



II JORNADA NACIONAL DE INNOVACIÓN Y COMPETITIVIDAD

Ing. & CAP Carlos Alberto Martínez Gutiérrez



General Information



OVERVIEW

Aeromarmi SA de CV is a Mexican company consolidated in June 2005 with the purpose of **design, build and repair ultra light aircrafts.**

Manufacturing license and commercialization rights acquisitions for the American Market (Stela aircraft model / Aeromoragon / Spain)

Location, San Luis Potosí, México

We are settled in a 1000 m² floor operations





Product



The *M1*[®] is two-place, fixed tricycle gear, single-engine, monocoque ultra light aircraft.

We offer two power engines, the R1100S BMW and the J3300 from Jabiru Aircraft

Five hours autonomy

Empty weight 360 kg, 793 pounds

Maximum take off weight 650 kg, 1450 p.

A 12.6 m² wing area, 135 ft² make it perfect for slow gliding.





Product



- The M1
- Take off and Landing roll: 200 mts,
- Cruiser speed (V_c): 150k/h, 81knot
- Stalling speed (V_{so}): 55 k/h, 30 knot
- Never-exceed speed (V_{ne}): 217 k/h, 117 knot



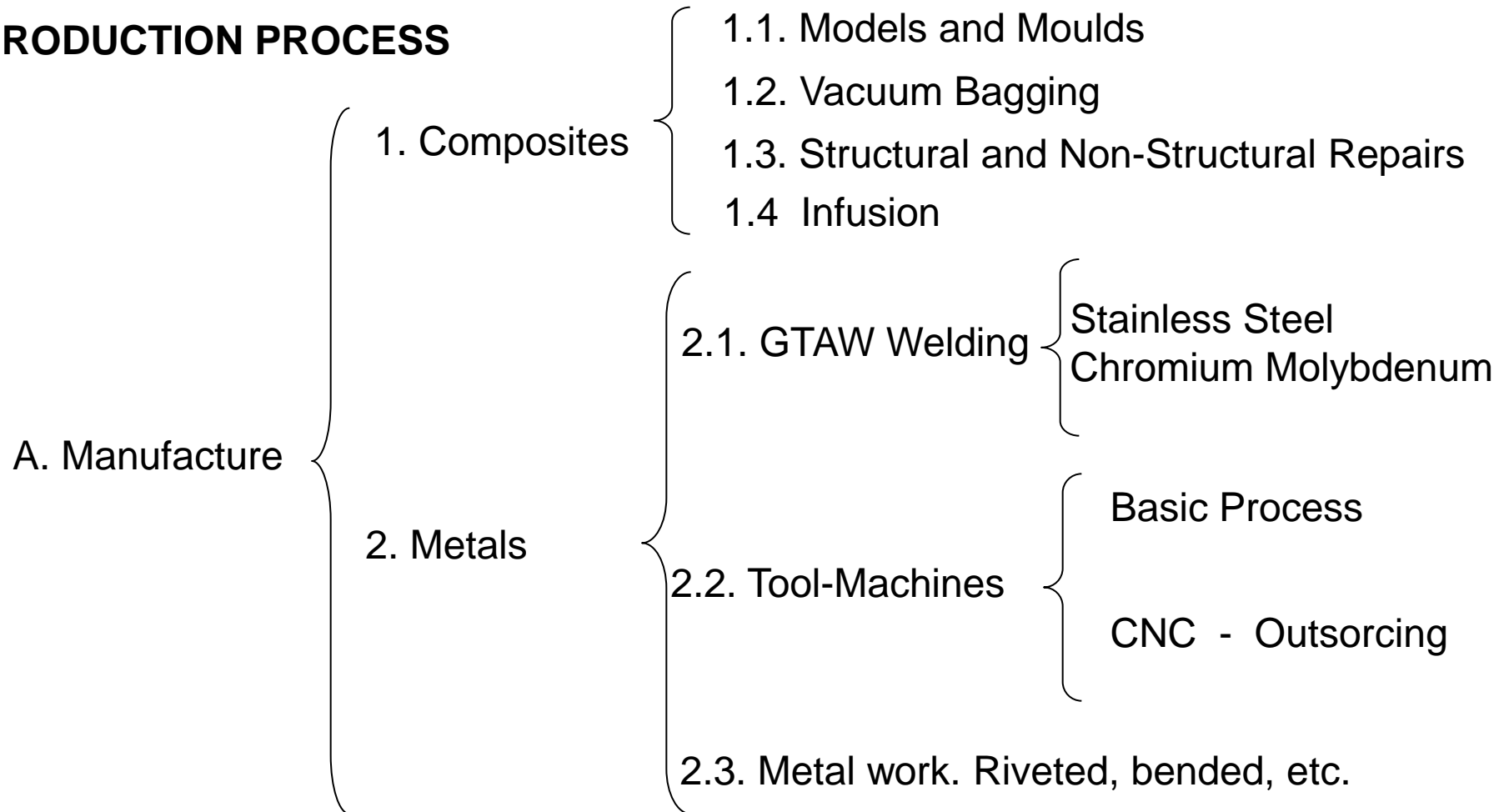
Tree blades, R1100S BMW power plant,
Aeromarmi SA de CV®



Two blades, Jabiru 3300 power plant,
Aeromarmi SA de CV®

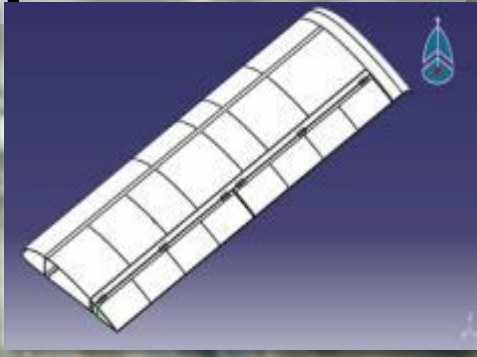


PRODUCTION PROCESS





1. Composites





2. Metals



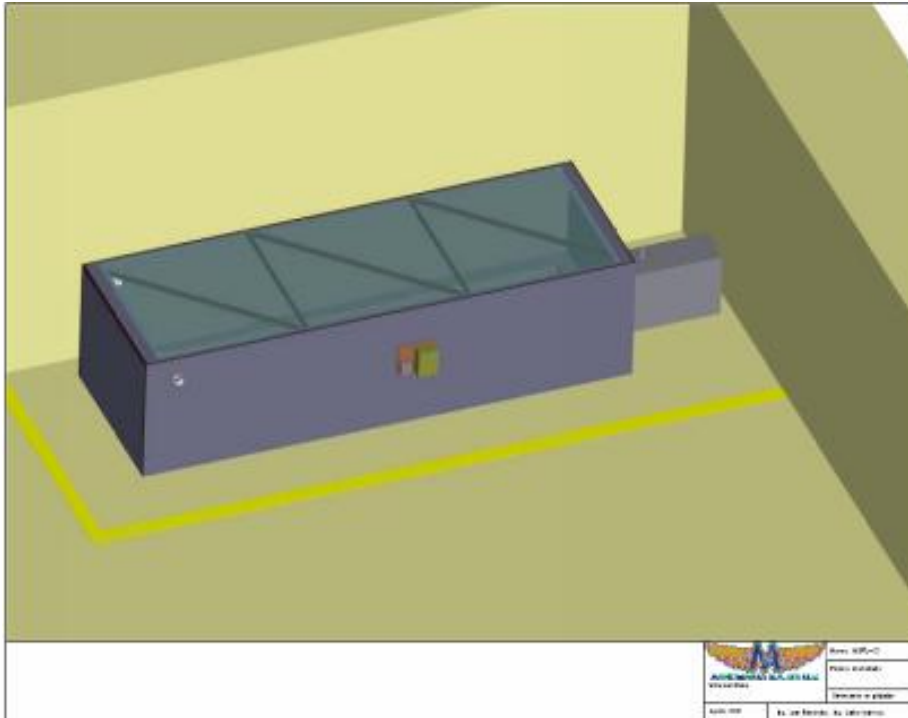


Alliances



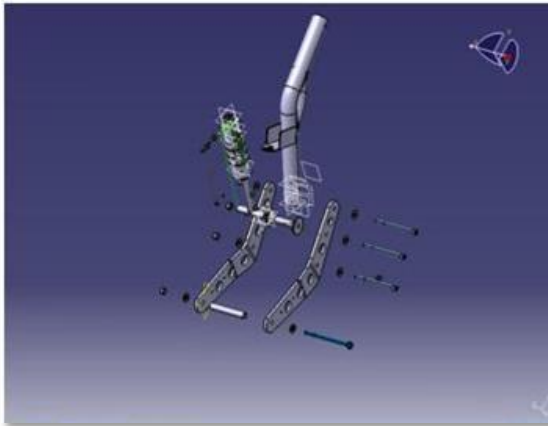


Hybrid Solar-Forced Convection Composites Curing Oven

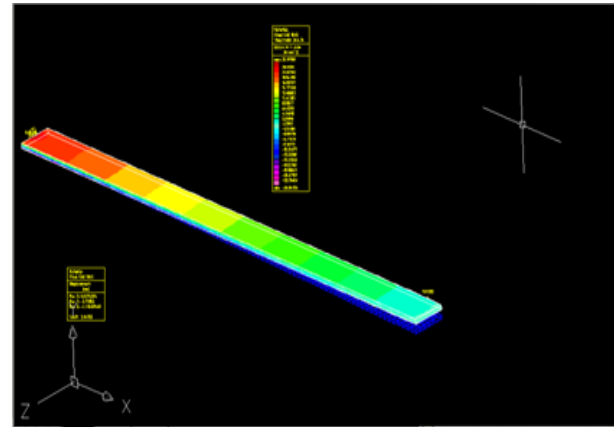




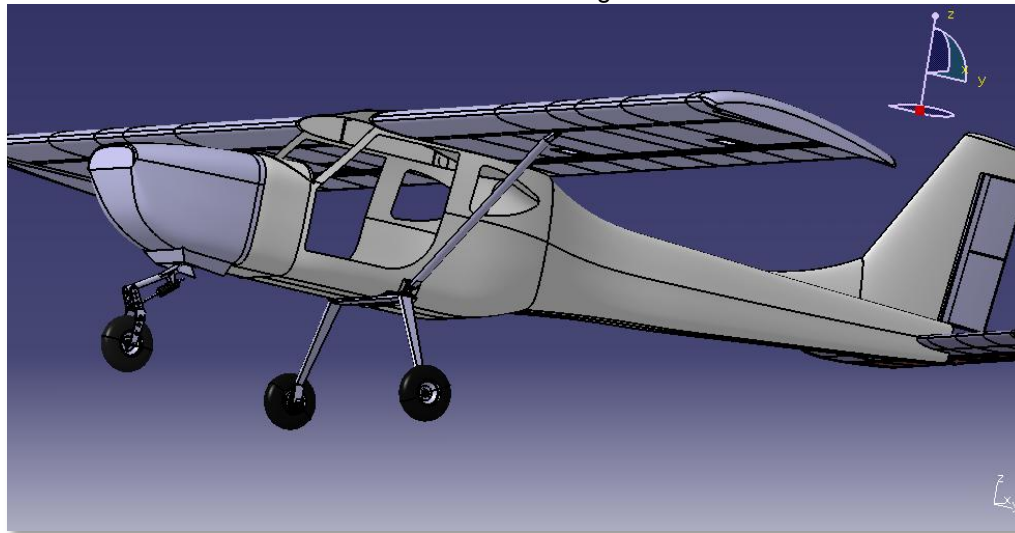
Full Computer Assisted Design



Nose gear Aeromarmi SA de CV® CATIA



FEA Wing Profile Aeromarmi SA de CV®





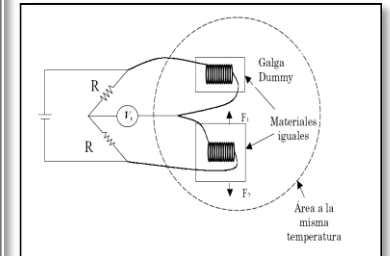
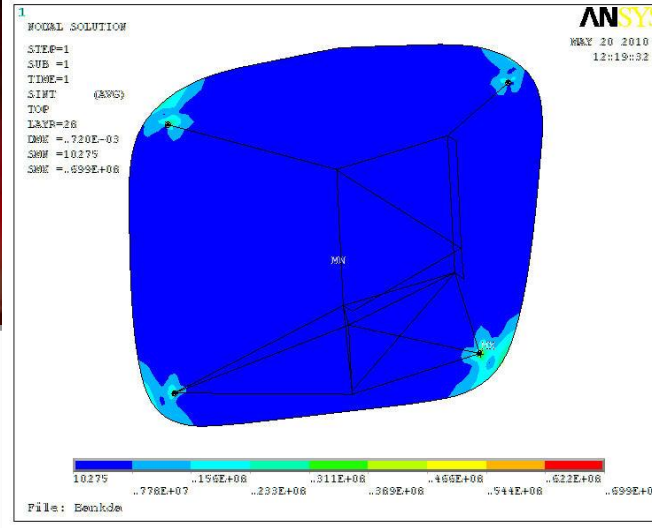
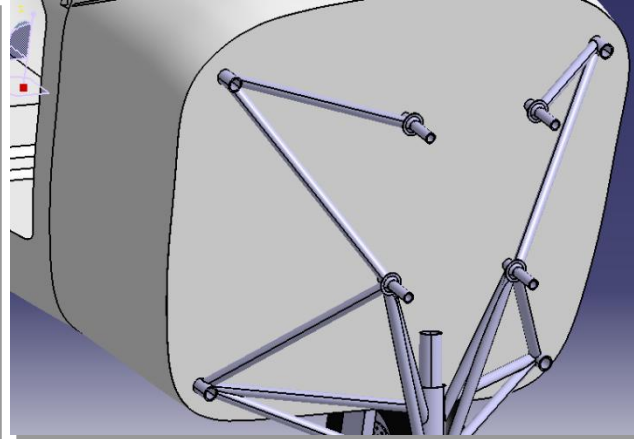
Real Size Flight Training Device

Looking for offer a completely aviation experience, we developed our own real size Flight Simulator.



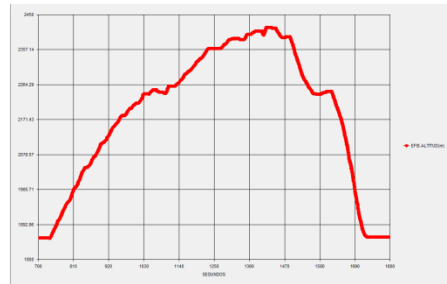
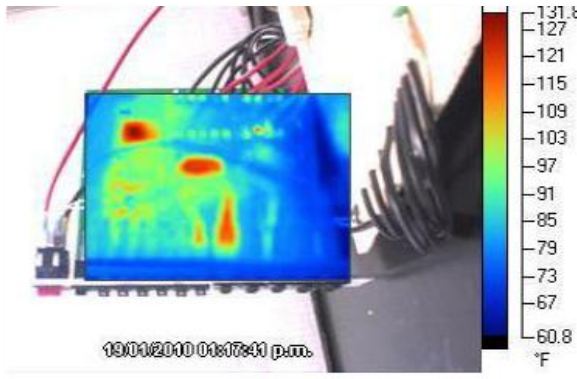
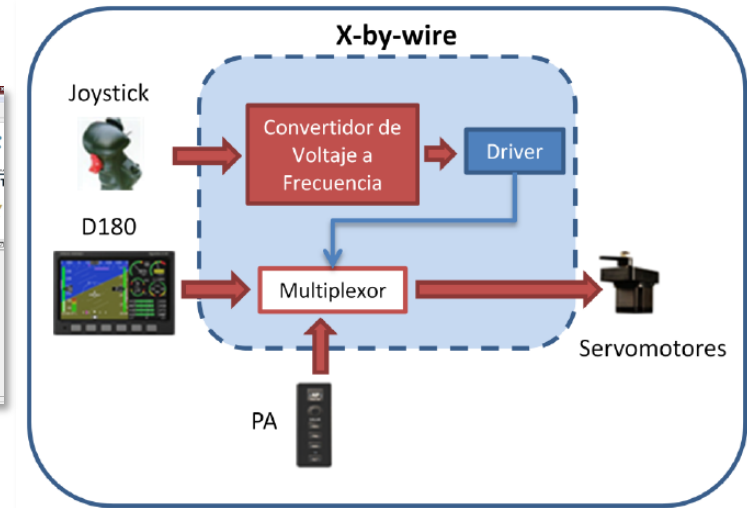
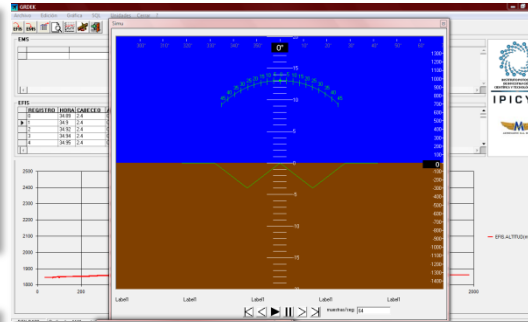


Product Lifecycle Management





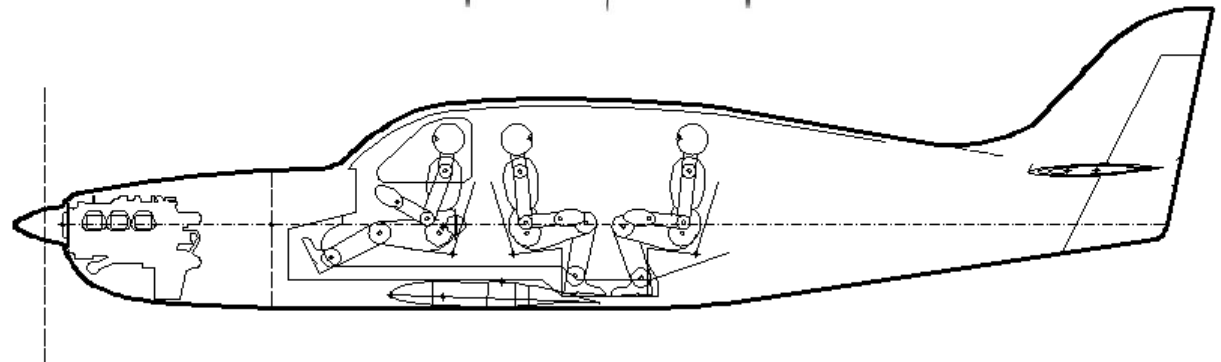
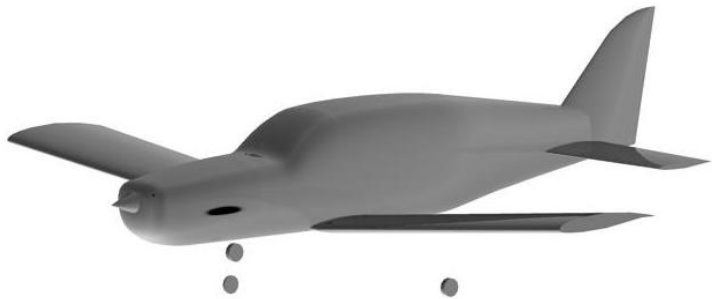
More Electric Vehicles (*Electric Redesign / Real Time Data Acquisition / FbW & Automatic Pilot*)





Future

Now days Aeromarmi works in a new design, a six seats low wing aircraft. By now, we have achieve the aerodynamic design, looking forward for the mechanical analysis





- From May to November 2009, we worked with the Bombardier composites group in Mexico regarding to manufacturing parts of the M1 Stela, achieving top quality in every process.





Bombardier Internship



AV. DR. SALVADOR NAVA MARTINEZ 1643 Mz E COL. SAN JUAN DE GUADALUPE, SLP, SAN LUIS POTOSI, MEXICO. CP. 78340
TEL. (444) 815-12-15, FAX. (444) 815-80-08 www.aeromarmi.com



Actual Situation



- Followed successful case scenario (Government-Company Join venture)
EMBRAER
- Very complicated Market
- FAA-DGAC disqualified

DIVERSIFY

 **mexicomposites**

CEAMC is a Mexican corporation in the composite materials industry

Legal corporation

CENTRO DE ESTUDIOS
APLICADOS PARA
MATERIALES COMPUESTOS

Engineering and Scientific services in
Composite Materials

Commercial Trademark

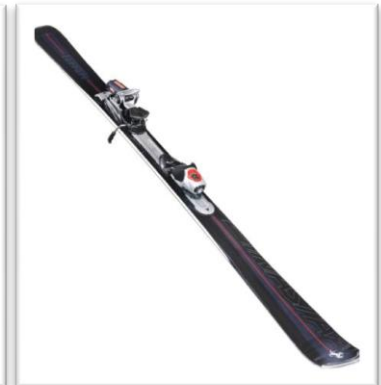
 **mexicomposites**®

■ Mission

To lead the ***innovation and technology*** markets through a robust ***R&D policy***, enhancing the ***design and manufacture*** of Composite Materials in México and Latin America.

The benefits of Composite materials

- High strength (6x Steel)
- Lightweight (1/3 of Aluminum)
- Corrosion resistance
- Design flexibility
- Durability (50 years lifespan)
- Low relative investment



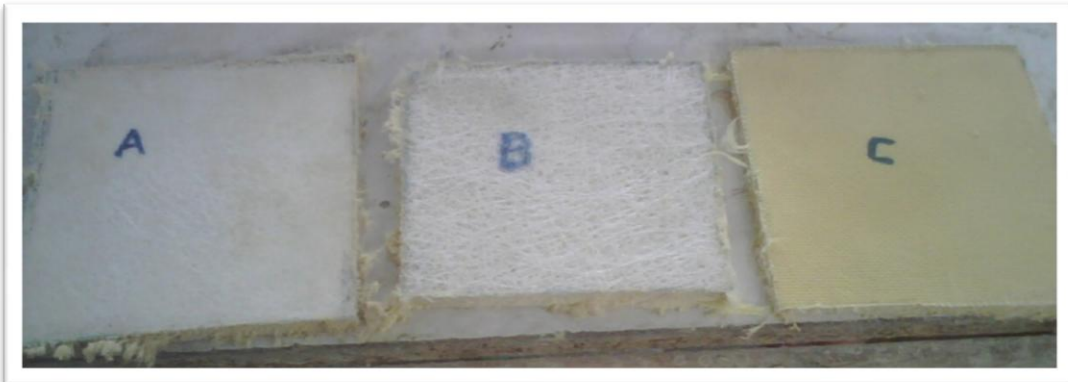
Projects and industries served

- Armoring industry
- Wind turbine blades industry
- Training and consulting in Composites



Armoring industry:

*Design and manufacture of
bullet impact resistant panels*



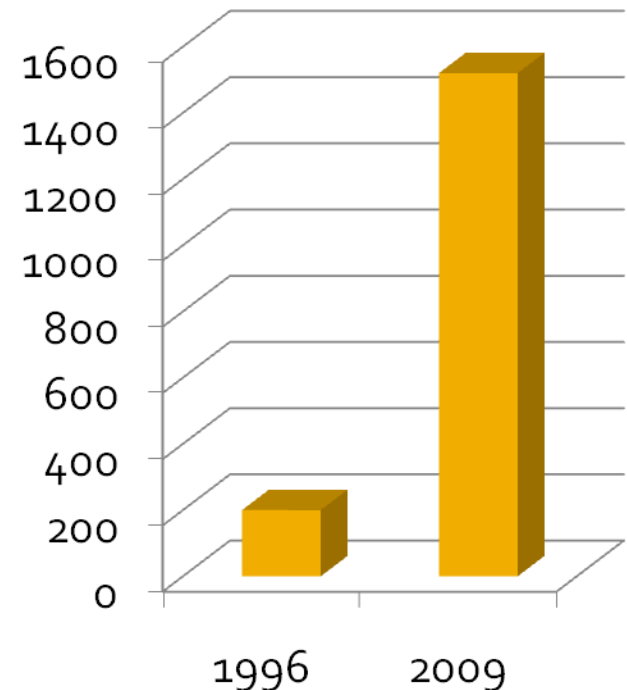
Light-weight ballistic test panels

Currently, MEXICOMPOSITES is in the process of obtaining HP White's international certification of its ballistic panels.

Our advantages:

- Fully functional ballistic test tunnel
- Proprietary mathematical modeling software
- Manufacturing capabilities
- Liaison with industry SMEs
- Established relation with Mexican secretariats
- Patent (pending)

Armored vehicles in Mexico



Armoring industry:

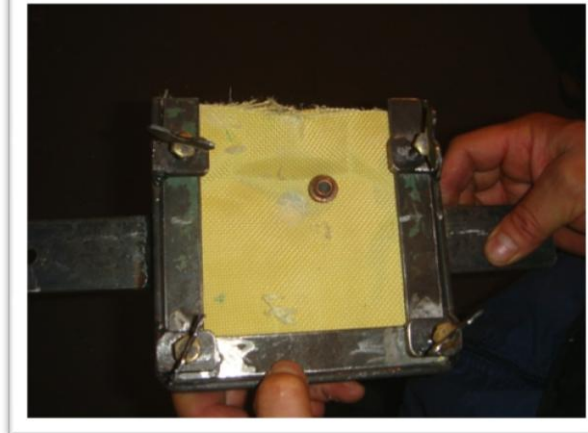
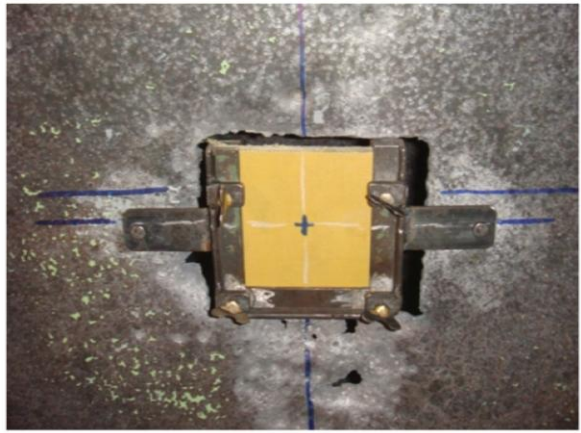
*Design and manufacture of
bullet impact resistant panels*



- Ballistic test - Video

Armoring industry:

Design and manufacture of bullet impact resistant panels



Completed

Pending

In-house testing

Patent

Certification

Sales and export

- Bullet: 9mm FMJ
- Standards: NIJ / NOM
- Threat Level: 3A
- Bullet speed: 1343 fps

Projects and industries served

- Armoring industry



- Wind turbine blades industry



- Training and consulting in Composites



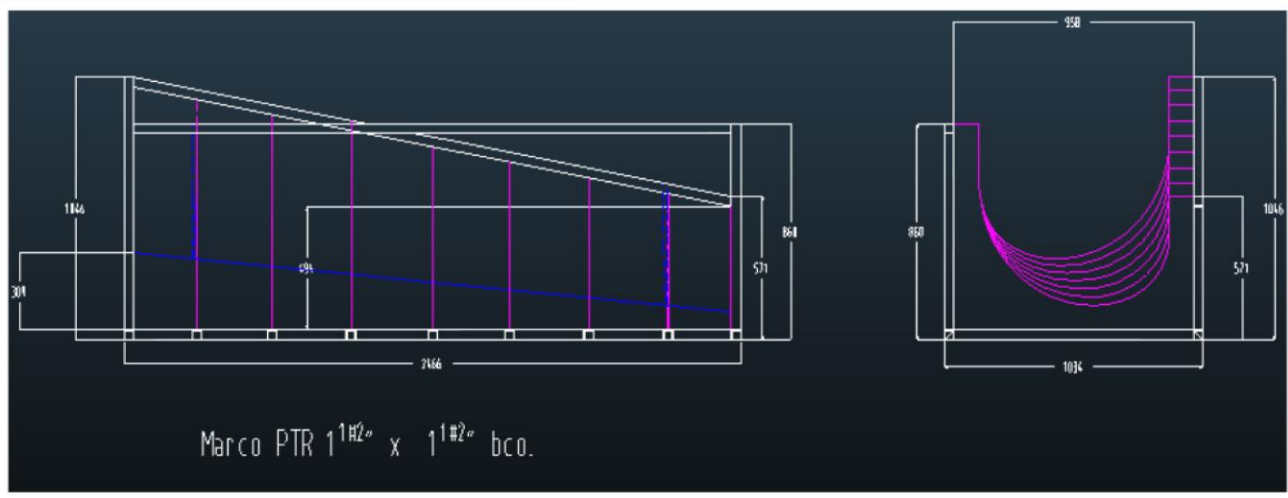
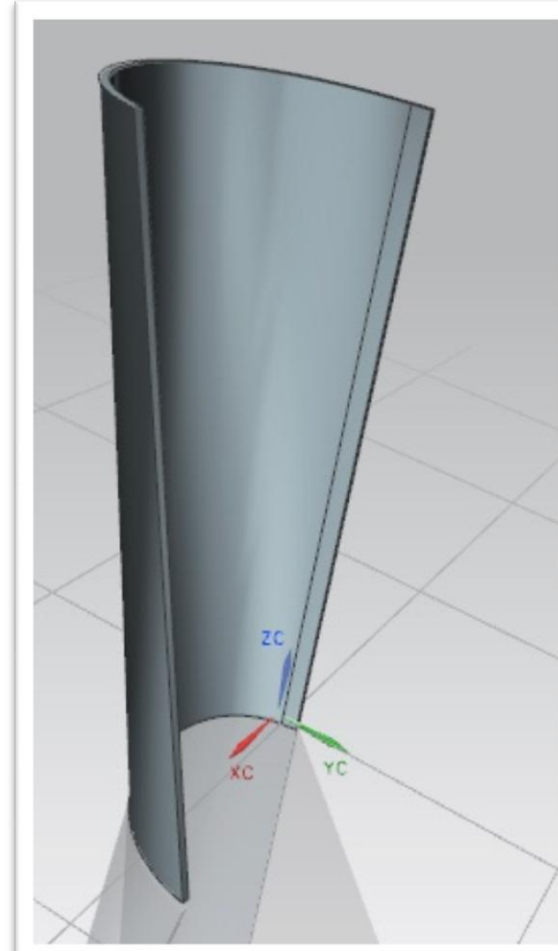
Wind turbine blades industry:

Design and manufacture of blades for wind turbines

“Bridging the gap between design & manufacture in composites”



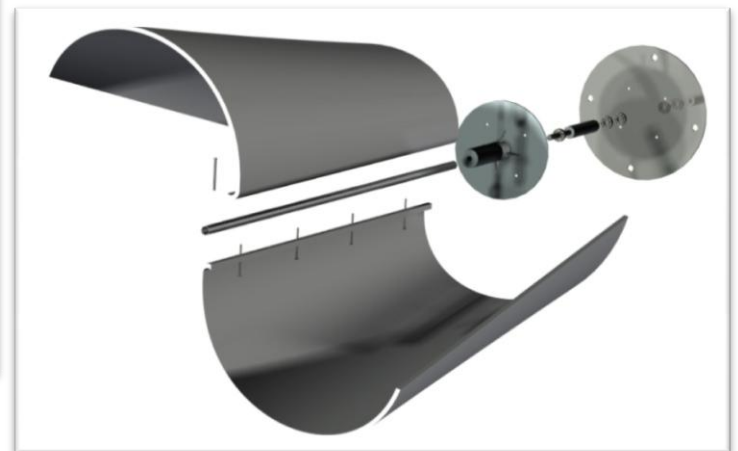
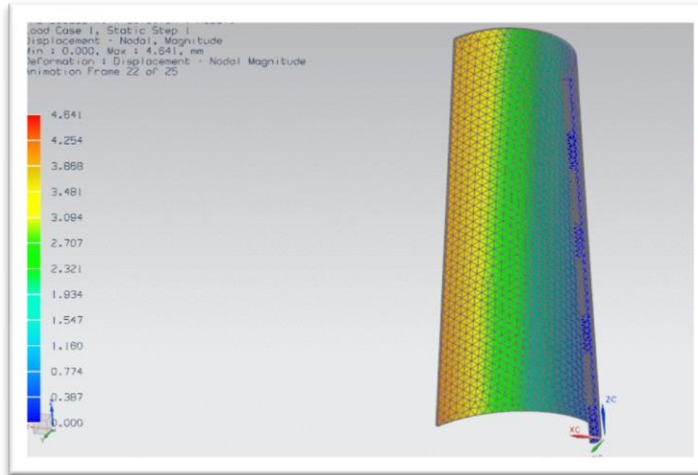
1st Prototype



Wind turbine blades industry:

Design and manufacture of blades for wind turbines

“Bridging the gap between design & manufacture in composites”



Wind turbine blades industry:

Design and manufacture of blades for wind turbines

“Bridging the gap between design & manufacture in composites”



**2nd Prototype
In construction**

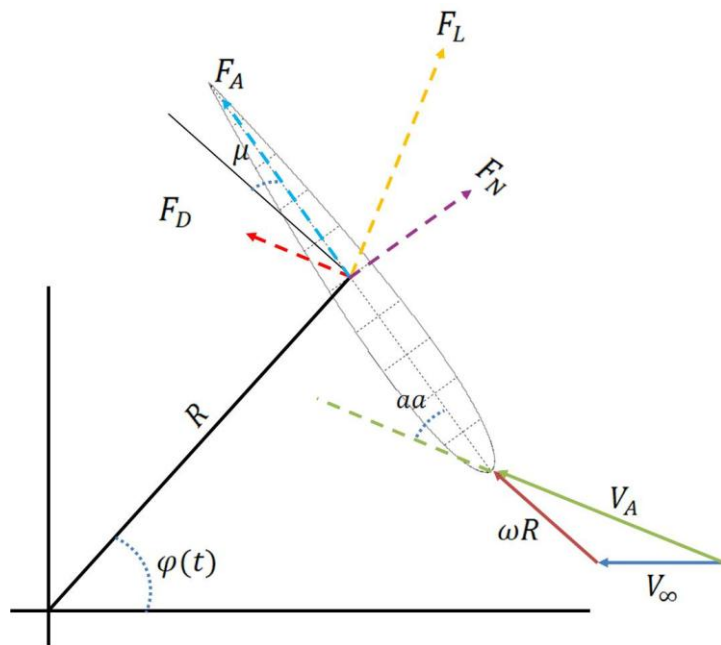
Wind turbine blades industry:

Design and manufacture of blades for wind turbines

"Bridging the gap between design & manufacture in composites"



3rd Prototype
(in analysis)



Projects and industries served

- Armoring industry



- Wind turbine blades industry




- Training and consulting in Composites



Training and consulting in composites:



- 1st sale of company
 - ZOLTEK, Multinational Carbon fiber manufacturer
- Integration of our training course to the Academia (E.g. universities)

 **CENTRO DE ESTUDIOS
APLICADOS PARA
MATERIALES COMPUESTOS**

Mecánica de materiales.-

- 1) ¿Qué es el módulo de Young o módulo de Elasticidad?
- 2) ¿Qué es la relación de Poisson?
- 3) Menciona la diferencia entre esfuerzo normal y esfuerzo cortante.
- 4) Siendo $A \propto B$ con

A	B	C	D	E
1	5	4	-2	11
-2	3	4	-3	9
3	-6	3	0	9
0	-1	6	1	11

Resuelve para x.

- 1) ¿Recuerdas trigonometría para poder usar las funciones seno, coseno, tangente?
- 2) ¿Qué es el coeficiente expansión térmica?
- 3) Dibuja un esquema de un diagrama esfuerzo deformación y menciona las zonas y puntos importantes.
- 4) ¿Qué es la gravedad específica?
- 5) ¿Cuál es factor de conversión entre Mpa y psi?
- 6) ¿Cómo se define la deformación unitaria?
- 7) ¿Qué es esfuerzo de ruptura?
- 8) ¿Qué es esfuerzo de cedencia?

Materiales Compuestos.-

- 1) ¿Qué es un laminado de 8 capas 0, 90, 45, -45, 90?
- 2) ¿Qué es un material compuesto?
- 3) ¿Qué es infusión?
- 4) Cuando nos referimos al refuerzo en un material compuesto, estamos hablando de:
 - a) la fibra
 - b) la resina
 - c) ninguno de los dos
 - d) no se

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Composite materials training manual
Designed and developed by our company
(Certification by the Secretariat of Public Education pending)

Sponsorship

Design and manufacture of carbon fiber parts for a FORMULA SAE series vehicle for the *I.P.N. racing team* which participated in Michigan, USA



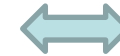
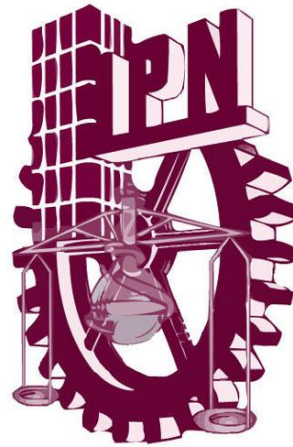
Networking



TECNOLÓGICO
DE MONTERREY®



mexicomposites®



Dr. Robert Michelson

Expert in:

Unmanned Aerial Vehicles (UAV's)

Georgia Institute of Technology

Dr. Anoush Poursartip

Expert in:

Mathematical Modeling of Armoring

University of British Columbia

Thanks for your attention

**Today, many of the largest composites molding companies have their roots in small entrepreneurial companies that entered the business because of the low initial investment.*

Contact:

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