

PT FirstOne®

INNOVATION IN FIRE PROTECTION

non-combustible
emission-free
lightweight

Fire protection with PT FirstOne®

Efficiency and flexibility

PT FirstOne® is the result of IBV's many years of experience with optimized, application-specific composite materials.

The completely new construction material PT FirstOne® has all the advantages of classical fiber-reinforced composi-

tes, but is completely incombustible. Even at temperatures above 1500°C no flue gases or pollutants are emitted.

PT FirstOne® - the ideal construction material



Shipbuilding

- Window boxes
- Bulkhead partitions
- Drywalls
- Offshore - Solutions

Railway Vehicles

- Interior trims
- Seals
- Seating
- Bulkheads



Aircraft construction

- Interior trims
- Seating
- Galley solutions

Automotive Industry

- Heat shields
- Underbody panels

For whom?

Construction engineers and planners in the preventive fire protection area, architects, interior designers and many others will find the ideal structural material in PT FirstOne®.



Building construction

- Structural fire protection
- Fire walls
- Doors, gates and covers
- Trims and claddings
- Thermal insulation
- Ventilation and cable ducts
- Utility ducts
- Tunnel trims
- Hazardous material storage

WHAT'S NEW

Uncompromising protection

The long-standing experience of our experts in dealing with preventive fire protection has led to the development of PT FirstOne®.

IBV was able to fall back on in-depth knowledge of relevant industry standards, norms, regulations and trends in the respective fields of application.

With PT FirstOne® the user deals with construction material that enables completely new fire protection solutions.

Focus on human beings

A main focus during the design and development of PT FirstOne® was the protection of people.

The fire resistant material and its non-combustibility significantly improve the possibilities of fire-fighting and the design of escape routes.

Even at temperatures above 1500 °C, the material does not soften and there is no smoke or other emissions of pollutants. Thus health damage caused by gas emission can de facto be excluded.

In addition, the material is completely safe for people's health while processing, use, and disposal.

Flexible in design

PT FirstOne® can be processed from flat panels to components of any three-dimensional form.

In addition, its flexible and specific material composition simplifies the adaptation of strength, stiffness, and toughness to a requested load profile.

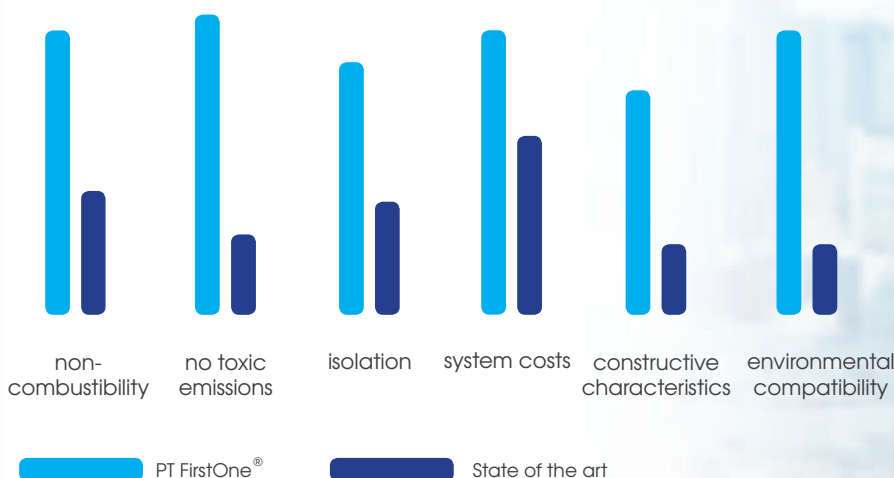
Thus, a material for applications where non-flammability and thermal insulation combined with low weight have the highest priority, is now available and can perfectly be optimized for all structural requirements.

No less important is the simple application of aesthetic refinements of the upper surfaces with films or coatings when using PT FirstOne®. Even highly resistant upper surfaces can be realized by means of gel coats.

System costs under control

PT FirstOne® reduces system costs importantly due to its superior technical properties. It also improves both aesthetics and safety at the same time.

Outstanding features of PT FirstOne® by comparison



The figure shows the properties of PT FirstOne® in the area of fire protection compared with the state of the art. A longer bar stands for a better performance.

BASIC DATA

Basic data and characteristic values

PT FirstOne[®], the construction material, has excellent features due to its flexible structure and characteristics.

The innovative concept of the material allows adaptation, such as strength and stiffness to be individually configured for the individual requirements and needs of the corresponding applications.

A variety of processing options for dimensional stability

Shape stability

PT FirstOne[®], a composite material, combines excellent thermal characteristics with absolute dimensional stability and high resistance against environmental impacts.

Flexible with wall thicknesses

Components made with PT FirstOne[®] can be prepared in any desired wall thickness.

Tooling costs

The components are typically built using simple form tools by following individual and specific requirements of the customer.

Fire protection in 3 dimensions

With PT FirstOne[®] a huge variety of three-dimensional molded parts can be produced, for example for the interiors of ships, trains, or airplanes.

Basic characteristics of PT FirstOne[®]

Density	0.8 - 1.9 kg/dm ³
Component thicknesses	min. 1.0 mm
Moisture content	< 0.1 %
Compressive strength	60 MPa
Tensile strength*	30 - 100 MPa
Tensile module of elasticity*	3,000 - 12,000 MPa
Bending strength*	50 - 120 MPa
Flexural modules of elasticity*	7,000 - 15,000 MPa
impact strength*	40 - 80 kJ/m ²

* As a function of fiber content and fiber orientation

STANDARDS AND TESTS

PT FirstOne® meets all major standards

PT FirstOne® complies with all relevant standards. PT FirstOne® can be used effectively in a wide variety of fields due to its excellent technological property profile.

All of the specific European and international standards are met by PT FirstOne® and in some cases significantly exceeded.

Highest classification levels are a matter of course.

Of particular note are the outstanding results in the smoke- and tox - tests.

With PT FirstOne® you are already prepared today for future, more stringent regulations.

Tests and examinations

Shipbuilding

- Non-combustible according to IMO FTPC Part 1
- Fire resistance according to IMO FTP B-15

Rail vehicles

- Smoke density / ISO 5659-2 toxicity highest level HL3 according to requirement R1
- Heat release ISO 5660- highest level HL3 per requirement R1
- Flame propagation in accordance with ISO 5658-2 highest level HL3 per requirement R1-R16

Aircraft usage

- Bunsen burner test passed in accordance with FAR § 25
- Heat release test passed in accordance with FAR § 25
- Smoke density / toxic gas emission passed in accordance with ABD 0031

Building construction

- Classification of fire behavior according to DIN EN 13501-1
- Non-flammable level A1
- No smoke development
- No flaming droplets

and others.

Smoke density / toxic gas emission test by ABD 0031 Issue FA / TM 2.0007B & 3.0005

	Standards	*PT FirstOne®
Smoke density D _S (4)	< 200	0
Gas concentrations (ppm)		
HCN (hydrogen cyanide)	< 150	1
CO (carbon monoxide)	< 1,000	0
NO / NO ₂ (nitric oxide / dioxide)	< 100	2
SO ₂ / H ₂ S (sulfur dioxide / -hydrogen sulphide)	< 100	0
HF (hydrogen fluoride)	< 100	0
HCl (hydrogen chloride)	< 150	0

*Results from the authorized fire laboratory Lufthansa Technik in Hamburg

SAVINGS POTENTIAL

Comparison to the state of the art

PT FirstOne® shows superior properties in many areas compared to the state of the art.

In shipbuilding, by using PT FirstOne® for example for the construction of window boxes, up to 40 percent weight can be saved in comparison to the conventional technique.

Besides in wagon construction in addition to the non-combustibility, weight plays a significant role. Absolutely fireproof

coverings with minimum wall thickness can be manufactured by using PT FirstOne®.

More significant performance improvements are possible, compared with the technologies currently used in wagons.

In building and tunneling construction PT FirstOne® allows for completely new approaches in usage. Sealing systems for example, can be represented with a fire

resistance of more than 240 minutes.

The fire resistance and fracture strength of common insulating materials can be significantly increased when coating them with PT FirstOne®.



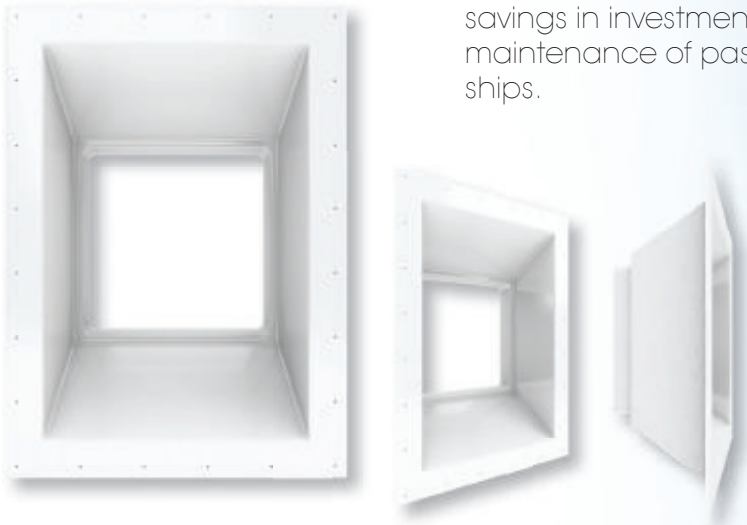
Outstanding features of PT FirstOne® against current fire-fighting equipment

Example	Technology	Reaction to fire	Benefits	Results
SHIPBUILDING B15 window box, ceiling panels A60	PT FirstOne®	non-flammable no dripping no emissions	cost reduction and weight saving up to 40%	flexible window boxes replace so-called porch boxes
BUILDING roof panels / deputy walls, tunnel linings, cable channels	PT FirstOne®	non-flammable no dripping no emissions >F240, >EI 120	weight saving cost saving time saving weather-resistance flexural strength	foreclosure, integrity and thermal insulation remain in the event of a fire condition
WAGON interior	PT FirstOne®	non-flammable no dripping no emissions	wall thickness reduction weight saving	lighter interior fittings with the same strength and optimum fire protection

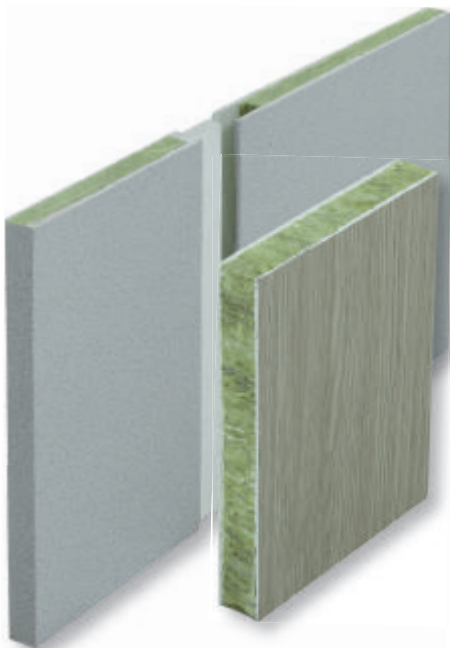
APPLICATIONS

Products and processes

Window boxes type class B15 made from PT FirstOne® reduce the weight and simplify assembly. It permits high cost savings in investment and maintenance of passenger ships.



Window box B15



PT FirstOne® allows direct application of quality decorative upper surfaces (paints / films) without "detours".

PT FirstOne® can be individually configured for a requested fire protection level, using patented hybrid technology.

Ceiling panels and special components in hybrid technology with surface finishing

PT FirstOne®

Innovative system solutions for preventive fire protection

"The usage of PT FirstOne® will positively, significantly and sustainably influence the efficiency and quality of fire protection solutions for our customers.

With our quality product portfolio and a team of dedicated development and service engineers we are able to offer individual solutions to our customers for the most demanding applications."

Wilfried Grüdl, managing director IBV Holding.

System solutions for our customers

IBV is a leading European manufacturer of fiber-reinforced plastics. In addition to the main sales markets of Germany, France, Benelux and the UK, these are also used successfully in Spain, Italy, Switzer-

land, Scandinavia and Eastern Europe.

Premium Service

IBV stands for professionalism, premium product quality, technical expertise and reliable logistic support.

We help our clients in every phase of the product development process.

Our aim is to develop the technically and economically optimal solution in collaboration with the customer.

IBV is the "Premium - OneStop" for complete solutions in the field of preventive fire protection.

From the tool to the final system

For the realization of specific components which are

following the requirements in every respect, extensive knowledge in various fields is required. For example, the preparation of a powerful mold is a critical first step in the development of a high quality product.

IBV as a partner

As a reliable partner, we help our clients with their challenging projects.

Our dedicated support engineers provide up-to-date technical back up based on innovative solutions and efficient processing techniques.

Compliance with all standards and legal regulations is a matter of course for us.

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