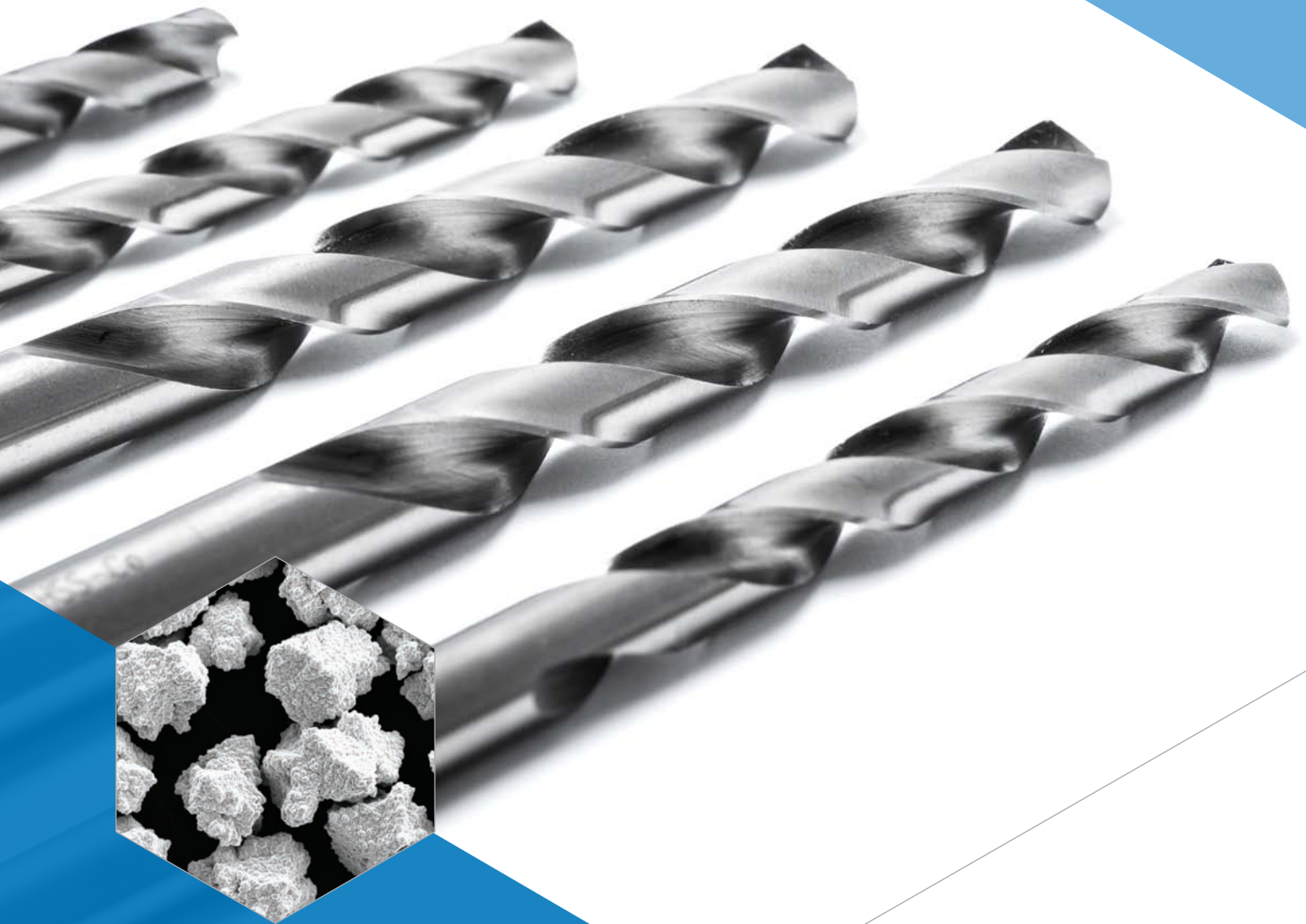


TOOLMAKER SOLUTIONS
RVG[®] Diamond



Diamond abrasive for
premium applications
in carbide grinding
and electronics

 **HYPERION**
Materials & Technologies

RVG[®] DIAMOND

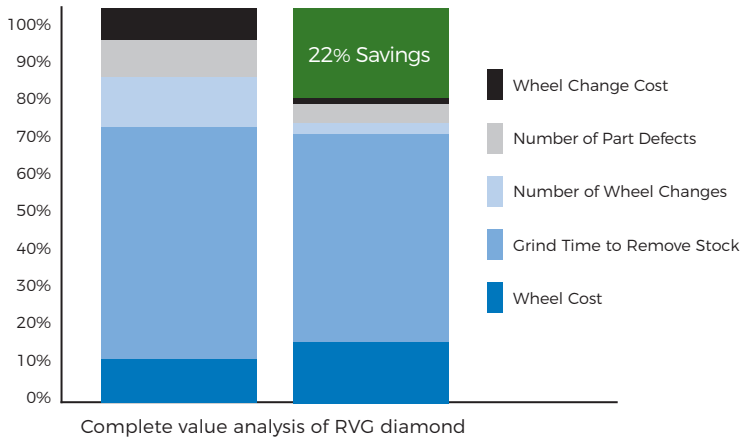
SIX SIGMA CONTROLLED QUALITY

Hyperion's RVG diamond family is engineered to provide optimum performance in a wide range of non-ferrous materials. Its properties extend from defined tough blocky crystals to highly friable irregular shapes. These characteristics coupled with a proprietary Six Sigma controlled manufacturing process provide the most comprehensive and consistent series of diamond grinding products on the market.

SUPERIOR PERFORMANCE IN ALL BOND SYSTEMS AND PROVEN SUCCESS ON HARD-TO-GRIND MATERIALS

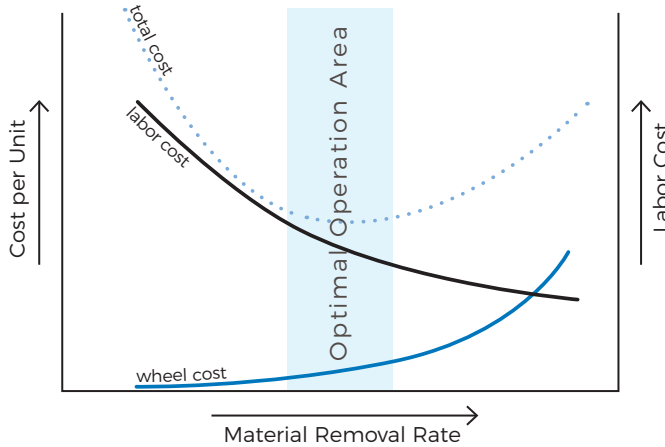
RVG diamond achieves optimum performance in all bond systems, from phenolic resin to high temperature polyimide resin and vitreous bonds. Challenging materials such as tungsten carbides, glass and technical ceramics are no match for RVG diamonds. This product achieves considerably higher material removal rates and excellent surface finishes in wet or dry grinding modes. In addition, RVG diamond proves to be highly cost effective. Significant increases in productivity and workpiece quality can be achieved if RVG diamond products are utilized following the recommended application guidelines.

TOOL MANUFACTURING COST COMPARISON



Complete value analysis of RVG diamond

OPTIMIZED TOTAL GRINDING COSTS



One of the most significant cost factors in a grinding operation is the relationship between wheel performance and the costs incurred to attain these performance capabilities. Tools made with RVG diamonds help the end user to remain consistently in an optimal operation area.



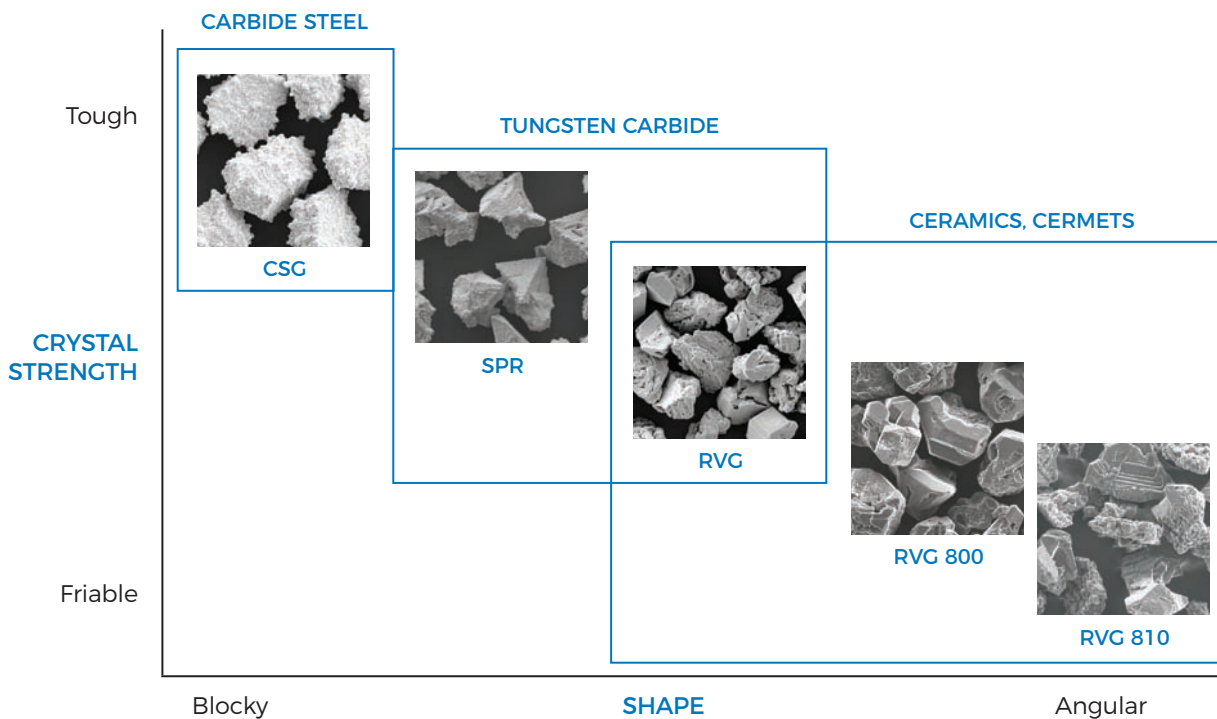
RVG® DIAMOND

REAL VALUE GRINDING

Oftentimes, the price to performance value measurement is simply calculated as wheel cost per part. Use of RVG diamonds shows an advantage using this simple measurement; however, it does not fully depict the total cost benefit achieved. Many hidden costs are directly impacted by the performance of superabrasive diamond, including direct and indirect grinding costs and downtime process. Real value grinding with RVG diamond maximizes productivity within the entire grinding process.

ADVANTAGES OF REAL VALUE GRINDING

- Fewer tool changes
- Labor cost savings
- Reduced scrap rate
- Enhanced overall productivity
- Increased parts per hour / cycle time reduction
- Reduced machine maintenance / increased machine uptime
- Increased production capacity without additional capital investment.



RVG® DIAMOND

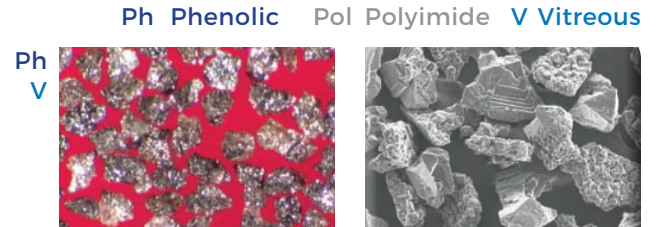
HIGH FRIABILITY

RVG 810 Series

RVG 810 Diamond

Uncoated

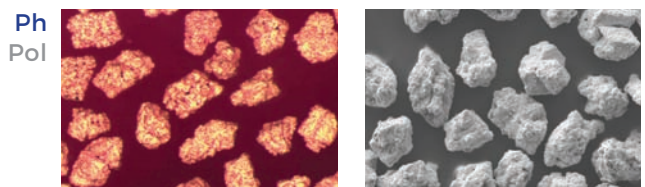
This product is ideal for high precision grinding in demanding materials with stringent quality requirements. RVG 810 diamond is extremely effective where wheel life and/or form retention are critical.



RVG 810D Diamond

Copper-based alloy coating [coating level 50 wt %]

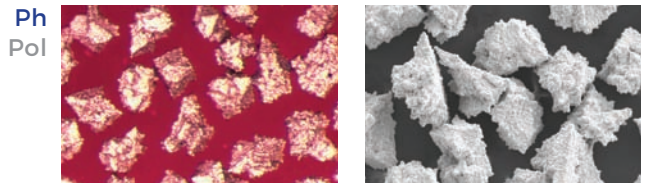
RVG 810D diamond is a highly friable crystal with Cu coating for ideal performance in dry phenolic or wet polyimide grinding of carbides and polycrystalline diamond (PCD).



RVG 890 Diamond

Nickel-based alloy coating [coating level 56 wt %]

This is the most productive crystal in the RVG diamond family. It boasts excellent free cutting characteristics and controlled micro fracturing mode while providing superior surface finishes. RVG 890 diamond is unparalleled in part-to-part consistency when it comes to technical ceramics, CERMETS and new hard-to-grind materials.

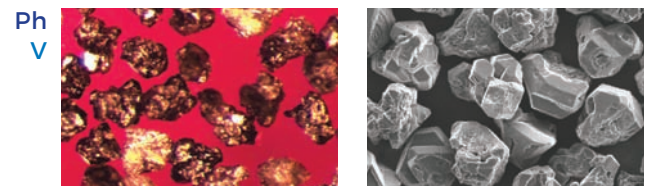


RVG 800 Series

RVG 800 Diamond

Uncoated

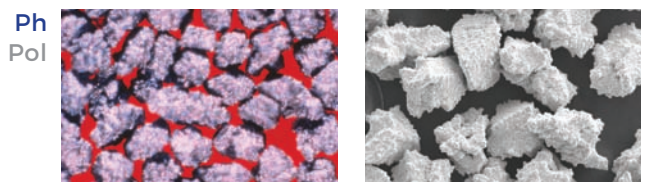
RVG 800 diamond offers superior free cutting capabilities due to the controlled microfracturing of the crystals. It is suitable for applications with demanding tolerance requirements. Consistent finishes and accurate geometries are achieved in grinding of tungsten carbides, new materials, CERMETS, and technical ceramics.



RVG 880 Diamond

Nickel-based alloy coating [coating level 56 wt %]

RVG 880 diamond offers even more improved free cutting and fracture characteristics, provides extended wheel life and requires low grinding power. Textured coating enhances crystal retention while extracting heat from the grinding interface. This diamond is highly suitable for wet grinding of cemented carbide and ceramic workpieces.



RVG® DIAMOND

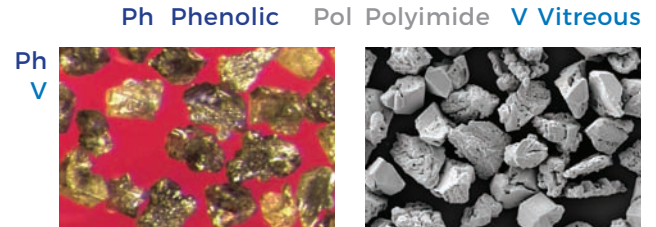
MEDIUM TOUGHNESS AND FRIABILITY

RVG Series

RVG Diamond

Uncoated

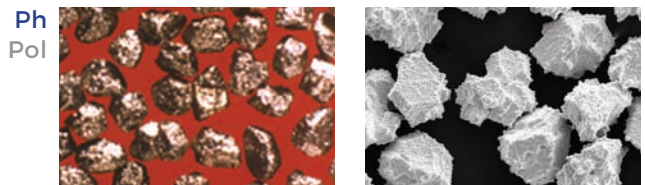
Shape irregularity enhances bond retention while friability enhances self-sharpening and free cutting properties. Uncoated RVG diamond is recommended for wet or dry tungsten carbide grinding and difficult-to-grind technical ceramics such as SiN and SiC.



RVG W Diamond

Nickel-based alloy coating [coating level 56 wt %]

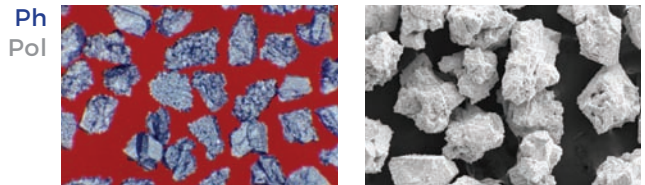
RVG W diamond is designed for and globally successful in wet grinding applications. The product is universally applicable and the most widely used diamond in phenolic bonds on the market today. Enhanced bond retention and heat dissipation result in prolonged tool life.



RVG W30 Diamond

Nickel-based alloy coating [coating level 30 wt %]

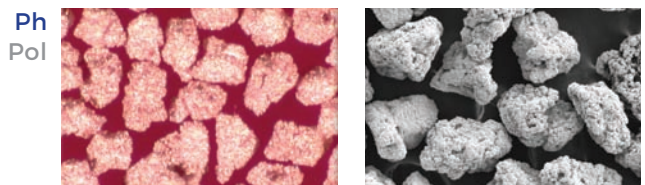
RVG W30 diamond is an effective compromise between free cutting RVG diamond and longer life RVG W diamond. Balance between long life and low power consumption is achieved with RVG W30 diamond, which is widely used in tungsten carbide tool grinding.



RVG D Diamond

Copper-based alloy coating [coating level 50 wt %]

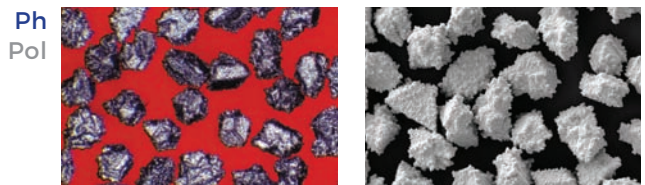
Due to its excellent thermal conductivity, RVG D diamond is widely used in demanding wet and dry tool room applications where temperature control is a must.



RVG WS60 Diamond

Spike nickel-based coating [coating level 60 wt %]

RVG WS60 diamond has a specially designed coating for improved bond retention in wet grinding applications, namely water-based coolants. Highly thermal resistant metallic spikes provide extremely long life in severe applications. Excellent thermal stability makes this diamond ideal for applications with long contact lengths such as flute grinding of tungsten carbide drills and face grinding of technical ceramics.



RVG® DIAMOND

MEDIUM TOUGHNESS AND FRIABILITY

RVG Series

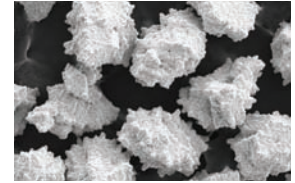
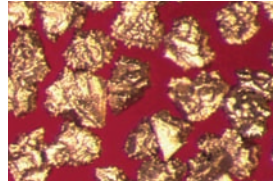
RVG NS56 Diamond

Spike nickel-based coating [coating level 56 wt %]

RVG NS56 diamond is engineered to expand the bond retention advantage of spike nickel coatings to all general purpose applications. It is also universally applicable in all wet grinding applications. The performance advantage offered by the spike coating can be realized in both phenolic and polyimide bonds systems.

Ph Phenolic Pol Polyimide V Vitreous

Ph
Pol

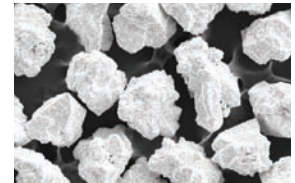
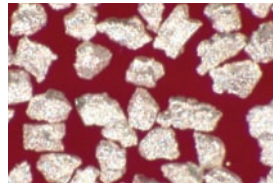


RVG AG50 Diamond

Silver coating [coating level 50 wt %]

This product is specially designed for tungsten carbide flute grinding with straight oil coolant. Characteristics of this diamond are friable, irregular shapes with a spike silver coating that enhances bond retention, adds lubricity and dissipates heat quickly. Carbide cracking, smoke generation and short wheel life can be eliminated when straight oil is used as a coolant. Other benefits of RVG AG50 diamond are prolonged tool life and decreased power requirements. Best results are produced at low wheel speeds.

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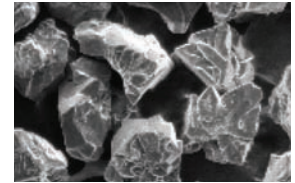
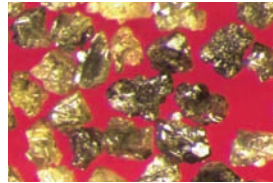
RVG 2 Series

RVG 2 Diamond

Uncoated

RVG 2 diamond is an uncoated, medium-grade resin bond diamond. The product was designed for applications that require performance better than that of economy-grade diamond. The product offers controlled fracturing and self-sharpening properties that lead to excellent free cutting.

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V

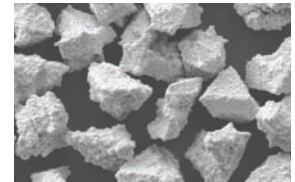
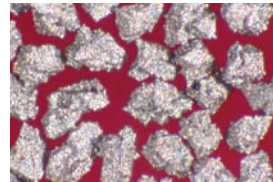


RVG 2-W Diamond

Nickel-based alloy coating [coating level 56 wt %]

This product is the coated version of our medium grade resin bond diamond. RVG 2-W diamond is produced with an improved nickel coating that is ideal for wet grinding of ceramics and tungsten carbides. The enhanced coating improves bond retention, resulting in long tool life and consistent performance.

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Pol



RVG® DIAMOND

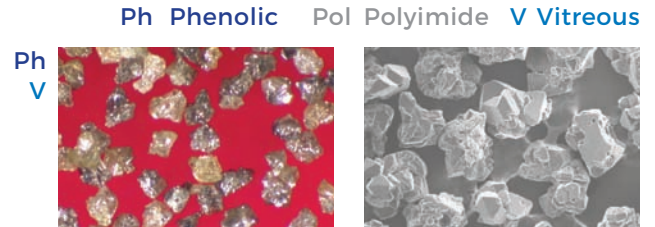
MEDIUM TOUGHNESS AND FRIABILITY

SPR Series

SPR Diamond

Uncoated

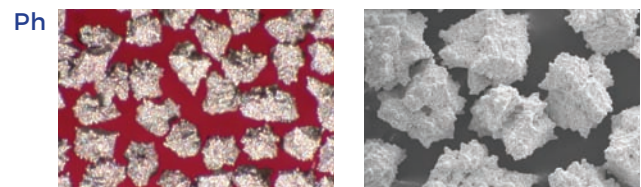
This economy grade grinding product is used for less demanding applications where abrasive cost is the primary consideration. The friability of SPR diamond enables controlled diamond fracturing, wheel self-sharpening and free cutting action.



SPR N Diamond

Nickel-based alloy coating [coating level 56 wt %]

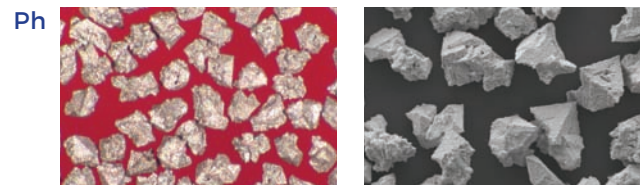
SPR N diamond has a standard nickel coating for improved retention and heat dissipation in bond, resulting in longer wheel life.



SPR N30 Diamond

Nickel-based alloy coating [coating level 30 wt %]

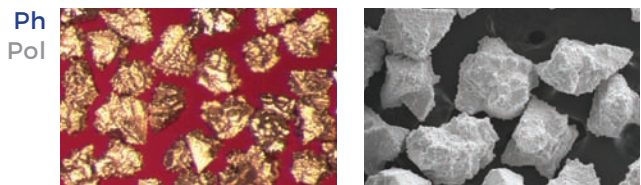
SPR N30 diamond is similar to SPR N but has a 30% coating level that enables a reduction in grinding energy and heat generation yet maintains minimal reduction in wheel life.



SPR CU50 Diamond

Copper coated [coating level 50 wt %]

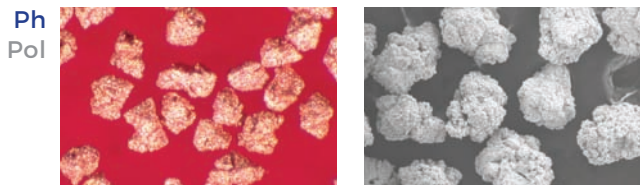
Copper coating increases the thermal conductivity of the wheel rim while improving heat dissipation. SPR CU50 diamond prevents thermal workpiece damage in dry grinding applications.



SPR NS56 Diamond

Spike nickel-based coating [coating level 56 wt %]

Spike nickel-based coating is designed to increase crystal retention in the bond system. Often crystal concentration can be reduced compared to standard coatings, providing additional value.



RVG® DIAMOND

HIGH TOUGHNESS

CSG Series

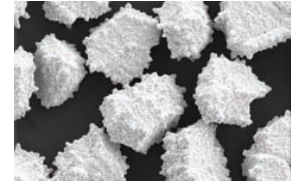
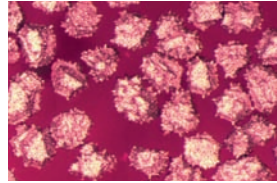
CSG-II Diamond

Nickel-based alloy coating [coating level 55 wt %]

This very tough diamond reduces wheel loading and minimizes workpiece burn when grinding tungsten carbide/ steel combinations. Due to its toughness and impact resistance, CSG-II diamond is highly recommended for heavy duty grinding and applications with interrupted cut.

Ph Phenolic Pol Polyimide V Vitreous

Ph



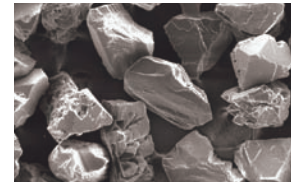
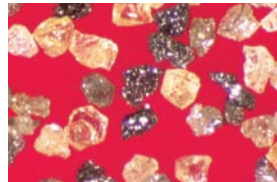
RB Series

RB-I Diamond

Uncoated

RB-I diamond is best suited for applications where free cutting capabilities, low cutting forces and thermal stability are required. Tungsten carbide and PCD grinding are excellent matches for this diamond.

Ph
V

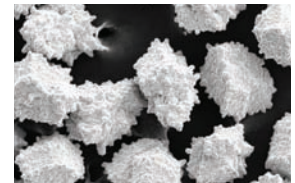
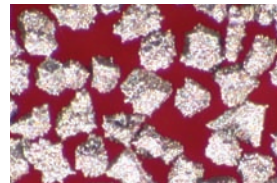


RB-II Diamond

Nickel-based alloy coating [coating level 56 wt %]

This blocky crystal form provides long tool life in applications where high material removal rates in hard-to-grind materials are a priority. Very good results are delivered in applications that sustain interrupted cuts. RB-II diamond is recommended for tungsten carbide and PCD grinding.

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Pol

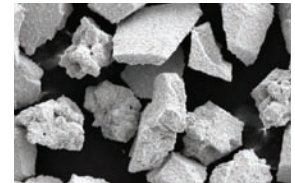
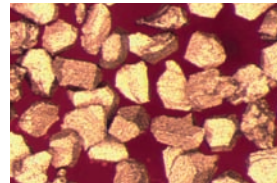


RB-II 30 Diamond

Nickel-based alloy coating [coating level 30 wt %]

This diamond is similar to RB-II diamond but has a lower coating level. RB-II 30 diamond provides lower grinding energy and heat and is ideal where a balance of wheel life and grinding energy is critical.

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Pol

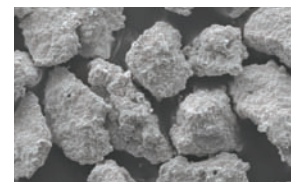
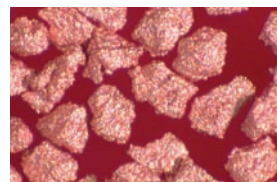


RB-D Diamond

Copper-based alloy coating [coating level 50 wt %]

RB-D diamond is a blocky crystal with copper coating applied, which provides excellent performance in dry grinding or wet polyimide, tungsten carbide and PCD grinding.

Ph
Pol



RVG® DIAMOND

LEADER IN DIAMOND COATING PROCESSES

Hyperion continues to be recognized as the premier coating expert for industrial diamond grinding products. A variety of high-tech coatings is offered to enhance diamond performance. The success results from the combination of first grade crystals and a superior coating technology.

NICKEL COATING

Nickel coating is recommended for use in phenolic resin bonds and polyimide bonding systems to improve the mechanical retention characteristics of the diamond, grinding wheel life and surface finish.

Spike nickel coating provides an extremely spiked surface texture and achieves superior retention of RVG diamond. Excellent heat dissipation allows for aggressive material removal rates.

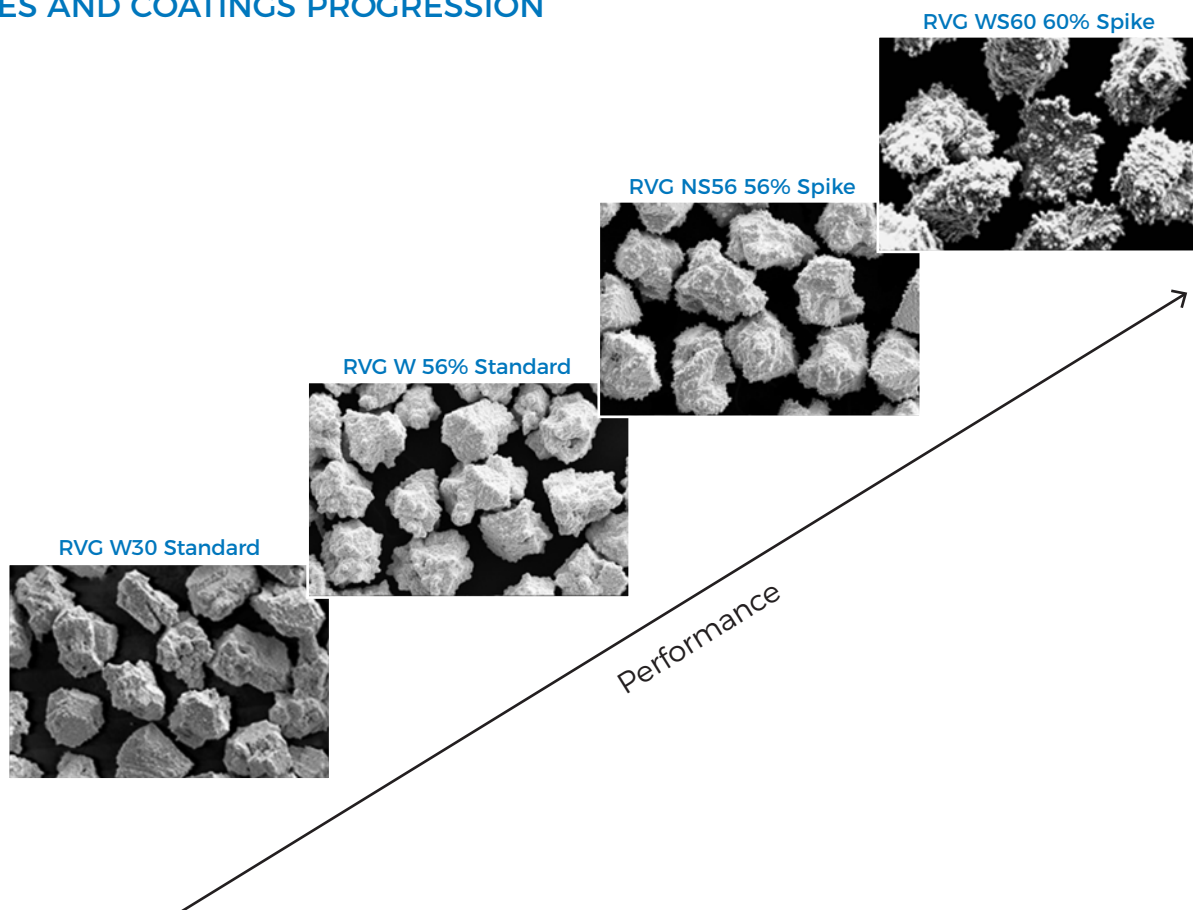
COPPER COATING

Copper coating provides improved chemical adhesion as well as mechanical retention of RVG diamond. It is very effective in dry grinding applications by transferring the heat from the cutting zone to the rim of the wheel.

SILVER COATING

Silver shows the best thermal conductivity of all coating materials. The spike silver coating not only enhances bond retention but adds lubricity and dissipates heat away from the grinding zone. Grinding wheels using silver coating prove successful in applications where straight oil coolants are used.

TYPES AND COATINGS PROGRESSION



RVG® DIAMOND

COATING TYPES

	UNCOATED	STANDARD NICKEL		SPIKE NICKEL		COPPER	SILVER
TOUGHNESS		56% Ni	30% Ni	56% Ni	60% Ni	50% Cu	50% Ag
Friable	RVG 810	RVG 890				RVG 810D	
	RVG 800	RVG 880					
	RVG	RVG W	RVG W30	RVG NS56	RVG WS60	RVG D	RVG AG50
	RVG 2	RVG 2-W					
	SPR	SPR N	SPR N30	SPR NS56		SPR CU50	
	RB-I	RB-II	RB-II 30			RB-D	
Tough		CSG-II					

AVAILABILITY CHART

US Mesh FEPA	60/80 D252	80/100 D181	100/120 D151	120/140 D126	140/170 D107	170/200 D91	200/230 D76	230/270 D64	270/325 D54	325/400 D46	400/500
CSG-II	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RB-I	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RB-II	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RB-II 30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RB-D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RVG	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RVG NS56	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RVG W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RVG W30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	•
RVG D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RVG WS60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RVG 800	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RVG 810	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RVG 810D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RVG 880	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RVG 890	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
RVG 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RVG 2-W	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RVG AG50	n/a	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
SPR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SPR N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SPR N30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SPR CU50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n/a
SPR NS56	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Available • Special [please refer to your sales representative]

Order example [Product name, US mesh size or FEPA designation]: RVG-W30 120/140 or RVG-W30 D126.



