

Dynatech[®]

A Revolutionary Weight-Reducing System for Aircraft &
High-Speed Train Interiors

IN COOPERATION WITH



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Dr. Michael Effing,
AMAC

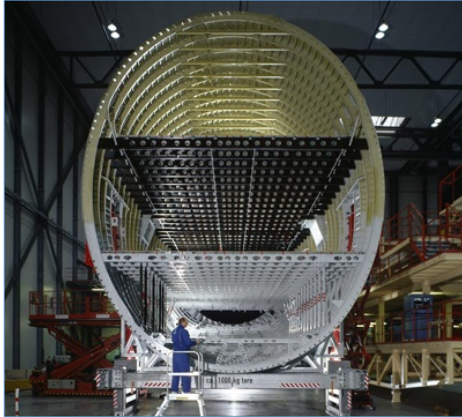
Mr. Christophe Jenny,
SMTC

Mr. Gilles Le Masson,
SMTC

Dr. Michael Effing,
AMAC

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AMAC

Introduction

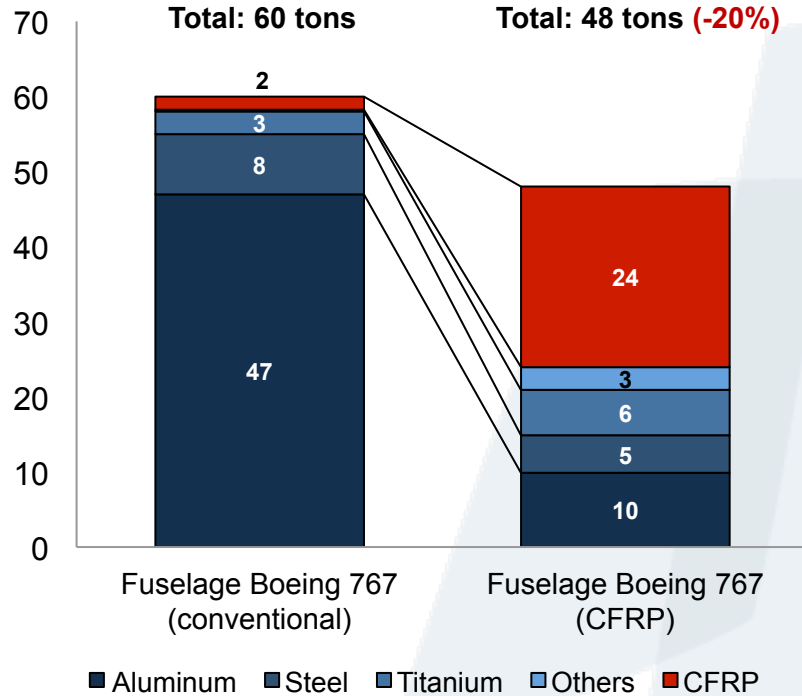


- Weight saving: major driver for aircraft
- Aircraft industry:
 - Value: 400-600 EUR/kg due to better fuel efficiency

- Dynatech® aircraft cabin can contribute to significant weight savings:
 - Single aisle (A320 type): 400 – 500 kg
 - Large aircraft (A 350/A380): 750 – 1,500 kg

Source: Airbus, RWTH Aachen, Example: A 380, Fuselage in Modular Structure

Example: Life-Cycle-Analysis Aircraft



1 ton weight saved on the interior over 20 years leads to

- Co₂ reduction: **120 tons**
- Fuel savings: **€3 Mio**



CO₂ – Emission reduction by 20% or 12 tons / fuselage

- During 20 year - life cycle: **1,400 tons**

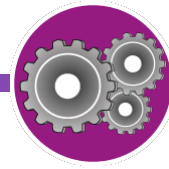
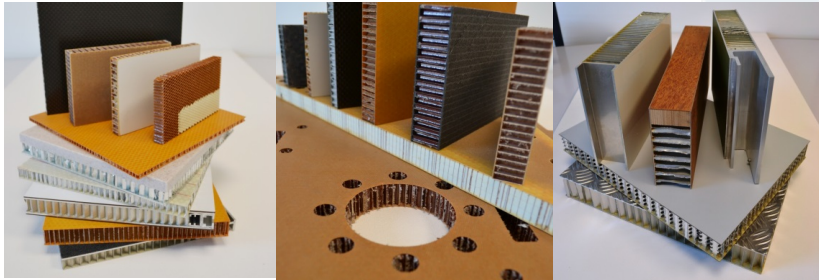


Source: Toray, Japan Carbon Fiber Manufacturers Association (JCMA), AMAC

SMTC at a glance



- **Activity:** Design, Manufacture and Sales of customized products based on composite panels for the sectors of transport (Earth, Air, sea)
- **Date of creation:** 1983
- **Legal form:** SAS
- **Turnover 2013:** 16 Mio €
- **Employees:** 120
- **Focused** on Innovation for performance and comfort in mass-transportation
- Design capabilities, **integrated laboratory**



Our Customers



AEROSPACE

DEFENCE

MARINE

RAIL

ROAD

ARCHITECTURE

INDUSTRY



Requirements for Aircraft and High Speed Train Interiors



- **Reduce weight** significantly
- Create **new designs**
- Gain **space and comfort** for the passenger
- Improve **safety**

The Idea

“In order to improve the fuel efficiency for aircraft manufacturers, thus reduce the CO₂ emissions and improve the ecological footprint, I designed this automated, thermoforming process technology.”



Mr. Martin de Groot
Inventor of the Sandwich System

The Project Partners



- **Project Leader**
- **Industrialization & Marketing**



- **Project Management**
- **Business Development**



- **Owner of the Patents**
- **Knowledge Provider**

What is Dynatech?



- Foamed In-situ Thermo-formable Sandwich System (FITS Patents)
- One (PEI) system in an-isotropic core and fiber-reinforced facings, ready to be formed
- Significant weight savings potential
- Lower total system cost

Other Features:

- New design opportunities
- thinner layers - space/comfort
- Better safety: Superior mechanical performance & FST values
- Non fungus, no humidity absorption
- Environmentally friendly, easy to recycle



Benefits vs. Traditional Material

Weight saving potential: 20-40%

- improved stiffness and damage tolerance
- no additional resin to close edges
- simplified painting process

Cost saving potential: 10-30%

- Lower total system cost
- Low cycle times in thermoforming
- Elimination of labor intensive assembly and edge finishing

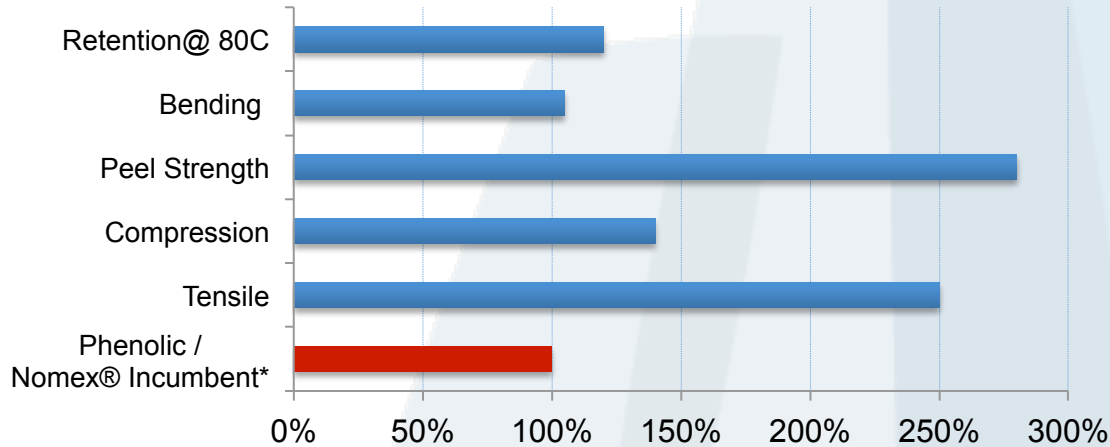
Reproducible processing

- Fully automated processing
- Quality controls via process
- Easy to recycle



Superior Mechanical Performance

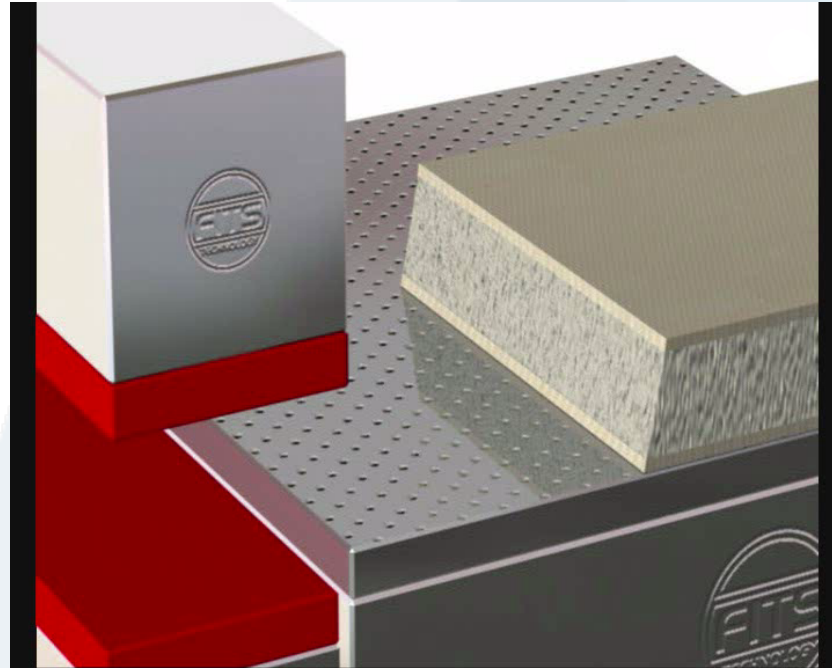
Dynatech® vs. Incumbent



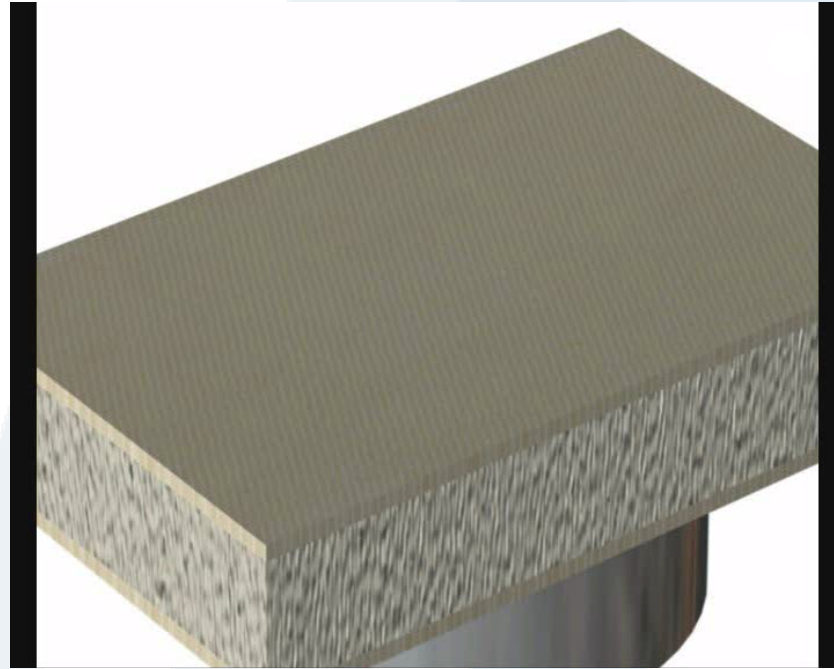
These differentiators lead to significant weight saving potential

* Normed values reference Phenolic/Nomex® set to 1

Edge Finishing - Video



Insert Ultrasound - Video



Aircraft Interior



**Weight Savings
Potential**

**Safety
Properties**

**Design
Opportunities**

Weight Saving Potential – Aircraft Interior



Side Wall, Seats
and Luggage Bin

Δ 400 kg



Galley Doors

Δ 25 kg



Seat Table

Δ 75 kg



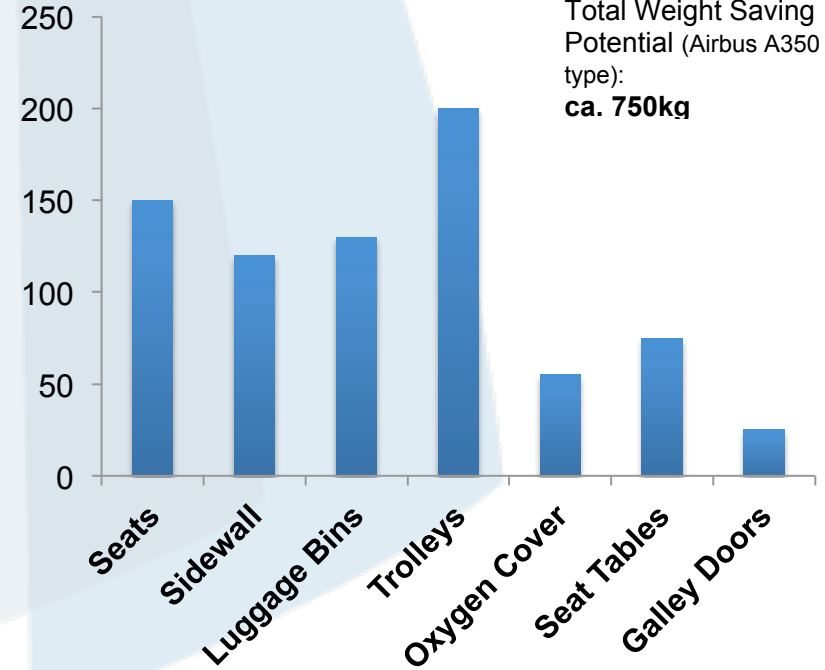
Cover Oxygen
& box

Δ 55 kg

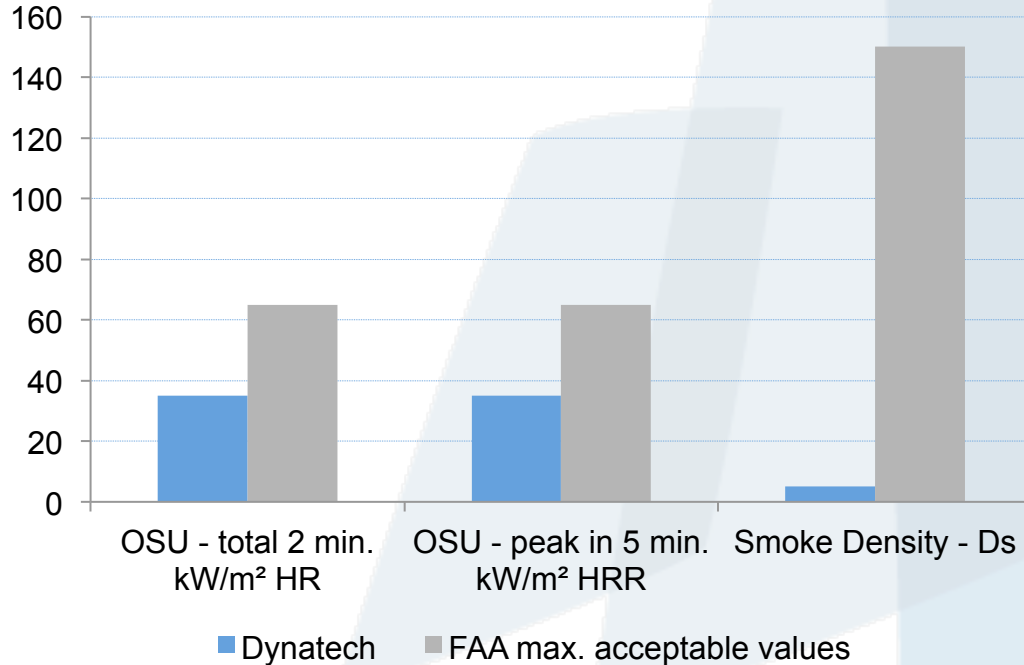


Trolley

Δ 200 kg



Safety Properties - Aircraft Interior



- All values were verified by Airbus /Boeing
- Dynatech® offers superior safety through low FST values

Design Opportunities - Aircraft Interior



Dynatech[®] offers new design, more space and comfort (better thermal & acoustic insulation)

DYNATECH® - Market Introduction



2009-2013

2014

2016

- Commercialization of Dynatech® Interior Panels -

Technology
Demonstration

Pilot Panel
Manufacturing
Testing &
Qualification
Parts
Prototyping

Design of Production
Facility
Panel Plant
Construction
Full Scale Series
Production

Summary and Outlook

- SMTC launches **Dynatech**[®] at JEC
- Ramping- up **Dynatech**[®] pilot panel production by June 2014
 - Demonstration on full scale
- Approaching now Tier1 / OEMs for prototyping and certification projects:
 - Weight Savings
 - Total System Costs
- **Dynatech**[®] high volume production line in 2016

Weight Savings Potential

Safety Properties

Design Opportunities

Q&A

Thank you !

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