

Saint-Gobain Oil & Gas Group

Partnering for energy progress

Saint-Gobain Ceramics (Specialty Refractories)

High purity bonded shapes
Refractory bricks

Saint-Gobain Ceramics (Wear Resistant Technologies)

Catalyst and coke transfer lines
Cyclone dust bowls and dip legs
Flow nozzles
Reactor stripper nozzles
Regenerator nozzles
Third-stage separator tubes

Saint-Gobain Ceramics (Structural Ceramics)

Choke beans
Wear liners
Valve components

Saint-Gobain Ceramics (Tooling & Components)

Zirconia and tetragonal zirconia material components

Saint-Gobain Performance Plastics (Composites: Coated Fabrics)

Chemical processing industry composites
Coated fabrics
Expansion joint composites

Saint-Gobain Performance Plastics (Composites: Films)

Extruded PTFE films
FEP films
High performance films
PTFE films
Pressure sensitive tapes
Polyimide films
Splicing tapes

Saint-Gobain Performance Plastics (Polymer Products)

Polymer materials

Saint-Gobain Performance Plastics (Seals)

Spring-energized high performance seals

Saint-Gobain Proppants

Ceramic intermediate strength proppants
Ceramic high strength proppants

Saint-Gobain SEVA (Alloy Casting & Machining)

Impellers
Drill bits
Metallic fibers

Saint-Gobain Crystals (Detectors)

Scintillation detectors
Scintillation materials
Geiger-Mueller and Helium-3 tubes

Saint-Gobain NorPro (Catalytic Products)

Catalyst carriers
Ceramic Pentarings
Guard bed media
High surface alumina rings
Low surface alumina rings

Saint-Gobain NorPro (Process Ceramics)

Catalyst bed support media
Ceramic mass transfer media
Heat transfer media

Saint-Gobain Grains & Powders (Coating Solutions)

Metal and ceramic coatings

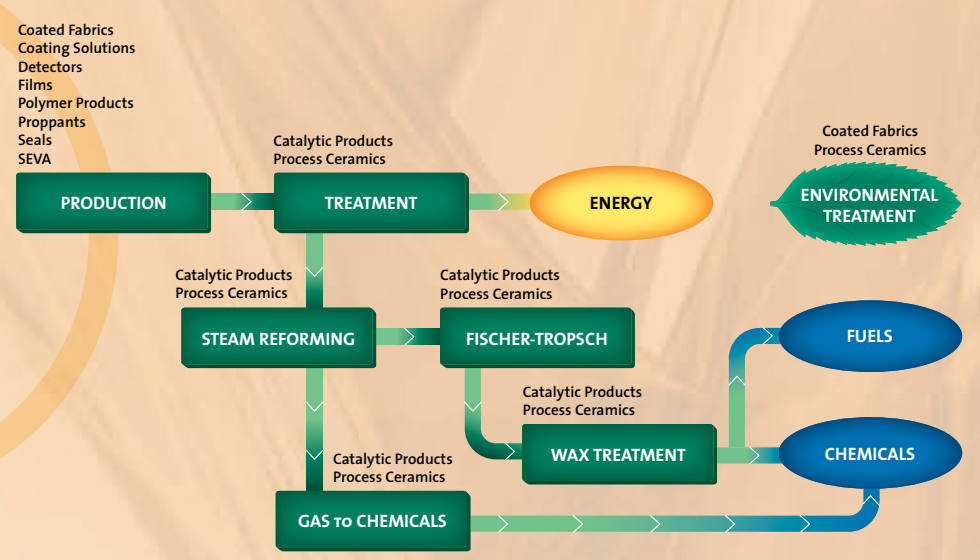
SAINT-GOBAIN OIL & GAS GROUP

Extracting, refining and processing fossil fuels are enormously complex operations that require a formidable arsenal of advanced technology and engineering expertise. Saint-Gobain — one of the 100 largest industrial companies in the world — designs and manufactures innovative products used in dozens of applications by businesses up and down the energy supply chain. We work closely with clients to develop new approaches to specific application-related challenges, and back our products with technical support and resources that literally span the globe.

This brochure will introduce you to the many Saint-Gobain business units that serve the natural gas, oil and oil sands, and coal industries, as well as those who rely on these energy sources for their own operations.

Visit our website at www.OilandGas.saint-gobain.com for more information on the individual businesses, including website addresses and contacts.

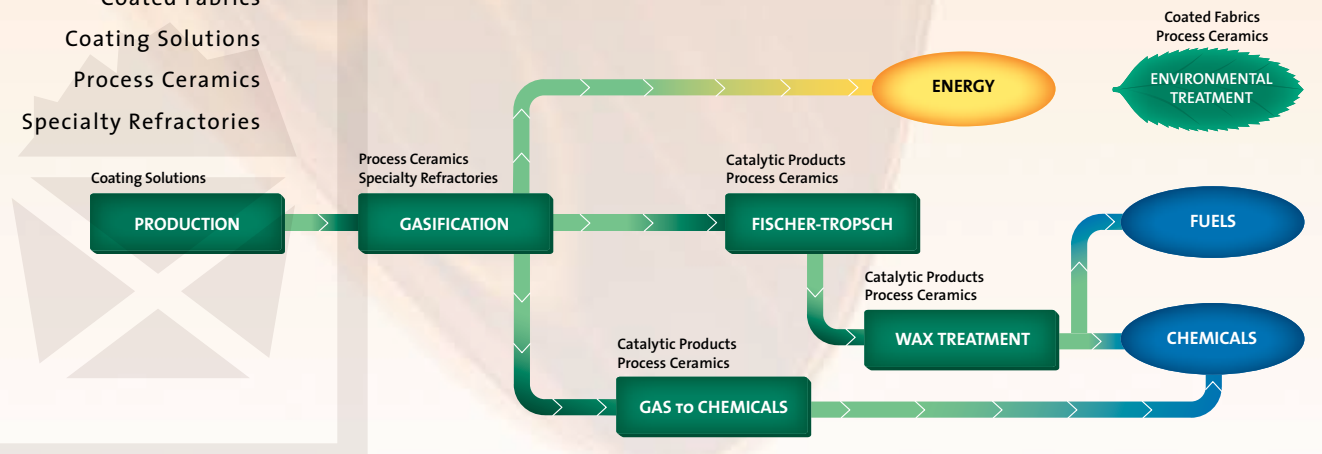
- Catalytic Products
- Coated Fabrics
- Coating Solutions
- Detectors
- Films
- Polymer Products
- Process Ceramics
- Proppants
- Seals
- SEVA Alloy Casting & Machining



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- SEVA Alloy Casting & Machining
- Specialty Refractories
- Structural Ceramics
- Tooling & Components
- Wear Resistant Technologies



- Catalytic Products
- Coated Fabrics
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- Process Ceramics
- Specialty Refractories





- Alundum® Fused Alumina High-Purity Bonded Shapes (AH 199H)
- Refractory Brick (AL 100)
- Insulating Refractory Brick (RI 34)
- Zirchrom™ 60 and Zirchrom™ 900 Refractory Brick — chrome-zirconia
- Compatible monolithics, including mortars and castables

- Cryston® — nitride bonded silicon carbide
- Norfrax® RB — reaction bonded silicon carbide
- Hexoloy® — alpha sintered silicon carbide
- Durafrax® — high alumina oxide
- Corguard® — fuse cast AZS

- Hexoloy® Silicon Carbide (SA, SP, SE, SG)
- Enhanced Hexoloy® SA Silicon Carbide
- AlNimax™ HP Aluminum Nitride
- Norbide® Hot Pressed Boron Carbide
- Noralide® NBD-200 Hot Pressed Silicon Nitride

- Norzide™ YZ-110HS Zirconia Ceramics

SPECIALTY REFRACTORIES: The Specialty Refractories business unit of Saint-Gobain Ceramics has been supplying complete refractory linings to gasifiers for more than 50 years, and has been a market leader since the late 1970s in supplying products to gasification refractories, which produce synthesis gas from low or negative-value carbon feedstocks such as coal, petroleum, coke, high sulfur fuel oil and materials otherwise disposed as waste. In addition to the products listed at left, the company offers services that include supervision of refractory installation, technical support for lining inspection and problem solving.

WEAR RESISTANT TECHNOLOGIES: With more than 40 years of experience serving the petrochemical industry, the Wear Resistant Technologies business unit of Saint-Gobain Ceramics is a leader in the design and manufacture of abrasion-resistant ceramic linings custom-engineered to extend the life of bulk material handling equipment. Specific machines and devices in which the company's products are used include catalyst and coke transfer lines, third-stage separator tubes, cyclone dust bowls and dip legs, and critical flow, regenerator and reactor stripper nozzles.

STRUCTURAL CERAMICS: For nearly 100 years, the Structural Ceramics business unit of Saint-Gobain Ceramics has been building a reputation for providing advanced, high-tech components to oil and gas industry customers. The company's ceramics offer high corrosion and erosion resistance and can be supplied as finished components (e.g., nozzles and valves), unfinished machined blanks, pressed near net shape blanks, high volume pressed net shape components, and complex, highly machined parts.

TOOLING & COMPONENTS: This Saint-Gobain Ceramics business unit is a manufacturer of custom engineered components with wear and corrosion resistant properties that extend the performance life of pumps and valves. Norzide™ YZ-110HS Zirconia provides premium performance for metal forming, stamping tools, battery tooling, industrial knives and petroleum pumps.

- Darlyn® expansion joint composites
- Flueflex® expansion joint composites
- Chemfab® coated fabrics
- Chemlam® CPI composites

- CHR® pressure sensitive splicing tapes
- Norton® PTFE extruded films
- Norton® FEP film

- Rulon® — available in 16 grades offering very specific properties
- Meldin® — available in both polyimide and thermoplastic product families

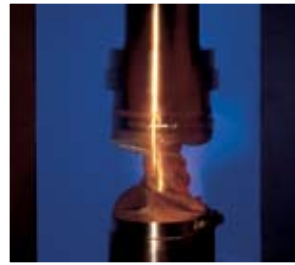
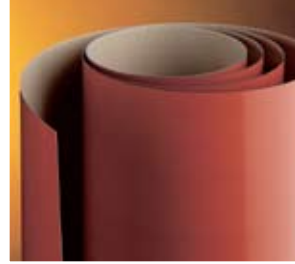
- OmniSeal® spring-energized seals
- OmniLip™ rotary lip seals
- OmniFlex™ elastomer o-rings

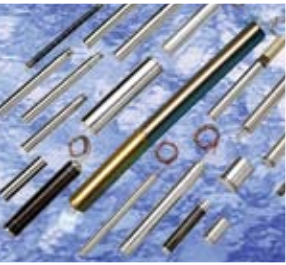
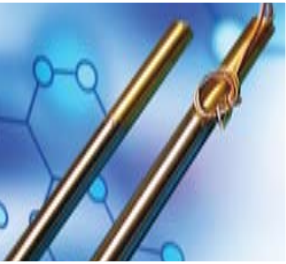
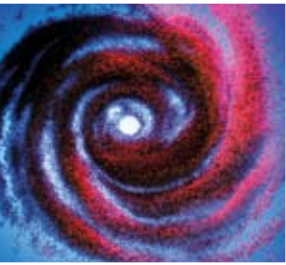
COATED FABRICS: Coated fabrics produced by the Composites Group of Saint-Gobain Performance Plastics are widely used throughout the oil and gas industries. These PTFE-based products include expansion joints, flexible floating roof seals for oil storage tanks, wire and cable insulation for downhole pumps, and insulation jacketing. Their high strength stands up to the severe environments in which they are utilized, and specific properties such as high temperature resistance, enhanced flex and dielectric insulation deliver excellent performance in conditions that are thermally extreme, chemically hostile and mechanically severe.

FILMS: The Composites Group of Saint-Gobain Performance Plastics is the world's leading supplier of high-temperature films and tapes for the oil and gas market. There are three major areas in which the company provides critical materials that enhance the durability of downhole pumps: splicing tapes for assembling power cables, used in the industry for over 20 years; insulation films for dielectric insulation (available in a range of colors); and chemical barrier and adhesive films for cable wrapping.

POLYMER PRODUCTS: The Polymer Products business unit of Saint-Gobain Performance Plastics has more than 40 years of material technology and fabrication expertise. The company's Rulon® engineered PTFE material has survived decades of use as slider beam support shoes for the Alaska pipeline, while its Meldin® products offer superior mechanical properties that allow for long-life, maintenance-free operation of pump and valve applications that support fluid handling and downhole drilling.

SEALS: The High Performance Seals business unit of Saint-Gobain Performance Plastics manufactures OmniSeal® spring-energized seals, which are made from proprietary blends of engineered polymers that can be coupled with many spring geometries and perform in harsh environments where aggressive media (e.g., sour gas, methanol) and extreme operating temperatures are common. Beginning in the early 1980s, OmniSeal® products were used in major oil field projects in the North Sea — experience that enabled the company to design an evolving series of innovative sealing solutions that comply with the continuously increasing performance requirements of valve manufacturers.





SAINT-GOBAIN
PROPPANTS

- Versaprop® — intermediate strength, patented engineered sieve distribution
- Interprop® — intermediate strength, standard sieve distribution
- Ultraprop® — high strength, patented engineered sieve distribution
- Sintered Bauxite — high strength, standard sieve distribution

SAINT-GOBAIN PROPPANTS: Proppants are the most effective materials available for the hydraulic fracturing of oil and gas wells. Their engineered shapes and inherent strength enable them to maintain integrity under the most rigorous conditions. Saint-Gobain Proppants has manufactured high-quality ceramic proppants for nearly three decades, and over the years has leveraged its knowledge of ceramic materials and the extensive R&D resources of Saint-Gobain to introduce new proppants that increase yields from existing wells and improve the industry's ability to effectively tap new formations.

SAINT-GOBAIN
SEVA

- Impellers
- Replicast® drill bits
- FibraFlex® metallic fibers

SAINT-GOBAIN SEVA: A specialist in the casting of technical alloys and the machining of complex shapes, the company provides products to the oil and gas industry that include impellers for centrifugal compressors, which are available up to 1 meter in diameter and in a variety of materials; drill bits made from heat and abrasion resistant alloys; and flexible, corrosion resistant metallic fibers used to increase shock resistance of cement plugs. The company also provides wear and heat resistant components made from special super alloys (nickel-, cobalt- or tantalum-based) for any high temperature process.

SAINT-GOBAIN
CRYSTALS

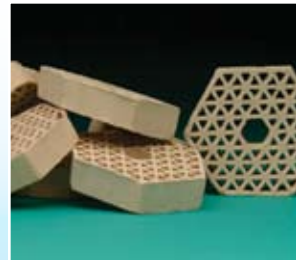
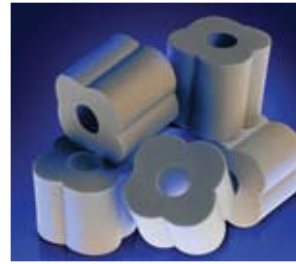
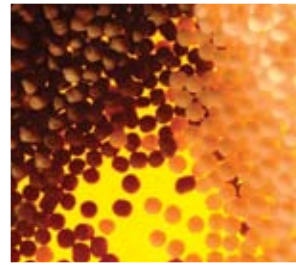
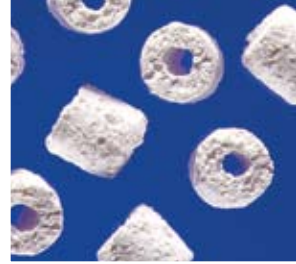
- Ruggedized scintillation detectors
- Gamma ray modules (integrated scintillation detectors)
- NxGen™ Ti detectors
- Spectra series detectors
- Polyscin®, BrillanCe™ 350, BrillanCe™ 380 and PreLude™ 420 scintillation materials
- Geiger-Mueller and Helium-3 tubes

DETECTORS: The Scintillation Products division of Saint-Gobain Crystals is the industry leader in ruggedized radiation detector solutions for the oil and gas industry, supplying customized gas-filled detectors and Bicron® scintillation crystal detectors. The company provides the expertise and experience required to meet both present and future industry demands for reliable performance in extreme environments.

- Catalyst carriers
 - Ceramic Pentarings
 - MacroTrap® guard bed media
 - High surface alumina rings
 - Low surface alumina rings
-
- Denstone® bed support media
 - HexPak™, Snowflake™ and Ty-Pak® heat transfer media
 - Norton™ saddles
 - Advanced ceramic materials — Proware™, HSB™, Hi-Temp™, Pharmaware™, Alkaware®, High Alumina

CATALYTIC PRODUCTS: Saint-Gobain NorPro's Catalytic Products business unit has been meeting the need for innovative, high quality ceramic catalyst carriers for more than 60 years. The company is the world's leading supplier of merchant catalyst carriers, using a co-development business model that involves joint development of new catalysts by clients and new carriers by the company. Products are engineered in a variety of materials and shapes with specific physical and chemical properties that provide optimum performance for the particular requirements of each catalytic application. This business unit also supplies a myriad of top bed solution products for catalyst protection.

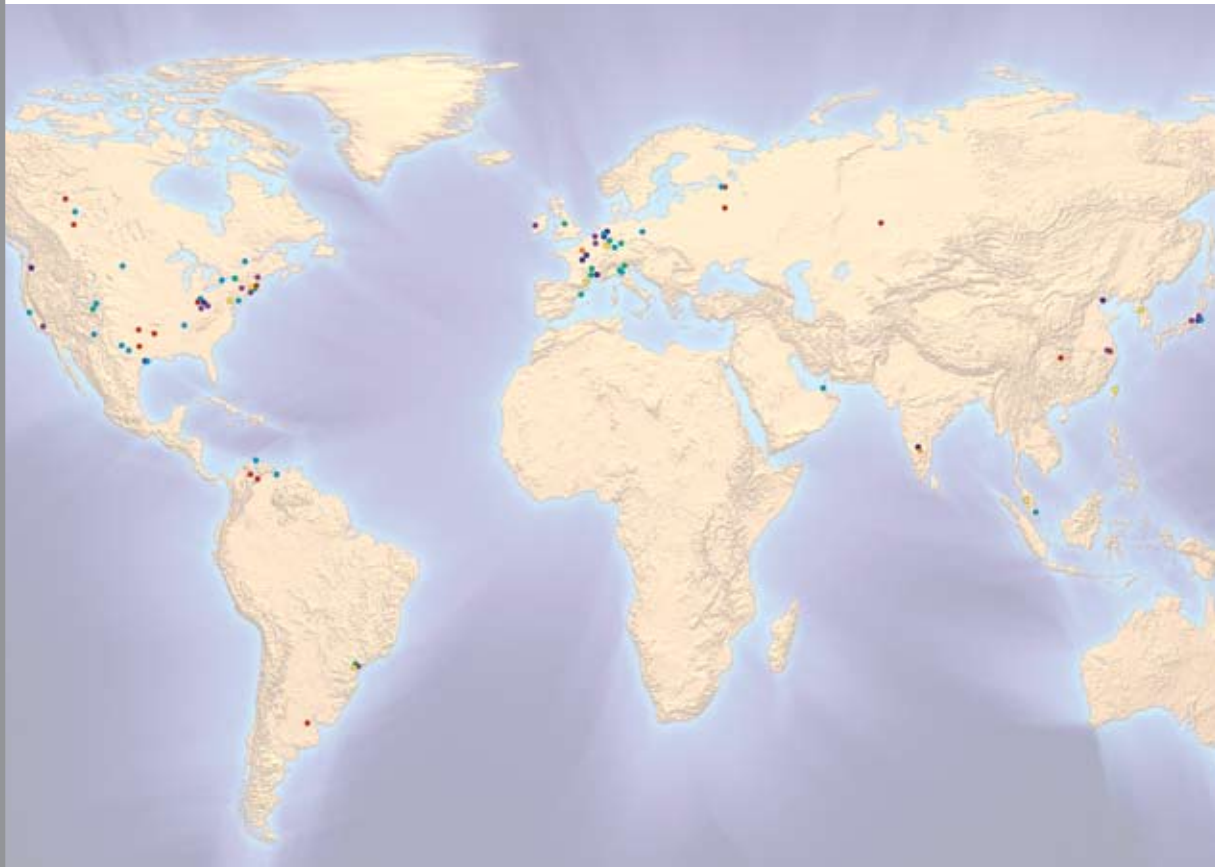
PROCESS CERAMICS: The Process Ceramics business unit of Saint-Gobain NorPro has been solving the technological challenges of the oil refining, petrochemical, chemical and environmental industries for decades. The company is a world leader in the development and manufacture of bed support media for fixed bed processes, and has extensive history in mass and heat transfer, specializing in reactor pressure drop mitigation along with thermal management and offering an array of innovative new products.



- TUF-COTE® hard-facing Flexicords (Tungsten carbide electrodes)
- ROKIDE® ceramic coatings

COATING SOLUTIONS: The Coating Solutions group of Saint-Gobain Grains & Powders 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 like abrasion, erosion and wear resistant coatings; corrosion and oxidation resistant coatings; thermal cycle resistant and thermal barrier coatings; and electrically insulating or conductive coatings.

The High-Performance Materials (HPM) sector of Saint-Gobain comprises three primary businesses: Abrasives, Ceramics & Plastics, and Reinforcements & Composites/Textile Solutions. A number of the individual business units that fall within the HPM sector were originally part of Norton, a company with a long and distinguished history in ceramics dating back to 1886. Norton was acquired by Saint-Gobain in 1990, and since then has both contributed to and benefited from Saint-Gobain's position as a major international supplier of highly advanced ceramic-based products. Other HPM business units apply decades of experience in fluoropolymers and other plastics, crystals and other advanced materials to products designed to serve the diverse needs of the oil and gas industry.



Saint-Gobain Oil & Gas Group

The Saint-Gobain businesses highlighted in this brochure have manufacturing plants, sales offices, distributors, R&D laboratories and other facilities located around the world. This global presence ensures that oil and gas industry customers are never far from the extensive technical support that sets Saint-Gobain apart from other suppliers.

- Saint-Gobain Proppants
- Saint-Gobain Ceramics
- Saint-Gobain NorPro
- Saint-Gobain SEVA
- Saint-Gobain Crystals
- Saint-Gobain Grains & Powders

Compagnie de Saint-Gobain

Compagnie de Saint-Gobain is a materials company with a distinguished history. It was founded more than 300 years ago and has since flourished as one of the world's top industrial corporations, with the single purpose of serving the customer through a commitment to quality and leadership. Saint-Gobain operates in more than 50 countries, employing over 200,000 people in five major business sectors: Flat Glass, Packaging, Construction Products, Building Distribution and High-Performance Materials. The businesses highlighted in this brochure all fall within the High-Performance Materials sector.



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www.OilandGas.saint-gobain.com