

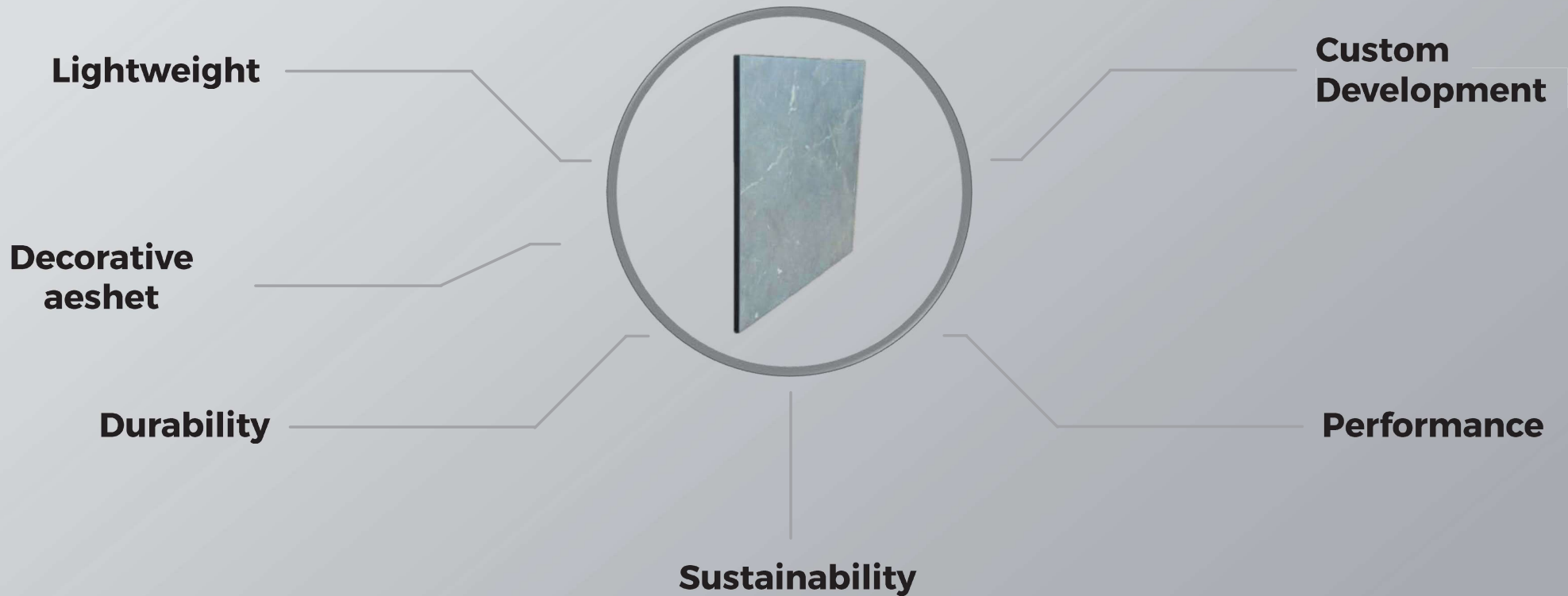
COMPACT SHIELD

BALLISTIC PROTECTION

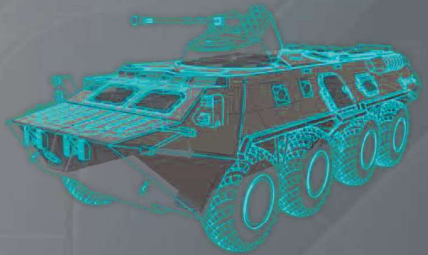
COMPACT SHIELD

Introducing CompactShield

A sleek, lightweight ballistic compact crafted with advanced materials for effective protection.



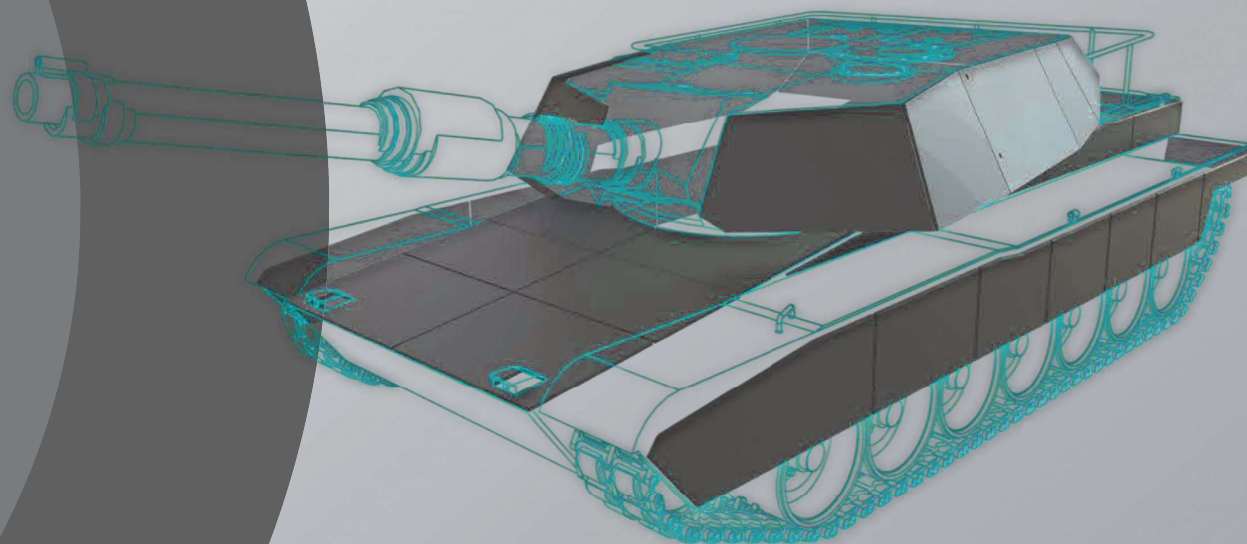
COMPANY APPROACH



SKILLS

BESPOKE BALLISTIC SOLUTIONS

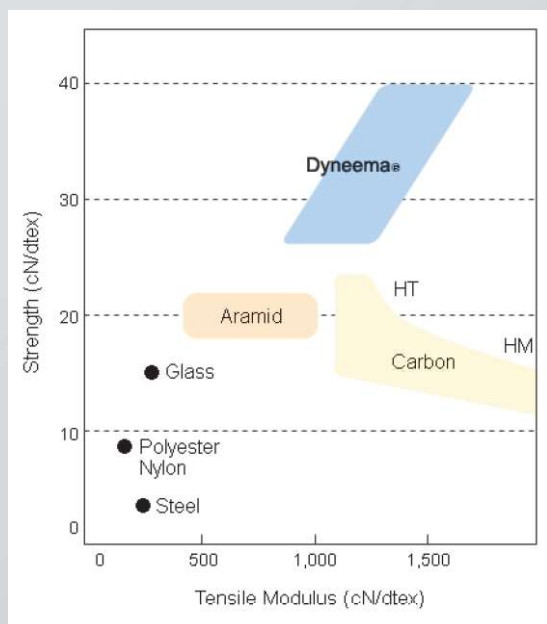
Specially designed and optimized solutions to provide the ultimate overmatch protection for your vehicle platform.



IMPACT RESISTANCE SKILLS

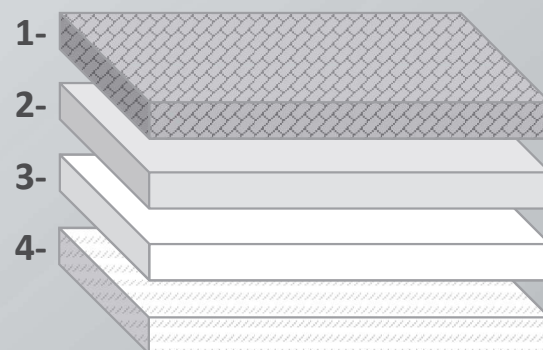
COMPACT
SHIELD

Materials



Ballistic Concept

Multi-layer Solution



Energy
Dissipation

Energy
Absorption

Composite Adaptability

Used technology

Level 1

- composites

Level 2 & 3

- composites & ceramics or steel

Level 4 & 5

- Composites & ceramics & steel



Modular armor

IMPACT RESISTANCE SKILLS

To the composite layer – energy dissipation

Objective of energy dissipation and support the fracture conoid.

- **High performance fibers**

- High modulus
- Tensile strength

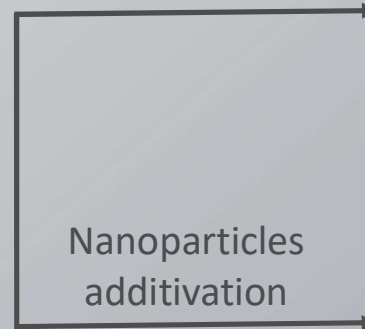
- **High performance matrix**

- High modulus
- Low elongation

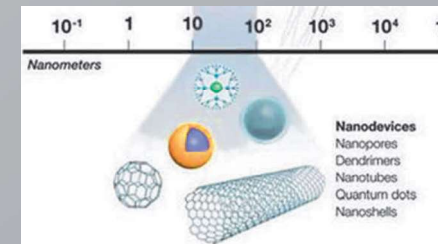


High modulus
composite laminate

Fibers orientation
(angle-ply)



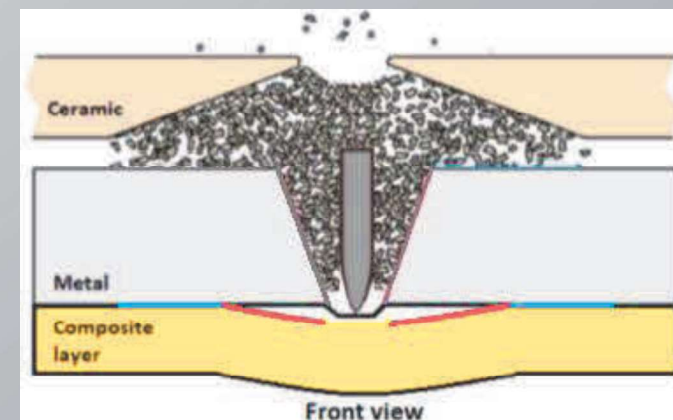
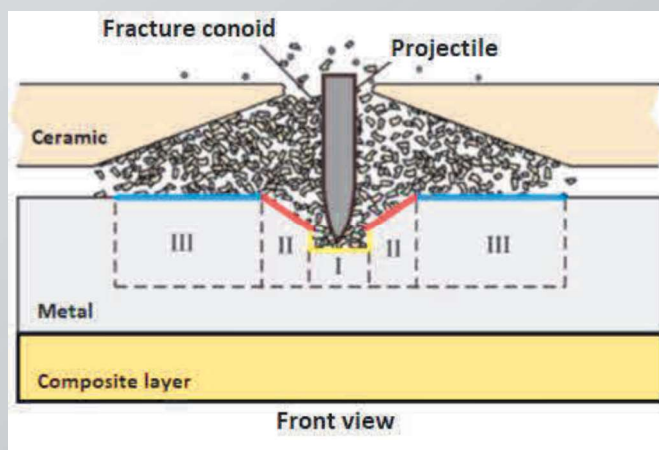
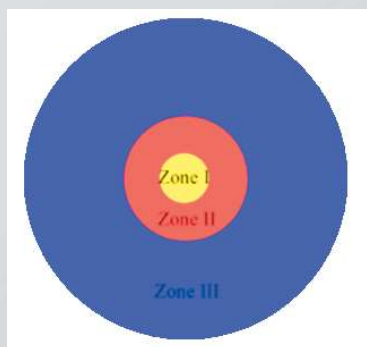
Increase energy dissipation



Increase mechanical properties and interfacial
adhesion

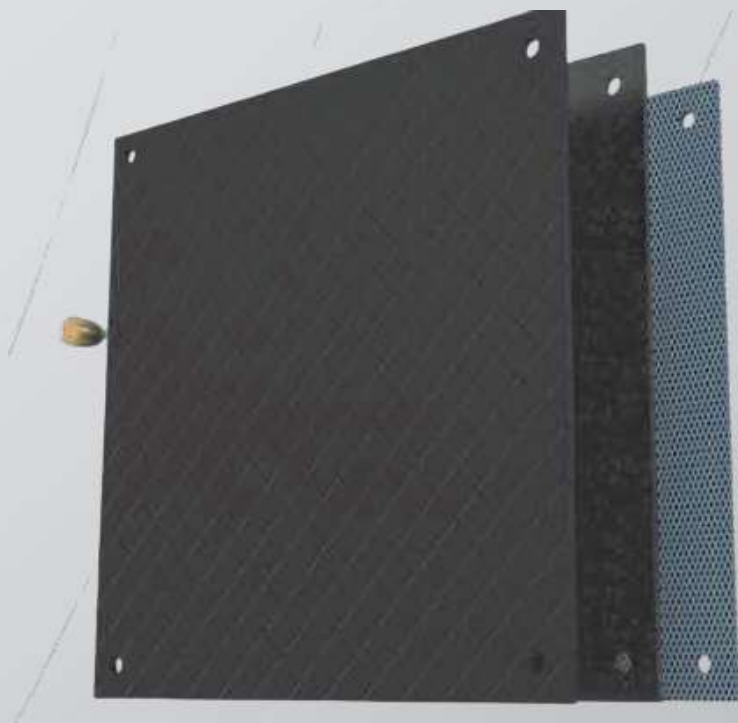
IMPACT RESISTANCE SKILLS

Ballistic impact mechanisms in **Ceramic, Metal** and **composite structure**



- **First phase:** Bullet start to deform after hitting the ceramic plate, that starts fracture.
- **Second phase:** Deformed bullet hits the metal, deforming even more the bullet, and dissipates it's energy;
- **Third phase:** The composite layer deflects and deform in order to absorb and dissipate the remain kinetic energy of the bullet.

Ballistic Applications Field Range



Ballistic panels offer **excellent flexibility** while providing **high ballistic protection**.

The ballistic plates has been designed with a **low density**, making it lightweight and highly suitable for applications where weight reduction is crucial.

The composite material used in ballistic plates exhibits **thermal, chemical, and mechanical** resistance, allowing it to withstand extreme conditions and maintain its structural integrity, providing protection even in demanding environments.

TECHNOLOGY SOLUTIONS

NATO STANAG 4569

COMPACT
SHIELD

Low Caliber

Medium Caliber

Heavy Caliber

STANAG LEVEL

1

2

3

4

5

Weapon

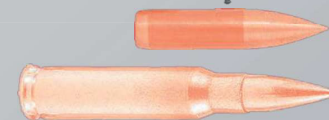
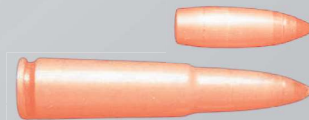
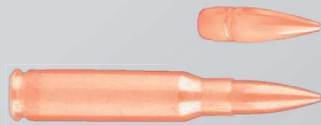
Rifle

Infantry Rifle

Sniper Rifle

Heavy Machine Gun

Automatic Cannon



Ammunition

7.62 x 51 NATO Ball
5.56 x 45 NATO SS109
5.56 x 45 M193

7.62 x 39 API BZ

7.62 x 51 (WC core)
7.62 x 54R B32 API

14.5 x 114AP / B32

25 mm APDS-TM-791

Velocity (m/s)

833 - 937

695

854 - 930

911

1258

STANAG 4569 SOLUTIONS For Vehicles

Protection Levels for Occupants of Logistic and Light Armoured Vehicles			
STANAG 4569	Ammunition	Mass /m ² (kg)	Thickness (mm)
1	7.62 mm x 51 NATO ball (833 m/s)	48	9mm (Composite) + 5mm (Steel)
	5.56 mm x 45 NATO SS109 (900 m/s) 5.56 mm x 45 M193 (937m/s)	20	19mm (Composite)
2	7.62 mm x 39 API BZ (695 m/s)	58	19mm (Composite) + 5mm (Steel)
3	7.62 mm x 54R B32 API (854 m/s) 7.62 mm x 51 AP (WC core) (930 m/s)	76	21mm (Composite) + 7mm (Steel)
4	14.5 mm x 114 API/B32 (911 m/s)	84	21mm (Composite) + 5mm (Steel) + 9 mm (alumina)

*Dimensions : (1,5m x 3m)

Techonolgy Solutions

NIJ 0108.01

COMPACT
SHIELD

Medium Caliber

Heavy Caliber

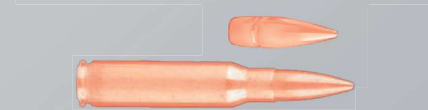
NIJ LEVEL

III-A

III

IV

Weapon



Ammunition

44 Magnum Lead SWC Gas Checked
9 mm FMJ

7.62 mm
308 Winchester FMJ

30-06 AP

Velocity (m/s)

426 +/- 15 m/s

838 +/- 15 m/s

838 +/- 15 m/s

NIJ STANDARD-0108.01 SOLUTIONS For Construction

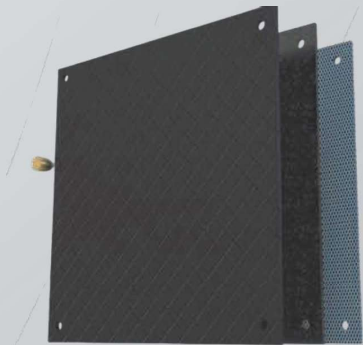
Ballistic Resistant Protective Materials			
NIJ 0108.01	Ammunition	Mass /m ² (kg)	Thickness (mm) *
III A SOFT	44 Magnum Lead SWC (426 m/s) 9 mm FMJ (426 m/s)	26	13 mm (Composite)
III A		21	11 mm (Composite)
III A Plus		7.5	8 mm (Composite)
III	7.62 mm (838m/s) 308 Winchester FMJ (838m/s)	59	28 mm (Composite)
III Plus		19	20 mm (Composite)
IV	30 - 06 AP (838 m/s)	45	20mm (Composite) - 9mm (Alumina)

*Dimensions : (1,2m x 3m)

OUR GUARANTEE

- Customizable product
- Great performance

CompactShield lightweight and durable spall liners are designed to protect vehicle crews against projectiles and secondary fragments.



COMPACT
SHIELD

BALLISTIC SOLUTIONS
FOR MOBILITY



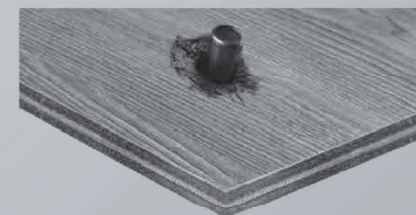
NATO STANAG 4569
Levels 1 to 4

BALLISTIC SOLUTIONS
FOR PERSONAL
PROTECTION



NIJ Standard 0108.01
Levels II to IV

BALLISTIC SOLUTIONS
FOR CONSTRUCTION



NIJ Standard 0108.01
Levels IIIA to IV

Lightweight

Durability

Sustainability

Performance

Custom developments

Advanced fibrous structures

High energy absorption structures

NEW BALLISTIC ARMOURING SOLUTIONS

COMPACT SHIELD

VS

Regular Steel Armour

NIJ LEVEL - IIIA



AMMO: .44 Magnum lead swc
9 mm fmj
Velocity (M/S): 426

WEIGHT PER M2: **7.5** kg/m²
TOTAL WEIGHT: **15** kg

WEIGHT PER M2: **32** kg/m²
TOTAL WEIGHT: **64** kg

WEIGHT REDUCTION %

76%

For a panel with 2 m² surface, the weight reduced with CompactShield is **49 kg**



NEW BALLISTIC ARMOURING SOLUTIONS

COMPACT SHIELD

VS

Regular Steel Armour

WEIGHT PER M2: **7.5** kg/m²
TOTAL WEIGHT: **37,5** kg

NIJ LEVEL - IIIA

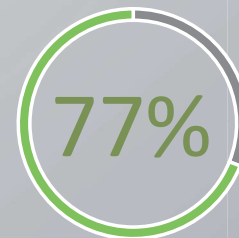


AMMO: .44 Magnum lead swc
9 mm fmj
Velocity (M/S): 426

WEIGHT PER M2: **32** kg/m²
TOTAL WEIGHT: **160** kg



WEIGHT REDUCTION %



For a vehicle with 5 m² surface, the weight reduced with CompactShield is **122,5 kg**

NEW BALLISTIC ARMOURING SOLUTIONS

COMPACT SHIELD

VS

Regular Steel Armour

WEIGHT PER M2: **20 kg/m²**
TOTAL WEIGHT: **2 000 kg**

STANAG LEVEL - I

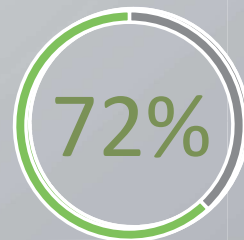


AMMO: 7.62 x 51 NATO BALL;
5.56 x 45 NATO SS109; 5.56 x 45 M193
Velocity (M/S): 833 - 937

WEIGHT PER M2: **72 kg/m²**
TOTAL WEIGHT: **7 200 kg**



WEIGHT REDUCTION %



For a vehicle with 100m² surface, the weight reduced with CompactShield is **5 200 kg**

NEW BALLISTIC ARMOURING SOLUTIONS

COMPACT SHIELD

VS

Regular Steel Armour

STANAG LEVEL - II



AMMO: 7.62 x 39 API BZ
Velocity (M/S): 695

WEIGHT PER M2: **58** kg/m²
TOTAL WEIGHT: **1160** kg

WEIGHT PER M2: **100** kg/m²
TOTAL WEIGHT: **2000** kg



WEIGHT REDUCTION %

42%

For a vehicle with 20m² surface, the weight reduced with CompactShield is **840 kg**

NEW BALLISTIC ARMOURING SOLUTIONS

COMPACT SHIELD

VS

Regular Steel Armour

WEIGHT PER M2: **76** kg/m²
TOTAL WEIGHT: **1520** kg

STANAG LEVEL - III

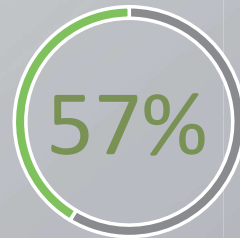


AMMO: 7.62 x 51 (WC CORE)
7.62 x 54R B32 API
Velocity (M/S): 854 - 930

WEIGHT PER M2: **176** kg/m²
TOTAL WEIGHT: **3520** kg



WEIGHT REDUCTION %



For a vehicle with 20m² surface, the weight reduced with CompactShield is **2000 kg**

NEW BALLISTIC ARMOURING SOLUTIONS

COMPACT SHIELD

VS

Regular Steel Armour

WEIGHT PER M2: **84** kg/m2
TOTAL WEIGHT: **1680** kg

STANAG LEVEL - IV



AMMO: 14.5 x 11AP / B32T
Velocity (M/S): 911

WEIGHT PER M2: **220** kg/m2
TOTAL WEIGHT: **4400** kg



WEIGHT REDUCTION %

62%

For a vehicle with 20m2 surface, the weight reduced with CompactShield is **2720** kg

COMPACT SHIELD

NEW SOLUTIONS FOR BALLISTIC PROTECTION



MOBILITY



PERSONAL
PROTECTION



CONSTRUCTION



From conception to production, entirely Portuguese



Utilising cutting-edge technology for superior ballistic performance



Adaptable to diverse applications, showcasing its **Versatility** in various fields



Exceptional strength with feather-light design combining resilience with **lightweight efficiency**



Utilisation of **high-performance materials**



Use of **recyclable and sustainable materials**