

# lightweight engineering

we support you in the realization of  
**innovative, sustainable** and **clever composites solutions**  
from the first idea till production.

**Crossfire Srl**

**Via Roma 7**

**48027 Solarolo (RA)**

**Italy**

# PRESENTATION

9 March 2021

**Innovative Green and Recyclable Building  
Structural Panels to an improved life  
comfort, by energy savings and no  
emissions**

# Crossfire ..... Whom ?



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- **Crossfire**, a very INNOVATIVE leader in composites technology Applied R&D :
  - Located in Solarolo, narrow the Faenza Composite pole,
  - Strictly connected with International Partners to joint Developments



## The Partners

- The Surface modification specialist:
  - **Nanoprom – Italy**
- The Press Technology :
  - **Orma Macchine – Italy**
- The Prepregging Technology:
  - **OMEGA – Italy**
  - The laboratory testing
  - **Netzsch – Germany**
  - **MaCoF – Bologna University/Faenza CNR site**
- Support to your FEM design :
  - **Internal Solidworks capability**
  - **Alfa Tauri F1 specialists**
  - **ANIFORM draping simulation by L'Aquila University**
- The Sandwich Panels Production
  - **HTR Walls**
  
- **Our Proto lines are made at our Specifications and Design**

## Working Together

- We support the customer's Lightweight project :
  - **By suggesting to the best “composite style” in the part design**
  - **By setting the Project leading CONCEPTS:**
    - Formability / Drapeability
    - Structurality
    - Crash behaviour
    - Noise dampening
    - Thermal barrier
    - Aesthetic behaviour
    - Over Moulding needs
  - **Without loosing the focus on :**
    - Fast and cheap production/high throughput
    - Process Automation
    - The lowest investment
    - No VOCs, no Solvents
    - Easy and cheap recyclability

# Sandwich Panels

- **The best lightweight composition to high and very high structural values**
  - Its Flexural modulus is mostly driven by the panel thickness
  - Its thermal insulation is mostly driven by the Core materials
- **Crossfire adds property technology tips to outstanding additional performances**
  - No glue bonding technology
  - No solvents
  - No VOCs
  - Recyclable as a whole in most of its compositions
- **Crossfire adds Surface features in the same, single shot production step**
  - Wood essences covering, already full/partly/no resin impregnated



# Sandwich Panel

- **House Internal Panelling**
  - Gypsum boards replacement
  - Intermediate flooring



- **House External Panelling**
  - Bungaglow Houses
  - Rescue temporary houses

# The Inside/Outside panel STRUCTURALITY

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- Our technology is based on the Addition of performances by a Single step production procedure
- ... the **STRUCTURALITY** : it comes from the composition :
  - The Composite Skins = any Crosspreg® grade depending on the required mechanical needs
  - The High Temperature resistant cores :
    - PET foams
    - Aluminium HC
    - Recycled PU (.. Purenit or similar)
    - Wood (like Balsa etc..)
  - The adhesion comes from Crosspreg® resin impregnation
    - At the Hot Plates Press process conditions the resin melts down at water like viscosity and bonds, while curing, perfectly, the panel components together



# The Inside/Outside panel SURFACE FEATURES

- ... the SURFACE features....
  - 1<sup>st</sup> The **Fire Resistancy**
    - Various levels of FR could be obtained
      - **The Flame Retardancy** is obtained by the Property resin FR modification and FR certified cores
      - The **No Flammability/No Smoke** is obtained by the addition, to the panel's surface, of a Nanoprom Fire-Shield composite laminate
      - It resists to direct firing without any smoke creation
        - Courtesy of Nanoprom Srl

# The Outside panel SURFACE FEATURES

- ... the SURFACE features....
  - 2<sup>nd</sup> : dressing with **Functional Coatings**
    - Reflective
    - Cool roof
      - By painting
      - By membranes

## The Inside/Outside panel SURFACE FEATURES



- 3rd .... The **Thermal Insulation**
  - The PET GRW foam cores are capable of a pretty high level of thermal insulation; the maximum is obtained by the 50Kg grade
    - EN 12667 = W/mK (10°C) .... 0,030
- 4th ..... The **Extra Thermal Insulation**
  - Our technology can adhere, on a side of the panel, an Aerogel felt, capable of additional thermal insulation
    - EN 12667 = W/mK .... 0,015
- 5th.... The **Super Thermal insulation**
  - The additional Thermal Resistance could come from the **Nanoprom Thermal Shield** surface treatment
    - ISO/FDIS 22007-2 = W/mK .....0,0144
      - Courtesy of Nanoprom Srl

## The Inside panel SURFACE FEATURES

- 6<sup>th</sup> The **Anti Bacteria and Anti Viral protection**
  - By the addition, to the panel's surface, of the **Nanoprom BV-Stop**, we reduce, by over 99%, the bacterial and viruses load on the panel surfaces
    - Courtesy of Nanoprom Srl
- ISO 22196, By the Micro-B laboratory testing :
  - Escherichia Coli % reduction
    - 93,98% after 2hrs
    - 99,99% after 24hrs
  - Staphilococcus Aureus % reduction
    - 92,67% after 2 hrs
    - 99,99% after 24hrs

# Recap

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- **Crossfire Structural Composite Sandwich Panels**
  - Represent an opportunity:
    - To smart, green, recyclable building Technologies
      - Easy and fast assembly/disassembly
    - By simply added body and surface features :
      - Functional Coating
      - Thermal Insulation
      - Fire and Smoke resistance
      - Bacteria and Viruses clean ambient

# THANK YOU ! For Your attention

creating the next generation of  
**innovative, sustainable and clever**  
composites solutions!

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