

Desmocomp®



Raw materials for pultruded PU composites with extreme UV, chemical and weathering resistance



12. October 2016

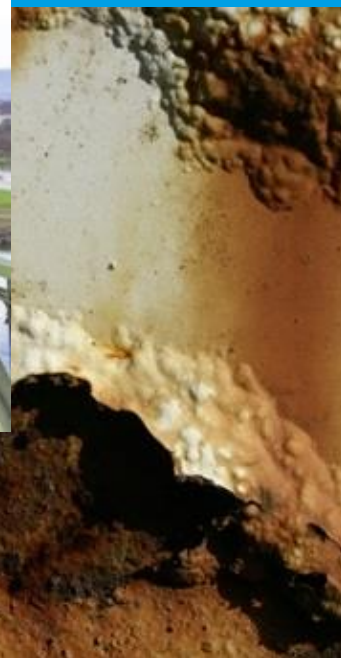
RAMSPEC - Milano IT

Dr. Paul Heinz



**Environmental
exposure:
UV irradiation**

**Protection:
sunscreen**

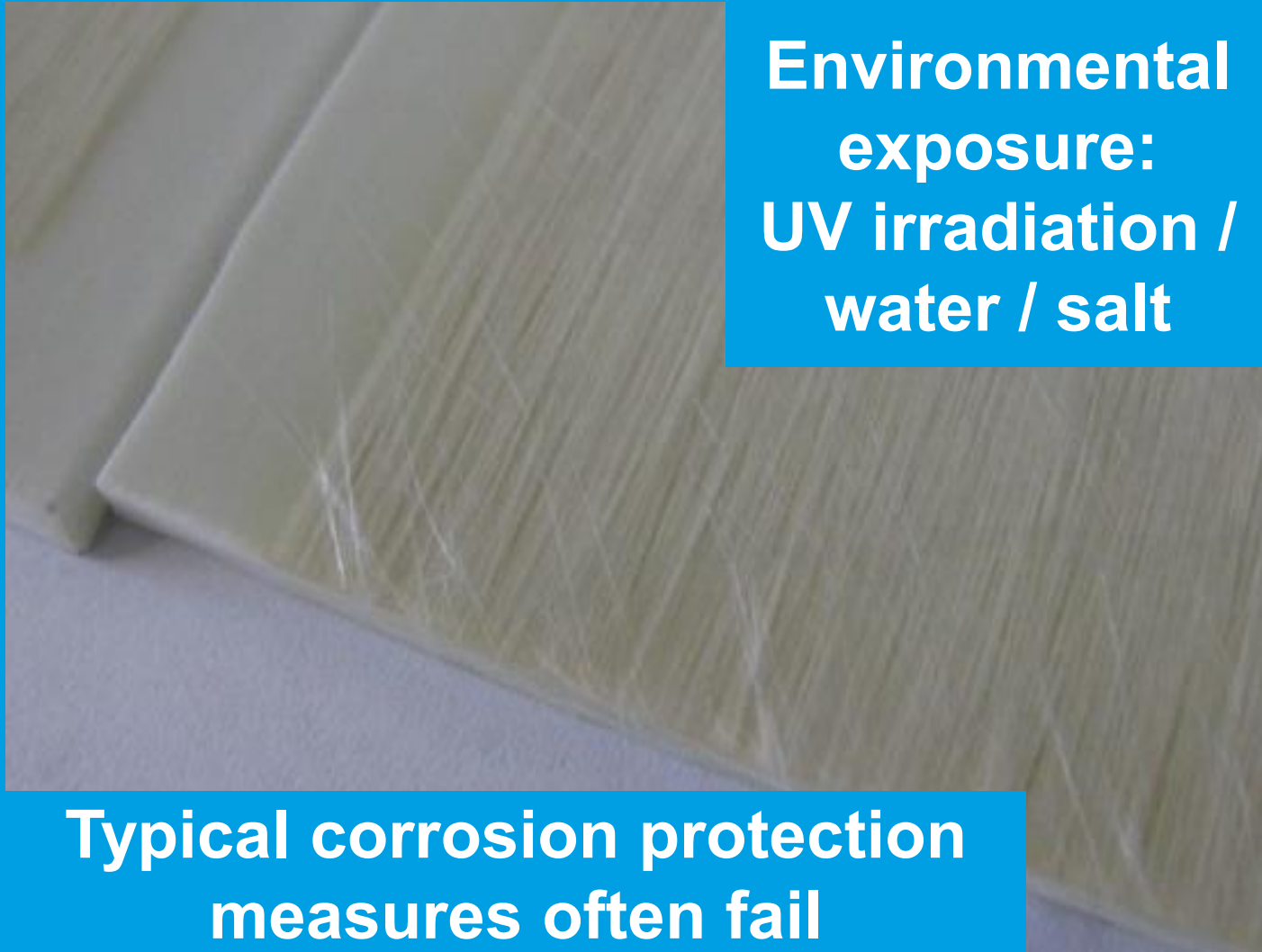


Environmental exposure: water / salt



Corrosion protection: coating

**Environmental
exposure:
UV irradiation /
water / salt**



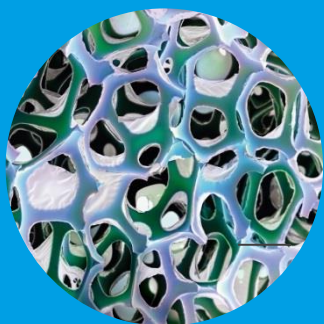
**Typical corrosion protection
measures often fail**



Desmocomp[®]

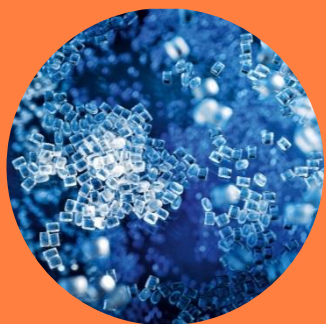
- **NEW UV- AND WEATHERING STABLE PU RESIN FOR COMPOSITES**
- **SIMPLE PROCESSING (1K)**
- **EXTREMELY LONG POT-LIFE**
- **SNAP-CURE BEHAVIOR**

Polyurethanes



Raw materials
for rigid and
flexible foams

Polycarbonates



Granules and
sheets for a
wide variety of
applications

Coatings, Adhesives & Specialties



Raw materials
for coatings,
adhesives and
specialties



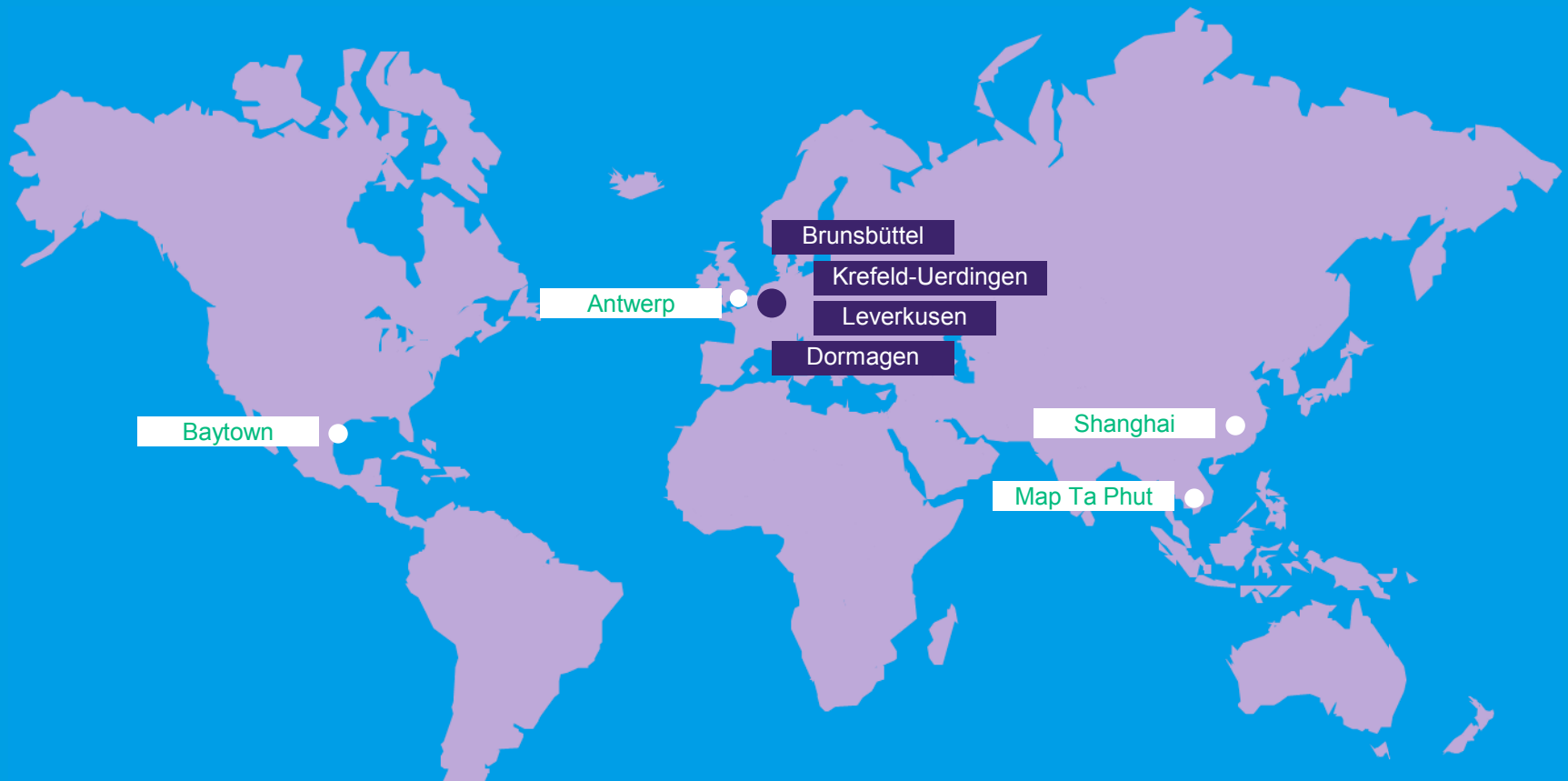
Basic Chemicals



Chlorine
production
as the backbone
for product
manufacture

Covestro

Global presence



Covestro

Key Data 2015



€12.08 bn

Sales

+2.7%

**Core volume
growth**

€1.64 bn

**Adjusted
EBITDA**

€0.34 bn

Net income

Automotive/
transportation



22%

Construction



19%

Wood/
furniture



18%

Electrical/
electronics



13%

Chemicals



9%

Sports/leisure,
cosmetics,
health



19%



Desmocomp[®]

For companies which produce Fiber Reinforced Materials

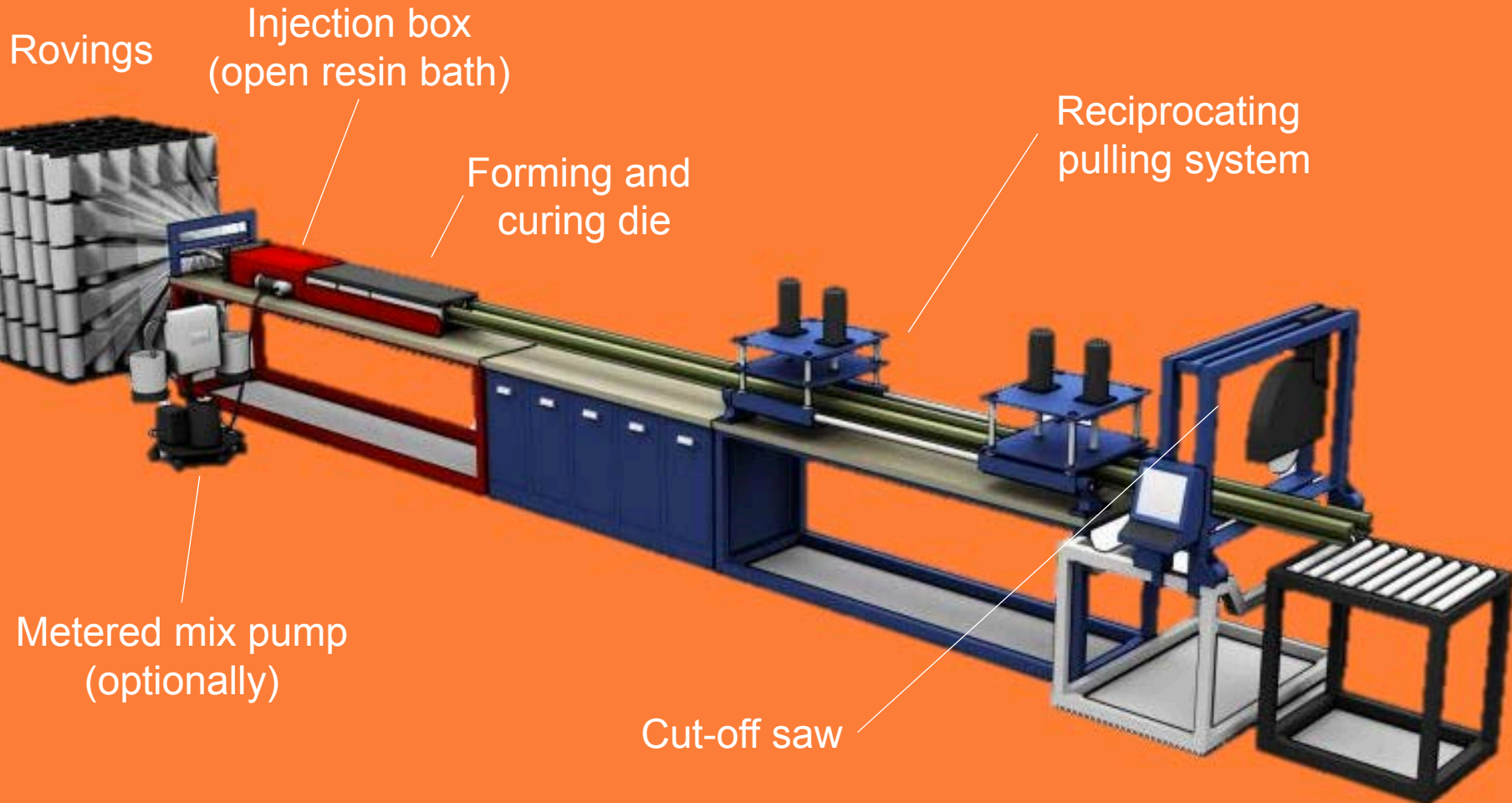
by PULTRUSION, we offer:

Brand new matrix material with excellent properties

- Avoid costly finishing process (coating or lamination)
- Reduce additives (UV stabilizers, mats, veils, etc.)
- Increased production speed (compared to e.g. UP)

What is Pultrusion?

Continuous manufacturing of fiber-reinforced thermosets



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Continuous manufacturing of fiber-reinforced thermosets



Pultruded PU Composites

Superior properties in comparison with traditional structure materials



Durability

PUL ~ Aluminum ~ PVC
>> Wood

Mechanical Stability

[E-Modulus in GPa]

Aluminum _[70] ~ PUL _[50]
>> Wood _[15] > PVC _[4]

Dimensional Stability

[thermal expansion coefficient in 10⁻⁶ 1/K]

PUL _[5] ~ Wood _[5]
>> Aluminum _[23] >> PVC _[50]

Thermal Insulation

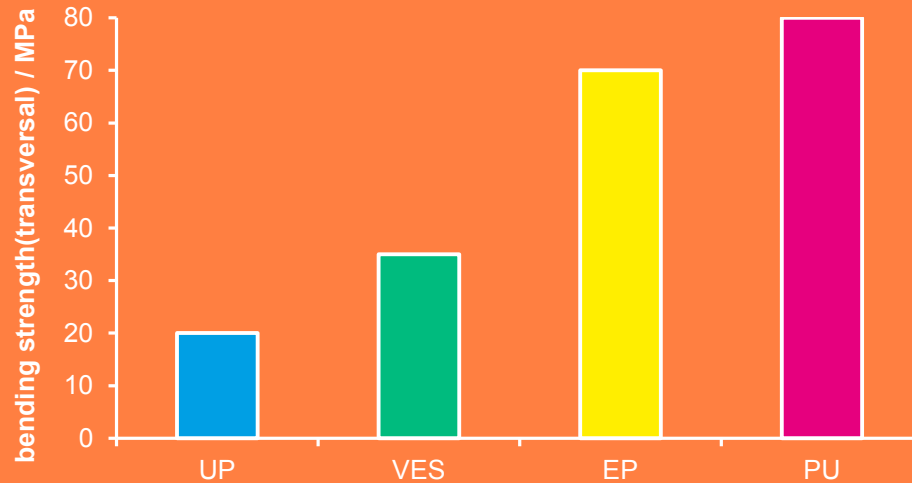
[thermal conduction coefficient in W/mK]

Wood _[0.2] ~ PUL _[0.5] ~ PVC _[50]
>> Aluminum _[236]

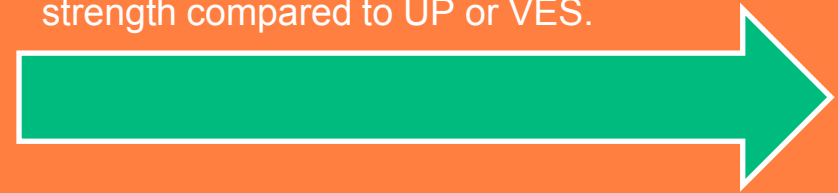
Pultruded PU Composites



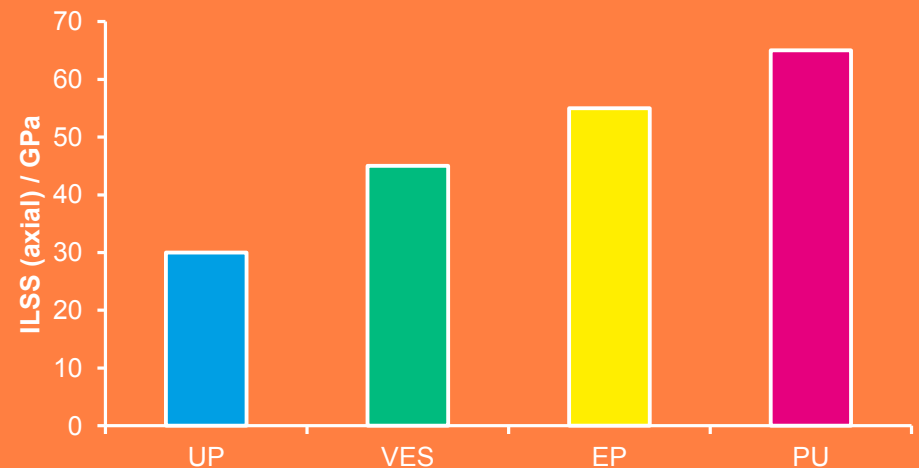
Bending strenght



Conclusion: Pultruded PU composites show superior transversal bending strength compared to UP or VES.



Interlaminar shear strength



Conclusion: Pultruded PU composites show significantly better ILSS when compared with UP or VES.



Covestro's offer to the Pultrusion Industry

Different formulations for different industry needs



Aromatic PU formulation

Highly reactive

High speed processing

- **2 component formulation**
- **PU metering system**
- **Injection box**
- **Line speed up to 2 m/min**



Aliphatic PU formulation

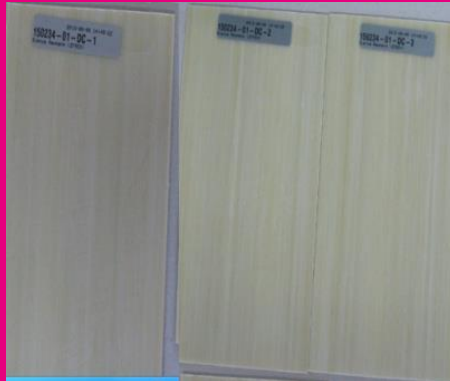
UV and weathering stable

Versatile and simple processing

- **1 or 2 component formulations**
- **PU metering system**
- **I-box or open resin bath**
- **Line speed up to 1 m/min**

Why Desmocomp®?

Extreme weathering, UV, and chemical stability without coating



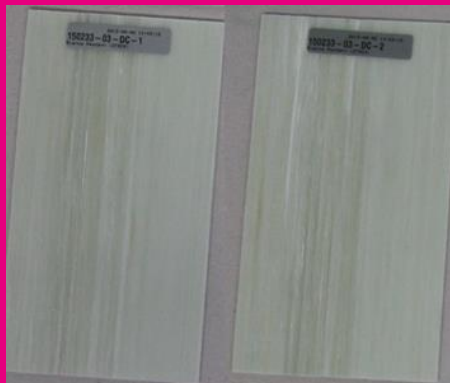
0 hours



5000 h

Other resins

~ 6 months on
rooftop in
Leverkusen



Desmocomp®

~ 6 months on
rooftop in
Leverkusen

Why Desmocomp®?

Extreme stability in accelerated weathering tests



Desmocomp® pultruded parts > 6000 h without changes in CAM 180¹

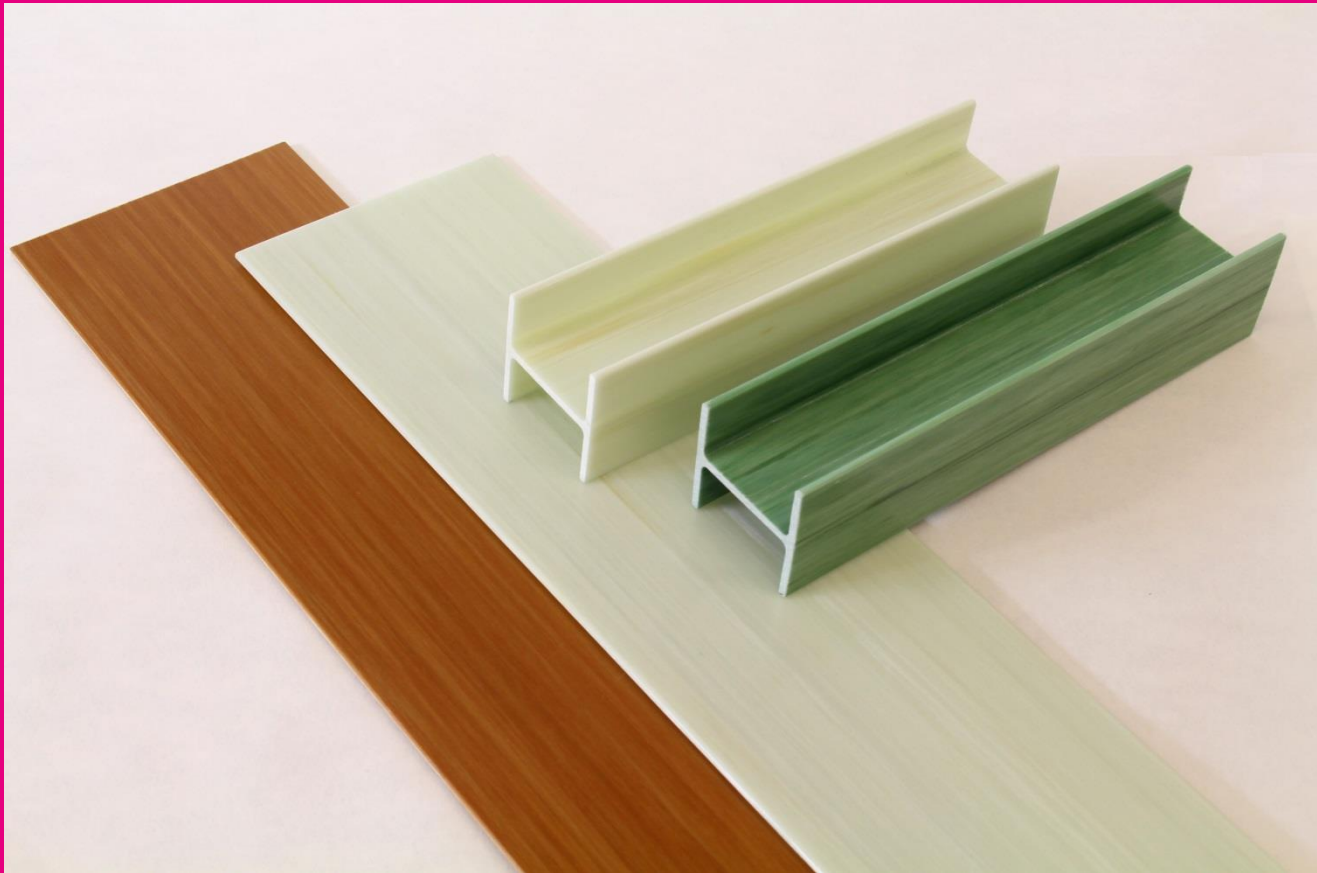
Desmocomp® (matrix only) > 20,000 h in Salt spray tests

Why Desmocomp®?

Excellent flammability properties



Flammability Class ¹	Smoke Generation Class ¹	Droplet Formation Class ¹
B	s1	d0



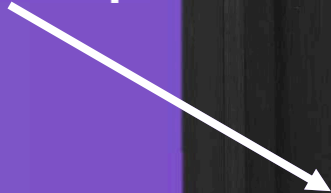
Applicable in various shapes and colors



In cooperation with

Sortimo[®]

 **Desmocomp®**



Sortimo®
HD System-Unit



Sortimo®

Pro Cargo CT1

Summary

- Desmocomp® can be used as matrix material in an established, robust and reliable pultrusion process.
- Due to the intrinsic UV-stability of Desmocomp®, surface protection of pultrudates by coatings or lamination is not required
- Pultrudates on the basis of Desmocomp® provide superior mechanical properties (strength, durability, flame retardance), when compared with other resin materials.
- Desmocomp® widens for our customers the application range of polyurethane-based resins.



Dr. Paul Heinz

CAS-R&D-New Applications

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