CoBlast Process

CoBlast Technology

ENBIO

Unique CoBlast Skins

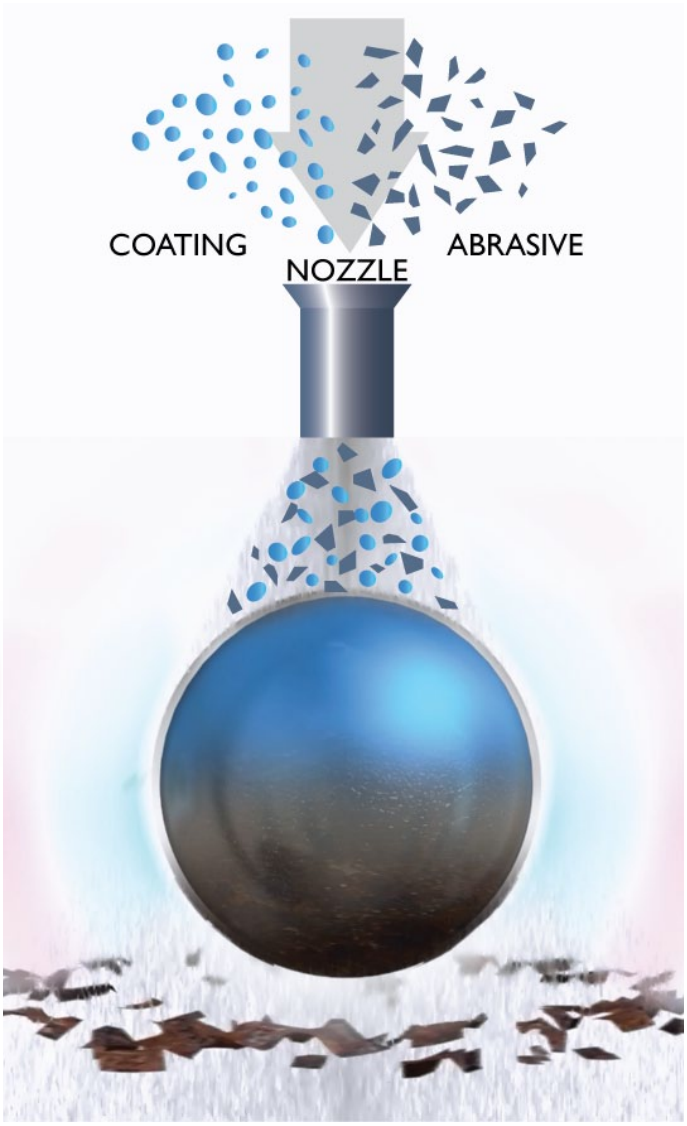
Exceptional coating adhesion and integration

One-step cleaning, roughening, and coating

Ambient temperature, ambient pressure

Minimal substrate alteration

No wet chemicals



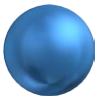
Remove the oxide layer

The oxide layer presents a barrier to coating adhesion that must be removed for the application of high performance coatings.

Roughen the metal surface

Roughening the substrate and exposing unreacted metal provides an ideal surface for exceptional coating adhesion.

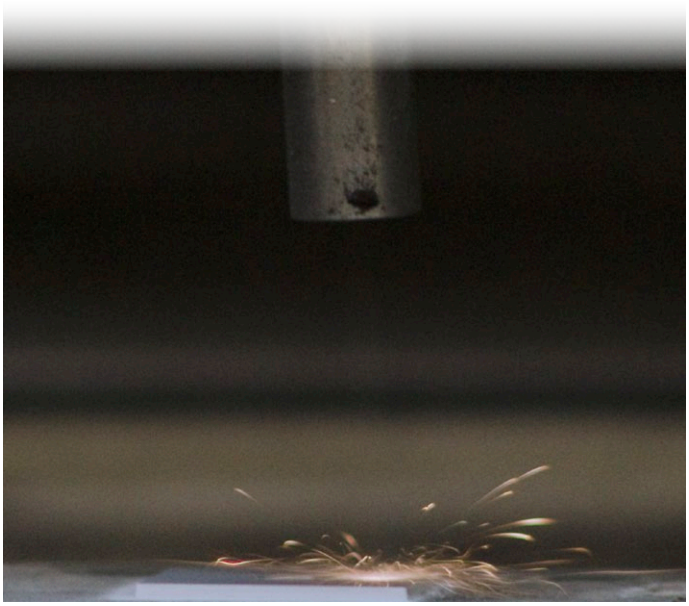
Apply unique Skins



CoBlast Skins are highly integrated with the substrate. This gives them excellent durability and stability, and allows previously impossible properties to be achieved.

In One Step

CoBlast is a one-step, ambient temperature, ambient pressure process that uses conventional grit/micro-blasting equipment to remove a metal's natural oxide layer and replace it with a desired functional Skin. Abrasive and coating powders are simultaneously blasted onto the metal surface from a single nozzle. The abrasive mechanically abrades the substrate, exposing active chemical bonds to which the coating particles bond before an oxide layer can reform. The inert nature of the abrasive ensures that it does not easily form chemical bonds, so that the process forms a coating with excellent coverage, with little or no abrasive remaining on the surface or embedded in the substrate. The level of coating/substrate integration achieved by this process is far beyond most coating methods and leads to some unique capabilities.



ENBIO. NovaUCD, Belfield Innovation Park, University College Dublin, Belfield, Dublin 4, Ireland.

Tel: +353 (0)1 525 3305 • Fax: +353 (0)1 525 3309
info@enbio.eu • www.enbio.eu

Substrate Geometries

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Complex 3D shapes

Fine details

Flat plates

Tubes

Foils

Wires

Foams

SolarBlack on Solar Orbiter component

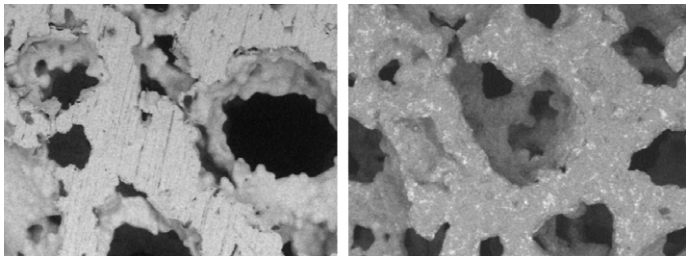
Complex shapes

CoBlast Skins can be applied to almost any substrate geometry, as the nozzle is easily mounted on standard industrial robots and other automation equipment. The process is line of sight and allows for convenient masking of uncoated sections. In general, if you can grit-blast or micro-blast it, you can CoBlast it.

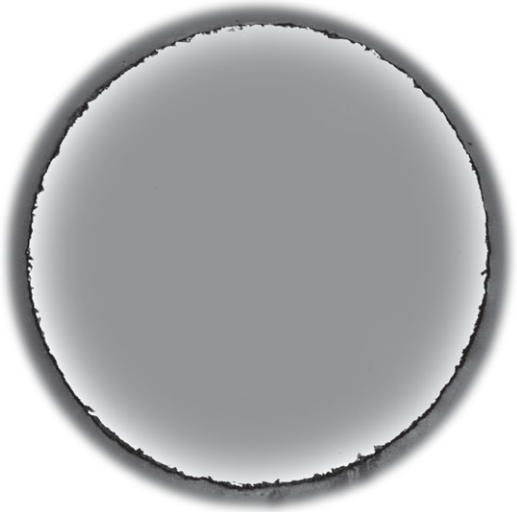
SolarBlack on 50 micron titanium foil

Delicate parts and fine details

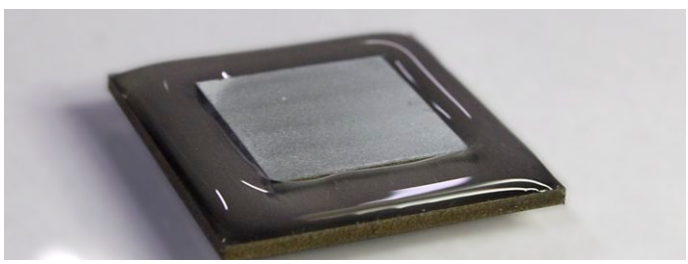
CoBlast Skins are typically 2-5 microns thick, meaning that fine surface details are preserved after coating. The abrasive and coating materials, and the process parameters, can be tailored to coat delicate parts with minimal mechanical or thermal damage. Skins have been applied to titanium foils as thin as 25 microns, and to delicate structures including stents and metal foams.



Uncoated and hydroxyapatite coated titanium foam



Hydroxyapatite coated nitinol stent



Hydrophobic PTFE coated stainles steel plate

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info@enbio.eu • www.enbio.eu

Substrate Materials

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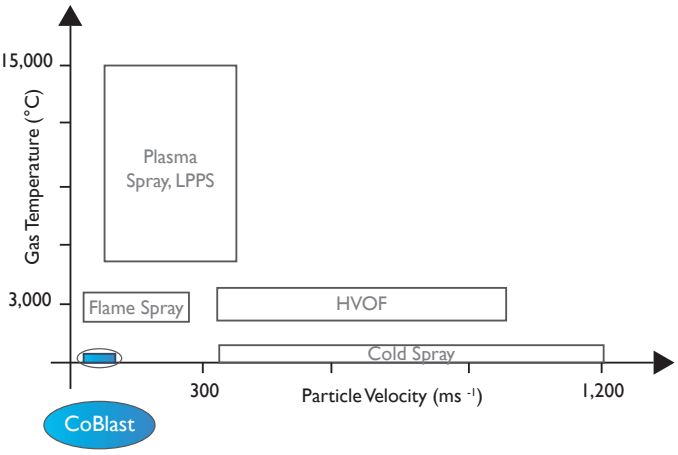
Titanium	Nitinol
Stainless steel	Inconel
Mild steel	Cobalt chrome
Aluminium	Bulk metallic glass
Magnesium	and more



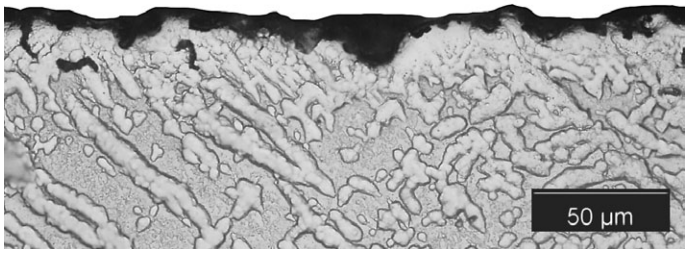
Standard CoBlast process parameters can be applied to many substrate materials and ENBIO can also provide parameters optimised for specific substrates. CoBlast Skins integrate exceptionally well even with substrates that normally suffer poor coating adhesion, thanks to the simultaneous roughening, chemical activation, and coating deposition.

CoBlast is an ambient temperature, ambient pressure process that can be applied to sensitive substrates without damage. Heat treated alloys can be coated without destroying the properties achieved during the heat treatment process.

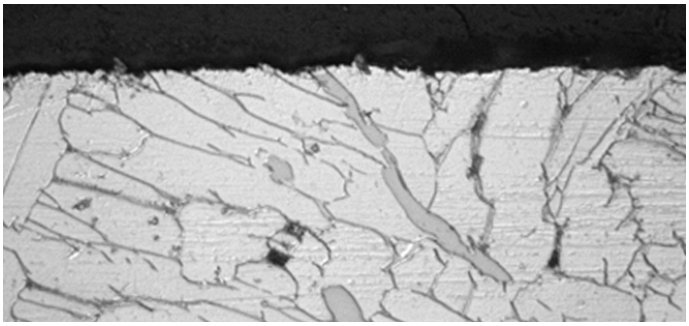
- Difficult substrates such as magnesium, nitinol, and Inconel can be coated with the standard process.
- There is no oxide layer between the coating and the metal.
- Coated nitinol parts have shown no loss of superelasticity or shape memory.
- Titanium can be coated with no evidence of oxygen infiltration or α-case formation.
- No heat affected zone is observed after CoBlast.
- Complex heat treatments of alloys such as aerospace aluminium grades are preserved.

The range of substrates is constantly expanding to include new materials and new grades, for example: titanium (G2, G5), aluminium (2000 and 6000 series) and stainless steel (304, 316). Please contact us with any queries relating to specific substrates.

	SolarBlack	Solar-White	HA	Zinc Phosphate	PTFE
Ti	O	O	O		O
SS	O		O	O	O
MS	O			O	O
Al	O	O		O	O
Mg	O		O	O	
Nitinol	O		O		O
Inconel	O				
CoCr			O		



SolarBlack coating on magnesium plate



Titanium grain structure maintained after CoBlast

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Capabilities
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Thermo-optical control

Corrosion protection

Hydrophobicity

Lubrication

Wear resistance

Biocompatibility

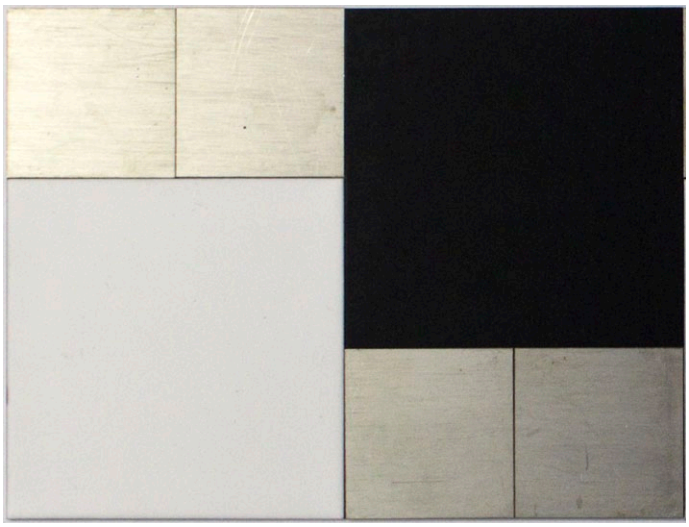
ENBIO's thermo-optical coatings are designed to survive the harsh conditions of space, and are tested to the highest standards of the European Space Agency. Thermo-optical properties remain extremely stable even after thousands of equivalent-sun-hours. The coatings are free from volatile organic compounds, essentially eliminating out-gassing and making them environmentally safe.

ENBIO are developing corrosion resistant coatings with the aim of matching the performance of zinc-rich paint primers, with the process efficiency and environmental benefits of CoBlast. Several corrosion resistant coatings including zinc phosphate, magnesium phosphate, and cerium oxide can be deposited using CoBlast, with no VOC content and minimal waiting time before the application of a topcoat.

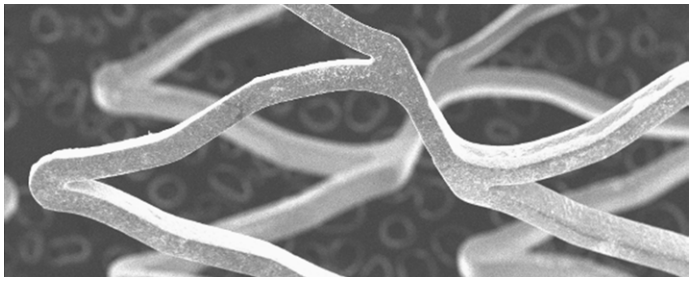
Hydrophobic Skins in development have reached water contact angles of 150° and hysteresis <10°. These coatings are being tested for durability, and they already contend with many available superhydrophobic options.

CoBlast Skins have achieved a coefficient of friction below 0.15, as measured by the pin-on-disk method. These coatings exhibit significantly reduced wear compared to the untreated substrate.

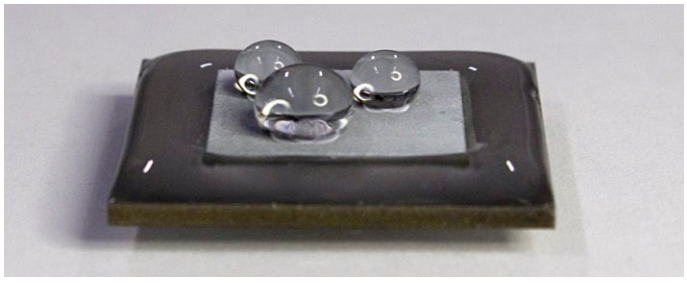
ENBIO began life in the medical device industry and continues to offer biocampatible Skins with many significant advantages over competing coating technologies. Calcium phosphates can be applied where other coating process may fail, such as on nitinol or magnesium, and on flexible parts such as stents.



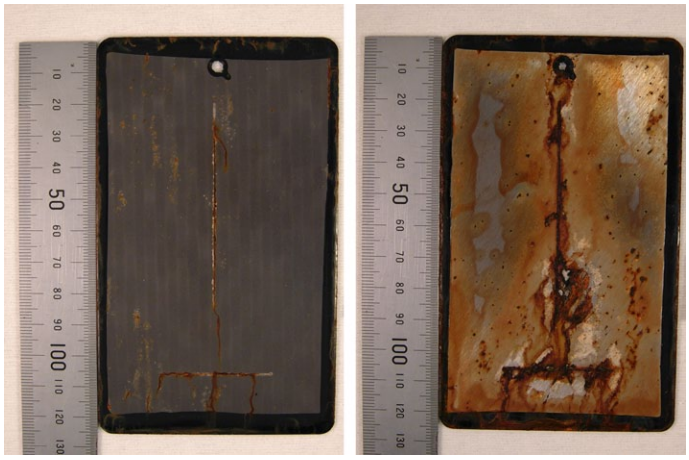
Thermo-optical control



Biocompatibility



Hydrophobicity



Corrosion resistance

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