ENGINEERED SOLUTIONS

Oil & Gas

High performance material solutions for the oil and gas industries

HYPERION
Materials & Technologies

HYPERION – YOUR OIL & GAS SOLUTION PROVIDER

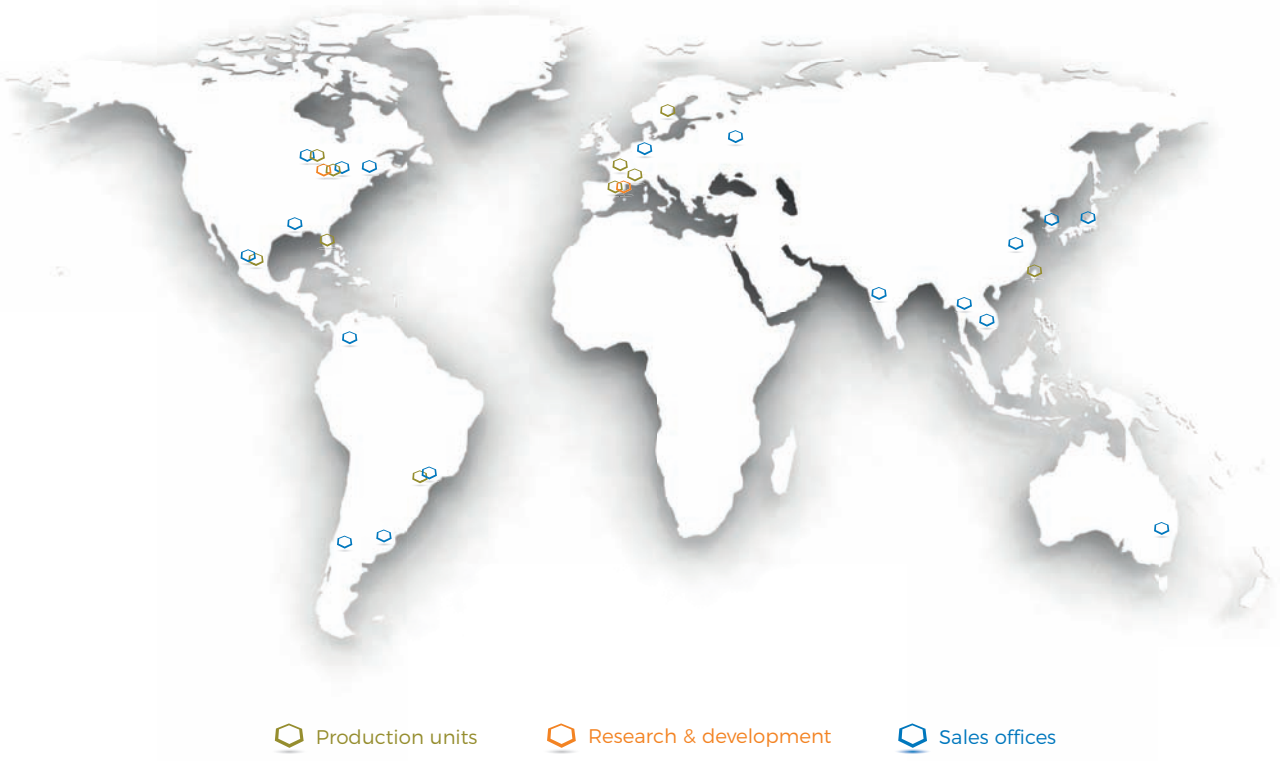
Hyperion Materials & Technologies, Inc. is an engineering company with decades of experience manufacturing hard and super-hard applied materials, including cemented tungsten carbide, tungsten carbide powders, diamonds, polycrystalline diamonds (PCD), and cubic boron nitrides for oil & gas applications. Hyperion's products are engineered to increase productivity and improve performance of our customers' applications.

INNOVATIVE PARTNERSHIPS ARE A WAY OF LIFE

Application Mapping - With such a wide range of materials and manufacturing capabilities, we find it best to approach products from the perspective of your end application. Studying the end application allows us to work together with customers to select a material grade, design the solution, and identify process improvements that might be needed. Hyperion believes that a high level of involvement from both the customer's team and our team is the key to increasing productivity and performance.

Teamwork - At Hyperion, a cross-functional team approaches each customer's requirements and provides their input to create the most effective solution. Our customers are in contact with specialists who have the knowledge and ability to give valuable support and make the right decision without any delay. This business model allows us to support our customers with flexibility and efficiency.

Support Network - Our global footprint makes us unique in this industry. In addition to our product specialists and technical experts, our local offices and production sites are also supported by a global supply network. This network links production facilities from around the globe to share information and, more importantly, provide backup supply if necessary. Keeping involved and in contact with our colleagues around the world is essential for success.



HYPERION HIGH PERFORMANCE MATERIALS

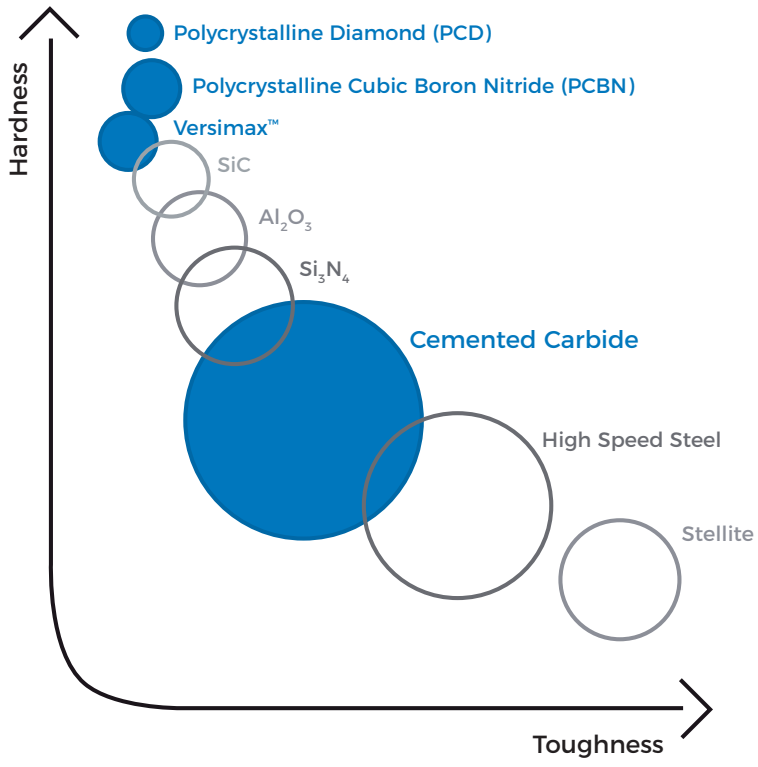
The equipment used in the oil & gas industry faces aggressive environments that often include corrosive, abrasive, and impacting elements, and therefore, require components and sub-assemblies that withstand these harsh conditions. Hyperion Materials & Technologies manufactures a range of hard and super-hard materials that can be engineered so that the resulting physical and chemical properties ensure maximum resistance to wear, deformation, fracture, corrosion, and oxidation:

Tungsten Carbide - Hyperion has the widest range of tungsten carbide grades in the industry. We serve a range of industries and have successfully created high performance solutions unique to each need. We have the expertise to tailor the chemical and physical properties of tungsten carbide to create a cemented carbide precisely for our customer's applications.

Versimax™ - Hyperion's patented Versimax is a ceramic-bonded diamond composite with exceptional wear resistance, mechanical strength, and high temperature performance. Versimax may be attached to tungsten carbide, metal, or ceramic substrates using a range of joining techniques.

Polycrystalline Diamond - Hyperion manufactures a vast selection of engineered polycrystalline diamonds (PCDs). We have the capability to cut PCD into almost any shape specific to your needs. We also have the ability to partner with you and develop unique solutions involving combinations of PCD and tungsten carbide.

Composite Diamond Coating - We offer advanced protection through our proprietary Composite Diamond Coatings (CDC), which is a high performance thin film. It can be applied to any complex shape with no line of sight limitation.



HYPERION APPLICATION SPECIFIC ENGINEERED SOLUTIONS

DRILL BITS AND DOWNHOLE TOOLS

Hyperion Materials & Technologies offers tungsten carbide blanks for drill bits and downhole tools. These are manufactured to customer specific drawings with the cemented carbide chemistry and microstructure designed specific to your requirements. Blanks and other parts that can be manufactured include:

- Compacts, nozzles, and sleeves for drill bits
- Substrates for polycrystalline diamond (PDC) cutters
- Inserts for stabilizer pads
- Shaped inserts for fishing and milling tools.

Hyperion delivers consistent quality and service, with short lead times. This is possible because we manufacture in-house ready-to-press powders, which allows us to tailor the demand on powder manufacturing based on customer product needs. Further, the lean manufacturing setup enables us to quickly respond and adapt to changing requirements easily.

FLOW CONTROL VALVES

Hyperion manufactures the entire range of flow control choke valve parts with high performance erosion and corrosion resistant tungsten carbide grades. We have a market leading position and offer unique and patented carbide grades along with the ability to formulate the grade specific to your need.

The components include, but are not limited to, cages, sleeves, seats, points, rings, and discs for different design valves. Some of the features in these components are typically green machined to final tolerance, which enables these carbide components to have intricate geometrical features. These finished components can be directly assembled by customers in their valves.

Flow control sub-assemblies are manufactured by joining a tungsten carbide finished valve component with stainless steel/Inconel components to meet the customer valve design specifications. The sub-assembly is machined to final tolerance with the desired coating or surface treatment and is ready for direct assembly in the customers' flow control valves.

HYPERION APPLICATION SPECIFIC ENGINEERED SOLUTIONS

COMPONENTS AND SUB-ASSEMBLIES

Hyperion Materials & Technologies partners with its customers to develop tailor-made solutions and manufactures precision components and sub-assemblies for:

- Directional drilling
- Completion tools
- Pressure pumping
- Well services.

Precision components are made from high performance tungsten carbide grades that are finished to tight tolerances. Sub-assemblies are tungsten carbide components usually joined with other materials including stainless steel, Inconel, titanium, and diamond that are finished and ready for direct assembly into customers' tools.

Hyperion has successfully developed and supplied precision components and sub-assemblies for rotary steerable systems (RSS), measurement while drilling (MWD) tools, autonomous inflow control devices (AICDs), frac seats, valves, and well services.

A successful example of sub-assemblies is PCD faced tungsten carbide valve and seat assemblies for advanced RSS systems. These enable our customer to deliver precision, speed, and accuracy that are essential for drilling longer laterals in a short amount of time and at optimum cost.

A broad range of application specific, high performance, tungsten carbide grades are available for design and development of precision components and sub-assemblies for the oil & gas industry. Hyperion can partner with its customers and offer a unique platform for rapid prototyping, testing, and industrialization of new products. Our customers need not look for multiple vendors to develop components with different materials and processes as we provide a single window for a complete solution.

HYPERION TUNGSTEN CARBIDE GRADES

Hyperion Materials & Technologies develops and manufactures a wide range of tungsten carbide grades for your oil & gas needs. Below is a sampling of our grades and their applications, including the new high performance grades DZ07 and CR9C.

HYPERION TUNGSTEN CARBIDE GRADES

Hyperion Grade	Average Carbide Grain Size (µm)	Hardness at 20°C HRA	Density (g/cm³)	Material Attributes			Application Examples
				Corrosion	Erosion	Toughness	
DZ05	0.8	93.5	15.0	■	●		High erosion resistant choke valves, AICDs, and MWD/LWD components
H6F	0.8	92.6	14.9		●	■	Choke valve components
H6N	2.0	91.8	14.9		●	■	Choke valve components
DZ07	1.0	92.9	14.7	●	●	■	High erosion resistant choke valves, AICDs, and MWD/LWD components
CR9C	1.0	91.8	14.6	●	■	■	Subsea choke valves, directional drilling bushings, seats for frac pumps, and AICDs
C9M	4.0	90.2	14.6	●	■	●	Directional drilling bearings and bushing components
DZ10	0.8	92.1	14.5	●	■	●	Seats for frac pumps
H10F	0.8	91.9	14.5		■	●	Directional drilling flow divider components
H11N	4.0	88.7	14.4		■	●	Nozzles
AM12	0.8	91.5	14.2	●	■	●	Subsea choke valves, directional drilling bushings, seats for frac pumps, and AICDs

● Primary attribute(s).
■ Secondary attribute(s).

NOTES

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