nor rivets.



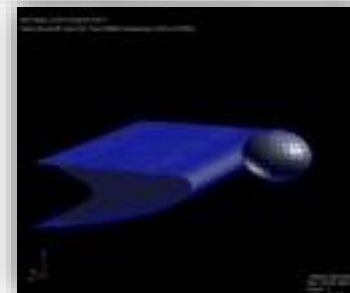
Design & Build Capabilities



VTP Leading Edges



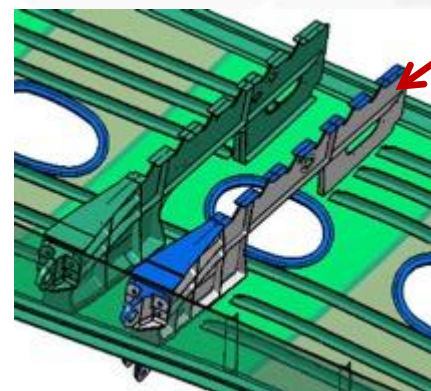
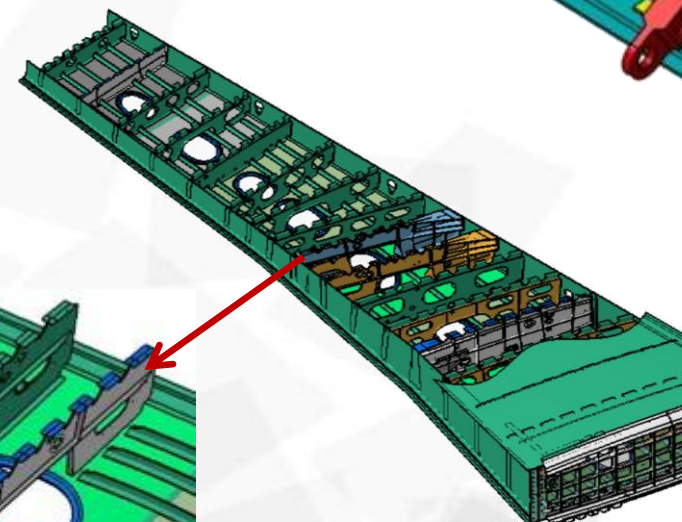
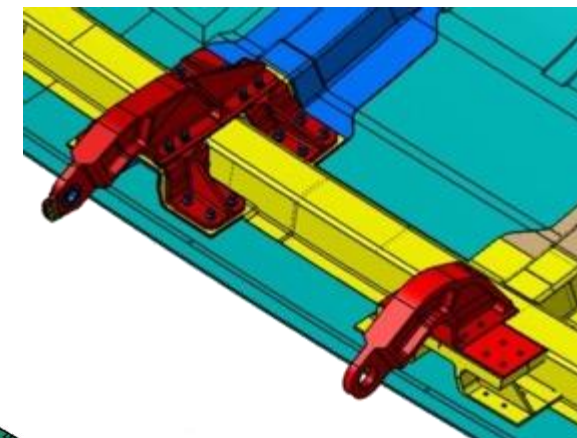
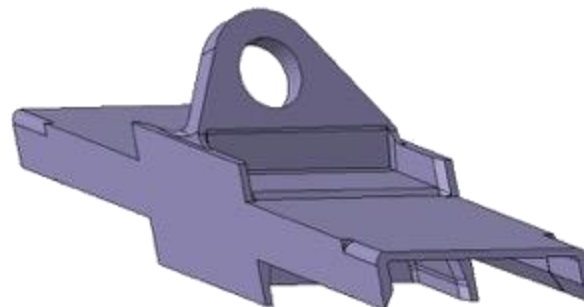
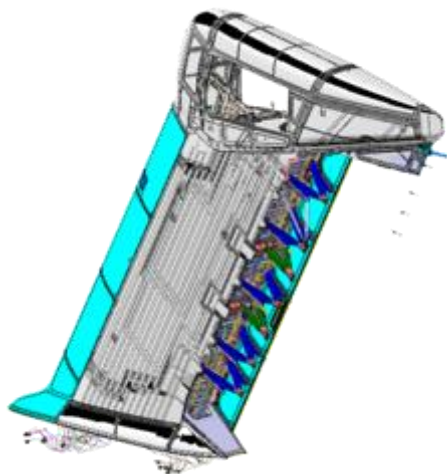
Wing Leading Edges



Certifications Capabilities

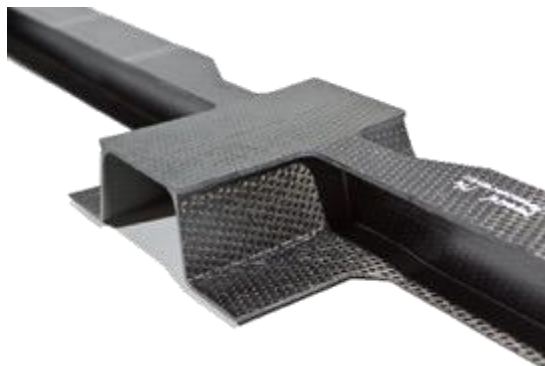
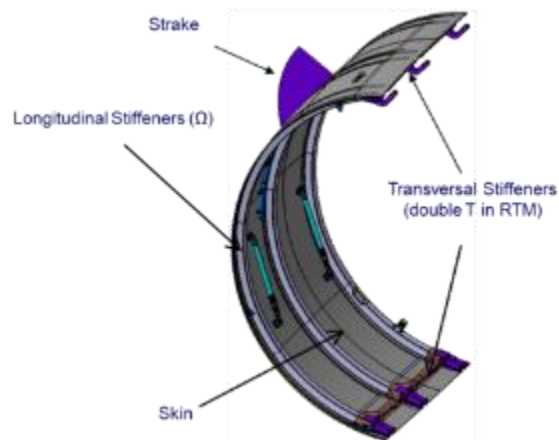
/ HINGES & FITTINGS

IDEC expertise applied to aerostructures Hinges & Fittings may provide alternative & competitive solutions for metal options.



/ FAN COWLS STRUCTURAL GRID & STRAKES

IDEC supported our customers to develop Fan Cowl structural grid, either as detailed parts –already in production as well as One-Shot-Injection grid.



Epoxy & BMI Resin Injection experience

/ AIR INLETS

IDEC supported our customers to develop TurboProp Engine Cowling Air Inlets. Design Concept & One Shot Manufacturing process easily apply to Nacelles or Fuselage Fairings.



/ SURROUND FRAMES

IDEC developed different solutions for Surround Frames and Structural Composite Joints already certified or tested.



/ INTEGRATED DOORS

IDEC developed manufacturable concept solutions for one-shot injection skin & grid for PAX Doors & Landing Gear Doors. Solutions that are directly applicable to Nacelles Fan Cowl of certain different solutions.



ONE-SHOT MONOLYTIC STRUCTURE.

TRADITIONAL DOOR STRUCTURE



TRADITIONAL DOOR STRUCTURE	
PARTS	STANDARDS
610	~10.000



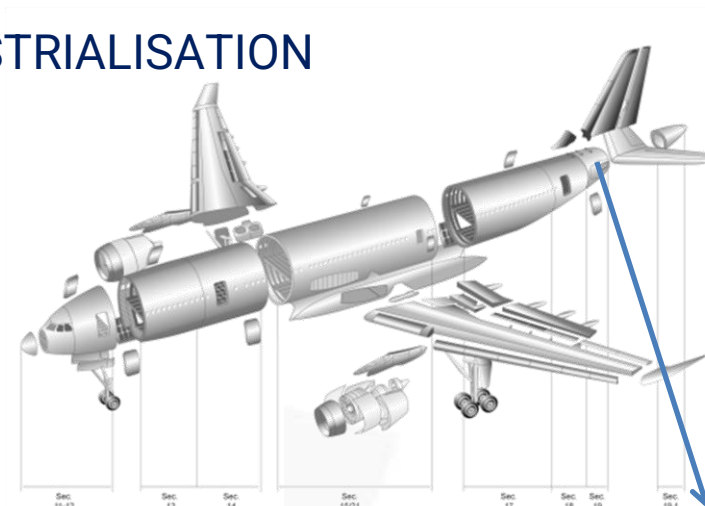
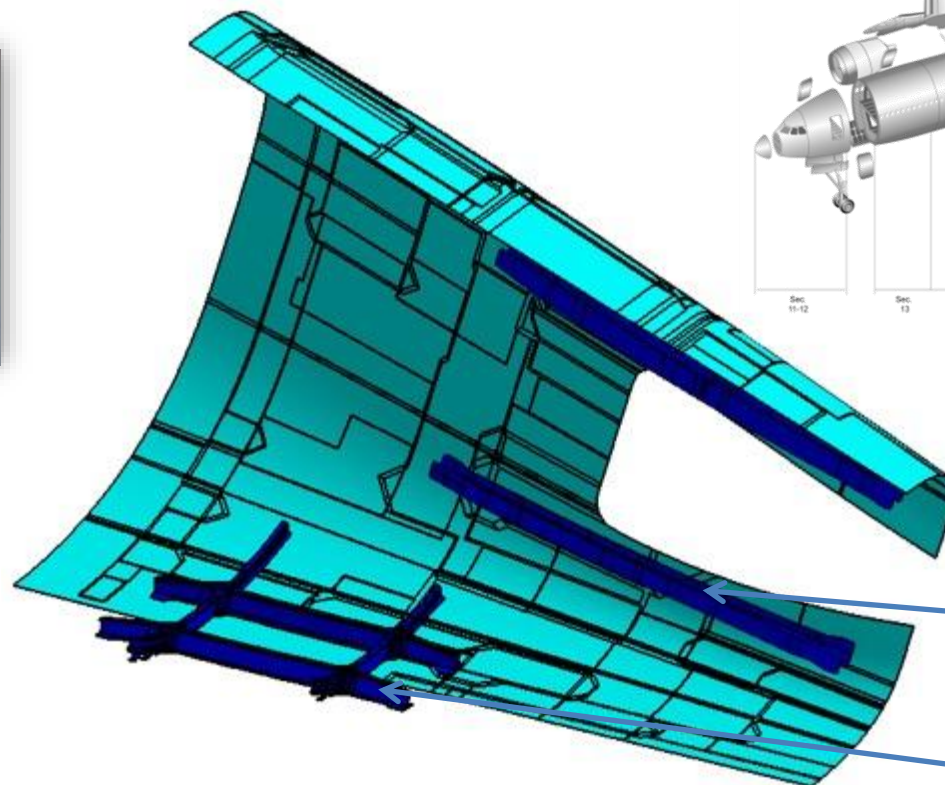
CF RTM DOOR STRUCTURE	
PARTS	STANDARDS
1	~100



**Integrated SKIN & GRID
ONE SHOT PART**

/ AEROSTRUCTURES – TURN KEY MANUFACTURING ENGINEERING

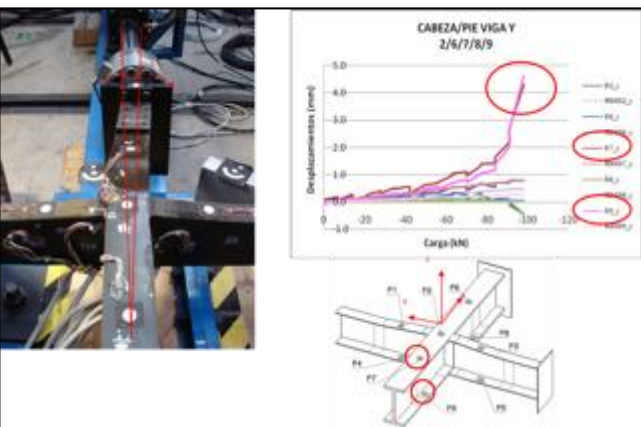
A350 XWB AIRBUS OPERATIONS 'MAKE' PARTS INDUSTRIALISATION



SECTION 19

**HTP CUT-OUT
BEAMS**

**ACCESS DOOR
INTEGRATED FRAME**



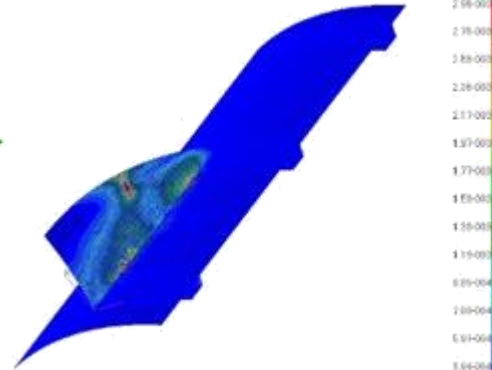
/ EXPERIENCE & CAPABILITIES – SUMMARY

FULL PRODUCT LIFE CYCLE EXPERTISE

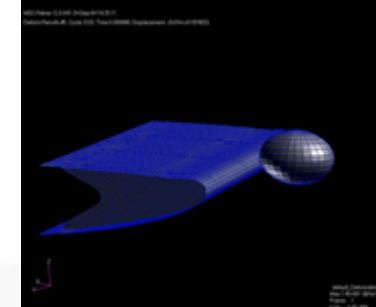
ENGINEERING



Design



Stress Analysis



Dynamic Simulation

MANUFACTURING



Lay-Up Clean Rooms

CONFIDENTIAL



Non Destructive Inspections



Metrology

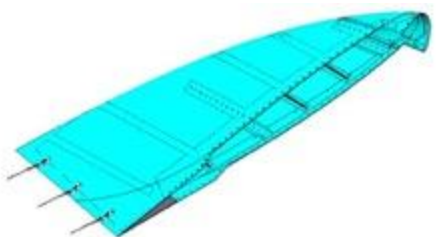
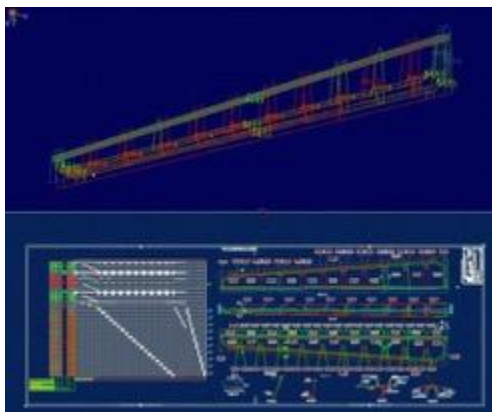
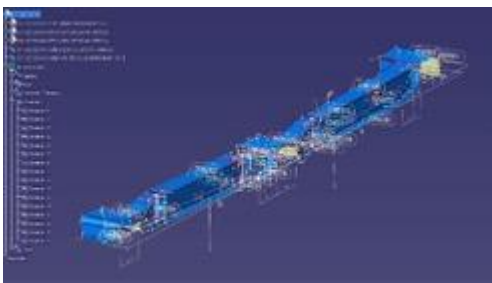


Machining

/ EXPERIENCE & CAPABILITIES - ENGINEERING



DESIGN.



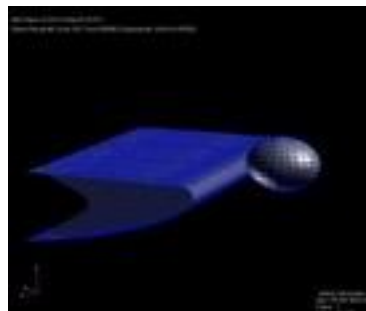
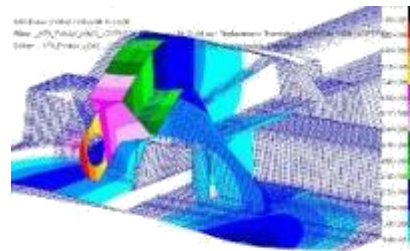
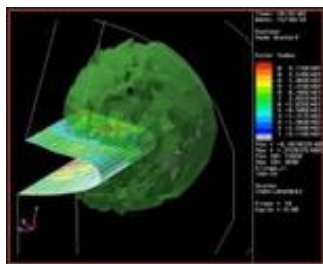
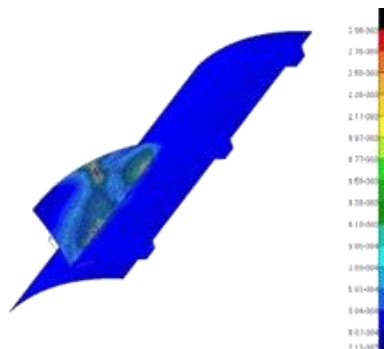
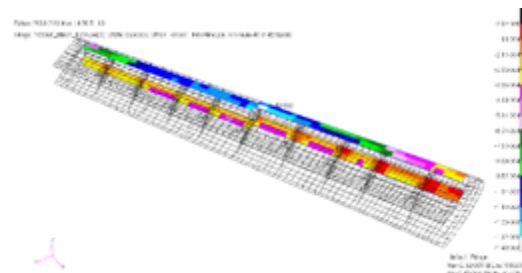
Software: CATIA

18.02.2025

CONFIDENTIAL



STRESS ANALYSIS.



STATIC
DYNAMIC
SIMULATION (IMPACT)

Software:

- Composites Dedicated.
- PATRAN-NASTRAN & DYTRAN
- Altair HyperWorks

© IDEC, S.L. All rights reserved.
Confidential and proprietary document

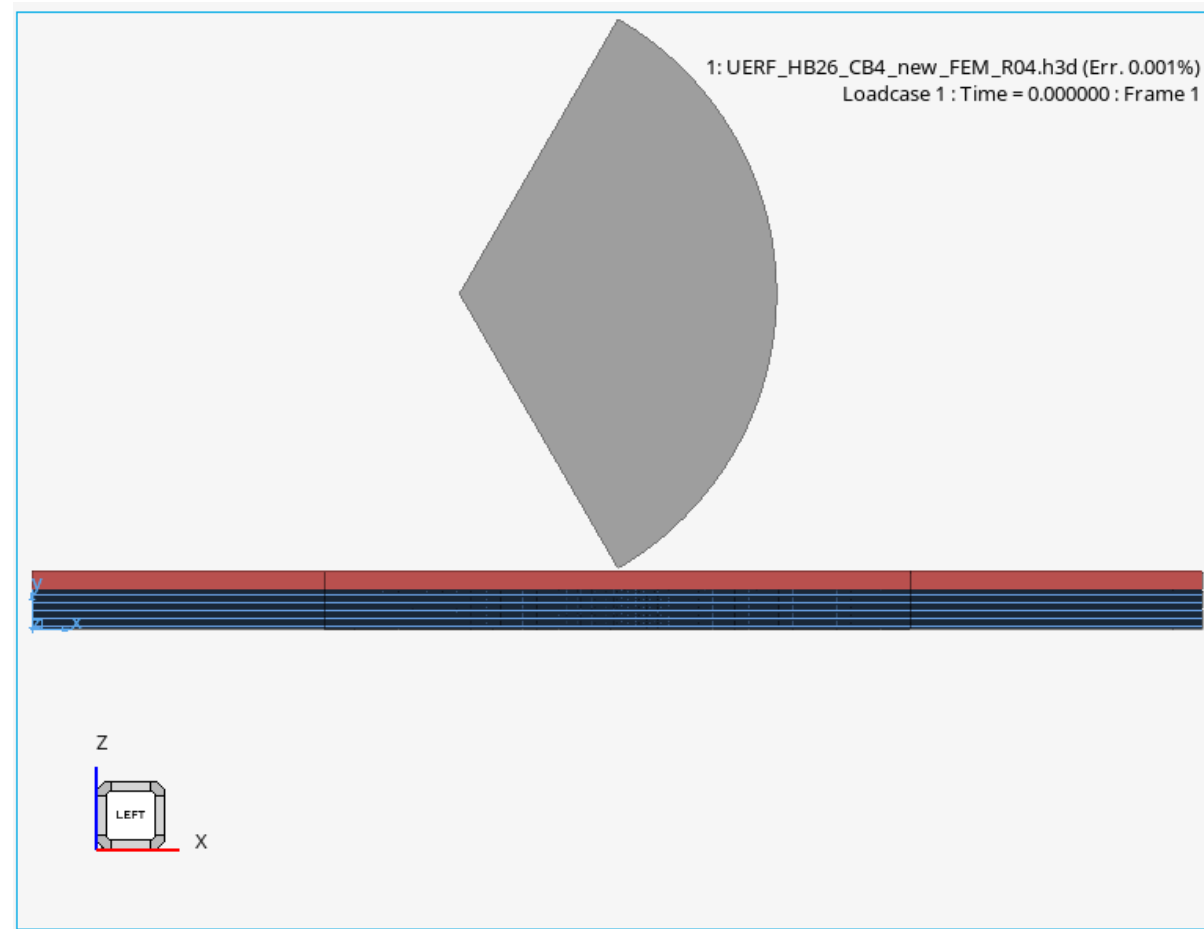
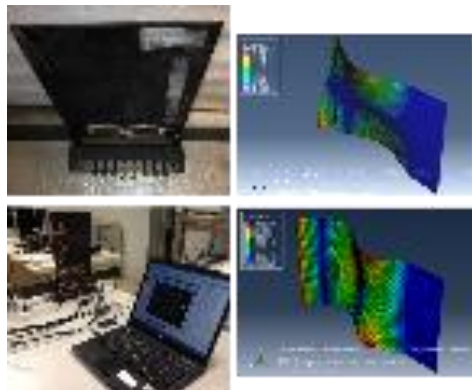
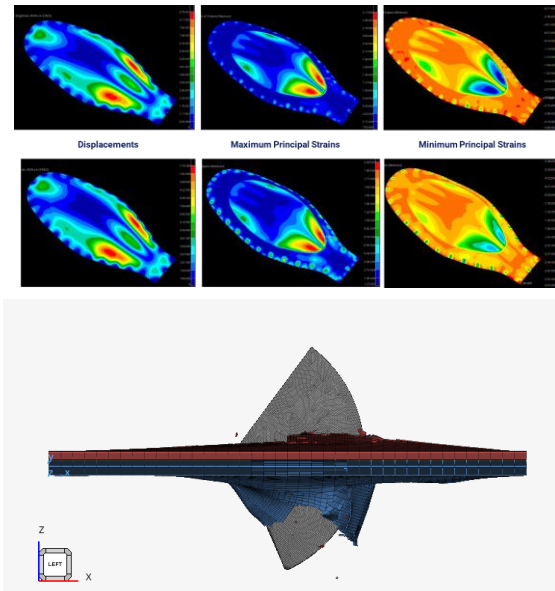


CERTIFICATION.



/ EXPERIENCE & CAPABILITIES - ENGINEERING

IDEC has gathered large experience in M&P and numerical simulation.



/ EXPERIENCE & CAPABILITIES – UAV'S

AEROSTRUCTURES

Development & Series Production

INDRA PELICANO RPAS:

- Main & Tail Rotor Blade
- Landing Gear
- Stabilizer



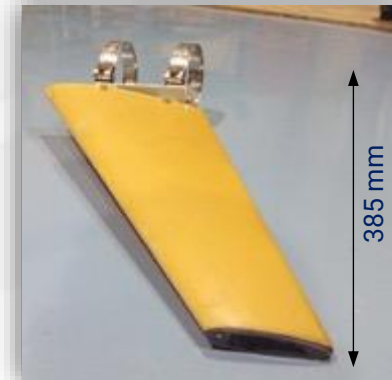
MAIN ROTOR BLADE



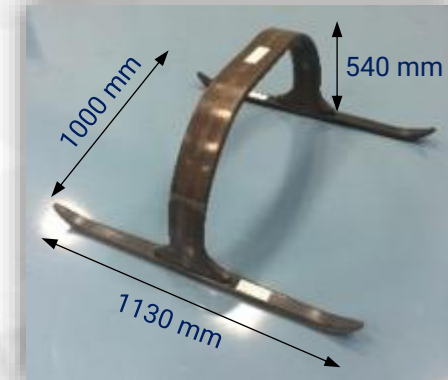
TAIL BLADE



STABILIZER



LANDING GEAR

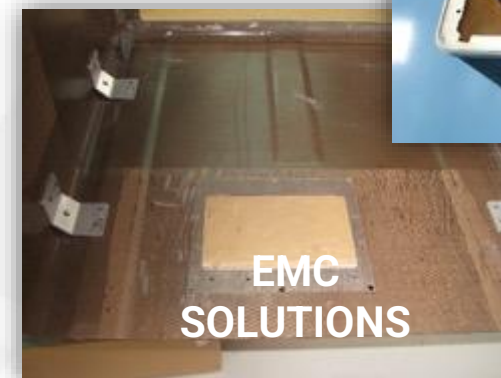
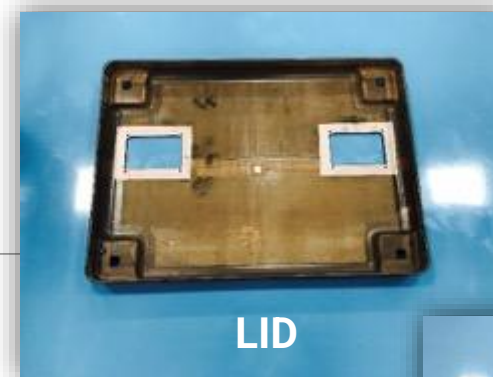
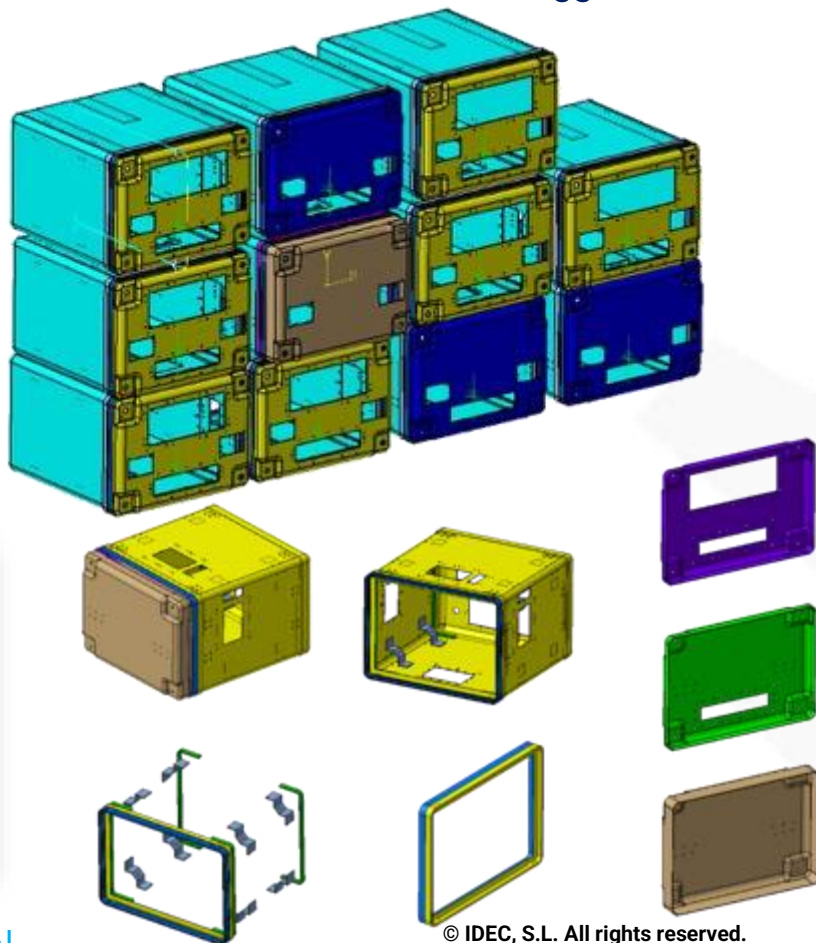


/ EXPERIENCE & CAPABILITIES – ECM APPLICATIONS

Development & Series Production

INDRA GENERAL PURPOSE ADVANCED TESTS EQUIPMENTS (CARBON FIBER STRUCTURE).

- Development and Production of Boxes for Portable and Ruggedized Test Systems.
- EMC.



/ EXPERIENCE & CAPABILITIES - DEFENCE

Development & Series Production

- Submarine Battery Containers. LARGE Production Rates



/ EXPERIENCE & CAPABILITIES - DEFENCE

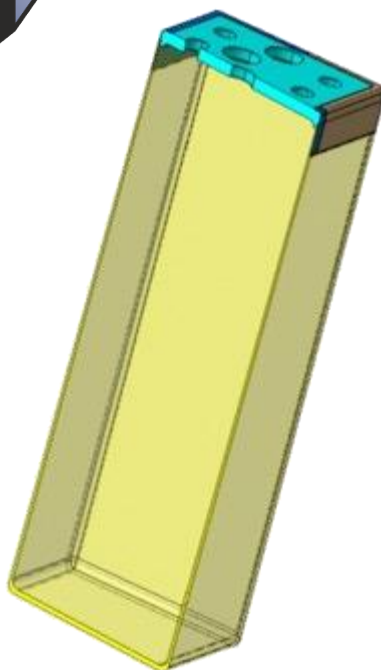
■ Design main parameters for submarine batteries :

- Charging time ratio
- Reliability
- Energy/power content
- Shock
- Vibrations
- Gassing

■ Restrictions :

- Available space
- Weight

**PARTIAL OR TOTAL RESPONSIBILITY
ON
CELL CONTAINER**

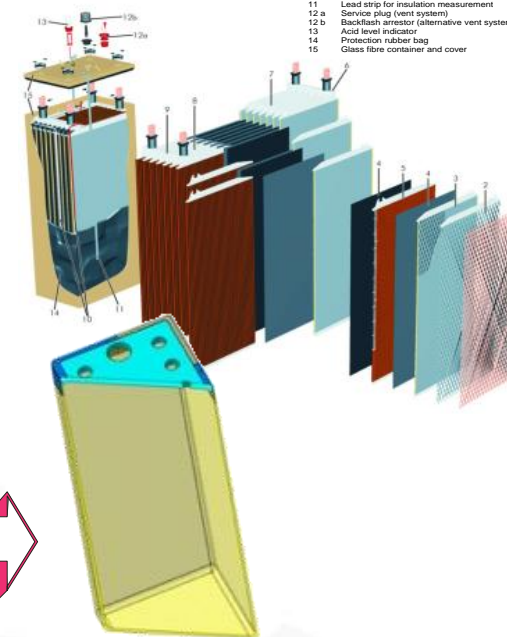


The submarine batteries are designed for optimization of maximum content of active materials (neg/pos/acid).

The batteries uses :

- Profiled Copper Stretched Metal (CSM) in the negative plates.
- Positive plates composed of low antimony lead spines and surrounded by acid resistant tubes made from polyester yarns.

➤ **Slim-walled high performance glass fibre containers.**



- 1 Negative grid of Copper-Stretch-Metal (CSM)
- 2 Lead coated negative CSM-grid
- 3 Single negative plate
- 4 Separator
- 5 Single positive tubular plate
- 6 Negative pole bridge
- 7 Negative plate set
- 8 Positive plate set
- 9 Positive pole bridge
- 10 Acid agitation pipes
- 11 Lead strip for insulation measurement
- 12 a Service plug (vent system)
- 12 b Backflash arrestor (alternative vent system)
- 13 Acid level indicator
- 14 Protection rubber bag
- 15 Glass fibre container and cover

REQUIREMENTS FOR SUBMARINE BATTERY CONTAINERS

- ☐ ELECTRIC ISOLATION.
- ☐ RESISTANCE TO ACID ENVIRONMENT.
- ☐ SHOCK RESISTANCE.
- ☐ STIFFNESS FOR DIMENSIONAL STABILITY (BULGING).
- ☐ MAXIMUM INNER SPACE TO OPTIMISE BATTERY CAPACITY.
- ☐ WEIGHT CONTROL TO GUARANTEE SHIP STOWAGE.



TECHNICAL SOLUTION : GLASS FIBRE COMPOSITE MATERIALS.

MANUFACTURING EXPERIENCED TECHNOLOGY: RTM.

© IDEC, S.L. All rights reserved.
Confidential and proprietary document

/ EXPERIENCE & CAPABILITIES – ELECTRONIC BOXES EMBARKED

Project currently under research and development at IDEC.

Target: to develop and produce affordable lightweight electronic boxes for aeronautics and space applications.

Strategy: to apply multi-functional opportunities of carbon fiber composite materials.

■ Main requirements:

- Electric conductivity.
- Thermal conductivity (heat dissipation capacity).
- Radiation containing capacity (shielding assurance, from chip to box).
- Ability to embed electronics into the box structure.
- Thermal isolation.
- Mechanical performance (acceleration, vibration).

■ Restrictions :

- Available Space.
- Minimum Weight.

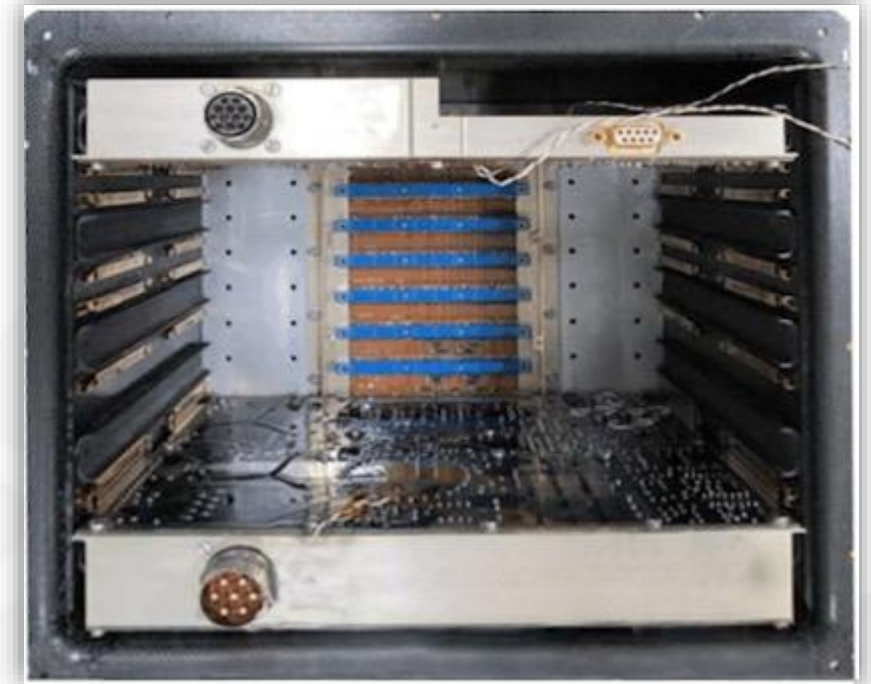


■ Qualification campaign:

- Vibration.
- Thermal Vacuum test.
- Bonding.
- EMI-EMC.

■ Goals:

- Relevant weight reduction comparing current metallic solution (~40%).
- Affordable Cost.



/ INNOVATION – R&D-T

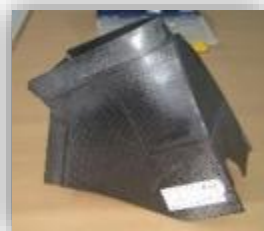
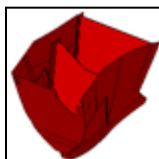
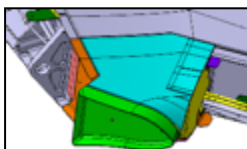
AIRBUS A380:
- Window Frames



AIRBUS A350:
- Access Door Frame
- Main Landing Gear Door
- S19 frame and beams
- HTP LE



UAV: NEURON

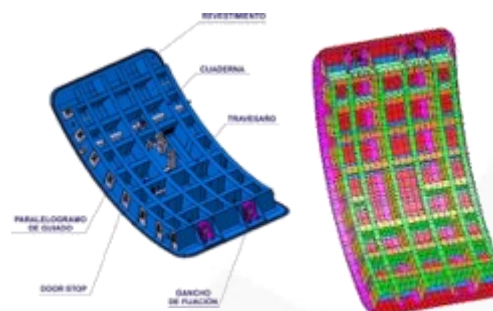


INTEGRATED PAX. DOOR:

A330 DOOR STRUCTURE	
PARTS	STANDARDS
610	~10.000



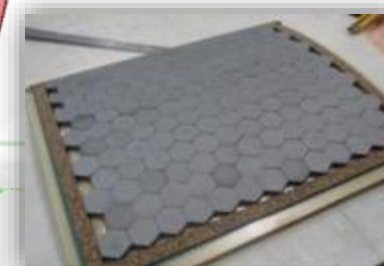
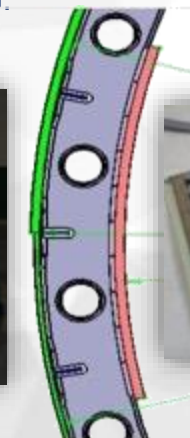
CF DOOR STRUCTURE	
PARTS	STANDARDS
1	~100



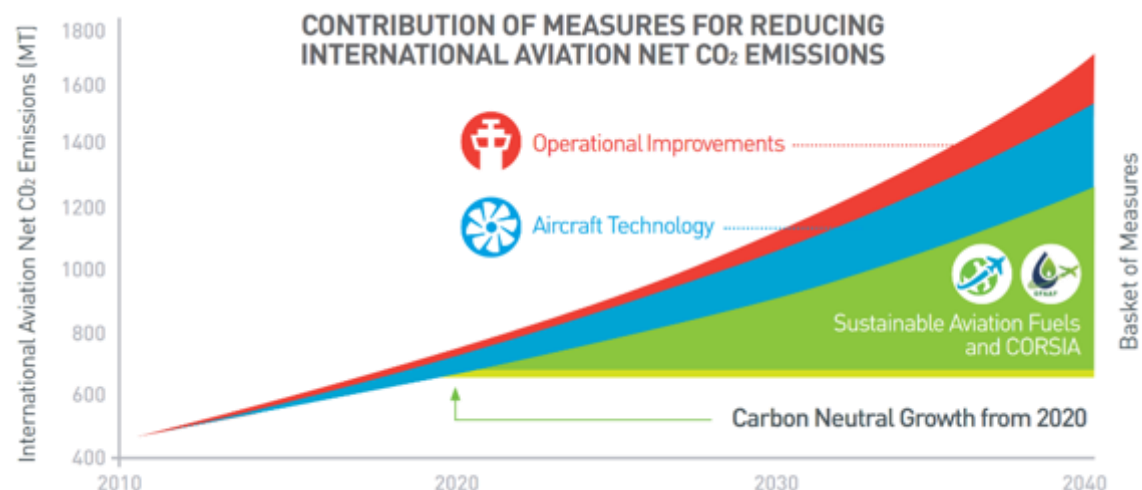
HIGH INTEGRATION FAN COWL STIFFENER:



LIGHT ARMOURING:



/ INNOVATION– SUSTAINABILITY



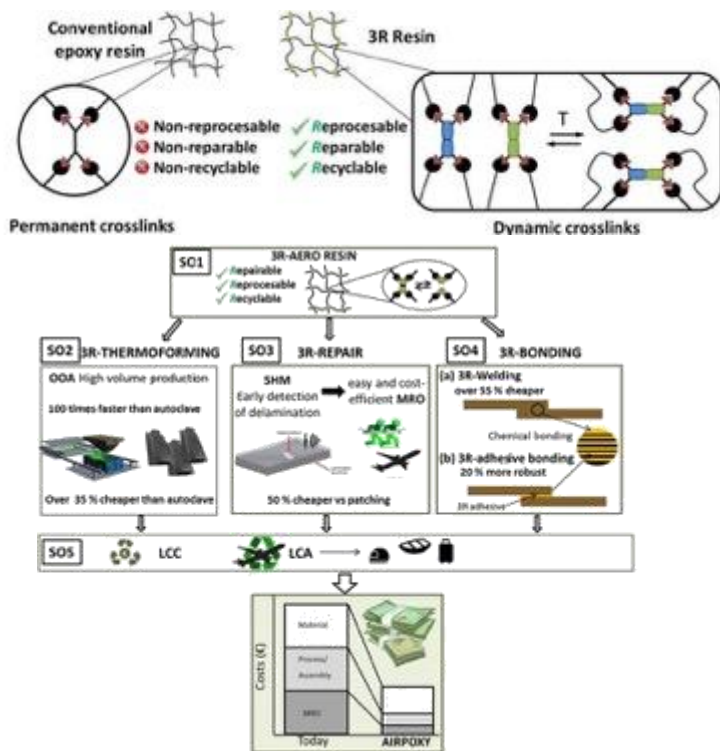
Application of the strategic elements (materials, designs, systems, technologies) to all the components (structures, cabin and systems) of the aircraft so that they all contribute to a greater or lesser extent to achieving both the reduction of fuel consumption (reductions in weight, drag, aerodynamics, new propulsion systems) of the aircraft, and its production in a 100% sustainable manner, thus minimising both the emissions of polluting gases such as NO_x and CO₂, as well as the CO₂ footprint throughout the aircraft's life cycle.

/ INNOVATION – SUSTAINABLE MATERIAL SOLUTIONS



AIRPOXY

3R REPROCESSING, REPAIRING & RECYCLING OF CURED LAMINATES ALLOW FOR MATERIALS WITH AN ENDLESS LIFESPAN



H2020 Grant Agreement Number 769274

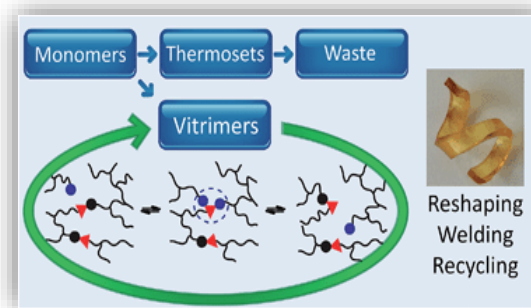
18.02.2025

CONFIDENTIAL



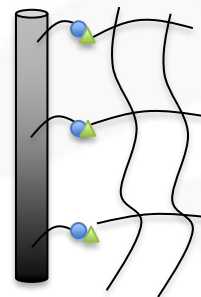
IMPROVING RECYCLABILITY OF THERMOSET COMPOSITE MATERIALS THROUGH A GREENER RECYCLING TECHNOLOGY BASED ON REVERSIBLE BIOBASED BONDING MATERIALS

Biobased Bonding Materials with controlled reversible properties



Reversibility in the crosslinked organic network

Reversibility at the fiber/matrix interface



© IDEC, S.L. All rights reserved.
Confidential and proprietary document

DeremCo

De- and Remanufacturing for Circular Economy Investments in the Composite Industry



The DeremCo project focuses on Fiber-Reinforced Plastics recovery and re-use into high value-added products, establishing an innovative SME-lead cross-sectorial circular value chain, by ground on the key enabling digital and hardware technologies developed and validated at TRL6-7 in previous local and European H2020 projects.

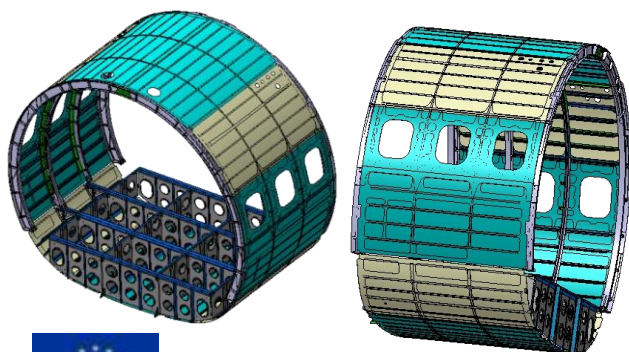
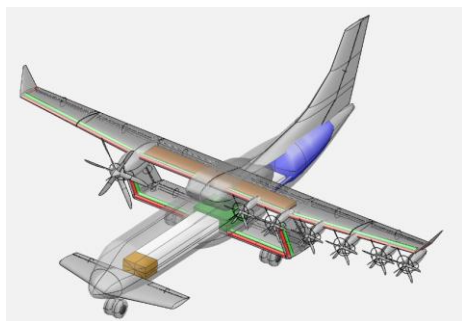


Interregional Innovation Investments Instrument (I3)

/ INNOVATION – SUSTAINABLE MATERIAL SOLUTIONS

HERFUSE

HYBRID ELECTRIC REGIONAL FUSELAGES & EMPENNAGES



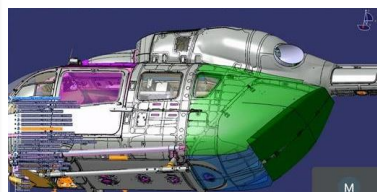
CLEAN AVIATION

18.02.2025

CONFIDENTIAL

LIDER

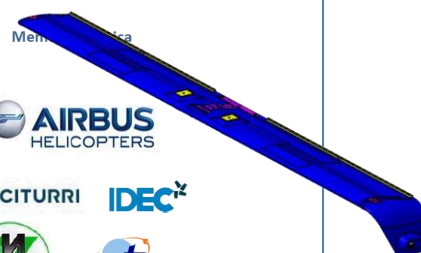
FUTURE DISRUPTIVE HELICOPTER



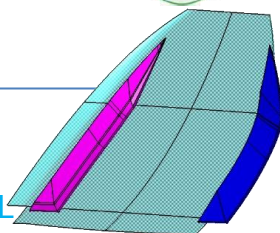
Programa Tecnológico Aeronáutico 2022

helIcóptero Disruptivo dEl futuRo

LIDER



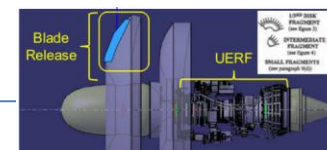
Julio 2022



© IDEC, S.L. All rights reserved
Confidential and proprietary document

TOPFAN

TECHNOLOGIES for NEW GENERATION OPEN FAN ENGINES INTEGRATION



Programa Tecnológico Aeronáutico 2023

TECNOLOGÍAS PARA INTEGRACIÓN DE MOTORES OPEN FAN DE NUEVA GENERACIÓN

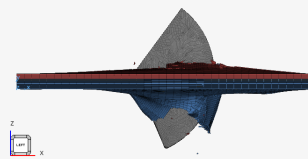
TOPFAN

Memoria Técnica

AIRBUS



Mayo 2023



ECONCARBON

CIRCULAR ECONOMY FOR DE-CARBONIZATION ORIENTED AEROSTRUCTURES



Programa MISIONES TEMÁTICAS 2024

Economía Circular para AeRoestructuras orientadas a la descarbonización

- EconCARBon -



Memoria Técnica

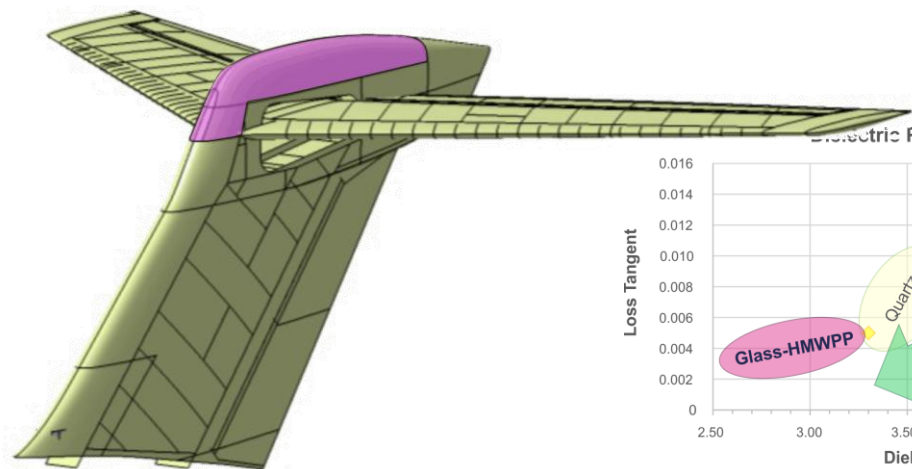
AIRBUS



Julio 2024

30

/ INNOVATION – R&D-T MATERIALS – HYBRIDATION FOR RADOMES



Need of Improvements for Radome Applications:

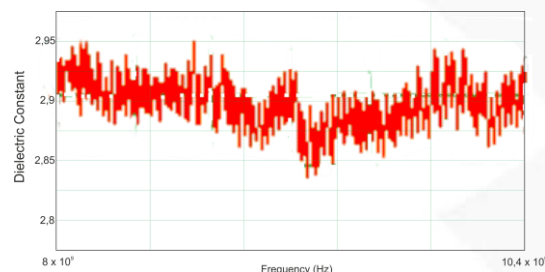
- Shifts to higher frequency communications bands .
- Not only electronic performance, but also mechanical performance, weather/impact damage resistance, system weight, and cost targets.
- Use of lower density, low dielectric materials therefore leading up to a hybrid system of fiber reinforcement offers the opportunity to optimize the composite system based on current materials as glass or quartz.

Running Project at IDEC:

- Manufacturing Trials with hybrid HMPP-E-Glass Fibers (on-going).
- Basic Mechanical Tests (on-going).
- Dielectric Tests (on-going).

Opportunities for Hybridization:

- High-modulus polypropylene (HMPP) combined with glass fiber and RTM6 aerospace qualified resin.
- Potentially achieving permittivity values in the range of that achieved with quartz fibers.
- Solutions of higher impact resistance and damage tolerance.
- Direct application to radome fairings at aircraft empennages.



Material	Fiber	Matrix	Dielectric Constant	Lost Tangent
Commercial	Quartz	Cyanate Ester	3,3	0,004
IDEC	Hybrid E-Glass/HMPP	Epoxy	3,0	0,020

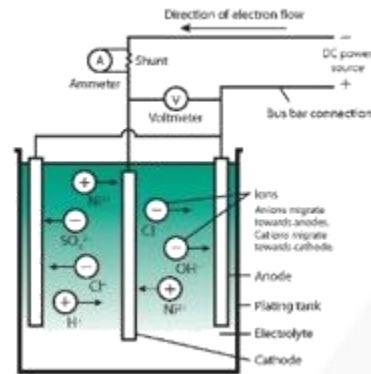


/ INNOVATION – R&D-T MATERIALS – METAL · COMPOSITE SOLUTIONS

Nickel Sulphamate solutions are chiefly used for the deposition of functional coatings. It is a highly precise and quality surface treatment which can achieve outstanding plating characteristics. By using an adequate technique to control plating film functional properties of corrosion resistance, hardness, wear, etc., following features can be met:

- Controlled layer up to needed levels.
- Small internal stresses.
- Strong adhesion to the composite substrate.
- Surface levelling and Microthrowing (for low porosity) abilities.
- Ductility to undergo deformation without cracking.
- Very low surface roughness.
- Excellent reproducibility of film properties under the same operating conditions.

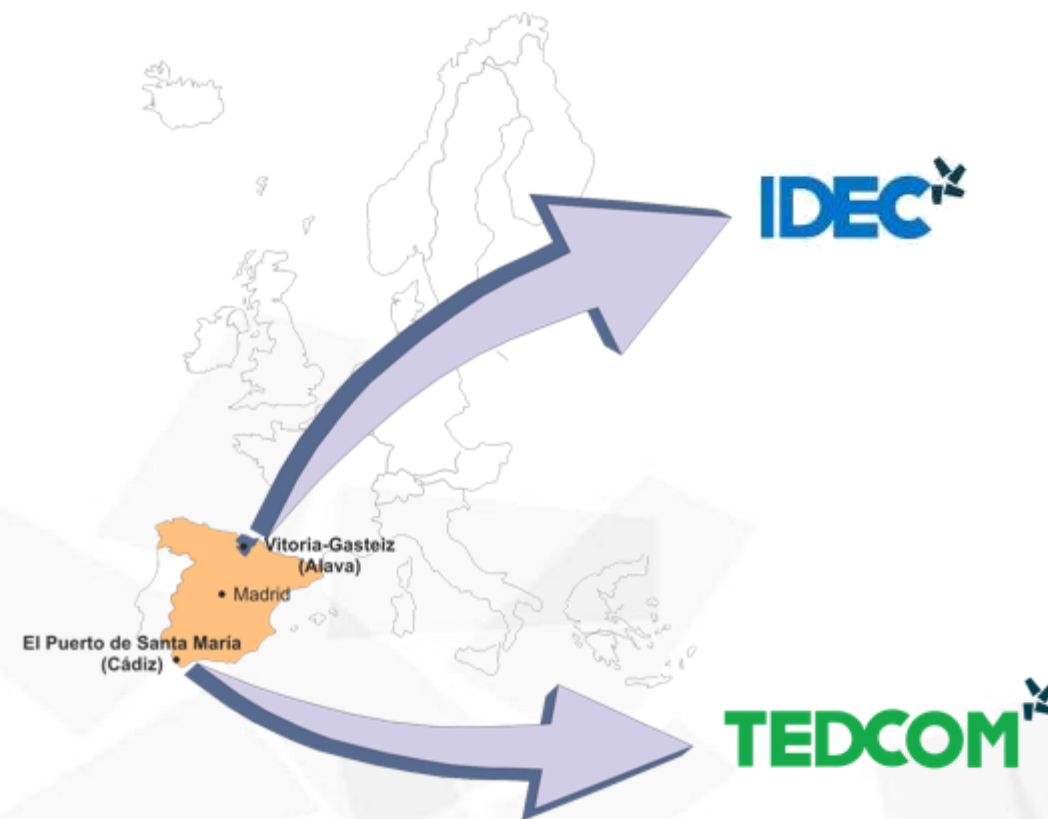
Then all above allows for an adequate technique for anti-erosion applications.



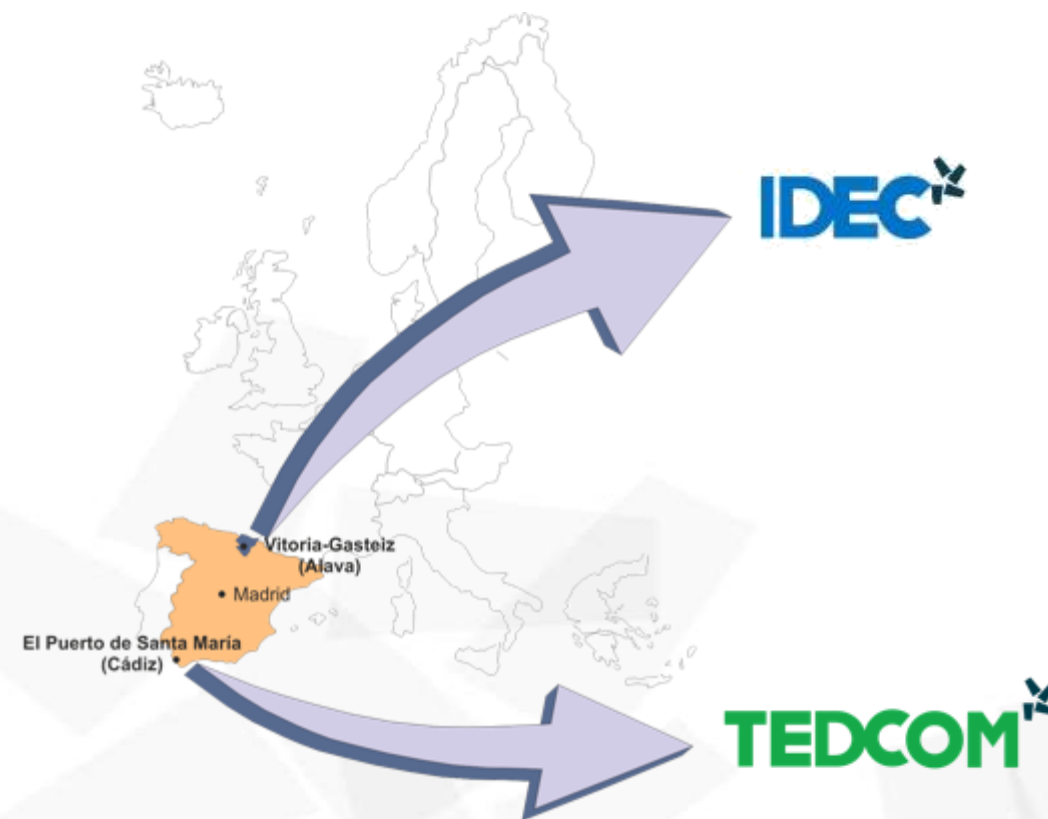
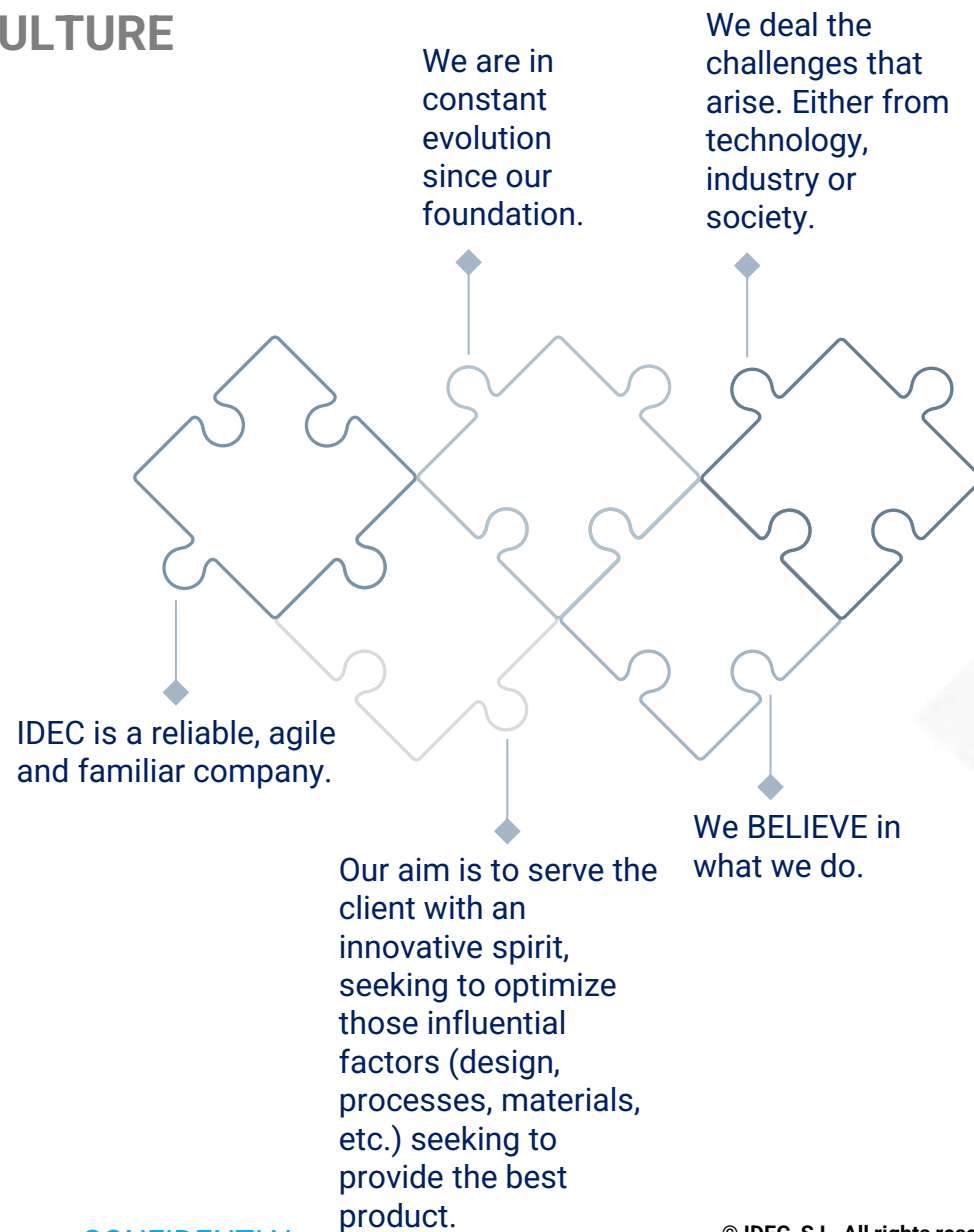
Anti-Erosion Solution for F8X Winglet



/ VISION & MOTIVATION.



/ COMPANY CULTURE



/ STRATEGIC POSITION



IDEC Strategic towards our Customers based on an End-To-End Service.



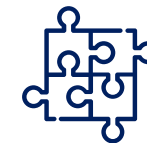
Proven full-cycle capability: R&T, Engineering, Development and Certification, Series Production, In-Service Support.



Company dominating a Technological Niche: Out-Of Autoclave (OOA) Liquid way composite processes: RTM & LRI.



Ability to work with OEM and TIER1.



Complement to the 'Make' Part of our Customers ('Buy-In-The-Make').



Support to OEM in their developments based on the expertise of certain aerostructures (i.e. Leading Edges, Wingtips).





THANKS!

IDEC S. L.

C/ Albert Einstein, nº 29-50
Parque Tecnológico de Alava
01510 Miñano Menor
Alava - Spain

Contact:
Pablo Martínez
Programs & Commercial Dir,
Tel. +34 630 023 422

e-mail : p.martinez@idec.aero



Vitoria-Gasteiz
(Alava)

• Madrid

El Puerto de Santa Maria
(Cádiz)

