

SAINT-GOBAIN PERFORMANCE CERAMICS & REFRACTORIES

PROTECTIVE CERAMIC MATERIALS

MAXIMUM PROTECTION -
MINIMUM WEIGHT




SAINT-GOBAIN

VALUE PROPOSITION

BALLISTIC PROTECTION

Saint-Gobain Performance Ceramics & Refractories is a global leader in supporting composite armor systems, offering unparalleled design flexibility with the most innovative and consistent ceramics on the market. Our high-performance, lightweight ceramic materials are designed for the utmost performance in modern ballistic protection.

**TAILOR-MADE
MATERIALS & SOLUTIONS**

Advanced silicon carbide and boron carbide materials have been instrumental in protecting military, law enforcement and security professionals for over 50 years. We continue to develop and produce industry-leading protective materials today, supplying ceramic armor to governments and agencies for military and law enforcement personnel globally.

BENEFIT FROM THESE ADVANTAGES:

Custom engineering to customer specifications

Robust export compliance

Co-development options

Rapid prototyping

Consistent high-quality manufacturing

Global R&D resources

Extensive worldwide capacity

OUR MATERIALS DELIVER VALUE

With over 125 years of experience with silicon carbide (SiC), today we leverage production capability in North America, Europe and Asia to support customers globally. Our material capabilities include:

Sintered SiC

Bonded SiC

Sintered SiC-B₄C

Hot pressed B₄C

WE PROVIDE PROTECTIVE CERAMIC MATERIALS DESIGNED TO MEET YOUR NEEDS



SAFETY



CUSTOM DESIGN



PERFORMANCE



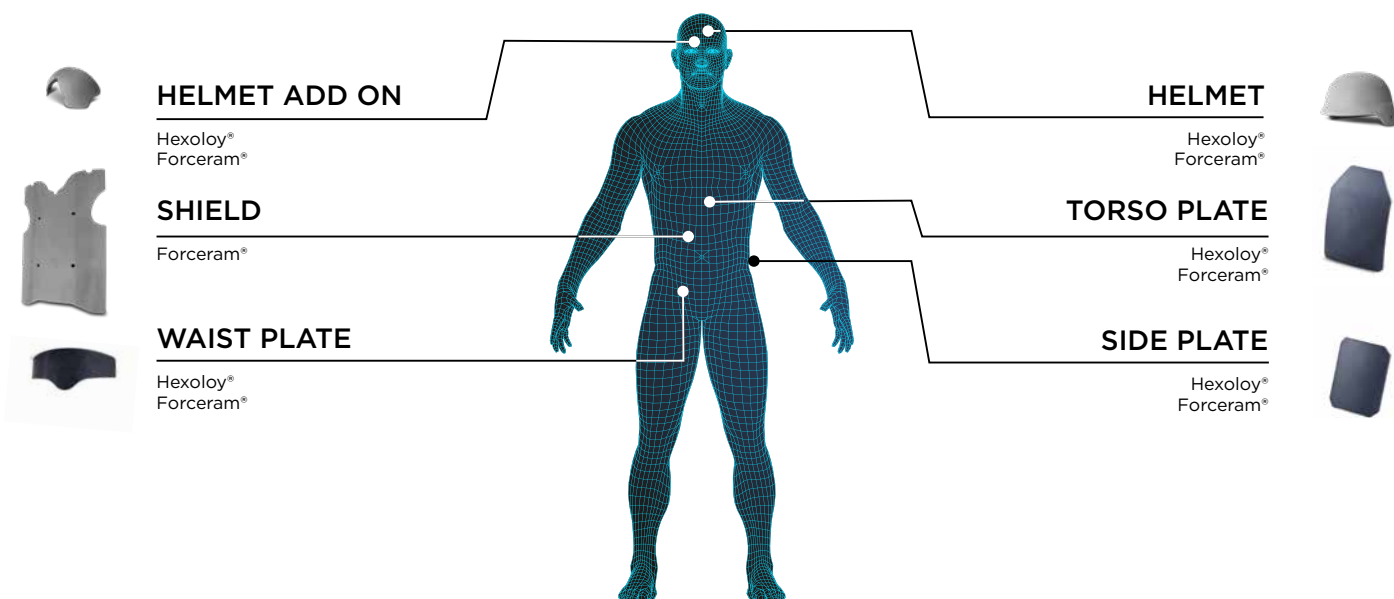
QUALITY

BODY PROTECTION

The core competence of Saint-Gobain Performance Ceramics & Refractories is the synthesis of expertise and leading production technology that reduce weight and improve reliability, safety & comfort.

Our high performance ceramic solutions increase the ballistic performance for personnel protection. Our leading production technology allows us to flexibly supply both prototype samples and large series-production quantities.

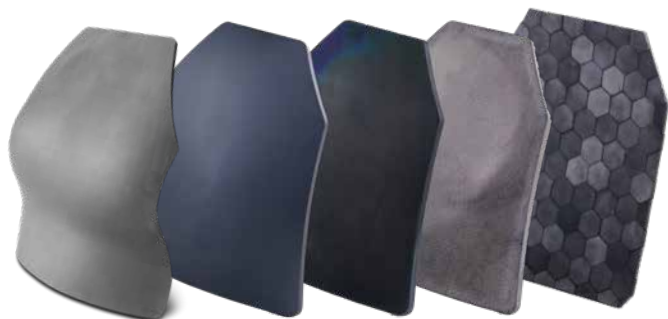
MULTIPLE SHAPES AVAILABLE



TORSO PLATES

Saint-Gobain Performance Ceramics & Refractories' torso plates offer superior protection performance in a range of scenarios. Multi and single curve plates are available to accommodate a wide range of current military and law enforcement designs.

100% QUALITY ASSURANCE



BENEFITS

- Superior single & multi-shot protection
- Net shape components
- High hardness
- Co-development options
- NEW - Female torso plate shape



In conjunction with our integrator partners, our ceramic materials are able to meet ballistic standards for NIJ, STANAG, worldwide military, and Special Threat specifications.

VEHICLE

VEHICLE ARMOR

High-performance, lightweight ceramic materials from Saint-Gobain Performance Ceramics & Refractories are designed to offer protection in extreme scenarios.

Panels are designed from a variety of shapes, including hexagons, squares and rectangles. Our forming capabilities ensure a suitable solution is available for any need, including unique machined tiles that accommodate complex shapes, holes and angles.

**PROTOTYPES &
LARGE-VOLUME SERIES
AVAILABLE**

BENEFITS



**Outstanding
multi-shot protection**



Net shape components



**Complex, highly
machined parts**



VEHICLE MOSAIC TILES

Hexoloy®

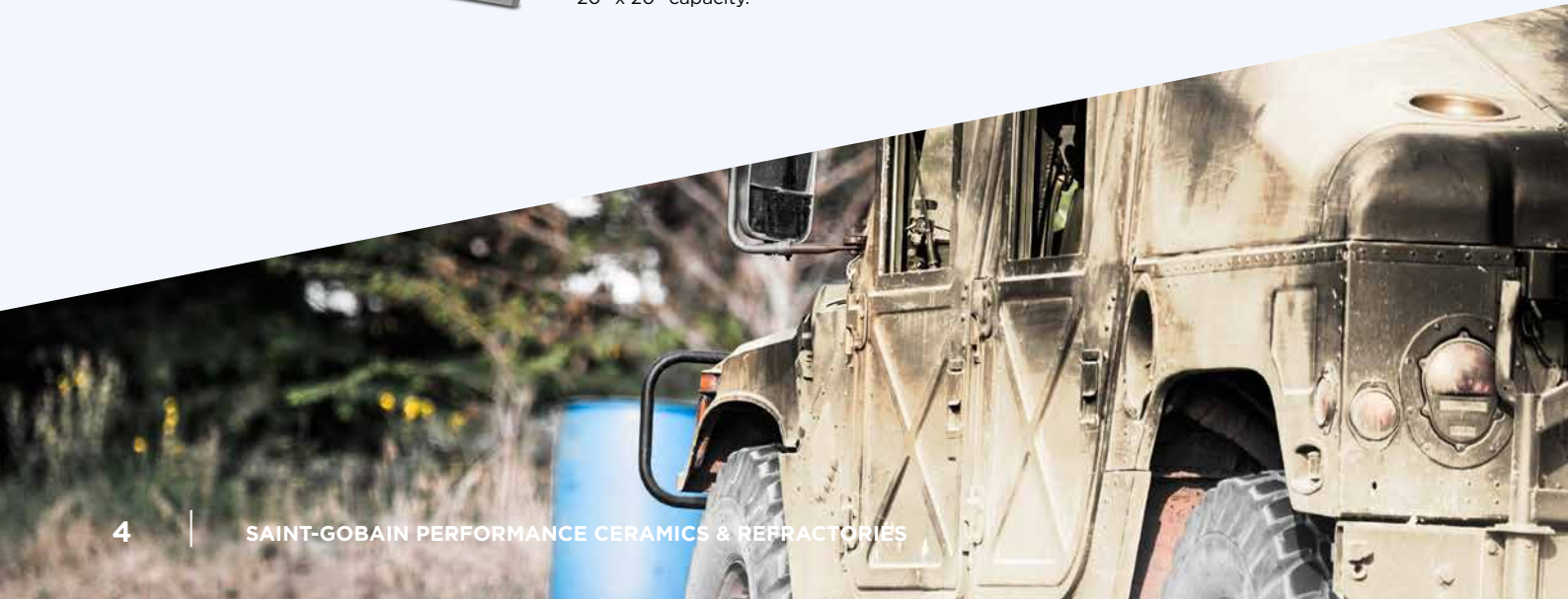
The mosaic-like structure of ceramic tiles for each part of the vehicle made of specialized elements gives protection systems the special ability to stop multiple threats.



FLOOR & SIDE PANELS

Forceram®

Panel kits and large panels available with 20" x 20" capacity.



AIRCRAFT ARMOR

Saint-Gobain Performance Ceramics & Refractories' silicon carbide and boron carbide ceramic tile armor assemblies protect fixed-wing and rotary-wing aircraft. All AC-130U gunships incorporate Hexoloy® SA sintered silicon carbide tiles.

Our application engineers are available to assist you with your technical project in designing cost effective high performing products that will meet your need now and in the future.

HEXOLOY® & NORBIDE® BENEFITS



Excellent multi-hit protection



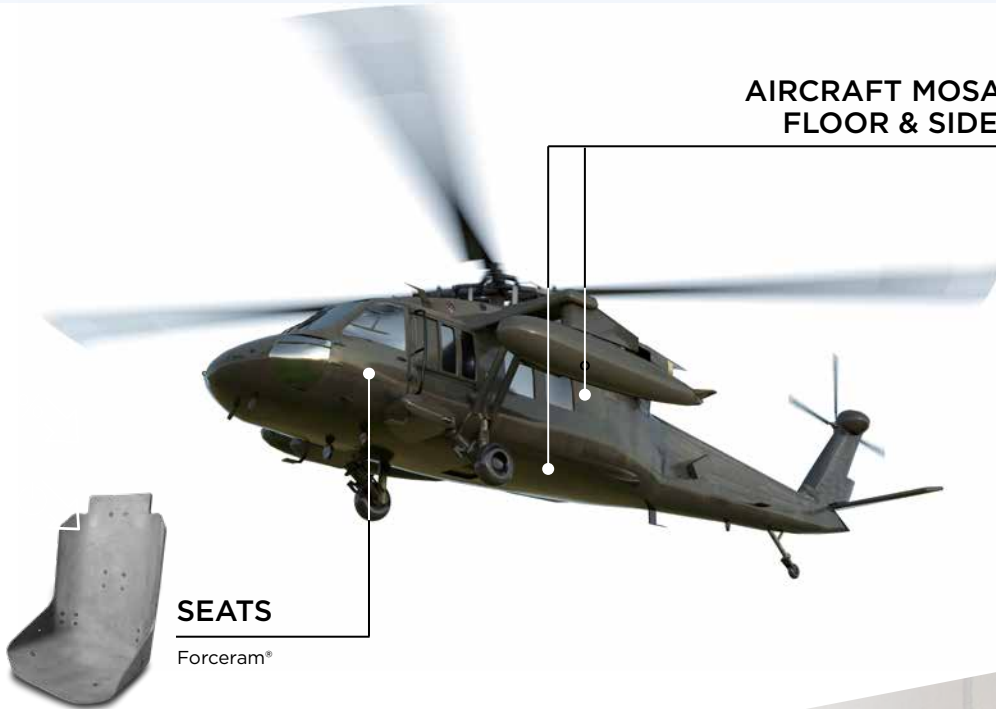
Kitting & assemblies available



Lightweight

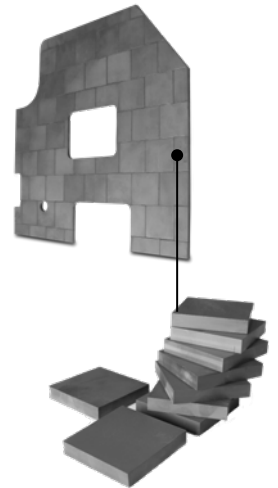
AIRCRAFT MOSAIC TILES FLOOR & SIDE PANELS

Hexoloy®
Norbide®



SEATS

Forceram®



Want to know more?
Visit our website.

Custom designed, co-developed and manufactured for protecting military and law enforcement personnel.

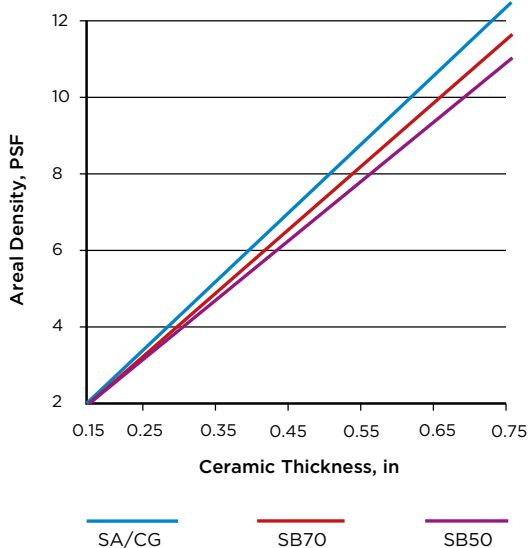
OUR MATERIALS

DISCOVER OUR ENTIRE PRODUCT RANGE

Saint-Gobain Performance Ceramics & Refractories' extensive portfolio of ceramic materials is available in all shapes and sizes, which meet or exceed Military, NIJ and Special Threat specifications.

Family	FORCERAM®			HEXOLOY®				NORBIDE®
Brand	FORCERAM® O-SiC	FORCERAM® N-SiC	FORCERAM® B ₄ C	HEXOLOY® SA	HEXOLOY® CG	HEXOLOY® SB70	HEXOLOY® SB50	
Features	Diverse size & shape capability Multi-Hit	Diverse size & shape capability Multi-Hit	Lightweight Multi-Hit	Industry-leading performance	Multi-Hit	Very Light Weight Multi-Hit	Very Light Weight Multi-Hit	Lightest Weight
Product Type	Bonded SiC	Bonded SiC	Bonded SiC-B ₄ C	Sintered SiC	Sintered SiC	Sintered SiC-B ₄ C	Sintered SiC-B ₄ C	Hot Pressed B ₄ C
Density	2.85	2.80	2.81	3.15	3.15	2.89	2.75	2.50
Hardness, kg/mm ² (Knoop)	1,100	1,200	2000	2,500	2,500	2,300	2,300	2,800
Flexural Strength, MPa (4 pts bending)	125	160	225	380	410	320	300	425
Elastic Modulus, GPa	240	250	400	430	410	320	300	440

Sintered Areal Density vs Ceramic Thickness



The above graphic is offered as a comparison of the weights of our ceramic materials

GLOSSARY OF TERMS

Ceramics	Inorganic, non-metallic materials
Sintered	Product resulting of high-temperature consolidation of a powder into a solid form without melting
SiC	Silicon Carbide, a ceramic compound of elements silicon (Si) and carbon (C)
B₄C	Boron Carbide, a ceramic compound of elements boron (B) and carbon (C)
Bonded SiC	Product resulting of high temperature consolidation of a SiC powder into a solid form with the assistance of other material additives used to create a bonding phase
Density	Mass of material per unit of volume
Hardness	Resistance of a material to localized plastic deformation
Flexural Strength	Resistance of a material to breaking under a bending stress
Elastic Modulus	Resistance of a material to being deformed elastically (i.e., non-permanently) when a stress is applied



SAINT-GOBAIN 2024

Derwent
Top 100
Global Innovator
2024

Clarivate
Analytics

top
EMPLOYER
Global
2025
FOR A BETTER WORLD OF WORK



46.6

in euro billion
2024 sales



161,000

employees



Represented in

80

countries

WE ARE COMMITTED TO ACHIEVING NET ZERO CARBON EMISSIONS BY 2050



1,100

manufacturing
facilities



-34%

Scope 1 & 2 CO₂ Emissions
(2024 vs. 2027)



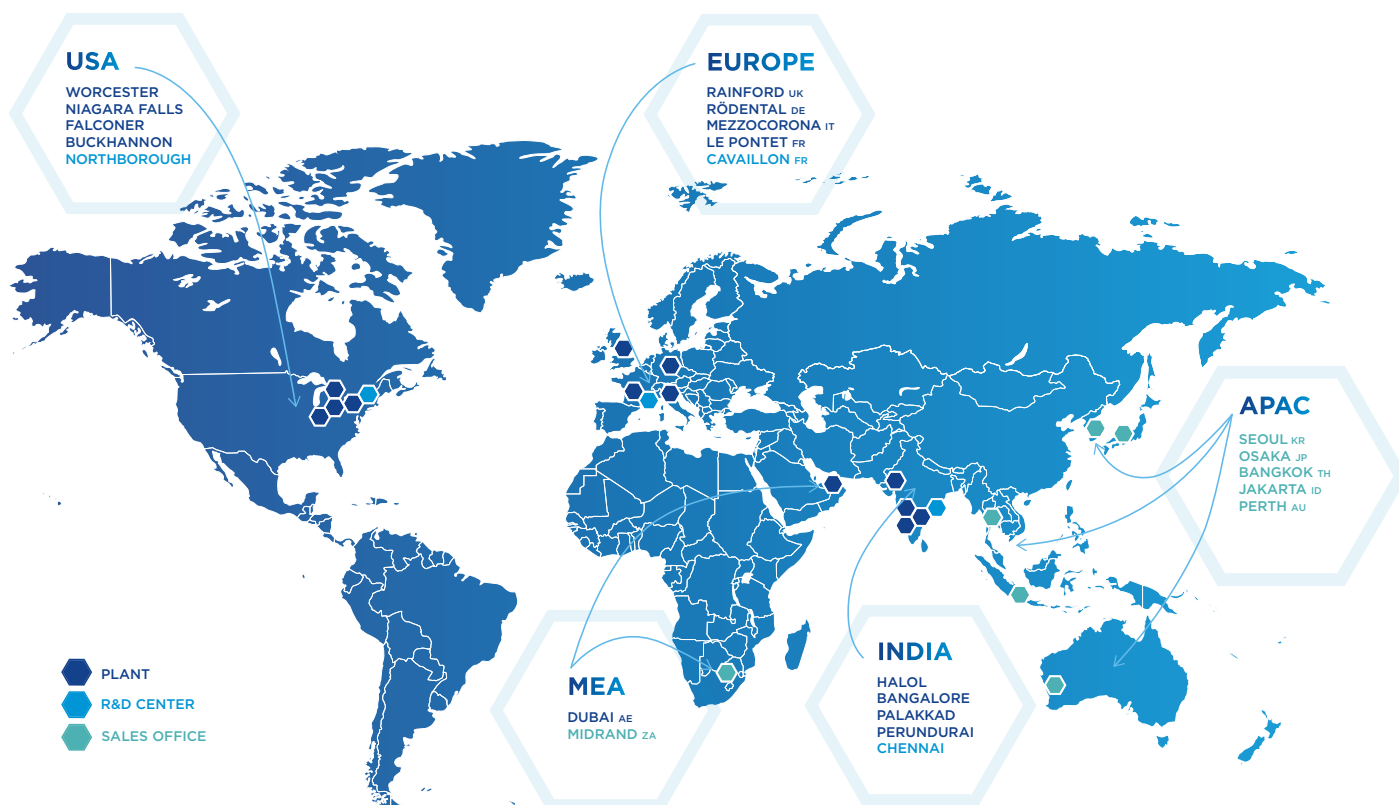
8

main
R&D centers

PIONEERING CERAMICS FOR A BETTER TOMORROW

SAINT-GOBAIN PERFORMANCE CERAMICS & REFRACTORIES

OUR GLOBAL PRESENCE



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