fibra

THINK COMPOSITE

Think of something...

HIGH MECHANICAL RESISTANCE

THERMALLY INSULATED

THERMAL SHOCK RESISTANT

LIGHTWEIGHT

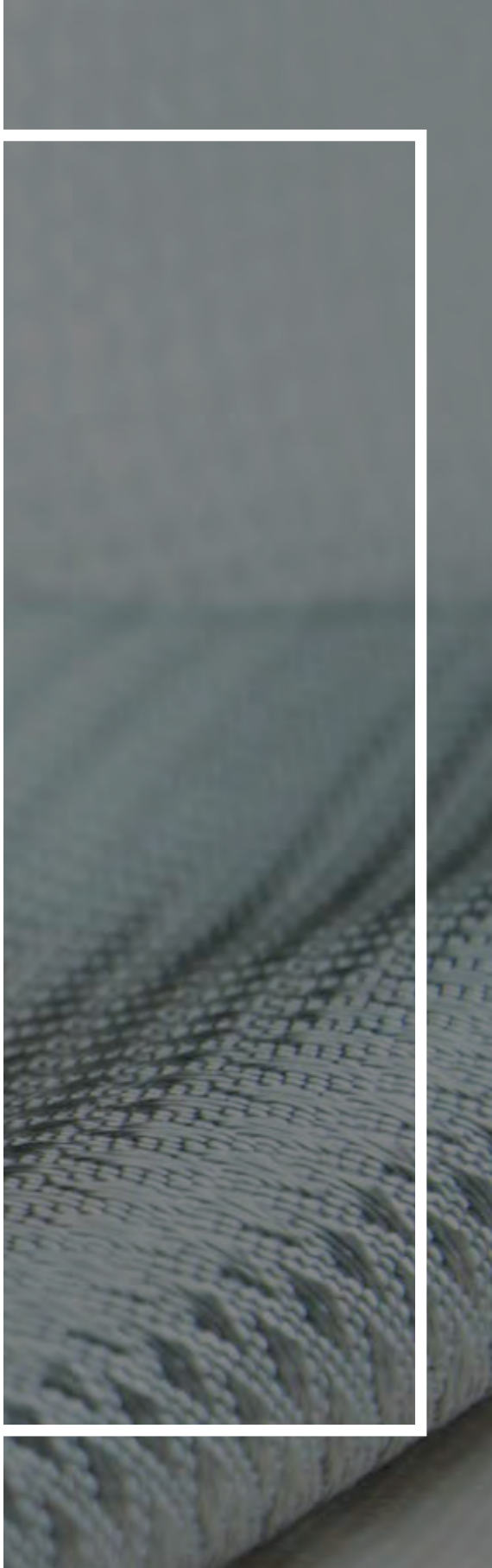
MAINTENANCE FREE

TRANSLUCENT

FIRE-RETARDANT

INDEX

fibra
THINK COMPOSITE



APPLICATIONS

INDUSTRY FIELDS

TECHNICAL DOCUMENTATION

The specialists in composite profiles

Specialised in composite material profiles, Saimex has a long experience in the field, both in manufacturing processes and raw material research.

During our work experience we have constantly improved our knowledge and ability to propose innovative materials and solutions.

Technology researchers

Development, high technology, innovation, research and experience are the values on which the company's mission is based: Saimex products meet the new market requirements, especially continuous updating, by replacing traditional materials and providing features of durability and endurance. Saimex srl actively cooperates with the most cutting-edge Universities in the field of research on composite materials for structural use.

FIBRA BY SAIMEX

Saimex - engineering

Saimex has a team of trained engineers and technicians available to customers, in order to check the possibility of using glass fibre profiles for their projects. Saimex srl has an organizational structure that can keep a close watch on every stage of the process, assisting the client in the stages of design, design calculations and preparation of executive drawings and thus succeeded in finding the most suitable solution for every specific request.

Target markets

GLOBAL COMPANY

Saimex has a multilingual staff operating in Italy, Europe and non-European areas.

APPLICATIONS

VERSATILITY OF FIBRA

Is architecture really innovative?

The role of the architect is to interpret the space used by the contemporary man, in order to meet the requirements of the modern world both in terms of environmental exploitation and especially with regard to those materials that create it.
What are the new needs that the contemporary architect should satisfy?

ARCHITECTURE:

FACADES - LOUVERS

BUILDING INDUSTRY:

DOORS AND WINDOWS - THRESHOLDS

LANDSCAPE ARCHITECTURE:

PEDESTRIAN WALKWAYS

FIBRA PROPERTIES

ENERGY EFFICIENCY

In case of reduced thermal transmittance FIBRA is applied to doors and windows, used as thresholds for lift-slide fixtures and curtain wall facades of class A buildings, ensuring energy performance standards that are impossible to achieve through traditional materials, such as steel and aluminium in the same section. **Value λ = 0.25 W/mK**

SUN LIGHT

FIBRA is widely used in Northern Europe, where the architect's primary task is to bring more natural light into less sunny areas as possible. Thanks to its thermal insulation properties, FIBRA creates reduced girder sections in a minimalist style, while leaving space for glazing and brightness both to curtain wall facades and to doors and windows.

LIGHTWEIGHT

Steel, cement and FIBRA.

FIBRA ensures the same tensile strength of steel and is used for the construction of modern lightweight structures **weighing 5 times less than steel.** **Density of 1,85 g/cm^3 - Tensile strength 450 MPa**

REDUCTION IN MAINTENANCE COSTS

Man, Environment and Time. The modern works are meant to last forever.

FIBRA does not undergo corrosion, does not oxidize and it resists the water and thermal shocks. **(- 40°C/+180°C)**

FIRE-RETARDANT

FIBRA meets ASTM international standards, class A, as well as the European standards EN 13501 Class A2 s1 d0.

INDUSTRY FIELDS

FIBRA SCOPES

ARCHITECTURE
facades – louvers

FIBRA allows the architect to explore other options in the production of building wall cladding with customized solutions and according to the architect's design.

This feature, combined with structural properties, **thermal insulation capacity, lightness and low maintenance costs**, allow to produce manufactured goods in accordance with the new requirements in terms of energy efficiency.

FIBRA may be used in various fields of architecture ranging from coatings for **facades**, structural components of curtain wall facades to blinds and louvers.

It is possible to obtain tactile and modern effects to be created both for customized shapes and colours.

FIBRA shows off a **translucent finish** through the use of special resins, able to create bright and appealing optical effects, breaking down the material and transforming facade portions into real lamps.

It gives elegance to architectural works and combines aesthetic and innovative solutions with high-performing and functional systems.

BUILDING INDUSTRY
window frames – thresholds

Thanks to its thermal break, typical of composite materials, FIBRA is broadly applied in the **green energy** sector, an area of increasing interest which shows that building industry, energy and economic savings may support each other.
Thanks to its insulating structure, because of composite material of which it is composed, and to its **thermal break**, FIBRA is used as **thresholds for sliding doors** and structural parts of **doors and windows frames**.
The value of thermal conductivity λ of fibreglass profiles is equivalent to **0,25 – 0,29 W/mK**. This makes possible the production of smaller structural profiles with low thermal transmittance compared to aluminum profiles.
Furthermore, FIBRA profiles are weather resistant and maintenance free.
The design of these composite materials is made easy without the need for polyamide inserts. The final profile turns out to be more competitive and energy saving.

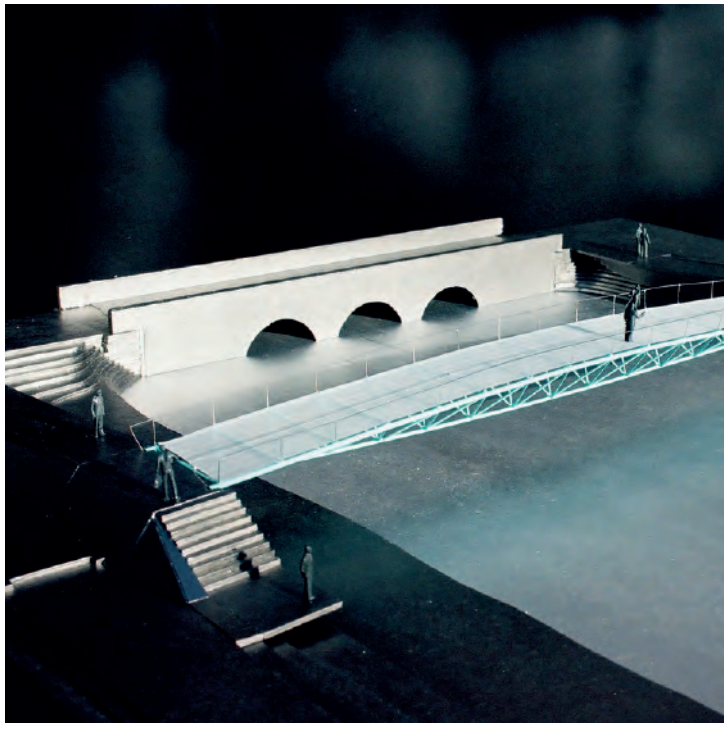
LANDSCAPE ARCHITECTURE
pedestrian walkways

Innovative materials make **architectural special effects** that applied to simple elements, such as pedestrian walkways can produce amazing design results. The translucent effect of FIBRA **breaks down the material**, turning floorings and handrails into real suspended lamps, while maintaining their primary function.

The play with FIBRA colours makes it possible to obtain manufactured products in RAL colours in direct extrusion, without the need for painting or subsequent surface treatments, with big cost savings.

FIBRA is considered an **ultra-light material weighing 5 times less than steel.** This property allows a totally new use. For example, it is possible to transfer walkways with helicopters or road transport vehicles; something unthinkable for steel.

Thanks to the extreme resistance of FIBRA in the outdoor, there are no maintenance costs and this topic becomes of primary importance for Public Administration or Emergency Units. It is possible to put back the manufactured products and use them when necessary, remaining unchanged and perfectly suitable for use even after long time.



PROJECTS

NEW PRODUCTS

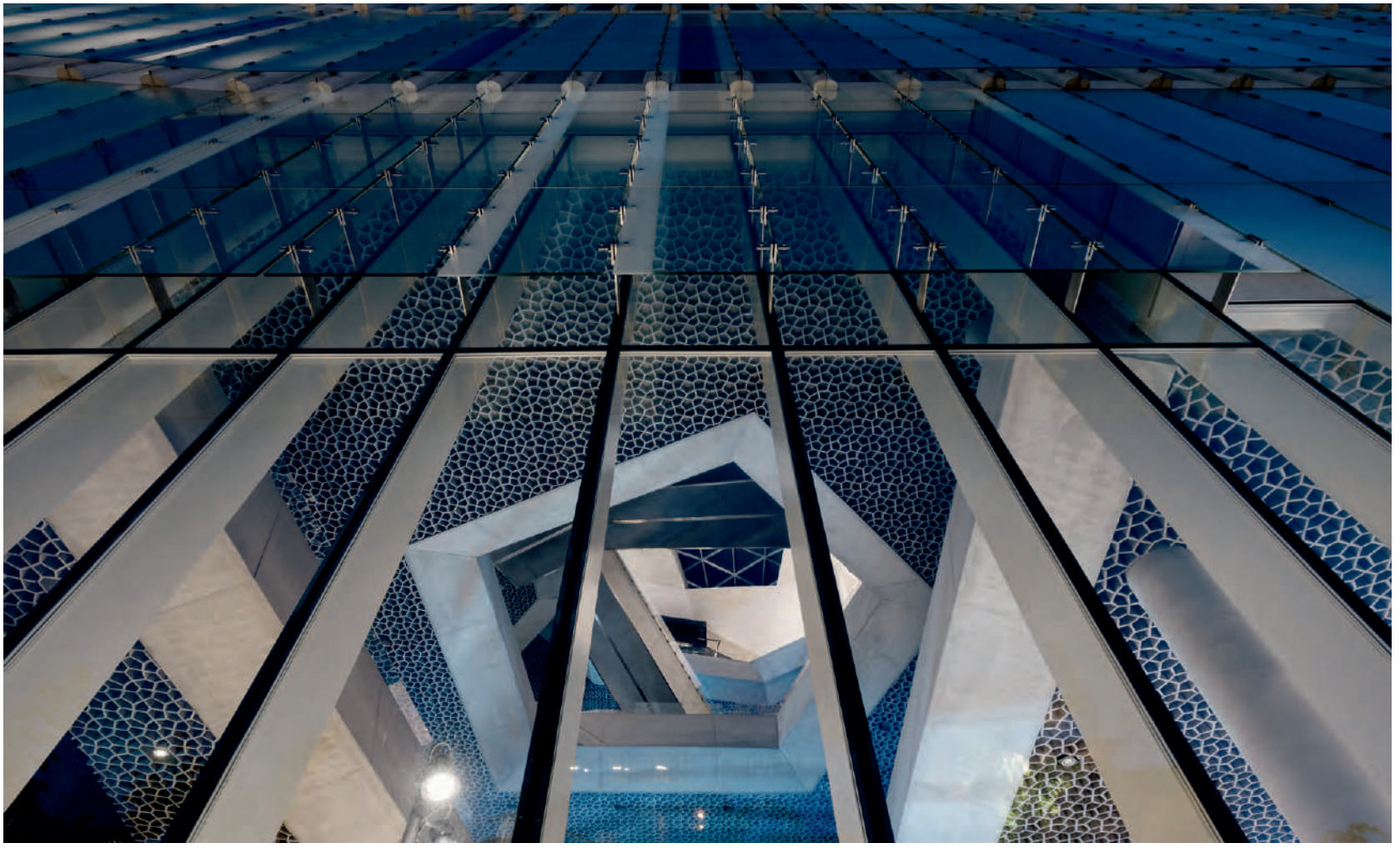
DEICHMAN LIBRARY

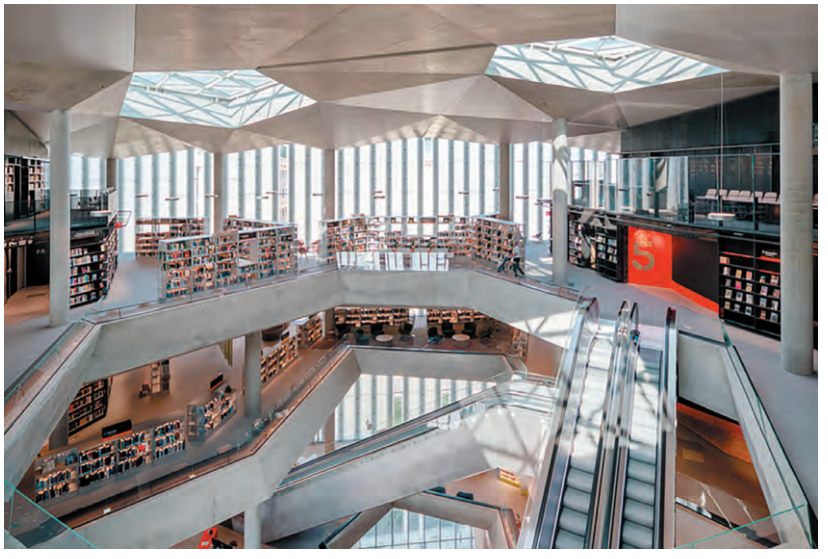
OSLO - Norway

Facade Structural Frame in FIBRA.

Sunlight, Lightweight, Energy saving: these three drives moved the popular Norwegian Architect Lund Hagem towards the most innovative FIBRA Project in Europe.

A 40 cm wide Facade Structural Profile for 13 m high glass panels instead of steel.





DEICHMAN LIBRARY

OSLO - Norway

BUILDING FIBRA WAVE

Render

Wall cladding in wave shape.

Innovative example of facade. The panel can reach 11 mt in one single piece. This is reducing the quantity of joints and subsequent use of silicons and sealants.

Considerable time saving in the logistic and movement of the parts.

In addition to Wave model, FIBRA allows several shapes and colours.

BRIDGE

CESANO MADERNO
Milan - Italy

Elevated bridge at railway station in Cesano Maderno Ferrovie Nord.

Pavement in FIBRA. High density traffic area.

BRIDGE

GIUBIASCO
Bellinzona - Switzerland

“The balloon bridge”: this innovative construction system is replacing the traditional self-supporting truss system. The bridge is lifted by two inflated rafts.
FIBRA grants more lightweight and less counterweight.

BRIDGE

PRATO
Florence - Italy

Pedestrian Bridge in Prato (Florence) Salvador Allende street Italy .

Pavement in FIBRA. Maintenance costs reduction. Thanks to FIBRA lightweight the bridge has been installed in two hours not interrupting the road traffic.

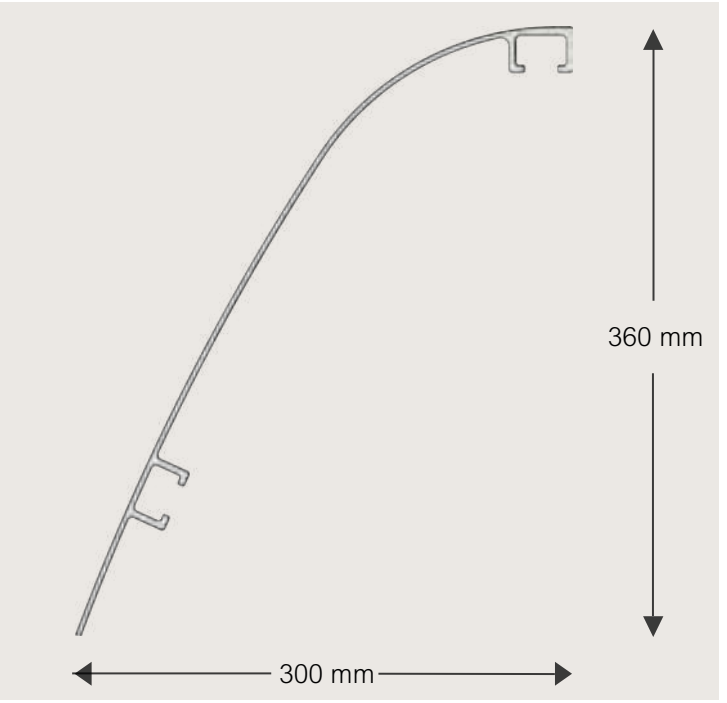
BRIDGE

CHIOGGIA
Venice - Italy

Pavement in FIBRA to grant corrosion strength near the river and waterish areas.

SUBWAYS' TRAIN

Ansaldo Breda fairing Los Angeles



Created for the Los Angeles Metro, it replaces the traditional aluminum panel, train's skirt and side.

It does not overheat and does not generate heat islands, it resists corrosion and bad weather, it does not dent, considerably reducing vehicle downtime costs compared to aluminium.

Lightweight

High temperature resistant

Corrosion resistant

No flex

Fire retardant

Maintenance free

APPLICATIONS

FIBERGLASS PROFILES

Innovation, research and development of new materials, analysis of new customers' needs are the challenges that the modern supply chain is facing to manufacture high-performance and improvement products.

High-voltage cable trays, access for maintenance, industrial fan blades are examples of the successful application of fiberglass profiles instead of steel.

ENGINEERING:

STRUCTURES - SHEET PILES - GRATINGS

TRANSPORTATION:

TRAIN - SHIPS - SUBWAYS

INFRASTRUCTURES:

BRIDGES - RAILWAY TUNNELS

INDUSTRIAL FINISHING

TENSILE STRENGTH : 450 Mpa

SPECIFIC WEIGHT : 1,85 g/cm^3

DIELECTRIC STRENGTH : 5-15 kV/mm

THERMAL INSULATION : Lambda value λ = 0,25 W/mK

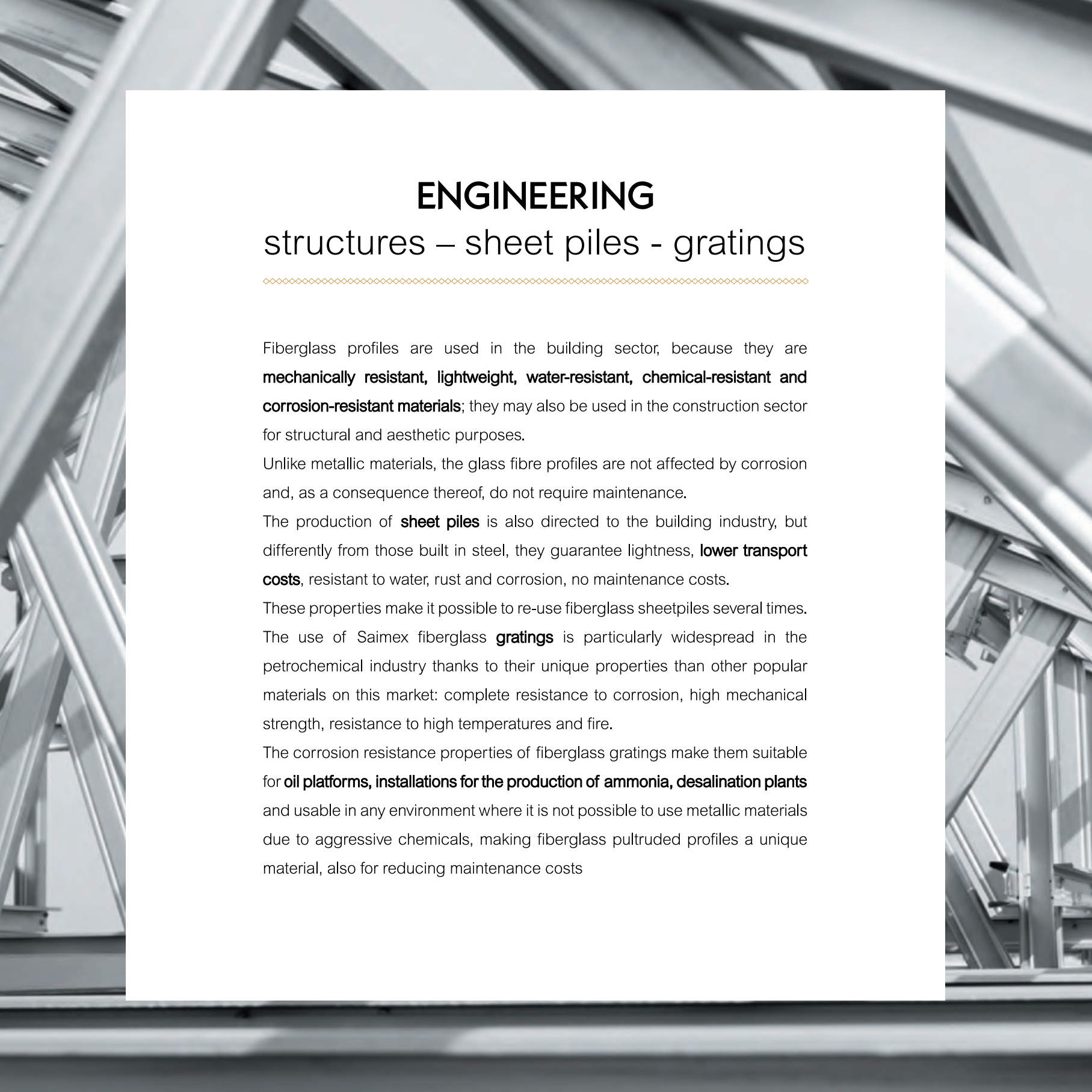
FIRE RETARDANT : EN 13501 calsse A2 s1 d0 and ASTM E 84 class A

SALT SPRAY CORROSION RESISTANCE AND RESISTANCE TO AGGRESSIVE CHEMICAL AGENTS

RADIOTRANSPARENT

INDUSTRY FIELDS

INDUSTRIAL APPLICATIONS



ENGINEERING

structures – sheet piles - gratings

Fiberglass profiles are used in the building sector, because they are **mechanically resistant, lightweight, water-resistant, chemical-resistant and corrosion-resistant materials**; they may also be used in the construction sector for structural and aesthetic purposes.

Unlike metallic materials, the glass fibre profiles are not affected by corrosion and, as a consequence thereof, do not require maintenance.

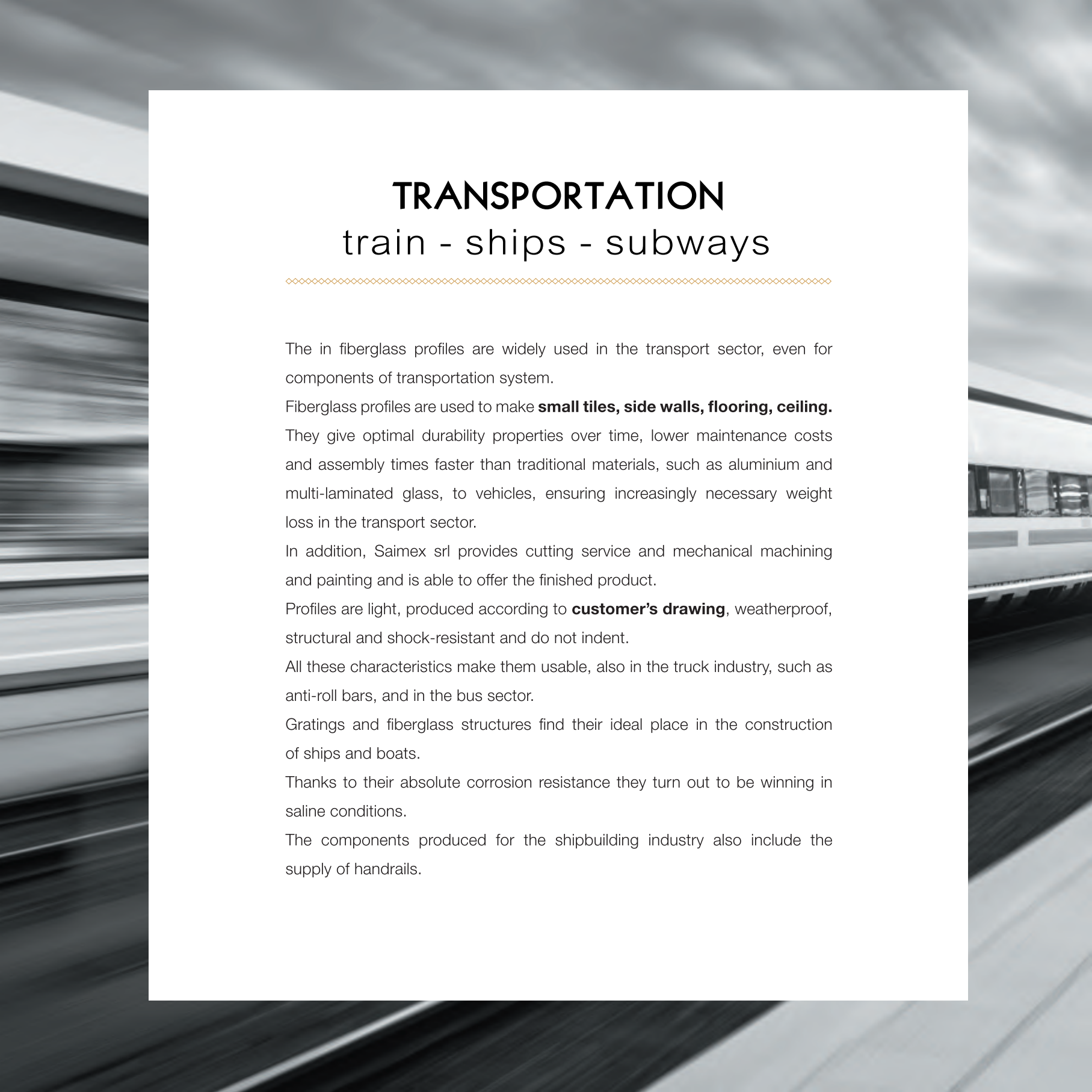
The production of **sheet piles** is also directed to the building industry, but differently from those built in steel, they guarantee lightness, **lower transport costs**, resistant to water, rust and corrosion, no maintenance costs.

These properties make it possible to re-use fiberglass sheetpiles several times.

The use of Saimex fiberglass **gratings** is particularly widespread in the petrochemical industry thanks to their unique properties than other popular materials on this market: complete resistance to corrosion, high mechanical strength, resistance to high temperatures and fire.

The corrosion resistance properties of fiberglass gratings make them suitable for **oil platforms, installations for the production of ammonia, desalination plants** and usable in any environment where it is not possible to use metallic materials due to aggressive chemicals, making fiberglass pultruded profiles a unique material, also for reducing maintenance costs


TRAINS
PLATFORM



TRANSPORTATION

train - ships - subways

The in fiberglass profiles are widely used in the transport sector, even for components of transportation system.

Fiberglass profiles are used to make **small tiles, side walls, flooring, ceiling.**

They give optimal durability properties over time, lower maintenance costs and assembly times faster than traditional materials, such as aluminium and multi-laminated glass, to vehicles, ensuring increasingly necessary weight loss in the transport sector.

In addition, Saimex srl provides cutting service and mechanical machining and painting and is able to offer the finished product.

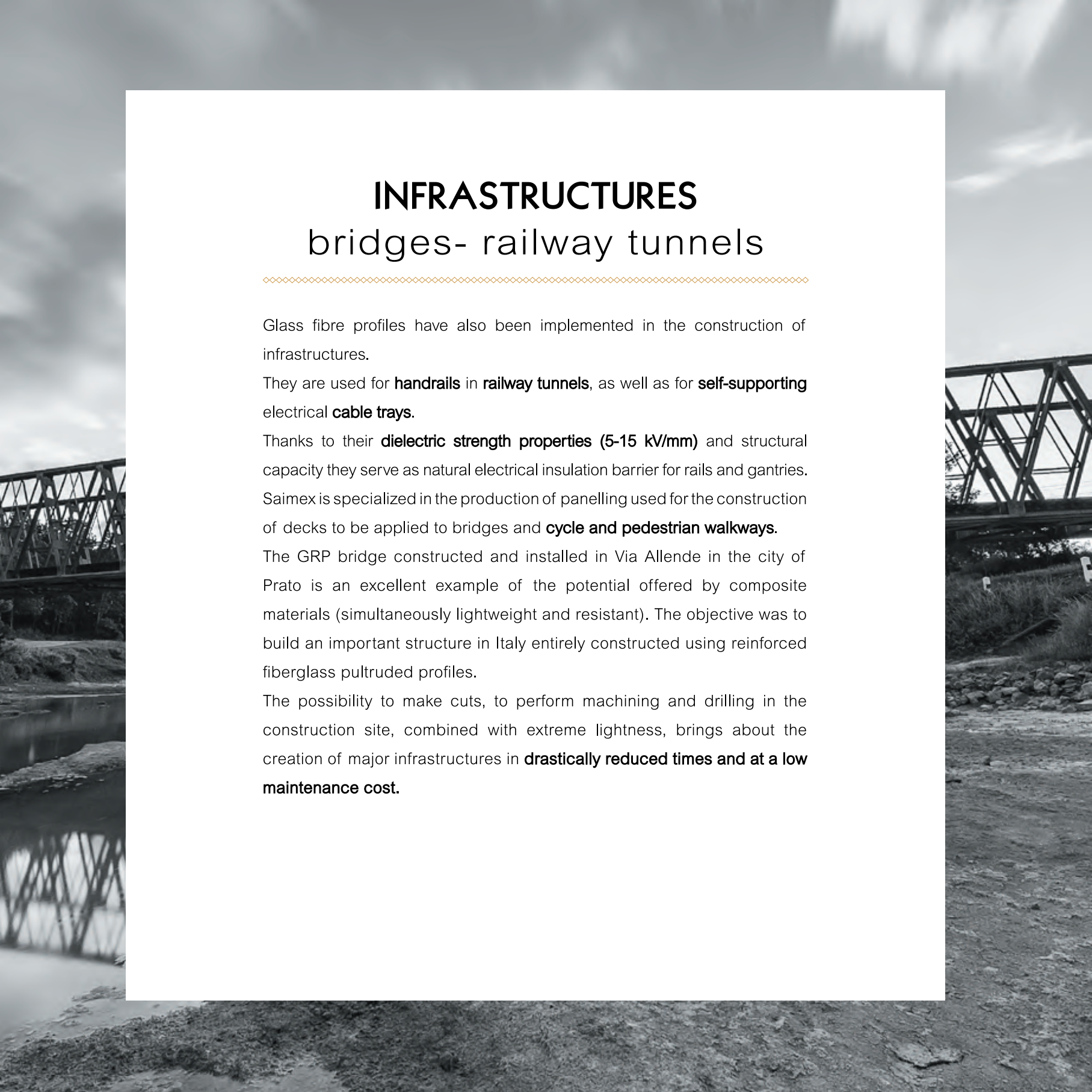
Profiles are light, produced according to **customer's drawing**, weatherproof, structural and shock-resistant and do not indent.

All these characteristics make them usable, also in the truck industry, such as anti-roll bars, and in the bus sector.

Gratings and fiberglass structures find their ideal place in the construction of ships and boats.

Thanks to their absolute corrosion resistance they turn out to be winning in saline conditions.

The components produced for the shipbuilding industry also include the supply of handrails.



INFRASTRUCTURES

bridges- railway tunnels

Glass fibre profiles have also been implemented in the construction of infrastructures.

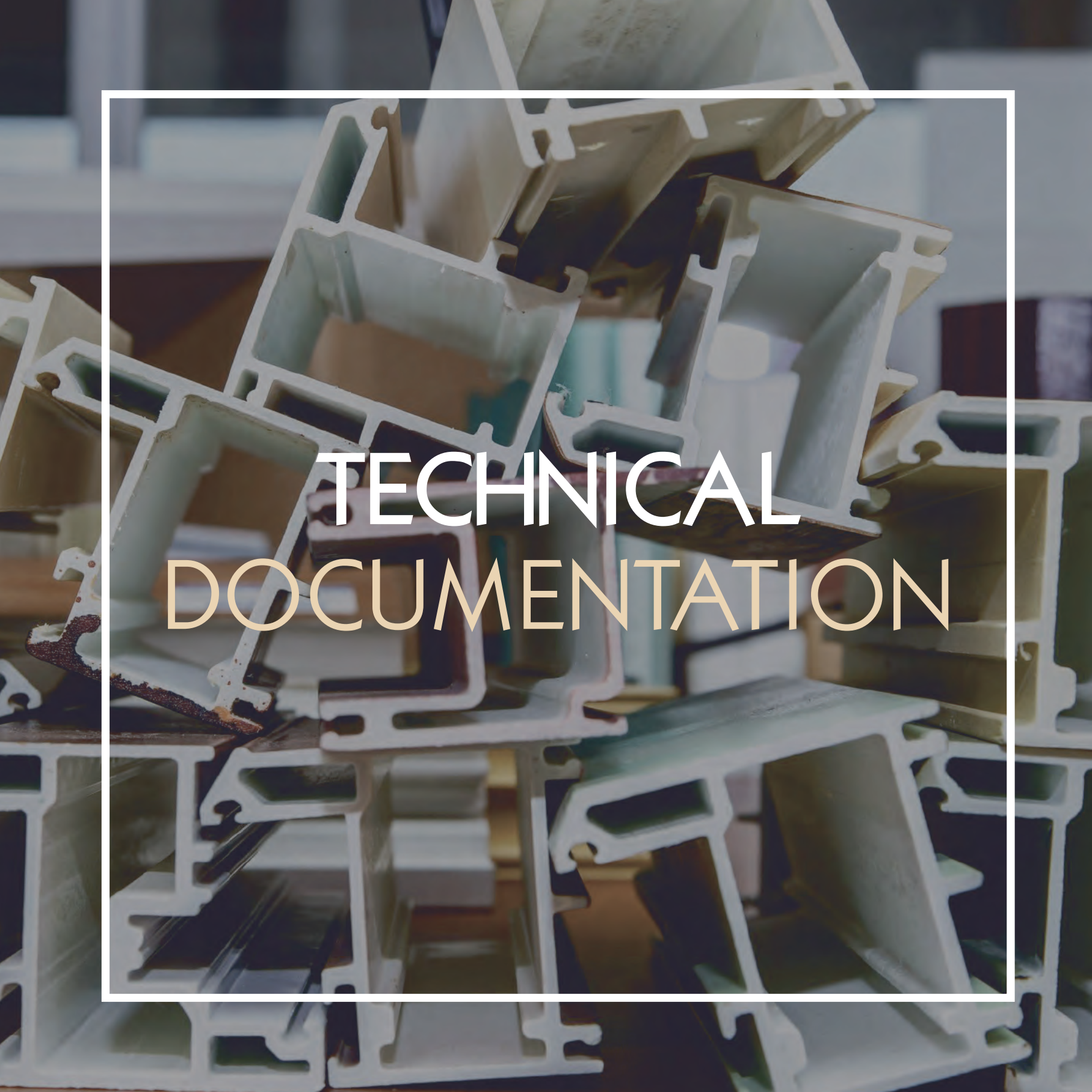
They are used for **handrails** in **railway tunnels**, as well as for **self-supporting** electrical **cable trays**.

Thanks to their **dielectric strength properties (5-15 kV/mm)** and structural capacity they serve as natural electrical insulation barrier for rails and gantries.

Saimex is specialized in the production of panelling used for the construction of decks to be applied to bridges and **cycle and pedestrian walkways**.

The GRP bridge constructed and installed in Via Allende in the city of Prato is an excellent example of the potential offered by composite materials (simultaneously lightweight and resistant). The objective was to build an important structure in Italy entirely constructed using reinforced fiberglass pultruded profiles.

The possibility to make cuts, to perform machining and drilling in the construction site, combined with extreme lightness, brings about the creation of major infrastructures in **drastically reduced times and at a low maintenance cost.**



TECHNICAL DOCUMENTATION

DATA SHEET

DATA COMPARISON

Property	FIBRA	Steel	Aluminum	PVC	Unit
Density	1.8	7.8	2.7	1.4	g/cm³
Axial - Tensile Strength	350 – 450	370 – 500	200 - 400	40 - 60	MPa
Pull elongation	1.5 – 2.0	13 – 35	5 – 35	10 – 80	%
Flexural Strength	400 – 450	330 – 500	200 - 400	70 – 100	MPa
Elastic Modulus	25 – 30	210	70	2.8 – 3.3	MPa x 10^3
Flexural Modulus	15 – 20	210	70	2.8 – 3.3	MPa x 10^3
Impact Resistance	200	400	200	85 – 95	MPa/ m²
Thermal Conductivity λ	0.25 – 0.35	100 – 230	100 – 230	0.15 – 0.25	W/m °C
Expansion Coefficient	5 – 20 x 10^{-6}	10 – 14 x 10^{-6}	20 – 25 x 10^{-6}	50 –100x 10^{-6}	m/m °C
Dielectric Capasity	5 - 15	-	-	40 - 50	KV/mm
Volume Resistivity	10^{10} - 10^{14}	0.2 – 0.8	0.028	> 10^{16}	ωcm

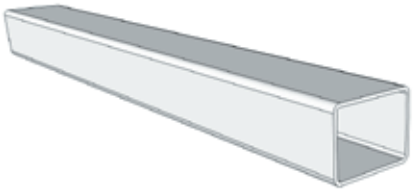
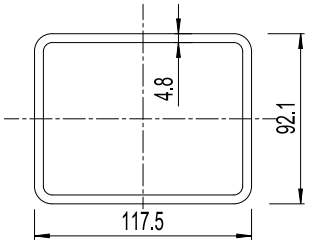
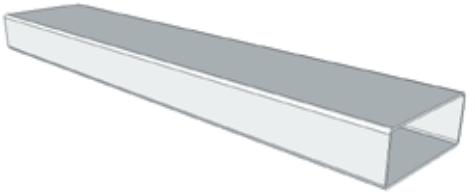
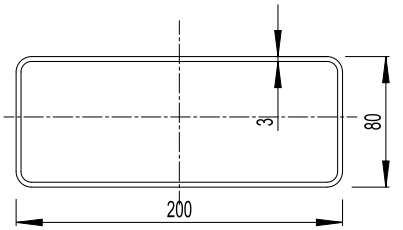
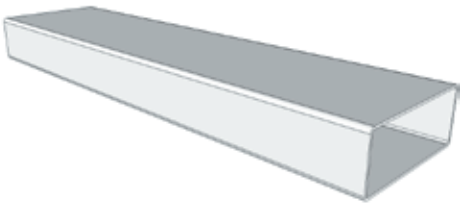
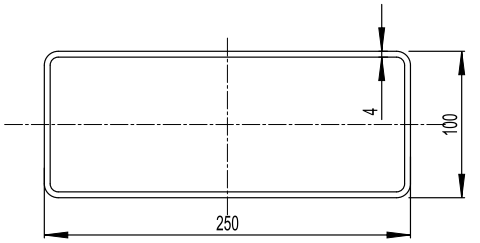
EN 13706 NORM

Minimum properties required for each grade			Minimum properties	
Property	**Unit**	**Test Method**	**E23 Grade**	**E17 Grade**
Full section test	GPa	Annex D, EN 13706-2:2002	23	17
Tension modulus - axial	GPa	EN ISO 527-4	23	17
Tension modulus - transverse	GPa	EN ISO 527-4	7	5
Tension strenght - axial	MPa	EN ISO 527-4	240	170
Tension strenght - transverse	MPa	EN ISO 527-4	50	30
Pin - bearing strenght - axial	MPa	Annex E, EN 13706-2:2002	150	90
Pin - bearing strenght - transverse	MPa	Annex E, EN 13706-2:2002	70	50
Flexural strenght - axial	MPa	EN ISO 14125	240	170
Flexural strenght - transverse	MPa	EN ISO 14125	100	70
Interlaminar shear strenght - axial	MPa	EN ISO 14130	25	15

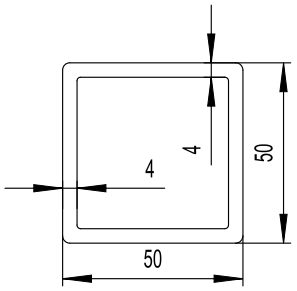
PROFILE LIST

Further profiles are available in the catalog.

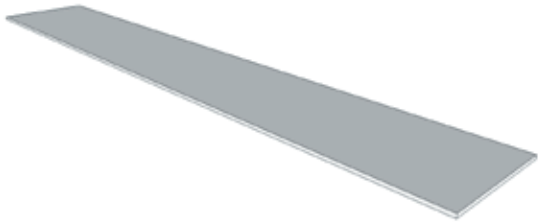
Special shapes on customer's design.

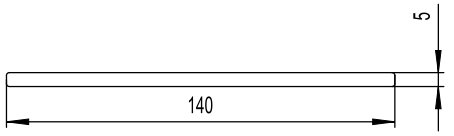
PROJECT	PROFILE	SECTION
	Rectangular profile 117.5 x 92.1 x 4.8 mm 	
	Rectangular profile 200 x 80 x 3 mm 	
	Rectangular profile 250 x 100 x 4 mm 	

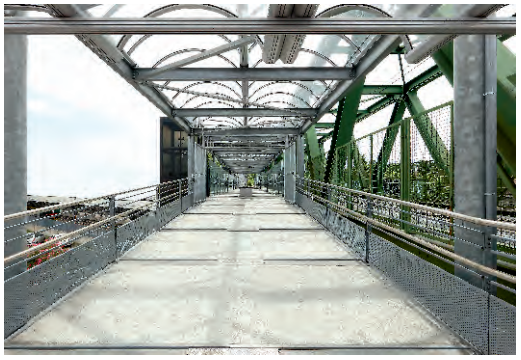
Square profile
50 x 50 x 4 mm



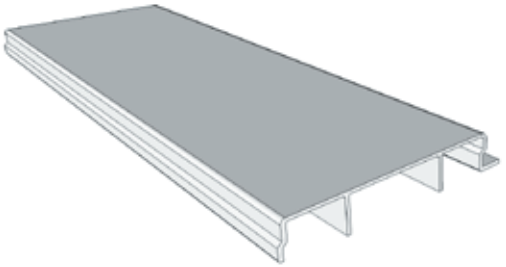
Flat profile
140 x 5 mm

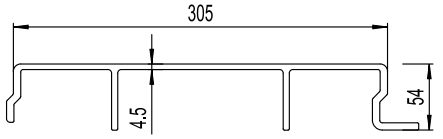




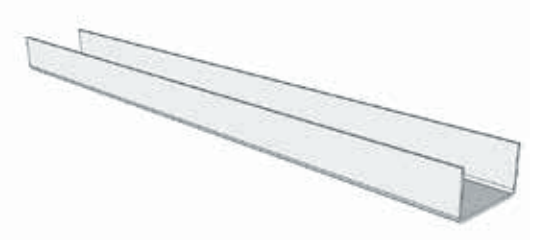


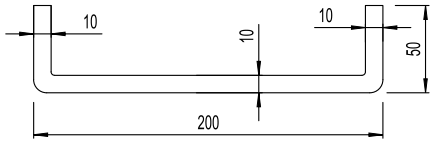
Deck plank 300
305 x 54 x 4.5 mm



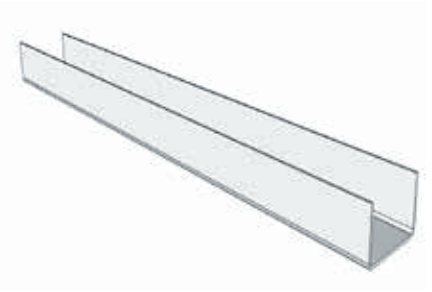


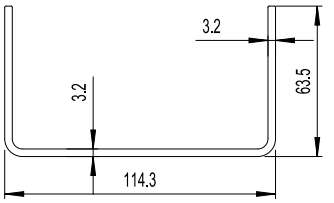
U profile
200x50x10 mm



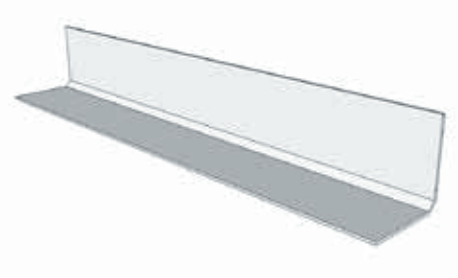


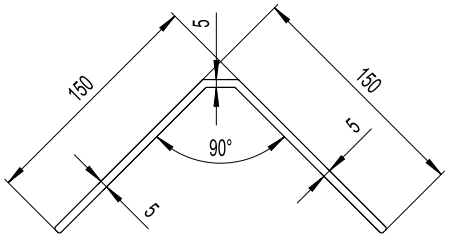
U profile
114.3 x 63.5 x 3.2



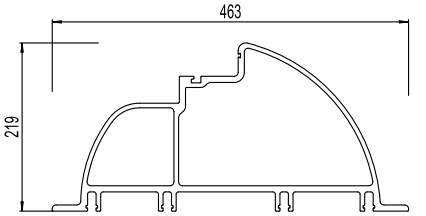


Cut corner
150 x150 x 5 mm

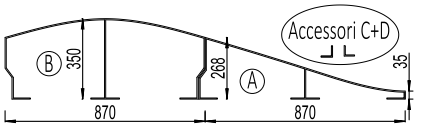




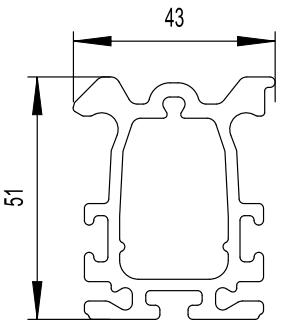
FIBRA Oslo 1 facade



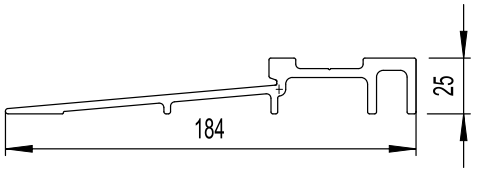
FIBRA Wave Cladding



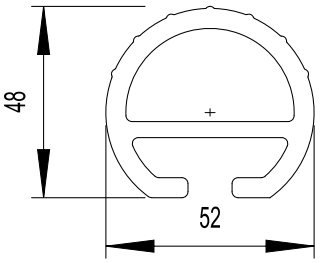
Window frame



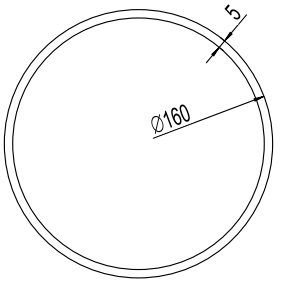
Doorstep for sliding window



Railway handrail



Tubo tondo
Ø160, spessore 5 mm



SPECIFICATIONS

COMPOSITE SHEETPILE STRUCTURAL WALL

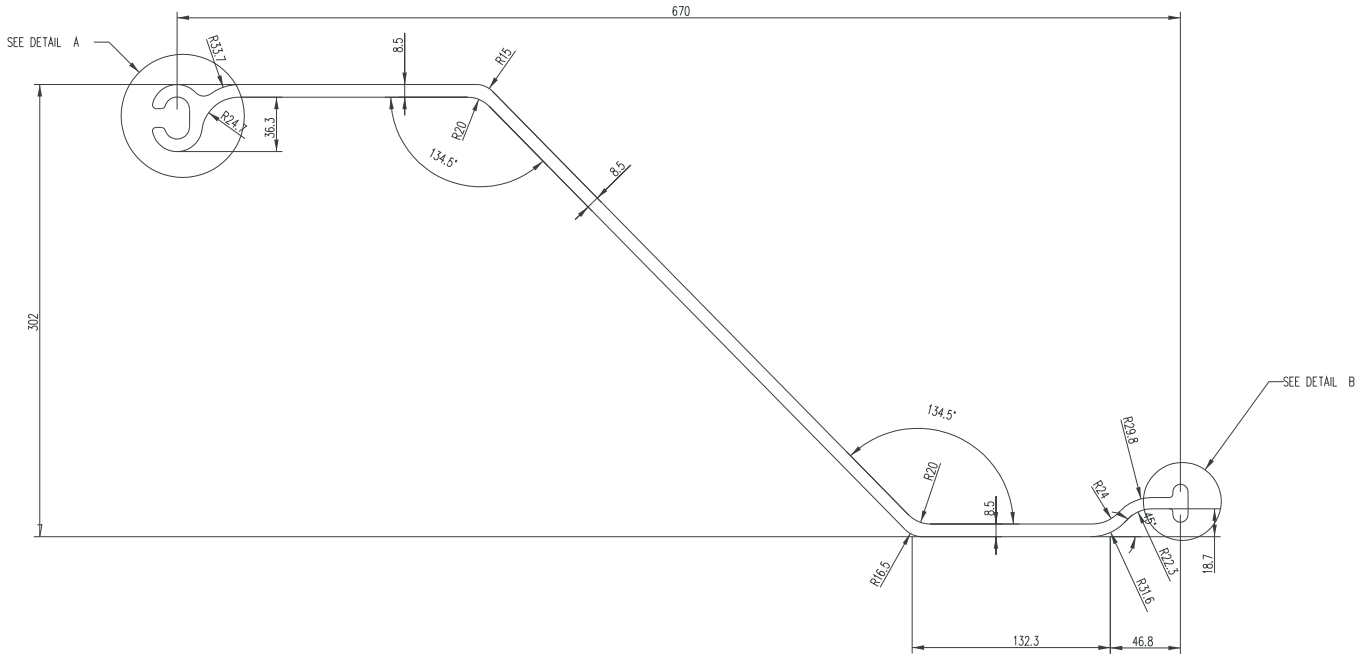
Composite sheet piles offer outstanding advantages when compared with traditional steel sheet piles.

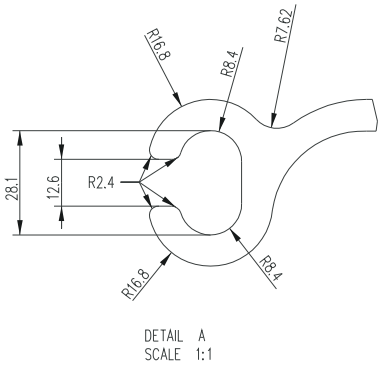
Weight: resin sheet piles are super-light. A whole batch of 1000 m² can be transported at one time, in one load.

Corrosion: engineered sheet piles do not rust. They can be reused and protect waterbeds, they are used foe aesthetic purposes along watercourses.

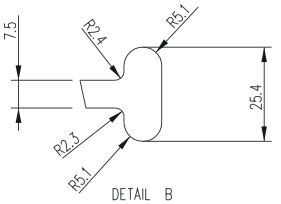
Flexibility: they do not warp.

Drilling and cutting: they are easy to work with directly on site.

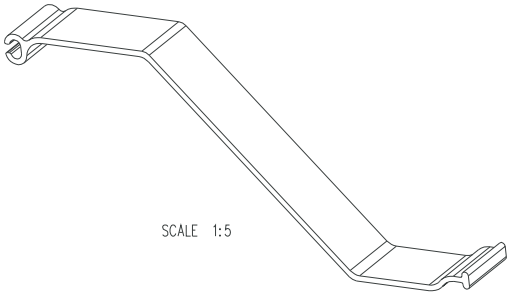




DETAIL A
SCALE 1:1



DETAIL B
SCALE 1:1



SCALE 1:5

DATI TECNICI

Size: 670mmx302mmx8,5mm
Inertia moment Iyy = 311929 10^3 mm^4
Inertia moment Ixx = 10568,6 10^3 mm^4
Load bearing capacity = kg / Linear meter
(400 kg/ Linear meter)

Weight= 14,072 kg linear meter (19kg square meter)
Area= 7606 mm^2

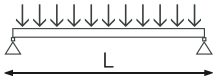
Area	A	7.606	$10^3 mm^2$
X-axial inertia moment	Ixx	105685.6	$10^3 mm^4$
X-axial section modulus	Wxx		$10^3 mm^3$
-	AK^1Y	---	$10^3 mm^2$
Y-axial inertia moment	Iyy	311929	$10^3 mm^4$
Y-axial section modulus	Wyy		$10^3 mm^3$
-	AK^1Y		$10^3 mm^2$

SPECIFICATIONS

DOUBLE FLANGE

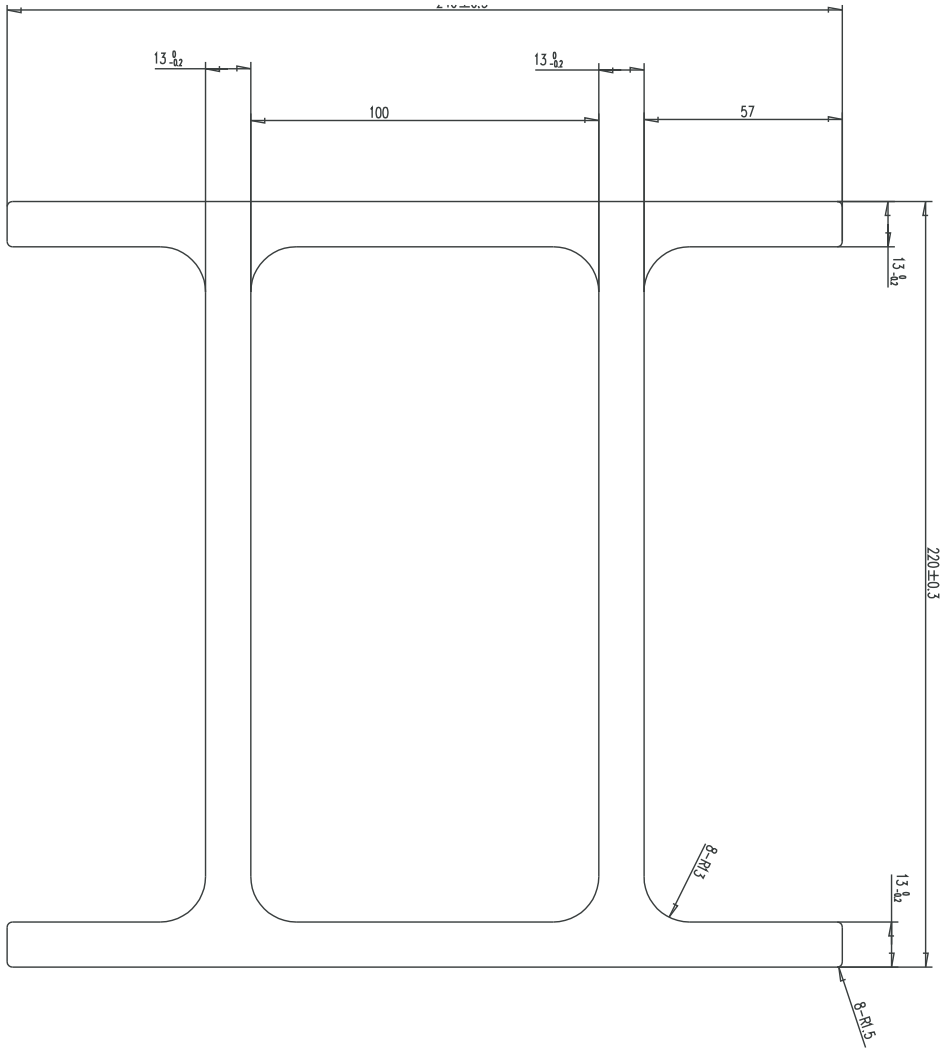
Double flange Beam. It is employed for big span constructions, high load bearing needs, underneath floor and roof structure.

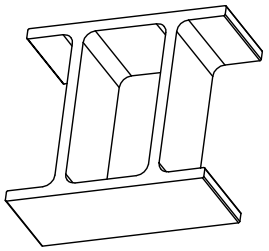
ONE SPAN



Load-bearing capacity in kN/m

L(m)	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5	10
Breaking point	154,4	98,6	68,3	50,0	38,1	30,0	24,2	19,9	16,6	14,0	12,0	10,4	9,1	8,0	7,0	6,2	5,6
L/200	103,16	52,82	30,56	19,25	12,89	9,06	6,60	4,96	3,82	3,00	2,41	1,96	1,61	1,34	1,13	0,96	0,83
L/300	73,36	37,56	21,73	13,69	9,17	6,44	4,69	3,53	2,72	2,14	1,71	1,39	1,15	0,96	0,80	0,68	0,59
L/400	55,02	28,17	16,30	10,27	6,88	4,83	3,52	2,65	2,04	1,60	1,28	1,04	0,86	0,72	0,60	0,51	0,44





SCALE 1:5

Area	A	11570,279	mm^2
X-axial inertia moment	lxx	47023,02	10^3mm^4
X-axial section modulus	Wxx	391,86	10^3mm^3
Y-axial inertia moment	lyy	85281,13	10^3mm^4
Y-axial section modulus	Wyy	775,28	10^3mm^3
Dead Load	Weight	21,520	Kg/mt

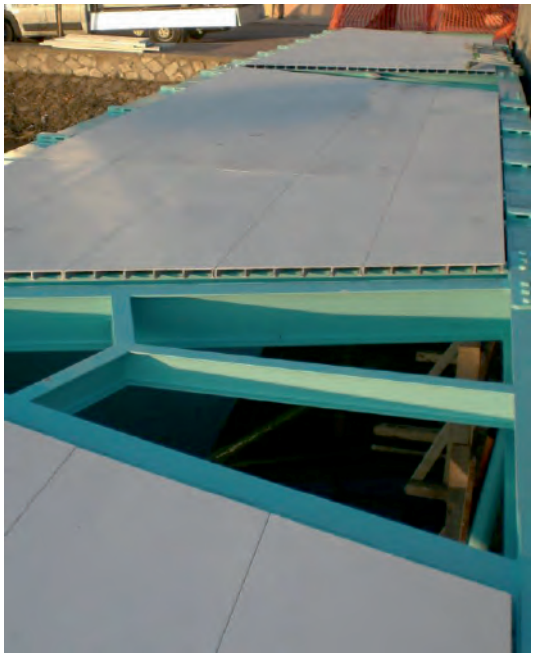
Material = E23

SPECIFICATIONS

DECK SYSTEM HD

Deck System is employed on pedestrian bridges, self-supporting catwalks, flooring, terraces and dehors, maintenance decking for chemical plants, structural partition walls. Deck System is salt waterproof and corrosion-proof, it is light and self-supporting, it is electrical and thermal insulating.

It can be provided with anti-slip surface in different colours.



ONE SPAN KN/m2 UNIFORM LOAD

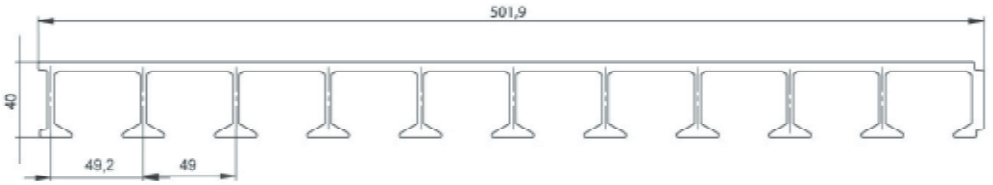
L (m)	0,50	0,75	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3
f_d	261	174	128	81,9	56,9	41,8	32	25,3	20,5	17	14,2
L/200	128	41,5	18,1	9,43	5,51	3,49	2,34	1,65	1,21	0,91	0,7
L/400	64	20,8	9,06	4,72	2,75	1,74	1,17	0,83	0,6	0,45	0,35

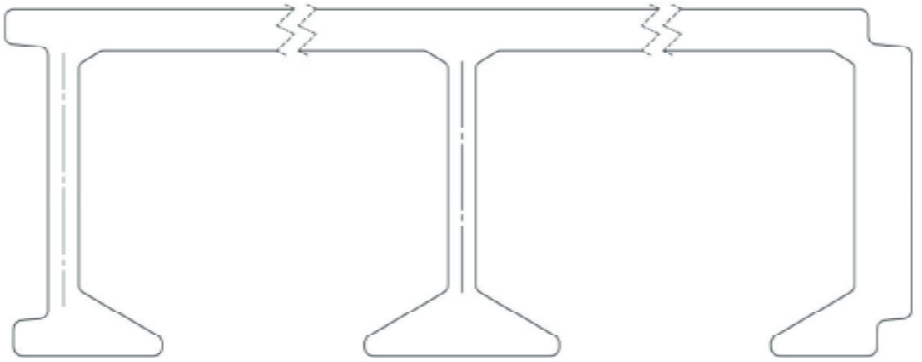
TWO SPANS KN/m2 UNIFORM LOAD

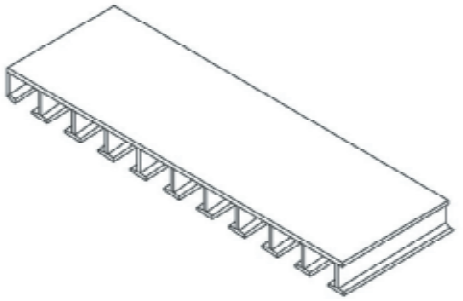
L (m)	0,50	0,75	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3
f_d	-	-	55,7	43,1	34,6	28,5	23,83	20,3	17,4	15,1	13,2
L/200	-	-	36	18,4	10,7	6,71	4,49	3,16	2,3	1,73	1,33
L/400	-	-	18	9,2	5,33	3,35	2,25	1,58	1,15	0,86	0,67

THREE SPANS KN/m2 UNIFORM LOAD

L (m)	0,50	0,75	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3
f_d	-	-	48,4	37,2	29,7	24,3	20,2	17,1	14,6	12,6	11
L/200	-	-	45,7	23,4	13,6	8,54	5,72	4,02	2,93	2,2	1,69
L/400	-	-	22,9	11,7	6,78	4,27	2,86	2,01	1,46	1,1	0,85







TEST CONDITIONS

- Constraint support distance 1500mm
- Load 5,51 kN/m2
- Max. deflection at midpoint = 7 mm
- Ultimate limit stress (VonMises) = 25MPa
- Material = E23 (UNI 13706)

LOAD TABLE FOR DECK HD

W x H = 500 x 40 mm
Load in kN/m2
Ultimate limit state: fd
Limit state of serviceability:
Max. deflection ‹ L/200
Max. deflection ‹ L/400

GEOMETRY

H:	40 mm
W:	500 mm
L:	6.000 mm

STIFFNESS

E_0:	$23x10^3$ MPa
I_{xx}:	$1.07x10^6$ mm^4
$E_{0X}I_x$:	$24.7x10^9$ Nmm^2

DEAD LOAD

Weight: 8.5 kg/m

fibra

THINK COMPOSITE

SAIMEX

COMPOSITES

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