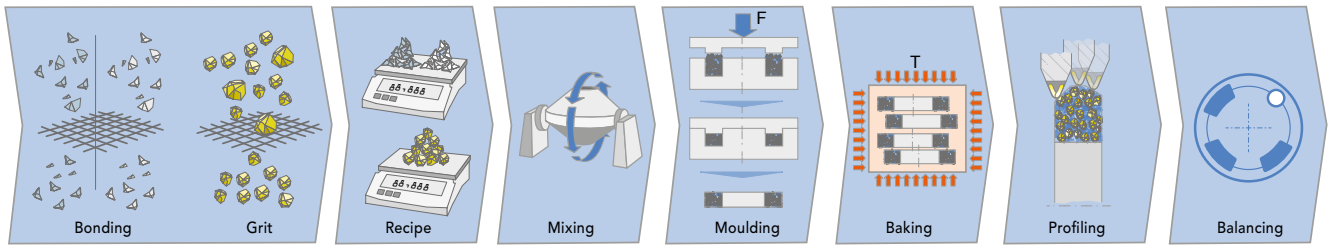
VITRIFIED BOND

TOP QUALITY PERFORMANCE - DRESSABLE

In the past few years vitrified bonded CBN has added a higher level of performance to grinding operations. The wear-free bond fully utilizes the high thermal and chemical stability of CBN in the grinding process. Advanced dressing techniques, tools, and machine concepts have now produced a grinding system that provides economic and efficient solutions when it comes to the high production of steel components.
Vitrified bonded diamond grinding wheels supply the best results for machining high-precision components made of non-ferrous materials.
Whether it is a matter of high-performance wheels or precision machining, vitrified bonds can be specifically designed for application-specific processes to permit the full utilization of CBN and Diamond superabrasives.

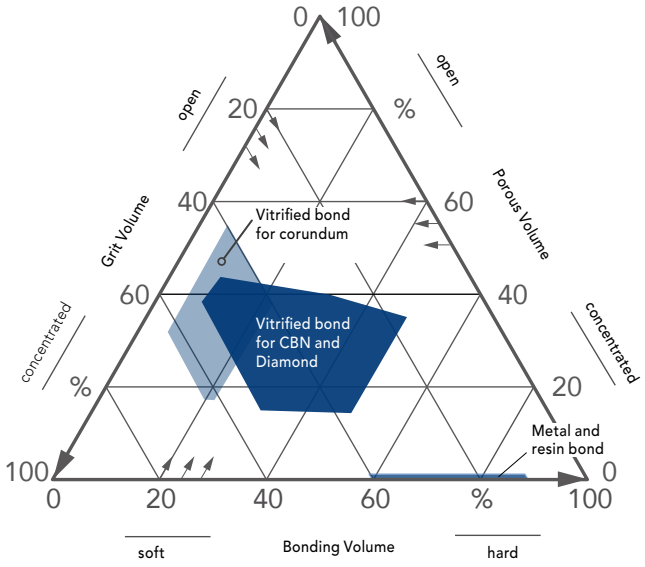
PRODUCTION PROCESSES

Extreme precision is required to achieve a constant quality of the various bond components and manufacturing variables. The bonding materials and grit are combined and mixed based on individual recipes. The finer the grit size of the recipe, the greater the resources needed. Depending on the layer size, the mixtures are pressed into special moulds and then cured in a furnace based on specific firing curves. In addition, inert gases prevent the undesired formation of oxidation. Grinding wheels receive their final geometry by profiling - this is a complex process utilizing diamond dressing tools. Before the grinding wheels are shipped, they are subjected to a balancing test to permit high-speed operation on the machine.



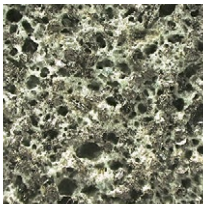
CLEAN GRINDING TOOLS GRIND BETTER

Abrasive grit, bond, and pores: that's all a grinding wheel needs. The abrasive grit grinds, the bond holds, and the pores remove the chips. Supporting grit (e.g. Aluminum Oxide or SiC) is only used in special cases. This makes DR. KAISER grinding wheels unique in their applications.

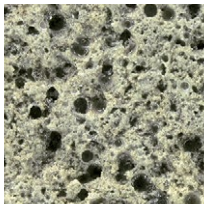


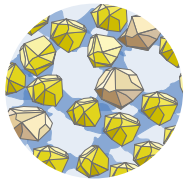
B151/181 – open structure

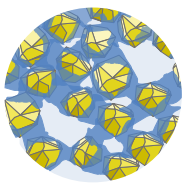
B151 – concentrated structure

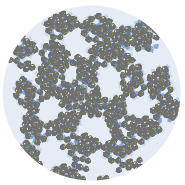


B3/6 – open Struktur









POROSITY - THE KEY TO CUTTING EFFICIENCY

Grinding tools from DR. KAISER feature a high volume of pores. This is possible by applying innovative production technology. Pore volumes up to 60% in conjunction with high-strength bonds give grinding wheels an effective cutting performance and make them very easy to dress. They permit the more efficient transportation of lubricoolant to and from the contact zone. This results in cooler grinding at higher speeds.

GRIT TYPES

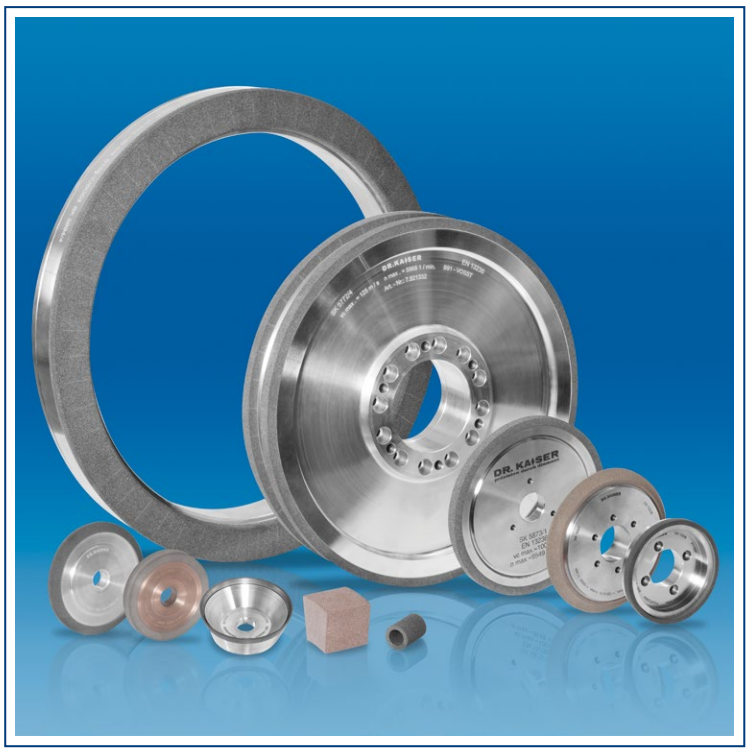
There are different types of CBN. The wide color spectrum ranges from black and brown through to amber. The grit shapes vary from blocky to splinter-shaped and lead to micro- or macrofracturing in use, despite its monocrystalline crystal structure. This results in a wide variety of applications that are modified to the process on a case-by-case basis.

There are different types of diamond. An increased use of synthetic grit has reduced the amount of wheels using natural grit. The reasons for this trend include the better availability and homogeneous quality of synthetic grits.

CBN

Synthetic diamond

VITRIFIED BOND



ALL SHAPES AVAILABLE

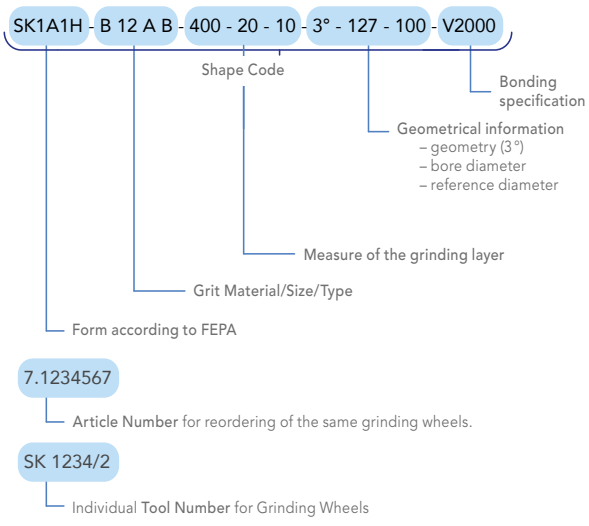
The large number of different grinding applications require an equally large number of wheel shapes. DR. KAISER supplies small grinding pins with diameters from 25 mm through to OD grinding wheels with diameters of 750 mm and centerless wheels with widths up to 500 mm. Grinding wheels are available with any profile. The standard shapes in compliance with FEPA* are available as well as special requirements.

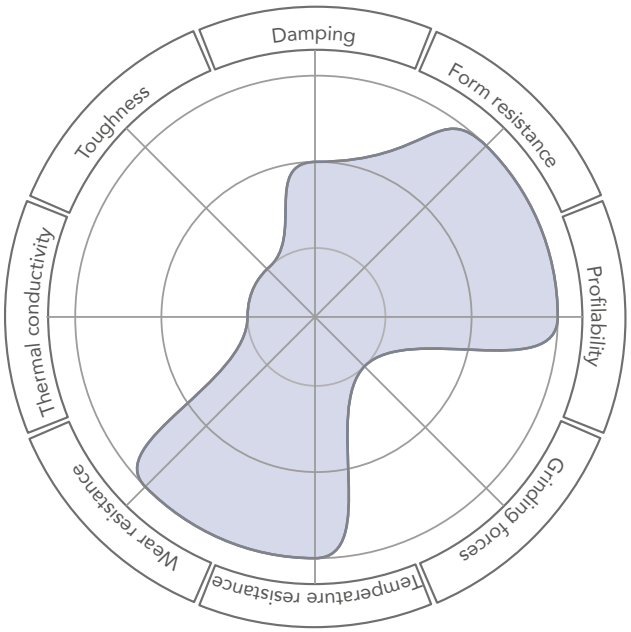
* Fédération Européenne des Fabricants de Produits Abrasifs.

SHAPE CODE

As with all tools from DR. KAISER, grinding wheels are also described by a type of a „talking" shape code. It reproduces the tool's shape, layer, layer dimensions, and detailed geometric data. The shape data is dependent on FEPA specifications. In addition, every tool type receives its own article number and every tool is given a serial number for unambiguous identification and trackability.

Form of Core	Form of Layer	Configuration	Modification
1	A, G	1	B
2	AH, H	2	C
3	B, K	3	H
4	C, L	4	R
6	CH, M	5	S
9	D, Q	6	V
11	E, U	7	W
12	F, V	8	Y
14		9	
		10	





BOND CHARACTERISTICS

High form stability requires a heat-resistant bond and superabrasive material. Vitrified bonded CBN and diamond grinding wheels possess these properties. Since vitrified bonds are easily dressed due to their brittle nature, vitrified bonded CBN and diamond grinding wheels are used in all types of industry, provided the grinding machines are capable of high cutting speeds.
Grinding wheels from DR. KAISER are designed to optimize grinding and dressing characteristics. Ask our experts to help with your applications.

SEGMENTING

Grinding layers up to 250mm in diameter are produced in the form of rings and are directly bonded to the wheel body. We also use individually produced segments which are fixed to the wheel body by gluing. This makes production easier and the tools efficient. Whether your requirement is for straight or formed layer segments, DR. KAISER can supply.

closed ring | straigth segments | beveled segments

ACCURACY

All wheels are subject to extremely high accuracy requirements and are preprofiled close to the final contour in processes which are gentle to the layer. To shorten initial dress time on your machine, we can manufacture to tolerances of less than 1/100 mm. Every vitrified CBN or Diamond grinding wheel has measuring surfaces which permit concentricity and face runout checks on the machine.

DELIVERY OPTIONS

Extreme precision is required to assemble grinding wheels. The tools have precision-machined reference surfaces which permit fine adjustment on the spindle flange. We ship your grinding wheels in wooden crates for safe transportation. On request, we will also supply you with a test coupon of the wheel profile.
Every grinding wheel leaves our plant with a test report that meets your inspection requirements after consultation with you.

VITRIFIED BOND

Core	Damping	Strength	Weigth
Aluminium	--	++	o
Al/Resin	+	o	o
Steel	-	++	--
Ceramic	+	-	o
Carbon fiber reinforced body	++	++	++

BODY MATERIAL - NOT ONLY A QUESTION OF WEIGHT

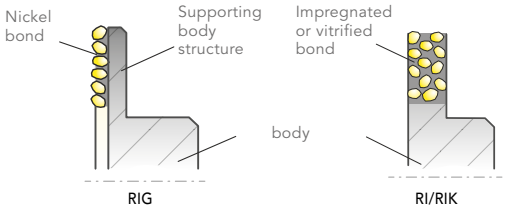
Diamond and CBN grinding wheels normally consist of a relatively thin-walled grinding layer fixed to a wheel body made of aluminum, steel, bronze, ceramic, or reinforced resin. The wheel body material not only determines the weight of the wheel, it also affects damping and strength.
The lighter a grinding wheel, the easier it is to retool the machine. Carbon fiber-reinforced grinding wheel carrier bodies are more frequently used due to their excellent damping properties and high strength. This new material has a density of ρ = 1.5g/cm³ and is an interesting alternative, especially with large grinding wheel sizes, difficult mounting situations, and high cutting speeds. The spindle's low mass moment of inertia is also a benefit for lower starting loads.

DRESSING VITRIFIED CBN GRINDING WHEELS

Ceramic bonded grinding wheels are particularly easy to dress due to their brittle bond. The „classic" dressing tool for profiling superabrasive grinding wheels is the sturdy, single-layer, nickel electroplated tool (RIG). Tools with sintered multilayers (RI) offer longer service lives and dressing capability with high cutting performance. Ceramic bonds (RIK) are ideal for intricate applications and the dressing of miniature grinding wheels. Modified or handset sintered tools (NC) are an excellent compromise between cutting performance and wear, and meet various requirements. The NCC point-crush dressing tool features a higher diamond concentration and has particularly low wear during crush dressing (q_d=1).

As a systems provider, DR. KAISER has the right grinding wheel for the job and – if necessary – the right dressing system. You will find further details on dressing vitrified bonded CBN wheels in our dressing brochure. Our experts will be delighted to assist you in selecting, designing and installing application-specific grinding wheel and dressing systems.

Self-Sharpening



Stable Form