fisco composite solutions

fi:resist – a non-flammable fiber-reinforced composite

David Thull – E-LASS Seminar Day – 26th June 2018

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fi:resist – a non-flammable fiber-reinforced composite

FISCO

A joint venture of fischer and Sortimo

1958

Artur Fischer invents the S-dovel.

1973

Herbert Dischinger develops the metal case KM 321.

since 1973

Mutual customer – supplier relationships between fischer and Sortimo.

2011

Cooperation and joint projects in the fields of replenishment und digitalization.

2015

Foundation of the joint venture FISCO.

Corporate purpose FISCO

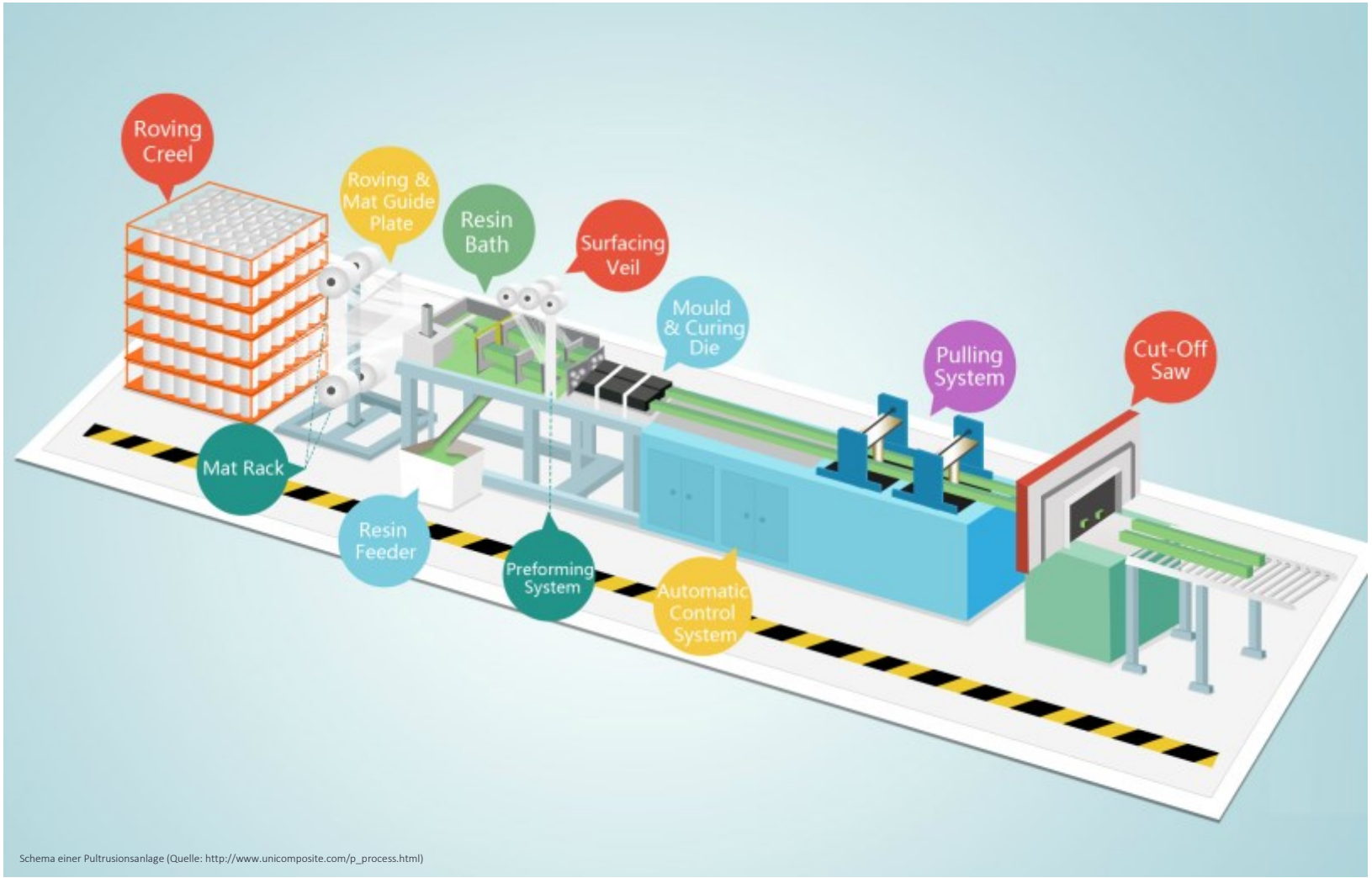
From joint projects to joint venture

Corporate purpose FISCO

From the first idea to the market launch

Fiber-reinforced composites

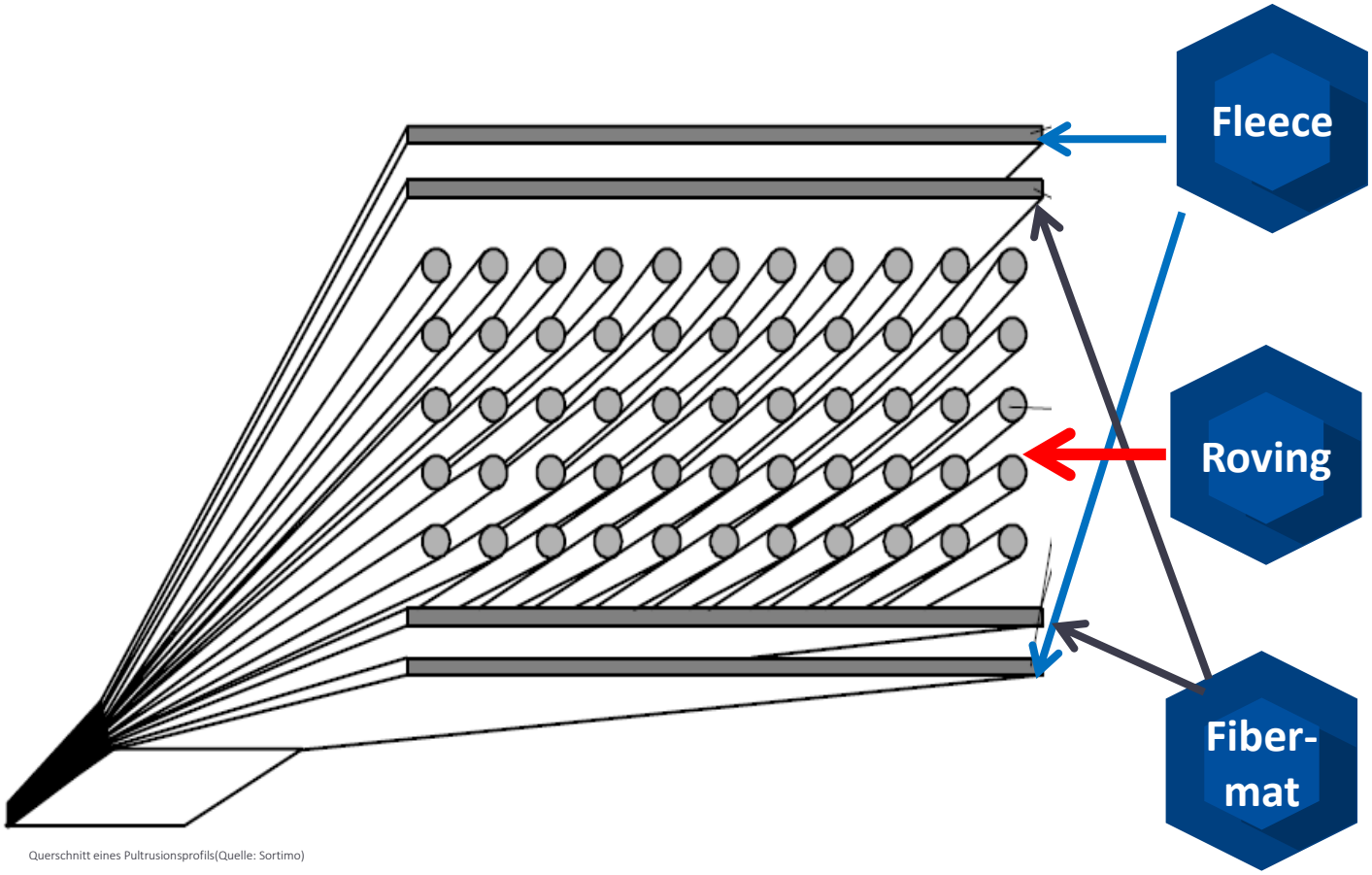
Production of fiber-reinforced composites by pultrusion



Schema einer Pultrusionsanlage (Quelle: http://www.unicomposite.com/p_process.html)

Fiber-reinforced composites

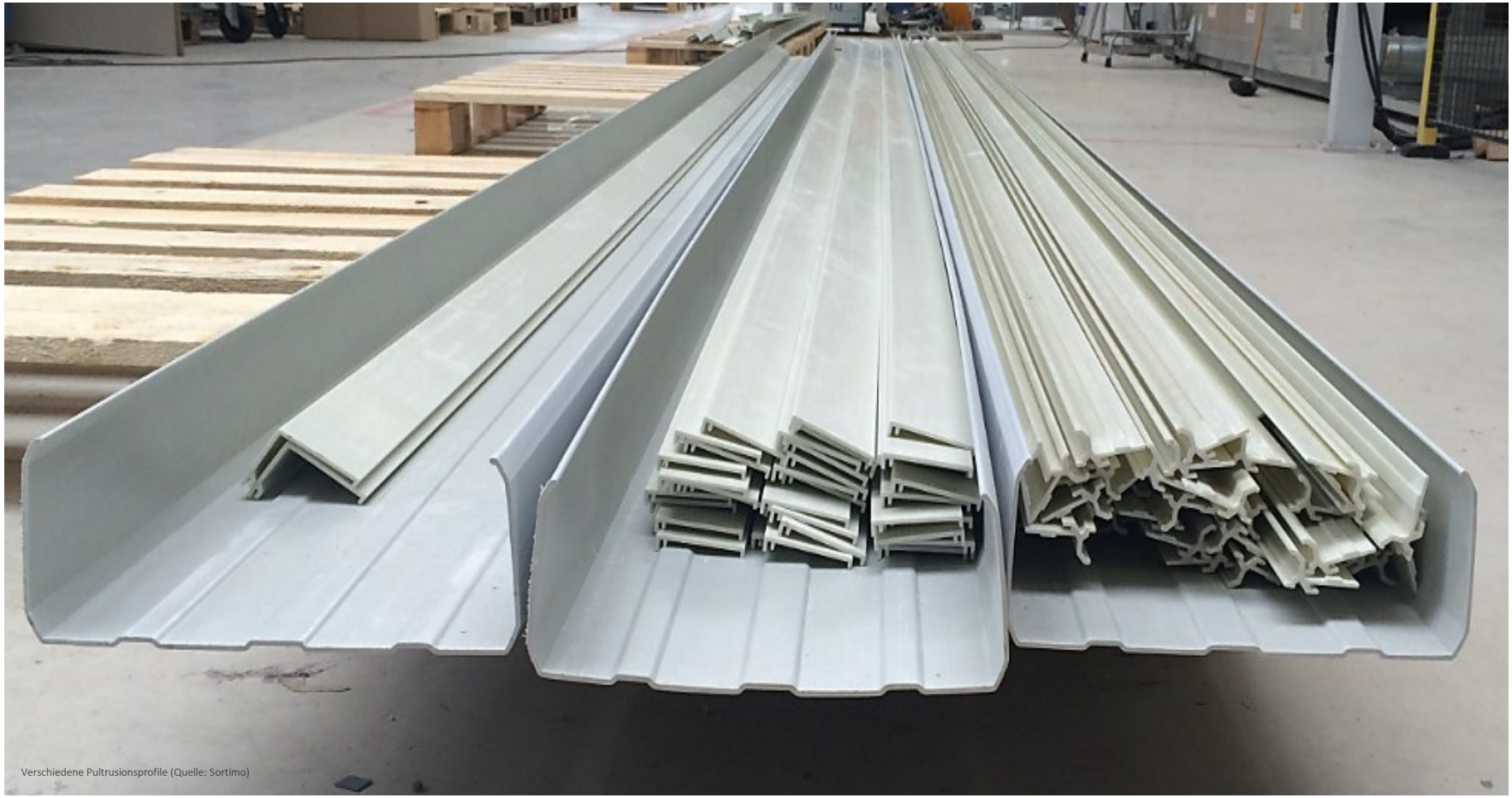
Typical Lay-Up of a pultrudet profile



Querschnitt eines Pultrusionsprofils(Quelle: Sortimo)

Fiber-reinforced composites

Pultrudet profiles



Verschiedene Pultrusionsprofile (Quelle: Sortimo)

Composites for the construction industry

Material properties of GFRP

- Light weight
- Low thermal expansion
- Mech. durability
- Resistant to chemicals
- Corrosion resistance
- Non-magnetic
- Low thermal conductivity
- Electically insulating
- Environm. friendly production
- Vibration damping

Fiber-reinforced composites

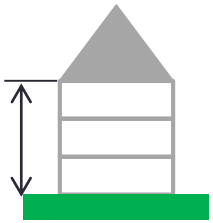
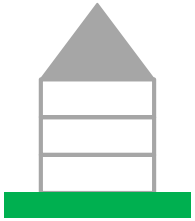
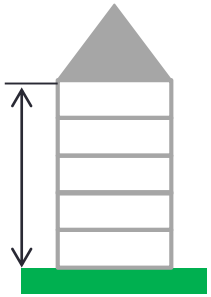
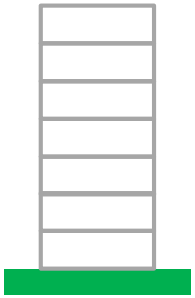
Challanges in the use of composites in the construction industry

- Combustibility
- Prices
- Recycling
- Processing
- Aging behavior
- Acceptance
- Unregulated building material

The combustibility of GRP is often an (insurmountable) hurdle for use in construction.

The problem – combustibility of composites

The combustibility of GRP is often an (insurmountable) hurdle for use in construction

Building classes				
1	**2**	**3**	**4**	**5**
				
- Residental - Freestanding - OKF ≤ 7m - ≤ 2 Units - ≤ 400m²	- Residetal - Not freestanding - OKF ≤ 7m - ≤ 2 Units - ≤ 400m²	- Other Buildings - OKF ≤ 7m	- OKF ≤ 13m - ≤ 400m² per Unit	- OKF > 13m or > 400m² per Unit
No requirements	**Fire resistance**	**Fire resistance**	**High fire resistance**	**Fireproof**

There are even stricter restrictions on assembly sites and public buildings.

The task- development of a new material

Development of a new material for the pultrusion of non-flammable profiles

The new material should fulfill the following requierements:

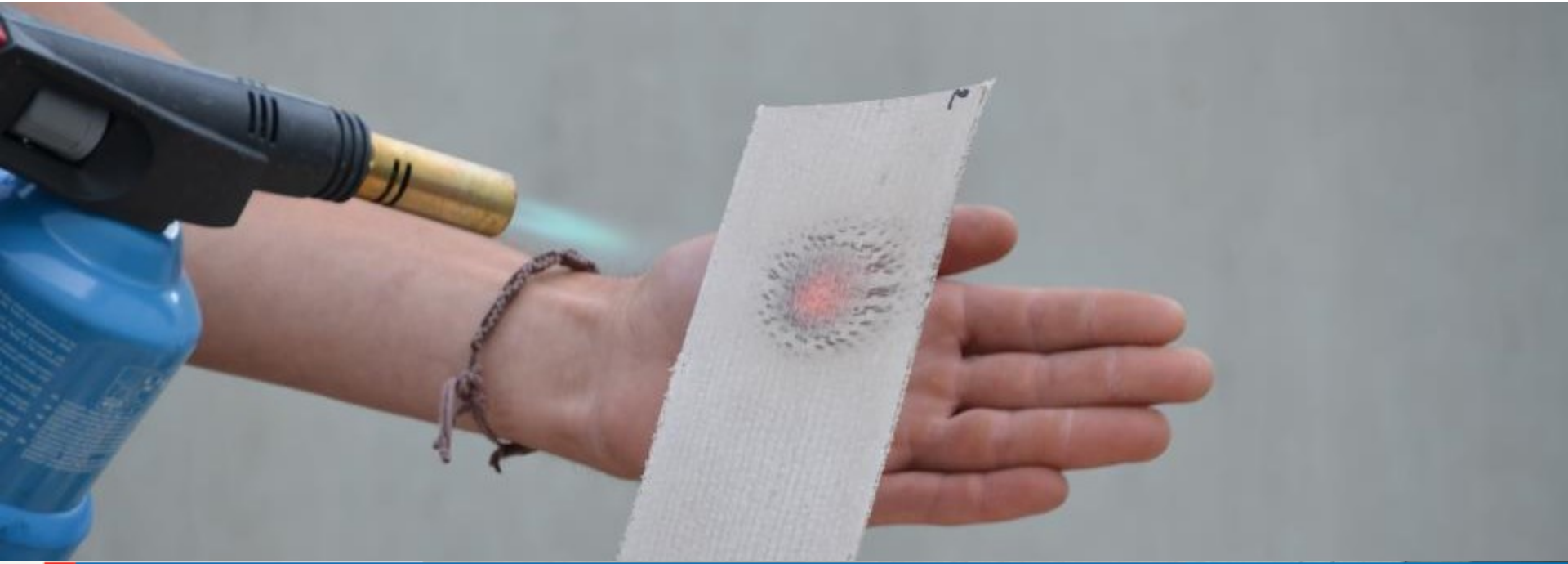
- Requirements of building material class A1 (DIN 4102-1 / EN 13501-1) must be met:
  Non-combustible without combustible components.
  - Glass fibers are inorganic and therefore reach the A1 classification.
  - The combustible matrix must be exchanged for an inorganic matrix.
  - Fleeces and fiber mats used must be inorganic.
  - Paints and adhesives used should have as small proportions of combustible constituents as possible.
  - No combustible additives may be used.
- Production with pultrusion must be possible.
- The new material should be suitable for use in technically demanding components.
- The new material should also be economically reasonable.

The solution – fi:resist

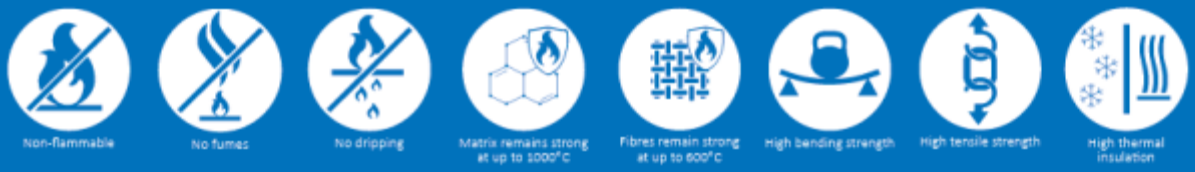
fi:resist is the only pultruded glass fiber reinforced material that does not burn

fi:resist. Doesn‘t burn.

The non-flammable GFRP material FISCO fi:resist unites unique properties that are very much in demand in many application areas.



fi:resist features

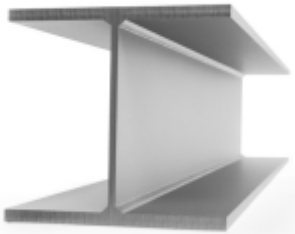


Material characteristics of fi:resist

Material characteristics of fi:resist in comparison with other material groups

Material groups used in construction:

- Metal
- Composites
- Mineral Materials



I-Träger (Quelle: www.stalatube.com)

Characteristics that are compared:

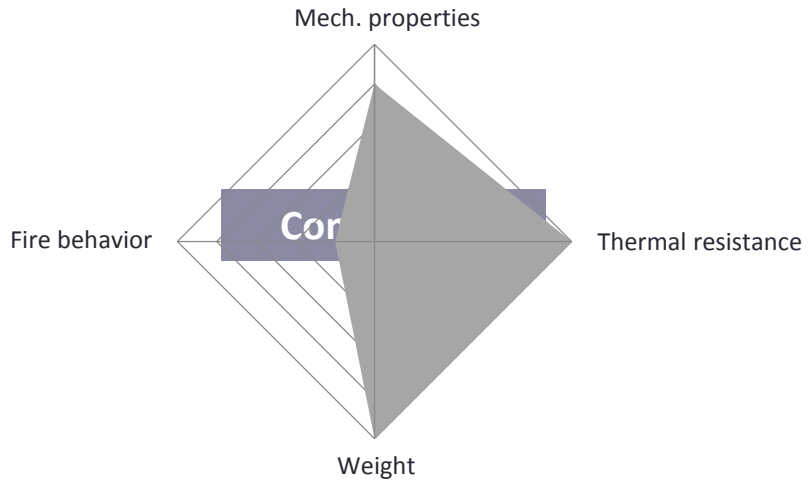
- Fire behavior
- Mechanical properties
- Thermal resistance
- Weight

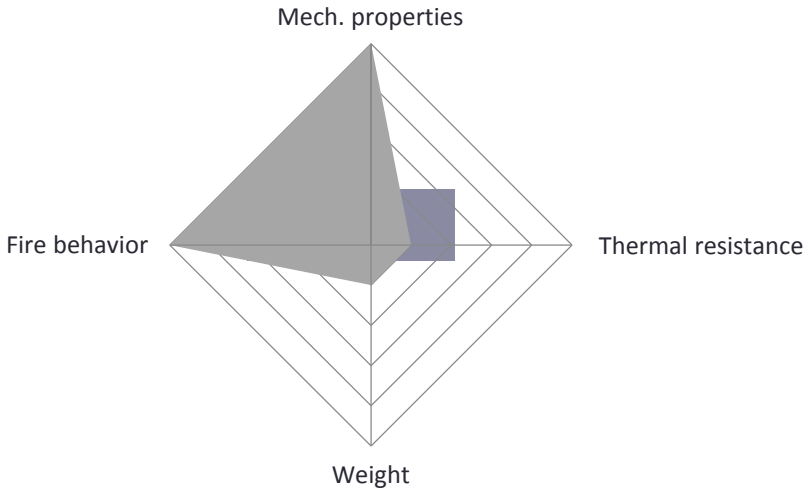
Sattelklemme (Quelle: www.bikehardest.net)

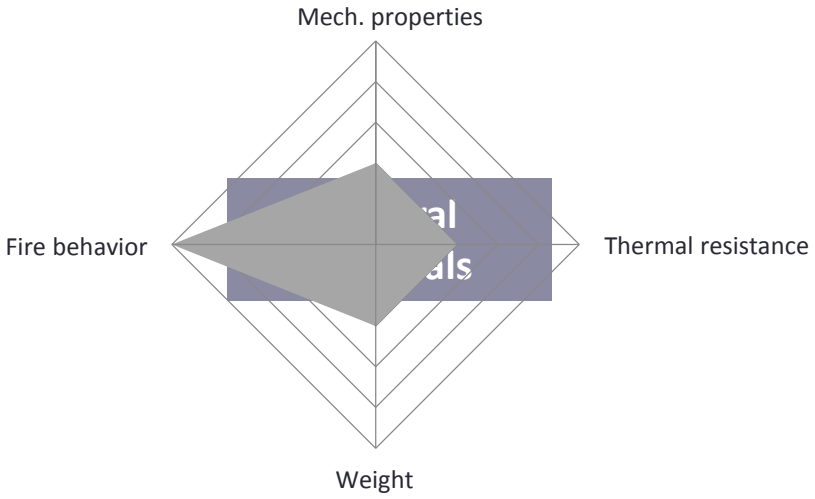
Betonblock (Quelle: www.realbud.com)

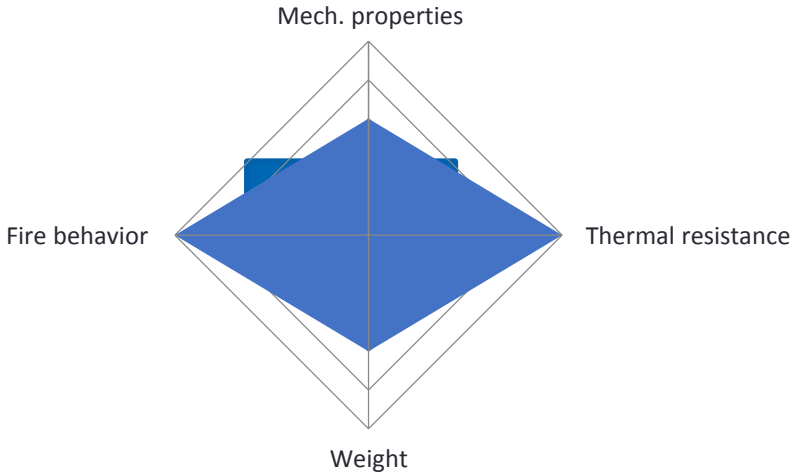
Characteristics of fi:resist

Material characteristics of fi:resist in comparison with other material groups









Characteristics of fi:resist – Fire behavior

Non-flammable.

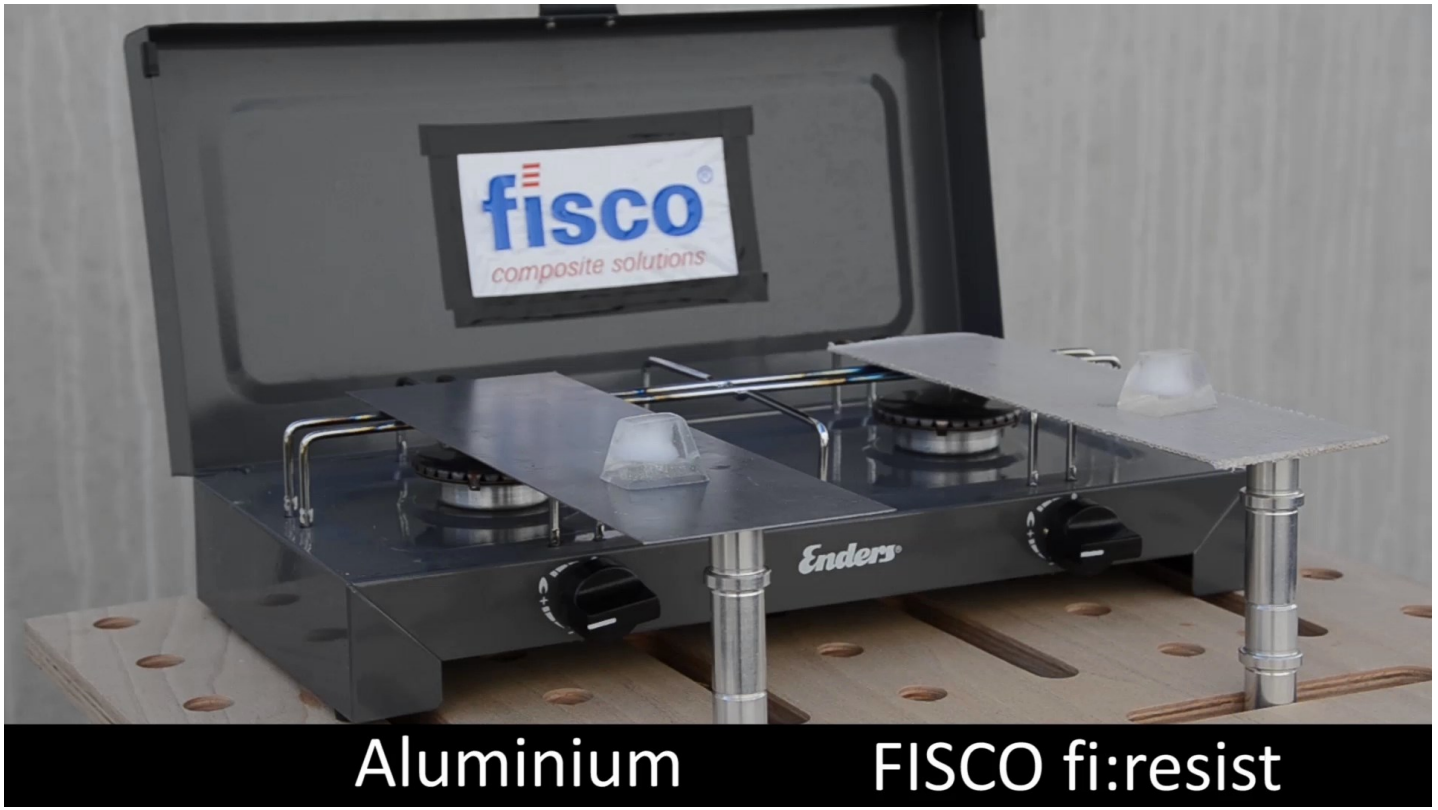
No fumes.

UP-Harz GFK

FISCO fi:resist

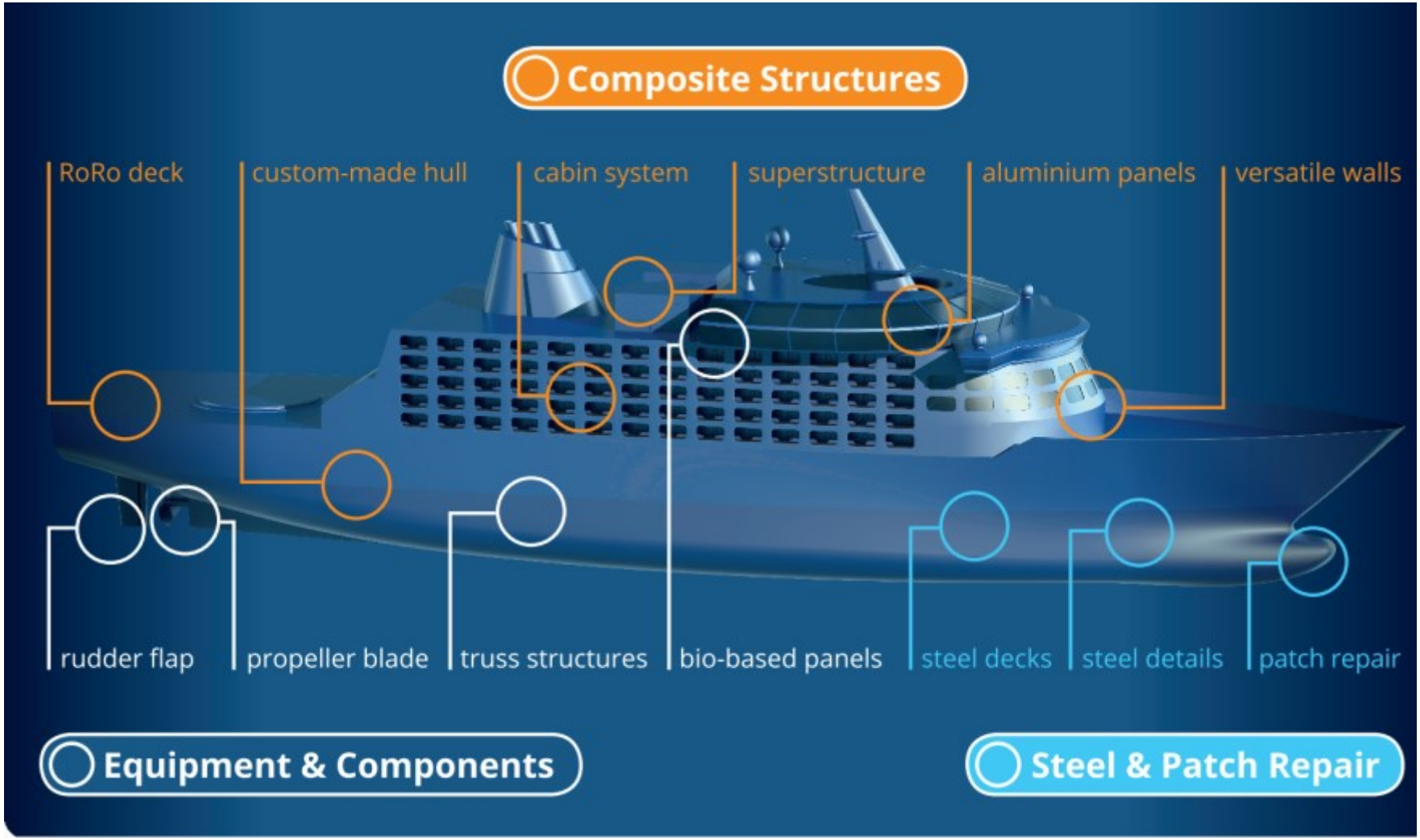
Characteristics of fi:resist – Therm. resistance

High thermal insulation.



Field of application: Maritime

Components and application fields with fire protection requirements



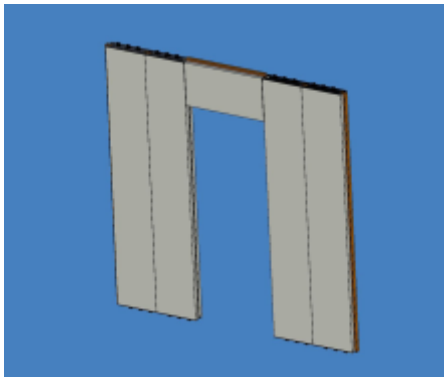
Übersicht Schiff(Quelle: ramsses-project.eu)

Possible products: Partition walls

Possible product developments with pultruded fi:resist profiles

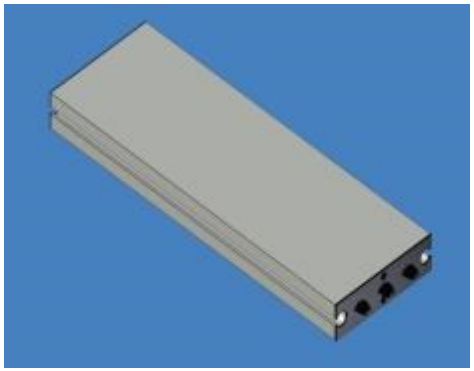
Advantages of fi:resist for partition walls:

- Robustness against environmental influences and during production and service.
- Less sound transmission between the cabins due to the good sound absorption.
- Reduction of weight allows the increase of pay-load.
- Easy assembly without welding is possible.



Smbolbild Schnellbauwand (Quelle: fischer)

Trennwand Kabinen (Quelle: NauticExpo)



Smbolbild Schnellbauwand (Quelle: fischer)

Possible products: Fire roller door

Possible product developments with pultruded fi:resist profiles

Advantages of fi:resist for fire roller doors:

- Lower weight with the same strength as comparable metal roller doors.
- Long functional integrity even at high temperatures.
- Smaller motors are required for the gates due to their low weight.
- Better crash / impact behavior than metal roller doors.
- By high thermal separation, UV- and corrosion resistance well suited for outdoor use.

Brandschutzrolltor (Quelle: www.blasl.at)

Symbolbild Rolltor (Quelle: fischer)

Brandschutzrolltor (Quelle: www.directindustry.com)

Possible products: Balconies

Possible product developments with pultruded fi:resist profiles

Advantages of fi:resist for ship balconies:

- Robustness against environmental influences and during production and service.
- No influence from the balcony into the deck/cabin due to the good sound absorption.
- No problems with hot cigarettes and potential misuse (e.g. barbecue).
- Very small displacements caused by temperature differences due to the low thermal expansion.
- Reduction of weight with a large lever arm.

Symbolbild Schiffbalkon (Quelle: cnravler.com)

Symbolbild Schiffbalkon (Quelle: go4travelblog.com)

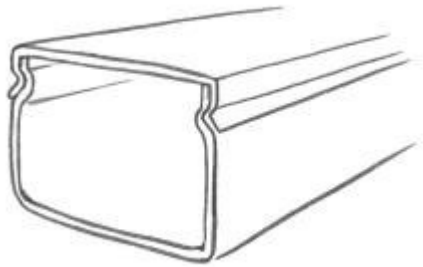
Possible products: Fire-resistant cable duct

Possible product developments with pultruded fi:resist profiles

Advantages of fi:resist for fire-resistant cable duct:

- Long functional integrity even at high temperatures.
- The use of fi:resist allows a 3-in-1 solution.
  - Firewall due to non-flammability of the material.
  - Protection of cables by good thermal separation.
  - Self-supporting cable duct with a large span.
- The production by pultrusion allows the integration of additional functions.

Knauf Fireboard (Quelle: www.knauf.de)



Symbolbild Kabelkanal (Quelle: fischer)

Aufbau Kabelkanal (Quelle: www.baulinks.de)

fi:resist. Doesn`t burn.

fisco composite solutions

Gewinner des Innovation Award 2016

FISCO gewinnt mit fi:resist, dem weltweit ersten nicht brennbaren GFK aus Pultrusionsfertigung, den Innovation Award 2016 der Experience Composites powered by JEC.

Kategorie: Bau & Infrastruktur
Mehr Information auf **www.fisco.de**

EXPERIENCE COMPOSITES

powered by JEC GROUP