

# Oil & Gas market,

## What can Saint-Gobain Coating Solutions do for you?

Saint-Gobain provides a diverse mix of innovative products and technical solutions to the oil and gas industry. Our high-performance materials are used throughout the hydrocarbon value chain, from upstream exploration and production to downstream petroleum refining and petrochemical processing.

Look inside to see



  
SAINT-GOBAIN

COATING SOLUTIONS

The Coating Solutions group of Saint-Gobain provides coatings that enhance the surface properties of tools and equipment — particularly important in the demanding environments in which rock drilling bits, pump components and other industry-related applications are employed. The company's ongoing R&D efforts result in new products and processing improvements that deliver greater productivity, higher yields and lower operating costs in products for abrasion, erosion and wear resistant applications; corrosion and oxidation resistant coatings; thermal cycle resistant and thermal barrier coatings; and electrically insulating or conductive coatings.

### PDC bits & Rock Drilling bits

Steel PDC bits are used for the strength and toughness of their steel alloy, but require hardfacing with our multi-purpose TUF-COTE® GrM or GrN as well as one of our customized TUF-COTE® solutions dedicated to the specific areas of the bit: body, blades, pads...

TUF-COTE® combines extreme abrasion, erosion wear and medium impact resistance. Our TUF-COTE® PLS is suitable for cone-roller bits thus enabling a higher contact load under severe abrasion.

### TUF-COTE®

Premium Hardfacing electrode with high-density tungsten carbide content, applied by using an oxy-acetylene welding torch.



### Stabilizers, reamers & hole openers

For increasing the abrasion resistance and withstanding eventual medium impacts, TUF-COTE® GrM (medium carbide size) and TUF-COTE® GrA (coarse carbide size) are the key products to hardface the stabilizer blades as well as the reamers and hole openers.

P.T.A welding using Tungsten Carbide coating material can be used for achieving low dilution, low H.A.Z and low crack occurrence layers.

### TUF-COTE®

- TUF-COTE® applied by using an oxy-acetylene welding torch.
- P.T.A welding with spherical Tungsten carbide powder.



### Oil sands, tar sands & coal extraction

Excavating, crushing and extracting the oil sands involve severe abrasion of the tools. Tungsten Carbide composite coating is the major answer to extend the tool life. Tungsten Carbide coatings are applied as thick layers by using TUF-COTE® or tailored mixtures of Tungsten Carbide welded with Plasma Transfer Arc welding machines.

### PTA & TUF-COTE® Hardfacing

- P.T.A – P.H.E Tungsten Carbide layers ranging from 1,5 up to 6mm.
- TUF-COTE® premium Hardfacing electrode with high-density tungsten carbide content.



  
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## Valves, pumps, fluid handling & mud pumps

The petrochemical valves are subject to severe corrosion and oxidation environments as well as mechanical stresses such as metal/metal friction, galling and erosion.

The valve and pump failure could cause the shutdown of a plant or a refinery. Valves or pump components are clad by using P.T.A – P.H.E™ hardfacing technologies.

Welded overlays are dense, porosity free with a low H.A.Z.



## P.T.A – P.H.E™ hardfacing

PTA: Cobalt grade 6 or 12, stainless steel, Inconel™\*

Refer to the thermal sprayed coatings that can also be used:

- ROKIDE C® Chrome oxide
- ChromKarb Chrome Carbide

## Pumps, fluid handling & mud pumps

Fluid handling involves equipment operating 24 hours/day under very demanding conditions. Fluids used tend to be corrosive, abrasive and erosive making pump maintenance a considerable drain of both time and money.

By using abrasion wear resistant ceramic or carbide coatings, major reductions in downtime and the associated cost savings to coat the pump parts: shaft, rotor, sleeve, piston, body, impeller... are achieved. The ceramic and carbide coatings can be applied on almost any base material: steel, stainless steel, aluminum, Inconel™\*, Cobalt superalloys...), graphite... without increasing the temperature of the substrate during coating.

Inconel\* is a trade mark of Special Metals Corporation



## ROKIDE C®, HardKarb & ChromKarb

- ROKIDE C®: the Best ceramic coating for abrasion resistance under severe corrosion.
- HardKarb or ChromKarb Flexicords: metal carbide coatings providing superior abrasion wear resistance for medium-low corrosive environment.
- Ti-Elite & AZ Flexicords: ceramic coatings having a good friction wear resistance as well as good corrosion resistance.

## Gas turbine combustion parts & vane blades

The higher output for the recent generation of gas turbines requires higher performance Thermal Barrier Coatings (TBC) with low impurities for a longer coating life.

Our Saint-Gobain #204 YSZ Yttria Zirconia materials are approved and meet the specification of major OEM such as Pratt & Whitney, General Electric, Siemens, Westinghouse, Lycoming, Honeywell...

Our ProPlasma coating equipment allows faster coating operations up to 4 times, with considerable coating material savings. The cost savings per kilogram of sprayed material can reach up-to 70%\*

\* Cost savings are calculated with European average costs2012.



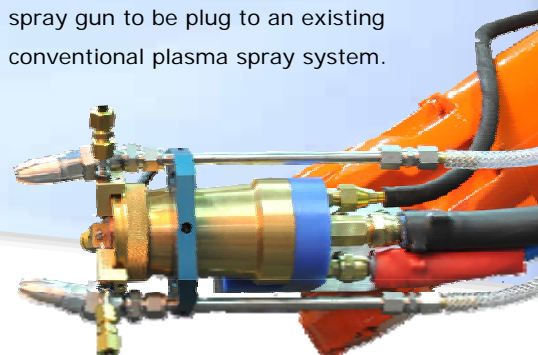
## #204 Yttria Stabilized Zirconia

#204: YZ Yttria Zirconia

#1190: YZ Yttria Zirconia

Our #204 YSZ advantages include:

- Hollow particles which allow easy melting and highest deposit efficiencies with up to 28% saving versus other powders.
- Obtain the highest quality and best value, buy direct from us, the "manufacturer".
- ProPlasma: high spray rate plasma spray gun to be plug to an existing conventional plasma spray system.



## Rebuilding & overhaul of worn parts

Flame spraying allows rebuilding of undersized mechanical parts.

Compared to welding technologies, flame spraying does not transfer the heat into the part which can cause distortion.

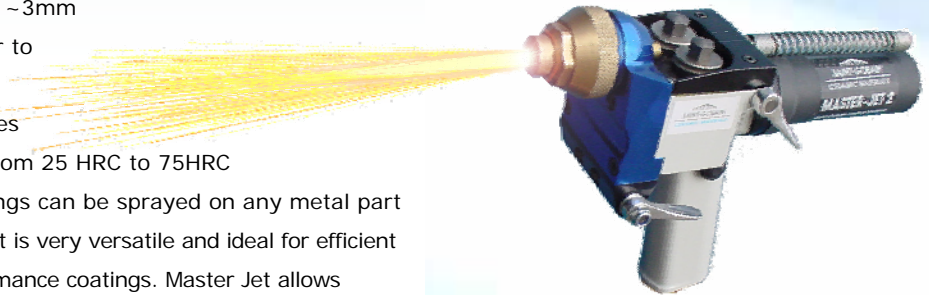
The advantages of thermal spraying are:

- Fast and economical process, easy to set-up even on site
- Range of thickness from 50µm to ~3mm
- No distortion and no heat transfer to the part (max 120°C)
- Coatings can be rebuilt many times
- Hardness of the coating ranged from 25 HRC to 75HRC
- Ceramic, carbide and metal coatings can be sprayed on any metal part

Our thermal spray Master Jet equipment is very versatile and ideal for efficient repair with high quality and high performance coatings. Master Jet allows producing ceramic, metal and carbide coatings for small or large surfaces.

## Master Jet coating solutions

- Stainless steel
- Cr steel (up-to 64HRC)
- Cr Aluminum steel
- Bronze, Babbitt
- Molybdenum



[www.coatingsolutions.saint-gobain.com](http://www.coatingsolutions.saint-gobain.com)



TUF-COTE®



PTA PHE™



FLEXICORD



Flame Spray



ProPlasma



Powders

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