

Bonded Abrasives



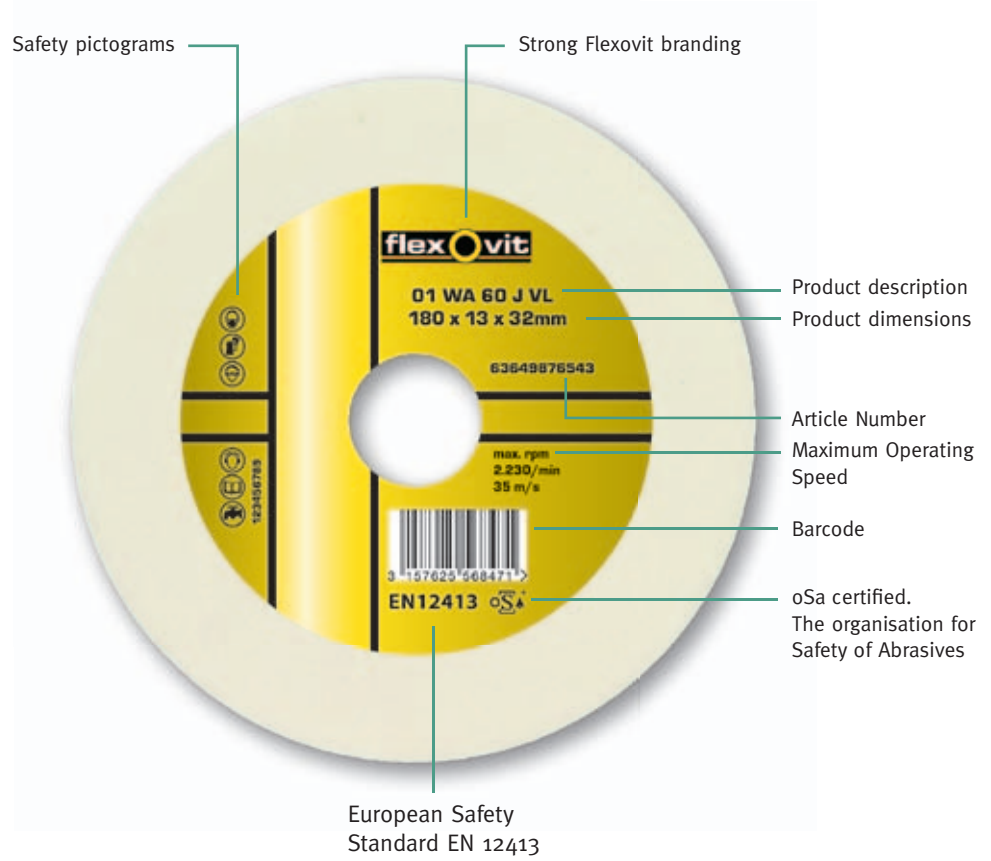
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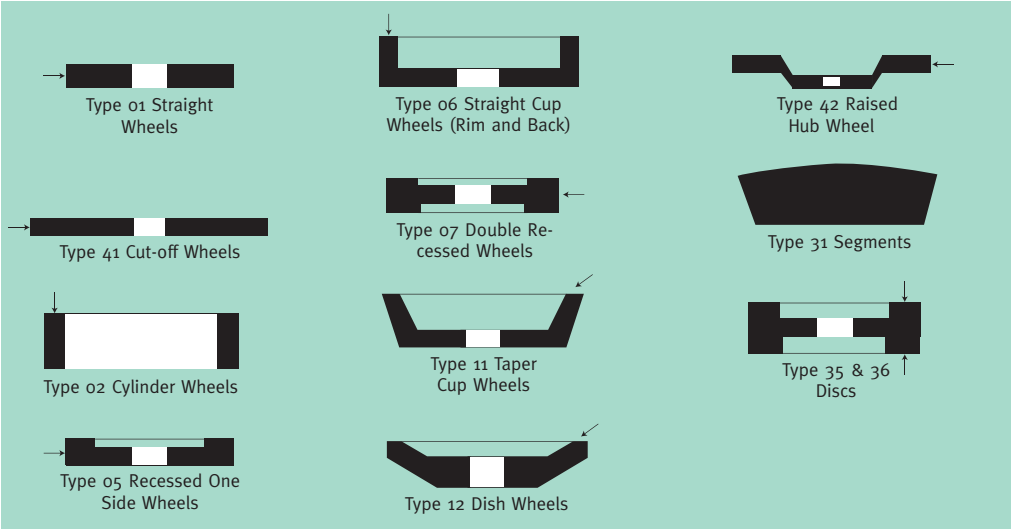
Technical Information

Flexovit has a reputation for meeting the changing needs of industry, coupled with a comprehensive support and technical service from teams of experts with knowledge in a wide variety of industrial applications.

Understanding the Product



STANDARD GRINDING WHEEL AND PERIPHERY SHAPES





What is a Grinding Wheel?

A grinding wheel is a precision tool with thousands of cutting points. It consists of abrasive grains held in a matrix of bond and separated by pores. The abrasive grains are the cutting points while the purpose of the bond is to hold the individual grains together. The pores (hollow spaces between adjacent abrasive grains and the bond) serve to provide clearance for coolant penetration and metal chips removed in the grinding process.

When the wheel is rotated at grinding speed and applied to the workpiece, the abrasive grains cut the material that is being ground, removing the material in small chips.

Under the action of the forces imposed during grinding the abrasive cutting points are worn flat, resulting in the points becoming blunt. This causes an increase in friction, heat build up and the forces imposed on the wheel.

The increase in grinding forces causes either the abrasive to fracture, exposing new cutting edges, or fractures the bond bridges holding the abrasive grains. In the latter case fresh abrasive grains are exposed to cut the workpiece.

In normal vitrified grinding applications the wheel has to be dressed.

By varying the properties of the abrasive, the type of bond, the make-up of the wheel, it is possible to produce grinding wheels with a vast range of different grinding characteristics.

ABRASIVES

Modern synthetic abrasives allow accurate control over the physical properties and form of the abrasive grain. This helps to ensure that grinding wheels can be manufactured with consistent cutting properties.

Flexovit offers a comprehensive selection of abrasive types to provide a wide range of specific grinding characteristics. This is necessary for maximum efficiency in the large variety of operations demanded by the industry today.

Abrasive Grain Size

The grain or grit size is most important in determining a wheel's ability to achieve the required surface finish and remove stock. The size is designated by a number which increases as grain size decreases. For example 10 grit has a median size of about 2.0mm and 60 grit 0.25mm.

Standard sizes are used in all Flexovit wheels as specified in the European Standards laid down by FEPA.

An ideal grinding abrasive has the ability to stay sharp with minimum point dulling, and when dulling begins it fractures revealing new sharp cutting edges. Abrasive grains used in the manufacture of bonded abrasives come in three main categories:

Abrasive Type	Size of the Abrasive Grain			Hardness of the Bond				Type of Bond
	Coarse	Medium	Fine	Soft	Med	Hard	Extra hard	
WA = Aluminium Oxide	C	M	F	Soft	Med	Hard	VHard	V = Vitrified
73A = Ceramic Abrasive	12	46	150	E	J	N	S	B = Resinoid
48A = Semi-friable Aluminium Oxide	14	54	180	F	K	O	T	BF = Resinoid reinforced
A = Aluminium Oxide	16	60	220	G	L	P	U	E = Shellac
GC = Silicon Carbide	20	80	240	H	M	Q	V	R = Rubber
C = Silicon Carbide	24	100	280	I		R	W	
41A = Aluminium Oxide	30	120					X	
44A = Aluminium Oxide	36							
							Z	



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Abrasive Type	Description
41A	Pink Aluminium oxide is a highly refined form of alumina containing a small proportion of chromium oxide. This addition makes 41A a little tougher than pure white, increasing the strength along the shear planes. This abrasive is available in a range of mounted points and wheels.
44A	Semi-pure brown fused aluminium oxide. General purpose abrasive used in the range of resinoid cut off wheels.
48A	Semi-friable alumina, purity falls part way between conventional regular brown alumina and white alumina. The resulting combination of friability and toughness gives wheels using semi-friable alumina their free cutting characteristics. This, combined with good form holding and a high degree of versatility, makes semi-friable alumina is widely used for cylindrical, centreless, crankshaft and angle head grinding operations.
73A	A ceramic form of aluminium oxide that is harder and sharp than conventional abrasive grains. This ceramic grain has a unique microcrystalline structure. The structure of the grain allows individual particles to break away as they become dull. This produces a very free grinding action that at the same time increases the number of parts ground between dressings by up to 70%. A high concentration blended with premium abrasives. Used for grinding hard abrasive resistant steels and operations where high stock removal rates are required.
79A	Blends of premium abrasives that include a low concentration of ceramic abrasive. Used in toolrooms on high vanadium type steels.
A	This is a particularly tough form of aluminium oxide. Its toughness is due to the presence of 3% of titanium oxide in the abrasive. Fired at low temperature the abrasive retains its natural brown colour. Fired at high temperature further oxidation of the titanium oxide takes place which changes the normal brown colour to a grey-blue. Because of its toughness, regular brown alumina is suitable for grinding high tensile strength materials, specifically off-hand grinding (bench grinding wheels) and sharpening stones.
C, GC	Silicon carbide abrasives are harder than the alumina type abrasives and are also more brittle. Silicon carbide abrasive is used for grinding low tensile grey iron, chilled iron, cast iron, soft bronze, copper, aluminium, stone, marble, rubber, hard facing alloys, and cemented carbides. There are two varieties of silicon carbide, very similar in physical properties and mainly distinguished by the colour. Black silicon carbide, is generally used for roughing operations in coarse grit and resinoid wheels. Light green silicon carbide, is preferred for specific applications such as most precision and carbide tool grinding.
52A	A blend of white and brown alumina, wheels containing this abrasive combine the toughness of brown with the cool, sharper cutting of white alumina. Used for sharpening engraving cutters and grinding hard chrome.
WA	White alumina is a highly refined form of aluminium oxide containing over 99% pure alumina. The grain structure is made up of several crystals that allow the grain to breakdown along the shear planes between the crystals as the grinding pressure increases. This gives wheels containing white alumina a property called 'friability' (the ability to fracture, exposing sharp cutting edges, as opposed to blunting). Used mainly for the grinding of very hard or heat sensitive materials.



BOND

Flexovit supplies bonded abrasive products made using both resinoid and vitrified bonds.

Vitrified Bond

Vitrified bonded wheels have a porous structure composed of abrasive particles held together by bond bridges of glass or similar vitreous material. Their strength is developed by firing in kilns at temperatures between 900 to 1250°C. Since vitrified bonded wheels are manufactured at such high temperatures, they are not affected by heat generated during the normal grinding process. Individual bond bridges can, therefore, only be fractured by mechanical forces imposed during grinding.

Grain	Bond	
Aluminum Oxide	VL	Low Temp
	VM	High Temp
Silicon Carbide	VK	Low Temp
	VKP	High Temp

Resinoid Bond

A number of different organic polymers are used to bond abrasives but generally resinoid bonds are based on thermosetting phenolic resin. Resin bonds are cured by heating in ovens under carefully controlled conditions at selected temperatures between 150°C and 200°C.

Resinoid wheels are tougher and less brittle than vitrified wheels. Their inherent toughness makes them ideally suited to heavy duty operations or high operating speeds, often with the aid of fabric or steel ring reinforcement.

GRADE

Grade is a measure of the bonding strength of the wheel, usually referred to as 'hardness'. Hardness will vary according to the amount of bond and abrasive in the wheel. Grade is not a measure of the hardness of the abrasive material but of the tenacity of the bond to hold the abrasive grains together.

Very hard abrasive can, theoretically, be bonded into a very 'soft' free cutting, fast wearing wheel, but an increase in the amount of bond will make the wheel act harder.

The grade of all Flexovit wheels are designated by letters of the alphabet and can range from 'E' for very soft to 'Z' for the hardest. A + sign after the letter indicates a hardness slightly greater than the grade.

Selecting the Right Product

There are nine main factors to be considered when selecting a grinding wheel for any application:

- The material to be ground – its type and hardness
- The stock to be removed
- The workpiece geometry and surface finishes required
- The grinding machine, the type of machine, the power available and its conditions
- Wheel speeds and feeds
- Grinding contact area
- Grinding fluid – whether the operation is wet or dry
- The severity of the grinding operation
- The dressing method

MATERIAL TO BE GROUND

The type of material affects the selection of abrasive, grit size and grade. Alumina type abrasives are the most suitable for grinding high tensile materials such as steel and ferritic cast irons. The more friable types of alumina are preferred on harder steels and applications having large arcs of contact.

Low tensile strength materials and non-metallic materials are most efficiently ground or cut with silicon carbide abrasive.

The hardness of the material governs the amount of penetration that can be achieved by the abrasive. For this reason finer grit size wheels are required to grind hard materials and soft materials are best ground with medium to coarse grit size wheels.

For most efficient operation the grade must be adjusted to suit the hardness of the material. As a general guide, the harder the material, the softer the grade of wheel required.



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STOCK TO BE REMOVED & SURFACE FINISH

This affects the choice of abrasive size and bond type.

High stock removal rates, as in fettling operations, require coarse grit wheels, typically 12 to 24 mesh. Fine finishes and tight limits on finished workpiece geometry require finer grit sizes.

Final surface finish is often achieved by 'spark out'. No further infeed is applied and the wheel is allowed to grind until the majority of the grinding sparks cease.

THE GRINDING MACHINE

The type of machine can effectively define the grinding contact area and the ease with which grinding fluid can be applied to the grinding zone.

The power available on the machine governs the stock removal rate. The greater the power available, the harder the grade of wheel that is required for efficient operation.

Any deterioration in the condition of machine bearings and slideways will lead to vibration and, consequently, premature wheel breakdown. This can, in part, be overcome by using a harder grade wheel and/or a tougher abrasive but the only effective solution is to maintain the machine as recommended by the machine manufacturer.

SPEEDS & FEEDS

The effect of speeds and feeds on grinding action and, hence, the selection of wheel, can best be summarised in the following table:

EFFECT ON GRINDING ACTION		
Speed	Increased	Decreased
Wheel Speed *	Harder	Softer
Work Speed	Softer	Harder
Traverse Speed	Softer	Harder
Infeed Rate	Softer	Harder

* The maximum peripheral speed (m/s) specified for the wheel must never be exceeded.

GRINDING CONTACT AREA

The contact area affects the selection of wheel grade and structure. Large contact areas, as on segmental grinders, generally produce low grinding pressures and require soft grade, open structure wheels. Induced porosity wheels are most efficient for grinding very large contact areas. Conversely, small contact areas, as on cylindrical grinding machines, require harder grade and/or closer structure wheels.

The size of workpiece can also affect the grinding contact area. In general, the larger the workpiece, relative to the grinding wheel diameter, the larger the contact area, requiring softer grade wheels.

GRINDING FLUID

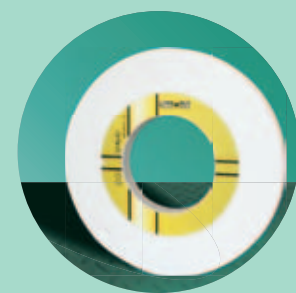
Dry grinding with vitrified wheels require wheels one or two grades softer than when wet grinding.

SEVERITY OF THE GRINDING OPERATION

This can affect the choice of abrasive type, grade and even bond type. Where the wheel is subjected to shock loads, as in fettling operations, a resinoid bond should be used. In general, the more severe the grinding operation, the harder the grade of wheel required and the tougher the abrasive that can be used. Severity of grinding operation can be due to heavy infeeds, high work speeds and traverse rates or intermittent grinding contact. The latter is usually due to workpiece geometry, resulting in a dressing action on the wheel.

GRINDING WHEEL DRESSING & TRUING

Truing and dressing of grinding wheels are often considered to be the same thing, since they are frequently performed as one operation. Truing is performed to ensure concentricity and introduce any profile that may be required on the wheel face. Dressing conditions the wheel surface to give the desired cutting action.



SINGLE & MULTI-POINT DIAMONDS

Diamonds are the first choice where close tolerances, fine finishes, speed and flexibility are required. Since diamond dressing is primarily a machining operation rather than a crushing operation, the surface formed on the wheel is closer than that obtained from mechanical dressers. This results in a slower cutting wheel with better form holding characteristics and superior finish control.

By varying the depth of cut per pass made by the diamond and changing the traverse rate, different wheel surfaces, and hence different cutting actions, can be achieved.

The following are general recommendations for dressing with single point diamonds.

	ROUGHING	FINISHING
Diamond Infeed mm per pass	0.025 mm	0.012-0.020 mm
Diamond Traverse rate mm /wheel rev.	0.18 mm	0.10 mm

The diamond should always be applied at the centreline of the wheel with a 5°-15° drag angle.

Diamond Size

The size of diamond is important when selecting a dressing tool and several factors are relevant in this selection, e.g. large, coarse grit wheels require a larger diamond than smaller, fine grit wheels. If a fine finish is required, the use of a diamond which is too large can adversely affect the finish and cancel the effect of fine grit selection. The trend today is away from single point dressers and towards multi-point dressers employing a matrix shape to suit the form required.

A useful formula for determining single point diamond size is:

Wheel diameter (mm) x Wheel thickness (mm)

MULTIPLY THE DIAMETER OF THE WHEEL BY ITS THICKNESS		
	Diameter x Thickness (mm)	Carat
	<3000	0.25 Carat
	3000-12000	0.50 Carat
>12000	1 Carat	

For best results, always use a coolant when dressing.

Coolant

Dressing with diamonds should always be carried out using a copious supply of coolant. The coolant should always be turned on fully before the diamond touches the wheel. The diamond life will deteriorate rapidly if it is allowed to become hot and then cooled rapidly as can be experienced with an intermittent coolant flow.

Rotation of the Dressing Tool

To ensure maximum diamond life, single point and conical cluster diamond dressing tools should be systematically rotated after every four or five dressings to ensure that the keen edge generated from the drag angle is constantly presented to the wheel.



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Surface Finish

The achievable surface finish in any grinding operation is highly dependant upon the grit size of the grinding wheel. The following chart shows the range of surface finishes achievable when using grinding wheels of different grit sizes on conventional precision grinding applications, together with the minimum form radius that can be ground using each grit size.

Other factors can affect the surface finish achieved. In particular:

- Production grinding applications, with higher stock removal ranges, will give surface finishes at the coarser end of the range
- Plunge grinding applications will often require the selection of a grit size one size finer than shown
- Dressing techniques and the type of material can also affect the surface finish achieved

SURFACE FINISH AND GRIT SIZE									
Surface	Finish	Grain Size							
μ in CLA	μ m Ra	46	60	80	100	120	150	180	220
42	1.10	●							
32	0.80	●							
26	0.70	●							
21	0.50		●						
16	0.40		●						
14	0.35		●	●					
11	0.25		●	●					
8	0.20			●	●				
7	0.17			●	●	●			
6	0.14				●	●	●		
5	0.12					●	●	●	
4	0.10						●	●	●
3	0.08							●	●
2	0.05								●
Min Form Radius	Metric mm	0.75	0.50	0.40	0.25	0.20	0.18	0.13	0.10
	Imp ins	.030	.020	.015	.010	.008	.007	.005	.004

Usage Key

- strongly recommended

Achieving Improved Surface Finishes

By changing the wheel dressing technique, it is possible to achieve finer surface finishes than those shown in the preceding table. As well as reducing the dresser infeed per revolution of the grinding wheel, it is also possible to reduce the infeed and traverse rate when grinding, thus reducing the stock removal rate. Obviously this approach will have limited application in production grinding but it can be very useful in toolroom work.



SOLVING SURFACE FINISH PROBLEMS

Many problems associated with grinding relate to surface finish defects. The following chart describes some common surface finish problems, shows the probable causes and suggests remedies to cure the problem.

TROUBLESHOOTING

Regular spaced chatter marks Immediately after dressing	
Cause	Machine vibration
Solution	Check for wear in machine bearings
Regular spaced chatter marks After a period of time	
Cause	Wheel too hard
Solution	Use softer grade of wheel
Chequered pattern	
Cause	Wheel out of balance
Solution	Balance wheel
Chatter marks	
Cause	Wheel out of truth
Solution	Re-dress wheel
Irregular chatter marks	
Cause	Wheel mounting insecure
Solution	Tighten wheel mounting
Cause	Workpiece centres loose
Solution	Adjust centres
Irregular surface scratches	
Cause	Wheel too soft
Solution	Use fine dress. Reduce workspeed. Use harder grade wheel
Cause	Coolant dirty
Solution	Replace coolant. Check filtration
Spiral marks	
Cause	Dressing techniques
Solution	Check diamond is sharp and secure
Cause	Dressing techniques
Solution	Check dress is parallel
Finish too coarse	
Cause	Grit size too coarse
Solution	Use fine, slow traverse dress
Cause	Wheel too soft
Solution	Decrease workspeed. Use harder grade wheel
Cause	Metal pickup on wheel
Solution	Dress more frequently. Use more open, softer grade wheel



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Mounting

A wheel should only be mounted on to the machine for which it was intended. The speed of the spindle on which the wheel is mounted should not under any circumstances exceed the maximum RPM speed specified for the wheel when it is full size. The wheel should fit freely, but not loosely, on to the spindle or spigot diameter of the flange plates. Wheels, blotting paper washers and flanges should be free from foreign matter. Certain wheels have a positioning mark (Mount Down or Mount Up) marked on them. Care must be taken to ensure that this mark occupies the position stated by the manufacturer.

REDUCING BUSHES

Where a removable bush is used as a means of reducing the bore of an abrasive wheel, care must be taken to ensure the bushes should not project beyond the side of the wheel and the wheel blotter. The clamping faces of the flange plates **MUST** clamp on the mounting washers attached to the wheel and not on any part of the reducing bush. Reducing bushes should never be used on wheels less than 6mm thick or on products with a back or web of less than 6mm. Never use plastic bushes in wheels used with portable grinding equipment.

MOUNTING WASHERS

Blotters should be used with all grinding wheels unless there is a specific exemption. Blotters should be slightly larger in diameter than the mounting flanges and free from any scuffs, wrinkles or other damage.

MOUNTING FLANGES

Mounting flanges are designed to clamp the wheel to the machine and transfer the driving forces from the machine spindle to the grinding wheel. They should be designed to take the driving forces away from the area around the grinding wheel bore and generally should be not less than one third of the grinding wheel diameter.

Flange surfaces should be flat, free from burrs, bumps, bruises and other damage. Flanges should be of equal diameter, have equal bearing surfaces and be properly recessed or undercut.

The rear flange must be positively driven by the machine spindle being either keyed or shrunk onto the spindle.

Flanges must run true to the machine spindle.

Clamping nuts (centre nut locking) should only be tightened sufficiently to hold the wheel securely without slippage and must not be over-tightened. When flanges are clamped by a series of screws, they should be tightened in stages uniformly in a diametric sequence.

In most instances it is appropriate to tighten the nut or screws by hand with the correct tool (spanner or hexagonal socket key) until they stop turning. By adopting this technique it is very rare that the wheel would be under-tightened and impossible to over-tighten the wheel. Bolts for mounting wheels with inserted nuts should be long enough to engage an adequate length of thread, i.e. equal to the thread diameter, but must not protrude through the nut insert.

For recommended designs of flanges, refer to the 'FEPA' Safety.

CAUTION

After mounting or re-mounting a grinding wheel on a machine, stand well clear, ensuring that there are no persons in line with the wheel and allow the wheel to run free for two minutes. A remounted wheel should always be treated as if it were a new wheel.

TYPE o6 CUP WHEELS – FIXED MACHINES

The diameter of the flange and paper washer inside the cup must be smaller than the diameter of the cup recess to avoid any risk of radial pressure on the wheel. When used for work heavier than light tool and cutter grinding, the back flange may be larger than that inside the cup but the recess diameter of both flanges must be equal.

MOUNTED POINTS & WHEELS

The spindle dimensions of the mounted point must be suitable for the collet being used and the spindle overhang corresponding to the machine speed should be observed.

TYPE 31 GRINDING SEGMENTS

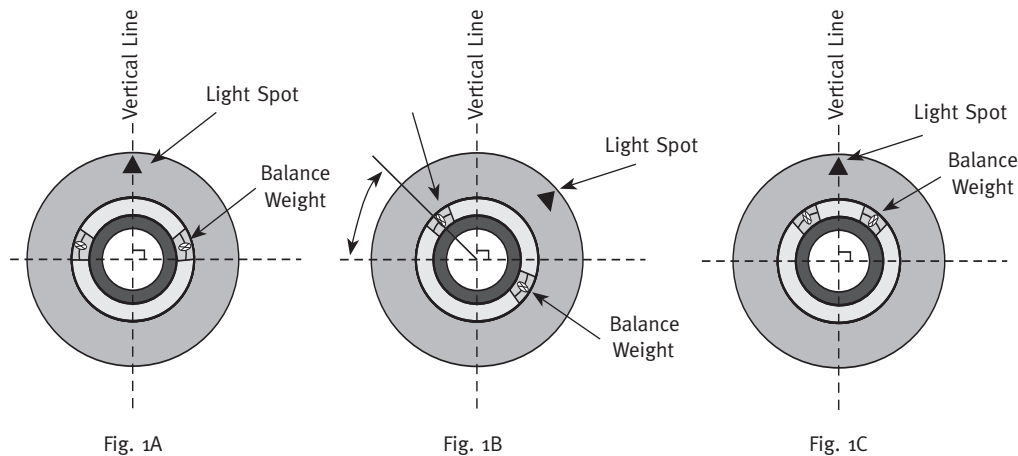
Segments are held by special chucks with suitable provision for adjustment to compensate for segment wear. To prevent breakages segments should not protrude more than 1.5 times their thickness from the clamping chuck face, and should be mounted with markings uppermost.



Wheel Balance

Most Flexovit grinding wheels are balance corrected to a minimum of ISO Standards. Precision grinding machines usually provide methods of accurately balancing the complete wheel and flange assembly. Modern production machines are now supplied with automatic balancing systems, whereas, tool-room and older production machines still have to be manually balanced, ensuring the best possible grinding performance from the wheel. The balancing procedure can be carried out either on a special balancing stand or in-situ on the machine. The machine manufacturer's instructions should be closely followed. There are many methods of manually balancing the wheel assembly, depending upon the number of balance weights in the wheel arbour, a typical 'two weight' balancing system technique is described below.

TWO WEIGHT SYSTEMS



- Mount wheel between flange plates
- Remove balance weights from annular groove on mounting flange (can also be set diametrically opposite if preferred – ensuring the weights cancel each other out)
- Dress periphery of wheel until running in perfect truth
- Remove complete wheel assembly from the machine (after allowing sufficient time for the coolant to spin out) and fix assembly onto the balancing mandrel
- Place on balancing unit and allow to turn freely – When stationary mark top centre (light spot) with chalk
- Re-position the balance weights so that the bottom side face of each weight, that is furthest from the light spot, forms a right angle i.e. 90° . See illustration 1A
- Turn wheel assembly so that one balance weight is approximately 45 degrees from the horizontal line and release the wheel. Note the direction in which wheel rotates, the weight may revolve upwards towards the vertical line. In this instance the weight should be moved down away from the light spot (always adjust the weights in the opposite direction of rotation) to begin bringing the wheel into balance. See illustration 1B
- Continue checking the weights, alternating between the left and right hand balance weights in turn. Repeat until the wheel remains stationary in all positions. Move the weights a maximum of 3mm at a time, reducing this amount as the wheel rotates slower. See illustration 1C
- Continue until assembly remains static in all positions. Lock balancing weights in position and remount assembly onto the machine spindle
- **Important:** – Ensure the balancing ways (knife edges or rollers) on the balancing stand are level in all directions. Care must be taken to initially find the true light spot of the wheel.



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Safety in the Storage & Use of Grinding Wheels

Stringent safety standards are maintained throughout the manufacture of Flexovit Grinding Wheels. To reduce the risk of accidents further, the law requires that certain basic precautions are taken in the storage and use of abrasive wheels.

RECEIPT

On receipt, grinding wheels should be thoroughly examined to see if they show any signs of damage, such as chips, cracks or discolouration. Damaged wheels must not be used.

HANDLING

Any mishandling that results in the wheel being subjected to any shock loading can damage all grinding wheels. This can occur if the wheel is inadvertently dropped, knocked over or banged against any other object. This is equally true if the wheel is secured on a pallet, which has been dropped heavily from a forklift truck.

Any grinding wheel subjected to such mishandling should be carefully examined for signs of damage. If in any doubt – do not use.

STORAGE

Small wheels up to 80mm diameter, together with cones, plugs, mounted points and wheels may be stored in suitable bins, drawers or boxes. Type 02 cylinder wheels, type 06 straight cup 04 wheels, type 12 dish wheels and type 13 saucer wheels should normally be stacked on flat sides with cushioning material between them. Thick rim and hard grade cylinder and straight cup wheels may be stored on their periphery as for plain wheels. Soft grade, straight cup wheels, and all type 11 taper cup wheels, should be stored base to base and rim to rim, to prevent chipping of edges and cracking of walls. Thin plain wheels, such as cutting off wheels or saw sharpening wheels should be stacked on a flat surface of steel, or similar rigid material. Other plain or shaped wheels of appreciable thickness, are best supported on their periphery in racks. The racks should provide cushioned, two point, cradle support to prevent the wheels from rolling.

STORAGE CONDITIONS

During storage, grinding wheels must not be subjected to:

- Exposure to humidity, water or other liquids
- Freezing temperatures
- Any temperature low enough to cause the formation of condensation on the wheels when moving from storage to an area of high temperature

SHELF LIFE OF RESINOID & VITRIFIED BONDED WHEELS

The outer surfaces of certain organically bonded wheels may be affected by oxidation if they are stored for long periods. These types of wheel should not be stored for more than three years and proper stock control should ensure that older wheels are used first. In use, a three year old Resinoid product will act considerably softer than a brand new wheel (wheel will wear away more quickly).

The glass bonding system used in vitrified wheels is very inert and generally only attacked by certain acids. Cold temperatures can result in a vitrified wheel cracking if wheels are put away wet and are subjected to freezing temperatures. It must be remembered that the longer a product is in storage the chances of it becoming damaged increases. Provided vitrified wheels are stored correctly, thoroughly examined and mounted correctly they will last for many years.

RING TEST

The ring test depends upon the damping characteristics of a cracked wheel to alter the sound emitted when it is lightly tapped. The test is applicable only to vitrified bonded wheels.

To perform the ring test; support the wheel gently with a finger through the bore section. Using a light non-metallic implement (a file handle is ideal), gently tap the wheel about 45° each side of the vertical centre line. Rotate the wheel 45° and repeat the test.

The sound an undamaged wheel will omit a clear tone. If cracked, there will be a dead dull sound – not a clear ring – and the wheel should NOT be used. The ring test should be carried out in a place where the ring can easily be heard.



Safe Working Practices

PERSONAL PROTECTION

Safety goggles, ear defenders, safety gloves, dust masks and, if grinding conditions are severe, additional face protection. Leather aprons and safety shoes must be worn.



TRAINING OF OPERATORS

Grinding operators should be trained in the safe use of each machine they operate.

SPEEDS

No abrasive wheel should be operated at a speed in excess of the maximum permissible speed marked on the wheel in RPM when the wheel is new and full size. It is permissible, however, to increase the spindle speed of the machine beyond the RPM stated on the wheel provided the increase is in proportion to the reduction in diameter and that the original peripheral speed is not exceeded (quoted on the wheel in metres/sec). In high production areas it is now normal for machines to have constant peripheral speed spindles. This is an electronic device that automatically increases the spindle speed of the machine as the wheel diameter wears down and prevents most of the reduction in wheel performance that is experienced when the wheel becomes smaller.

COOLANTS

The strength of resin bonded grinding wheels can be reduced by coolants. The concentration and alkalinity of coolants should be regularly checked and a pH value of 8 should not be exceeded. Prolonged immersion of a stationary wheel in coolant can produce an out of balance condition. Coolant should be shut off before stopping a wet grinding wheel, and the wheel allowed to run free until all the coolant has been spun out.

WORK RESTS

Work rests should be kept adjusted as close as possible (Gap between wheel and work rest should not exceed 3mm) to the wheel and maintained in good condition.

TRUING & DRESSING

Re-dressing of wheels that have become malformed and out of truth in off-hand operations must only be performed by a competent person.

If an out of balance condition, due to the wheel wearing excessively out-of-round, cannot be corrected by truing, the wheel should be removed from the machine.

Wheels should be dressed regularly to avoid loading.

SIDE GRINDING

Side grinding should only be performed with wheels designed for this purpose (straight cups etc.).

Grinding on the flat sides of wheels designed for peripheral grinding may be dangerous and cause a wheel breakage. This does not preclude their use for certain precision applications such as shoulder and form grinding, where it is recognised that a limited amount of side grinding is performed; however in these operations the operator has control of the pressure through the hand wheels of the machine whereas with bench grinding and off-hand machines the pressure is uncontrolled. Extreme caution should be exercised not to use excessive pressure.

As a general guide, do not use a straight wheel which has a thickness of less than 10% of the wheel diameter for side grinding.



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STOPPING WHEELS

Wheels should not be brought to rest by applying pressure to the periphery or face of the wheel.

ORGANIC CUTTING-OFF WHEELS

'Non-reinforced' cutting-off wheels should never be used:

- On a portable grinding machine
- On any machine where the workpiece is fed into the wheel by hand

Cutting-off wheels should only be mounted on machines designed for their use.

Cutting-off wheels should be inspected for warping before use. Warped wheels should not be used.

When grinding, twisting or the exertion of any pressure on the side of the wheel should be avoided.

Workpieces should be rigidly supported and firmly clamped wherever possible.

Plastic Reduction Bush Availability

The following Plastic Reduction Brushes are available on request.

PLASTIC REDUCTION BUSHES			
Specification (mm)	Quantity	Article Number	Barcode
Plastic Reducing Ring 20 x 10	1	07660717524	8711479367038
Plastic Reducing Ring 20 x 12	1	07660717525	8711479367045
Plastic Reducing Ring 20 x 12.7	1	07660717526	3157625646995
Plastic Reducing Ring 20 x 13	1	07660717527	8711479367052
Plastic Reducing Ring 20 x 14	1	07660717528	8711479367069
Plastic Reducing Ring 20 x 15	1	07660717529	8711479367076
Plastic Reducing Ring 20 x 16	1	07660717530	3157620728283
Plastic Reducing Ring 20 x 17	1	07660717531	8711479367090
Plastic Reducing Ring 20 x 18	1	07660717532	8711479367106
Plastic Reducing Ring 25 x 20	1	07660717535	8711479366987
Plastic Reducing Ring 32 x 15.88	1	07660717536	3157625647107
Plastic Reducing Ring 32 x 20	1	07660717538	8711479366871
Plastic Reducing Ring 32 x 25	1	07660717540	8711479366895
Plastic Reducing Ring 32 x 25.4	1	07660717541	3157625647114

Bonded Abrasives

Grinding Wheels



Bonded Abrasives



73A

- Abrasive: Ceramic aluminium oxide
- High removal rate & extend wheel life
- Suitable for very hard steels

79A

- Blends of premium abrasives that include a low concentration of ceramic abrasive
- Used in toolrooms on high vanadium type steels

Grinding Wheels

Plain wheels - Type 01 / 73A

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
150 x 20 x 32	01	73A 60 IVL	35	2	69936648619	3564653678858	Tool & Cutter
180 x 13 x 32	01	73A 60 IVL	35	2	69936648408*	3564653600125	Precision grinding
180 x 13 x 32	01	73A 80 IVL	35	2	69936648409*	3564653600132	Precision grinding
180 x 20 x 32	01	73A 60 G12VL	35	2	69936677180	3157626306041	Precision grinding
180 x 20 x 32	01	73A 60 IVL	35	2	69936648413*	3564653600682	Precision grinding
200 x 20 x 50.8	01	73A 46 IVL	35	2	66243530091	3157625626034	Precision grinding
200 x 20 x 50.8	01	73A 60 G12VL	35	2	69936677182*	3157626306119	Precision grinding
200 x 20 x 76.2	01	73A 46 GVL	35	2	69936648412*	3564653600453	Precision grinding
200 x 25 x 32	01	73A 60 IVL	35	2	69936648605	3564653674300	Precision grinding
250 x 25 x 76.2	01	73A 46 GVL	35	1	69936648594*	3564653674096	Precision grinding
250 x 25 x 76.2	01	73A 60 JVL	35	1	69936695938*	3564653674140	Precision grinding
300 x 25 x 127	01	73A 60 KVL	50	1	66243578844*	3157625630352	Precision grinding
300 x 32 x 127	01	73A 46 GVL	35	1	69936648595*	3564653674119	Precision grinding
300 x 32 x 127	01	73A 60 I+VL	35	1	69936648598*	3564653674157	Precision grinding
300 x 40 x 127	01	73A 46 GVL	35	1	69936648596*	3564653674126	Precision grinding
300 x 40 x 127	01	73A 60 I+VL	35	1	69936648599*	3564653674164	Precision grinding
355 x 25 x 127	01	73A 60 JVL	50	1	66243579391*	3157625630574	Precision grinding
355 x 40 x 127	01	73A 46 GVL	35	1	69936648597	3564653674133	Precision grinding
355 x 50 x 127	01	73A 46 GVL	35	1	69936648411	3564653600262	Precision grinding
406 x 40 x 127	01	73A 46 GVL	50	1	66243545548*	3157625626652	Precision grinding
406 x 40 x 127	01	73A 60 JVL	50	1	66243545545	3157625626645	Precision grinding
406 x 50 x 127	01	73A 46 HVL	50	1	66243580238	3157625630802	Precision grinding

* Made-to-order

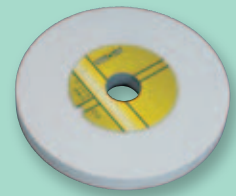
Plain wheels - Type 01 / 79A

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
200 x 20 x 32	01	79A 60 G10VL	35	2	69936639184*	3564652032811	Precision grinding
200 x 20 x 32	01	79A 60 IVL	35	2	69936639180*	3157625631106	Precision grinding

* Made-to-order

Plain wheels - Type o1 / WA

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
100 x 13 x 19.05	01	WA 60 KVL	35	2	66243548418	3157625626898	Precision grinding
125 x 16 x 25	01	WA 60 KVL	35	2	66243545514	3157625626515	Precision grinding
125 x 20 x 32	01	WA 60 KVL	35	2	69936648512	3564653669610	Precision grinding
150 x 6 x 32	01	WA 80 KVL	35	2	69936648525	3564653670357	Precision grinding
150 x 10 x 32	01	WA 60 KVL	35	2	69936648524	3564653670302	Precision grinding
150 x 13 x 32	01	WA 60 KVL	35	2	69936648528*	3564653670401	Precision grinding
150 x 16 x 32	01	WA 60 KVL	35	2	69936648531	3564653670548	Precision grinding
150 x 16 x 32	01	WA 80 KVL	35	2	69936648533	3564653670593	Precision grinding
150 x 20 x 32	01	WA 46 KVL	35	2	66243578390	3157625629349	Precision grinding
150 x 20 x 32	01	WA 60 KVL	35	2	69936676902	3564656215043	Precision grinding
150 x 20 x 32	01	WA 80 KVL	35	2	69936648540	3564653670807	Precision grinding
150 x 25 x 32	01	WA 46 KVL	35	2	66243578526*	3157625629363	Precision grinding
150 x 25 x 32	01	WA 60 KVL	35	2	69936648543	3564653670890	Precision grinding
150 x 25 x 32	01	WA 80 KVL	35	2	66243578530	3157625629394	Precision grinding
150 x 25 x 60	01	WA 60 KVL	35	2	69936648541*	3564653670814	Precision grinding
180 x 13 x 32	01	WA 60 IVL	35	2	69936648544*	3564653670906	Precision grinding
180 x 16 x 32	01	WA 46 GVL	35	2	69936648620*	3564653679343	Precision grinding
180 x 20 x 32	01	WA 46 HVL	35	2	69936648625*	3564653679725	Precision grinding
180 x 25 x 32	01	WA 60 KVL	35	2	69936648549	3564653671118	Precision grinding
200 x 6 x 32	01	WA 60 KVL	35	2	69936648554	3564653671231	Precision grinding
200 x 10 x 32	01	WA 60 KVL	35	2	69936648550	3564653671125	Precision grinding
200 x 20 x 32	01	WA 46 KVL	35	2	69936676905	3564656215180	Precision grinding
200 x 20 x 32	01	WA 60 IVL	35	2	69936676907	3564656215210	Precision grinding
200 x 20 x 32	01	WA 60 MVL	35	2	69936676908	3564656215241	Precision grinding
200 x 20 x 32	01	WA 80 MVL	35	2	69936648557	3564653671439	Precision grinding
200 x 20 x 50.8	01	WA 46 GVL	35	2	69936675833	3157625103115	Precision grinding
200 x 20 x 50.8	01	WA 46 KVL	35	2	66243530097	3157625626058	Precision grinding
200 x 20 x 50.8	01	WA 60 GVL	35	2	69936648622*	3564653679466	Precision grinding
200 x 20 x 50.8	01	WA 60 KVL	35	2	66243530096	3157625626041	Precision grinding
200 x 25 x 20	01	WA 60 KVL	35	2	66243545528	3157625626621	Precision grinding
200 x 25 x 32	01	WA 46 IVL	35	2	69936648558	3564653671491	Precision grinding
200 x 25 x 32	01	WA 46 MVL	35	2	69936676910	3564656215289	Precision grinding
200 x 25 x 32	01	WA 60 IVL	35	2	69936661169	3157625631182	Precision grinding
200 x 25 x 32	01	WA 60 MVL	35	2	69936676912	3564656215326	Precision grinding
200 x 25 x 50.8	01	WA 60 KVL	35	2	66243528422	3157625625914	Precision grinding
200 x 25 x 76.2	01	WA 46 MVL	35	2	69936661233*	3564653671507	Precision grinding
200 x 25 x 76.2	01	WA 60 KVL	35	2	69936648564	3564653671682	Precision grinding
200 x 32 x 32	01	WA 46 MVL	35	2	66243578540	3157625629479	Precision grinding
200 x 32 x 32	01	WA 60 KVL	35	2	69936648569	3564653671798	Precision grinding
200 x 32 x 32	01	WA 80 KVL	35	2	66243578552	3157625629493	Precision grinding
200 x 32 x 51	01	WA 60 KVL	35	2	66243578558	3157625629547	Precision grinding
200 x 32 x 76.2	01	WA 46 GVL	35	2	69936616805*	3564653671774	Precision grinding
200 x 32 x 76.2	01	WA 60 KVL	35	2	69936648571*	3564653671842	Precision grinding
250 x 10 x 32	01	WA 60 MVL	35	1	69936648572*	3564653671866	Precision grinding
250 x 13 x 76.2	01	WA 60 KVL	35	1	66243548451	3157625627109	Precision grinding
250 x 13 x 76.2	01	WA 100 JVL	35	1	66243548447*	3157625627079	Precision grinding
250 x 20 x 76.2	01	WA 60 KVL	35	1	66243548618*	3157625627888	Precision grinding
250 x 25 x 50.8	01	WA 46 KVL	35	1	66243528404	3157625625792	Precision grinding
250 x 25 x 50.8	01	WA 60 KVL	35	1	66243528405	3157625625808	Precision grinding
250 x 25 x 76.2	01	WA 80 KVL	35	1	66243578708	3157625630086	Precision grinding
250 x 25 x 76.2	01	WA 100 KVL	35	1	66243528408*	3157625625815	Precision grinding



WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

Bonded Abrasives



WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

Grinding Wheels

Plain wheels - Type 01 / WA

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
250 x 32 x 32	01	WA 60 MVL	35	1	69936648577	3564653672009	Precision grinding
250 x 40 x 76.2	01	WA 46 JVL	35	1	66243578721	3157625630178	Precision grinding
250 x 50 x 76.2	01	WA 60 KVL	35	1	66243578729	3157625630222	Precision grinding
300 x 13 x 127	01	WA 60 KVL	35	1	66243548621	3157625627901	Precision grinding
300 x 13 x 127	01	WA 80 KVL	35	1	66243548620	3157625627895	Precision grinding
300 x 25 x 76.2	01	WA 46 JVL	35	1	66243578852	3157625630383	Precision grinding
300 x 25 x 76.2	01	WA 60 KVL	35	1	66243578849	3157625630376	Precision grinding
300 x 25 x 127	01	WA 46 KVL	35	1	66243578783	3157625630321	Precision grinding
300 x 25 x 127	01	WA 60 KVL	35	1	66243578731	3157625630246	Precision grinding
300 x 25 x 127	01	WA 80 KVL	35	1	66243578848	3157625630369	Precision grinding
300 x 25 x 127	01	WA 100 GVL	35	1	66243578785	3157625630345	Precision grinding
300 x 25 x 127	01	WA 100 JVL	35	1	66243578784*	3157625630338	Precision grinding
300 x 32 x 127	01	WA 60 KVL	35	1	69936648579*	3564653673006	Precision grinding
300 x 40 x 76	01	WA 60 KVL	35	1	66243545522	3157625626584	Precision grinding
300 x 40 x 127	01	WA 46 MVL	35	1	69936648582	3564653673488	Precision grinding
300 x 40 x 127	01	WA 60 KVL	35	1	69936648583	3157625631144	Precision grinding
300 x 40 x 127	01	WA 80 KVL	35	1	66243548625*	3157625627925	Precision grinding
300 x 50 x 127	01	WA 46 HVL	35	1	66243548640*	3157625628045	Precision grinding
300 x 50 x 127	01	WA 46 KVL	35	1	66243548678	3157625628328	Precision grinding
300 x 50 x 127	01	WA 60 KVL	35	1	66243548637*	3157625628021	Precision grinding
355 x 25 x 127	01	WA 46 KVL	35	1	66243579395	3157625630581	Precision grinding
355 x 32 x 127	01	WA 60 KVL	35	1	69936648608	3564653677202	Precision grinding
355 x 40 x 127	01	WA 46 HVL	35	1	69936648610	3564653677592	Precision grinding
355 x 40 x 127	01	WA 60 KVL	35	1	69936648611*	3564653677608	Precision grinding
355 x 50 x 127	01	WA 46 KVL	35	1	66243579397	3157625630604	Precision grinding
355 x 50 x 127	01	WA 60 KVL	35	1	69936648612	3564653678001	Precision grinding
406 x 25 x 127	01	WA 60 KVL	35	1	66243580218	3157625630765	Precision grinding
406 x 25 x 203.2	01	WA 120 KVL	60	1	66243580233*	3157625658899	Precision grinding
406 x 25 x 203.2	01	WA 220 MVL	60	1	66243580234*	3157625630789	Precision grinding
406 x 50 x 127	01	WA 46 HVL	35	1	66243580241	3157625630819	Precision grinding
406 x 50 x 127	01	WA 46 JVL	35	1	66243580243	3157625630826	Precision grinding
406 x 50 x 127	01	WA 60 KVL	35	1	66243580237	3157625630796	Precision grinding
457 x 50 x 203.2	01	WA 60 LVL	35	1	66243580304*	3157625630871	Precision grinding

* Made-to-order

Plain wheels - Type 01 / 52A

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
150 x 6 x 32	01	52A 60 LVL	35	2	69936648628*	3564653680677	Precision grinding

* Made-to-order

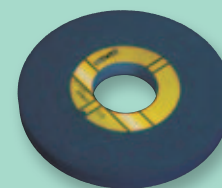
52A

- Abrasive: Blend of white and brown aluminium oxide
- Cool and fast cutting
- Used for sharpening engraving cutters and grinding hard chrome.

Plain wheels - Type o1 / 48A

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
250 x 13 x 76.2	01	48A 60 LVM	35	1	66243548704	3157625628564	Precision grinding
250 x 25 x 76.2	01	48A 46 KVM	35	1	66243548716*	3157625628632	Precision grinding
250 x 25 x 76.2	01	48A 60 KVM	35	1	66243548710	3157625628601	Precision grinding
250 x 25 x 76.2	01	48A 80 MVM	35	1	66243548713	3157625628625	Precision grinding
300 x 13 x 127	01	48A 60 LVM	35	1	66243548720	3157625628663	Precision grinding
300 x 25 x 127	01	48A 46 KVM	35	1	66243548734	3157625628786	Precision grinding
300 x 25 x 127	01	48A 60 KVM	35	1	66243548729	3157625628755	Precision grinding
300 x 25 x 127	01	48A 60 LVM	35	1	66243548727	3157625628731	Precision grinding
300 x 25 x 127	01	48A 60 MVM	35	1	66243548726*	3157625628724	Precision grinding
300 x 25 x 127	01	48A 80 KVM	35	1	66243548724	3157625628694	Precision grinding
300 x 40 x 127	01	48A 46 KVM	35	1	66243548737*	3157625628816	Precision grinding
300 x 40 x 127	01	48A 60 KVM	35	1	66243548740	3157625628854	Precision grinding
300 x 40 x 127	01	48A 60 LVM	35	1	66243548742*	3157625628878	Precision grinding
300 x 50 x 127	01	48A 60 KVM	50	1	66243580216	3157625635982	Precision grinding
300 x 76.2 x 101.6	01	48A 60 LVM	35	1	66243548698*	3157625628502	Precision grinding
355 x 25 x 127	01	48A 60 KVM	35	1	66243579410	3157625630697	Precision grinding
355 x 40 x 127	01	48A 46 KVM	35	1	66243579412	3157625630703	Precision grinding
355 x 40 x 127	01	48A 60 KVM	35	1	66243579405*	3157625630673	Precision grinding
355 x 40 x 127	01	48A 60 LVM	35	1	66243579413*	3157625630727	Precision grinding

* Made-to-order



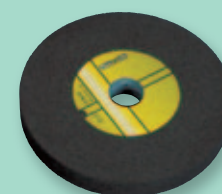
48A

- Abrasive: Semi-pure brown fused aluminium oxide
- Ideal for general purpose applications
- For use on steel & steel alloys

Plain wheels - Type o1 / A

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
100 x 16 x 25	01	A 46 MVM	35	2	66243545507*	3157625626478	General Purpose
100 x 50 x 16	01	A 24 MVM	35	2	66243548428*	3157625626928	General Purpose
125 x 16 x 25	01	A 46 MVM	35	2	66243545510	3157625626492	General Purpose
125 x 20 x 25	01	A 46 MVM	35	2	66243545518	3157625626546	General Purpose
150 x 16 x 32	01	A 36 MVM	35	2	69936648660*	3564653696029	General Purpose
150 x 16 x 32	01	A 60 MVM	35	2	69936648662	3564653696043	General Purpose
150 x 20 x 32	01	A 36 MVM	35	2	69936676891	3564656214886	General Purpose
150 x 20 x 32	01	A 46 MVM	35	2	69936676892	3564656214893	General Purpose
150 x 20 x 32	01	A 60 MVM	35	2	66243578437	3157625629356	General Purpose
150 x 25 x 32	01	A 36 MVM	35	2	66243578532	3157625629417	General Purpose
150 x 25 x 32	01	A 46 MVM	35	2	69936676894	3564656214916	General Purpose
150 x 25 x 32	01	A 60 MVM	35	2	66243578527	3157625629387	General Purpose
180 x 25 x 32	01	A 46 MVM	35	2	69936648668	3564653696173	General Purpose
200 x 20 x 32	01	A 30 MVM	35	2	69936648670	3564653696197	General Purpose
200 x 20 x 32	01	A 46 MVM	35	2	66243578533	3157625629424	General Purpose
200 x 20 x 32	01	A 60 MVM	35	2	66243578536	3157625629448	General Purpose
200 x 25 x 20	01	A 36 MVM	35	2	66243545527	3157625626614	General Purpose
200 x 25 x 20	01	A 46 MVM	35	2	66243545524	3157625626591	General Purpose
200 x 25 x 32	01	A 30 OVM	35	2	69936648672	3564653696227	General Purpose
200 x 25 x 32	01	A 46 LVM	35	2	69936676899	3564656214992	General Purpose
200 x 25 x 32	01	A 60 KVM	35	2	69936648563	3564653671668	General Purpose
200 x 25 x 51	01	A 46 NVM	35	2	66243578539	3157625629462	General Purpose
200 x 25 x 76.2	01	A 30 OVM	35	2	69936648675*	3564653696258	General Purpose
200 x 25 x 76.2	01	A 60 LVM	35	2	69936648677*	3564653696272	General Purpose
200 x 32 x 32	01	A 36 MVM	35	2	66243578555	3157625629516	General Purpose

* Made-to-order



A

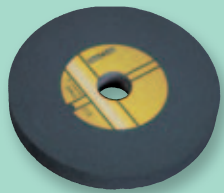
- Abrasive: Brown aluminium oxide
- Good cost/performance compromise
- Hard wearing wheels for general purpose applications
- Suitable for grinding most types of steel & soft iron

Bonded Abrasives



A

- Abrasive: Brown aluminium oxide
- Good cost/performance compromise
- Hard wearing wheels for general purpose applications
- Suitable for grinding most types of steel & soft iron



GC

- Abrasive: Green silicon carbide
- Harder & more friable than aluminium oxide abrasive
- Ideal for precision grinding & sharpening applications on metal carbide & non-ferrous metals

Grinding Wheels

Plain wheels - Type 01 / A

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
200 x 32 x 32	01	A 60 MVM	35	2	66243578554	3157625629509	General Purpose
200 x 32 x 76.2	01	A 46 MVM	35	2	69936675570	3157625085282	General Purpose
250 x 25 x 32	01	A 60 MVM	35	1	66243578559	3157625629554	General Purpose
250 x 32 x 32	01	A 30 OVM	35	1	69936648679	3564653696319	General Purpose
250 x 32 x 32	01	A 46 LVM	35	1	69936648680	3564653696326	General Purpose
300 x 32 x 51	01	A 60 MVM	35	1	66243578560	3157625629561	General Purpose
300 x 32 x 127	01	A 24 PVM	35	1	69936648686	3564653696388	General Purpose
300 x 32 x 127	01	A 36 LVM	35	1	69936648687	3564653696395	General Purpose
300 x 40 x 35	01	A 30 PVM	35	1	66243580201	3157625630734	General Purpose
300 x 40 x 35	01	A 60 MVM	35	1	66243548626	3157625627932	General Purpose
300 x 40 x 38.1	01	A 30 PVM	35	1	66243580204	3157625630741	General Purpose
300 x 40 x 38.1	01	A 46 MVM	35	1	66243548628	3157625627956	General Purpose
300 x 40 x 38.1	01	A 60 MVM	35	1	66243548627	3157625627949	General Purpose
300 x 40 x 50.8	01	A 24 PVM	35	1	69936648689	3564653696418	General Purpose
300 x 40 x 127	01	A 24 PVM	35	1	69936648690*	3564653696425	General Purpose
355 x 40 x 50.8	01	A 46 LVM	35	1	69936648609	3564653677394	General Purpose
355 x 40 x 127	01	A 24 PVM	35	1	69936648692	3564653696456	General Purpose
355 x 50 x 127	01	A 24 PVM	35	1	69936648693	3564653696470	General Purpose
355 x 50 x 127	01	A 36 LVM	35	1	69936648694	3564653696487	General Purpose
355 x 50 x 127	01	A 46 LVM	35	1	69936648695	3564653696494	General Purpose
406 x 50 x 127	01	A 24 PVM	50	1	66243545550	3157625626669	General Purpose

* Made-to-order

Plain wheels - Type 01 / GC

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
90 x 40 x 22.23	01	C 16 RVK	35	5	66243548878*	3157625629042	Carbide Tool
125 x 16 x 25	01	GC 80 JVK	35	2	66243545511	3157625626508	Carbide Tool
125 x 20 x 25	01	GC 80 JVK	35	2	66243545517	3157625626539	Carbide Tool
150 x 10 x 20/16	01	GC 80 JVK	35	2	66243545520*	3157625626553	Carbide Tool
150 x 16 x 32	01	GC 80 JVK	35	2	69936648828	3564653790604	Carbide Tool
150 x 20 x 32	01	GC 60 JVK	35	2	69936676914	3564656215401	Carbide Tool
150 x 20 x 32	01	GC 80 JVK	35	2	69936676915	3564656215425	Carbide Tool
150 x 20 x 32	01	GC 120 JVK	35	2	69936676917	3564656215456	Carbide Tool
150 x 25 x 32	01	GC 60 JVK	35	2	69936648842	3564653791700	Carbide Tool
150 x 25 x 32	01	GC 80 KVK	35	2	69936648843	3564653791717	Carbide Tool
150 x 25 x 32	01	GC 120 JVK	35	2	69936648844	3564653791731	Carbide Tool
180 x 20 x 32	01	GC 80 KVK	35	2	69936648845	3564653791762	Carbide Tool
180 x 25 x 32	01	GC 80 KVK	35	2	69936693065	3564653791793	Carbide Tool
200 x 20 x 32	01	GC 60 KVK	35	2	69936645514	3564656215746	Carbide Tool
200 x 20 x 32	01	GC 80 JVL	35	2	66243578534	3157625629431	Carbide Tool
200 x 20 x 32	01	GC 120 JVK	35	2	69936696265	3564656215555	Carbide Tool
200 x 25 x 20	01	GC 80 JVK	35	2	66243545525	3157625626607	Carbide Tool
200 x 25 x 32	01	GC 60 JVK	35	2	69936676919	3564656215562	Carbide Tool
200 x 25 x 32	01	GC 80 JVK	35	2	69936676920	3564656215579	Carbide Tool
200 x 25 x 32	01	GC 120 JVL	35	2	66243578537	3157625629455	Carbide Tool
200 x 25 x 76.2	01	GC 80 KVK	35	2	69936648849*	3564653791908	Carbide Tool
200 x 25 x 76.2	01	GC 120 JVK	35	2	69936648850*	3564653791915	Carbide Tool
200 x 32 x 32	01	GC 80 JVK	35	2	66243578551	3157625629486	Carbide Tool

* Made-to-order

Grinding Wheels

Bonded Abrasives

Plain wheels - Type 01 / GC

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
200 x 32 x 32	01	GC 120 JVK	35	2	69936648852*	3564653791946	Carbide Tool
200 x 32 x 51	01	GC 80 JVK	35	2	66243578557	3157625629523	Carbide Tool
200 x 32 x 76.2	01	GC 60 JVK	35	2	69936648834*	3564653790765	Carbide Tool
250 x 25 x 76.2	01	GC 80 JVK	35	1	66243578713*	3157625630116	Carbide Tool
250 x 32 x 32	01	GC 80 KVK	35	1	69936648648	3564653690003	Carbide Tool
300 x 25 x 127	01	GC 80 JVK	35	1	66243578782	3157625630314	Carbide Tool
300 x 40 x 38.1	01	GC 60 JVK	35	1	66243548633	3157625628007	Carbide Tool
300 x 40 x 127	01	GC 60 JVK	35	1	66243548623*	3157625627918	Carbide Tool
300 x 40 x 127	01	GC 80 JVK	35	1	69936648836	3564653790888	Carbide Tool
355 x 25 x 127	01	GC 60 JVK	35	1	66243579387	3157625630543	Carbide Tool
355 x 40 x 127	01	GC 60 JVK	35	1	69936648856*	3564653792066	Carbide Tool
355 x 50 x 127	01	GC 60 JVK	35	1	66243579396	3157625630598	Carbide Tool
457 x 50 x 203.2	01	GC 46 JVK	35	1	66243580305*	3157625630888	Carbide Tool

* Made-to-order

Recessed wheels - Type 05

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
13 x 13 x 4.76 EU 6 x 6	05	WA 60 LVL	35	20	66243578862	3157625630482	Precision grinding
20 x 25 x 6.35 EU 10 x 12	05	WA 60 KVL	35	20	66243578863*	3157625630499	Precision grinding
25 x 25 x 6.35 EU 13 x 12	05	WA 60 KVL	35	20	66243578864	3157625630505	Precision grinding
40 x 25 x 9.53 EU 20 x 12	05	WA 60 KVL	35	20	66243578865*	3157625630512	Precision grinding
50 x 25 x 12.7 EU 25 x 13	05	WA 60 KVL	35	20	66243578867	3157625630536	Precision grinding
300 x 40 x 127 EU 190 x 13	05	WA 60 KVL	35	1	66243548680	3157625628342	Precision grinding
300 x 40 x 127 EU 190 x 13	05	WA 80 KVL	35	1	66243548684*	3157625628366	Precision grinding
300 x 50 x 127 EU 190 x 25	05	WA 60 KVL	35	1	66243548686	3157625628397	Precision grinding
40 x 32 x 10 EU 20 x 16	05	73A 60 JVL	35	20	66243548877*	3157625629035	Precision grinding
50 x 25 x 12.7 EU 25 x 13	05	WA 60 KVL	35	1	66243548680	3157625628342	Precision grinding
300 x 50 x 127 EU 190 x 25	05	48A 60 KVM	35	1	66243548685	3157625628373	Precision grinding

* Made-to-order

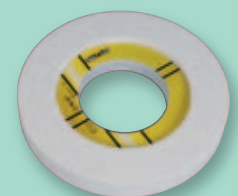
Recessed wheels - Type 07

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode	Main Usage
300 x 50 x 76.2 DU 160 x 10	07	73A 46 GVL	35	1	66243548690	3157625628434	Precision grinding
300 x 50 x 76.2 DU 160 x 10	07	WA 46 IVL	35	1	66243548689	3157625628427	Precision grinding



WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates



73A

- Abrasive: Ceramic aluminium oxide
- High removal rate & extend wheel life
- Suitable for very hard steels

flexovit

Bonded Abrasives



A

- Abrasive: Regular aluminium oxide
- For grinding construction steel or low-alloyed steel



WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for grinding all kinds of cutting tools



52A

- Abrasive: Blend of white and brown aluminium oxide
- Cool and fast cutting
- Used for sharpening engraving cutters and grinding hard chrome.

EKW

- Whetstone for sharpening house-hold tools
- By hand with water or by use of a light powered machine

Grinding Wheels for Creusen machines

Plain wheels - Type 01

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
150 x 20 x 15	01	A 80 MVM	33	1	66243538522	8711479193033

Recessed wheels - Type 05

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
150 x 40 x 15 EU 70 x 20	05	WA 100 J VL	35	1	66243538686	8711479196768
150 x 40 x 15 EU 80 x 20	05	WA 80 K VL	35	1	66243538694	8711479197000
150 x 40 x 25 EU 80 x 20	05	WA 80 K VL	35	1	66243538697	8711479197116
150 x 40 x 32 EU 80 x 20	05	WA 80 K VL	33	1	66243538695	8711479197031

Waterstone for Creusen machines

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
150 x 40 x 32	01	EKW 150 LV	35	1	66243538852*	8711479200205
200 x 40 x 32	01	EKW 150 LV	33	1	66243538853*	8711479200229

* Made-to-order

Bonded Abrasives

Dishes



Bonded Abrasives



73A

- Abrasive: Ceramic aluminium oxide
- High removal rate & extend wheel life
- Suitable for very hard steels

WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

Dishes

Type 12



Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
125 x 13 x 20	12	73A 60 I+VL	35	4	69936683138*	3564653600323
150 x 6 x 30.16	12	52A 150 MVL	35	4	66243548718*	3157625628656
80 x 13 x 19.05	12	WA 60 JVL	35	5	66243548725*	3157625628717
100 x 13 x 20	12	WA 120 LVL	35	4	69936683168*	3564653660136
125 x 13 x 32	12	WA 60 LVL	35	4	69936683170*	3564653660235
150 x 13 x 32	12	WA 60 JVL	32	4	69936689678*	3564653660365
200 x 20 x 32	12	WA 60 JVL	35	2	69936683177*	3564653660587
200 x 32 x 32	12	WA 46 IVL	35	2	69936683178	3564653660600

* Made-to-order

Bonded Abrasives

Cups



Bonded Abrasives



73A

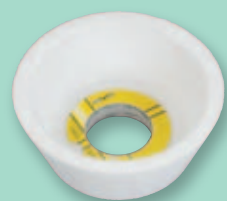
- Abrasive: Ceramic aluminium oxide
- High removal rate & extend wheel life
- Suitable for very hard steels

WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

GC

- Abrasive: Green silicon carbide
- Harder & more friable than aluminium oxide abrasive
- Ideal for precision grinding & sharpening applications on metal carbide & non-ferrous metals



WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

flexovit

Cups

Straight Cups - Type 06

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
100 x 50 x 20 Rim 10 - Back 10	06	73A 70 I+VL	32	2	69936693045	3564653674454

Straight Cups - Type 06

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
40 x 32 x 10 Rim 8 - Back 8	06	WA 60 KVL	32	3	69936648515*	3564653669801
100 x 40 x 32 Rim 13 - Back 13	06	WA 60 KVL	32	2	69936648479	3564653661102
100 x 50 x 19.84 Rim 10 - Back 10	06	WA 120 JVL	32	2	66243548829	3157625628953
100 x 50 x 20 Rim 13 - Back 13	06	WA 60 KVL	32	2	66243545694	3157625626751
100 x 50 x 20 Rim 10 - Back 10	06	WA 80 JVL	32	2	66243578857	3157625630444
125 x 63 x 32 Rim 8 - Back 13	06	WA 80 JVL	35	2	66243545693	3157625626744
150 x 80 x 32 Rim 10 - Back 16	06	WA 80 JVL	35	2	66243545691*	3157625626737
175 x 75 x 78 Rim 16 - Back 16	06	WA 36 GVL	32	2	66243545688*	3157625626713
180 x 63 x 50.8 Rim 16 - Back 16	06	WA 36 GVL	32	2	69936648496	3564653662055
180 x 63 x 50.8 Rim 16 - Back 16	06	WA 60 HVL	32	2	69936648497*	3564653662079
180 x 80 x 32 Rim 16 - Back 16	06	WA 46 GVL	32	2	69936648498	3564653662086
200 x 40 x 76.2 Rim 40 - Back 13	06	WA 46 JVL	32	2	69936648486*	3564653661348
200 x 40 x 76.2 Rim 40 - Back 13	06	WA 60 JVL	32	2	69936648488	3157625631137
200 x 80 x 78 Rim 16 - Back 20	06	WA 36 GVL	32	2	66243545685	3157625626706

* Made-to-order

Straight Cups - Type 06

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
200 x 40 x 76,2 Rim 40 - Back 13	06	GC 60 IVK	32	2	69936648371*	3564653366175

* Made-to-order

Taper Cups - Type 11

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
80 x 32 x 12.7	11	WA 60 KVL	32	5	66243548837	3157625629028
100 x 40 x 20	11	WA 60 KVL	35	3	66243545579*	3157625626683
125 x 50 x 32	11	WA 46 IVL	32	2	69936683184*	3564653660983

* Made-to-order

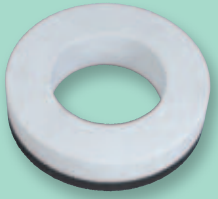
Dimensions Key: D = Diameter, T = Thickness, B = Bore

Bonded Abrasives

Discs



Bonded Abrasives



WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

Discs

Types 35 & 36

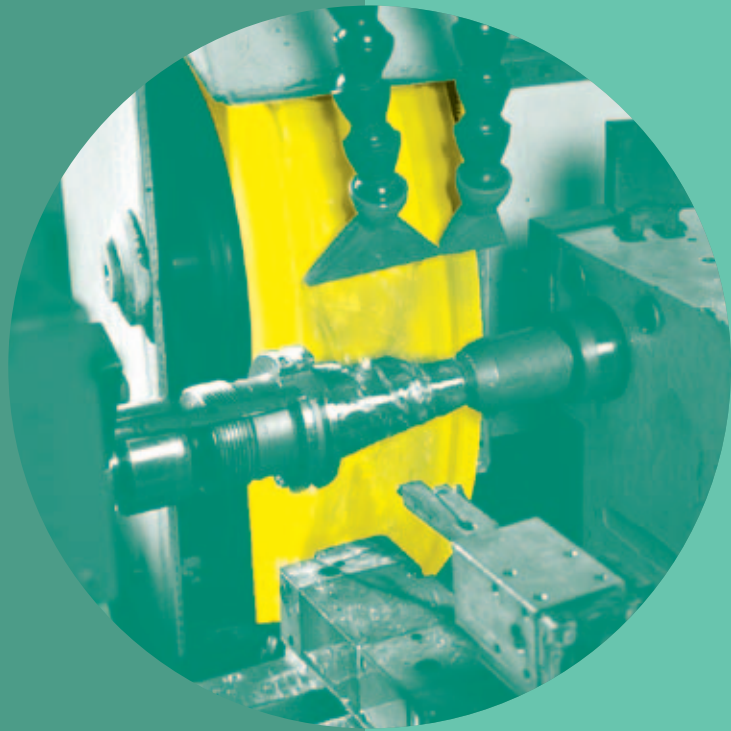


Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
203 x 50 x 114.3	36	WA 46 KVL	35	1	66243548738	3157625628823
300 x 50 x 150	35	A 36 OVL	32	1	66243548735*	3157625628793

* Made-to-order

Bonded Abrasives

Cylinder





WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

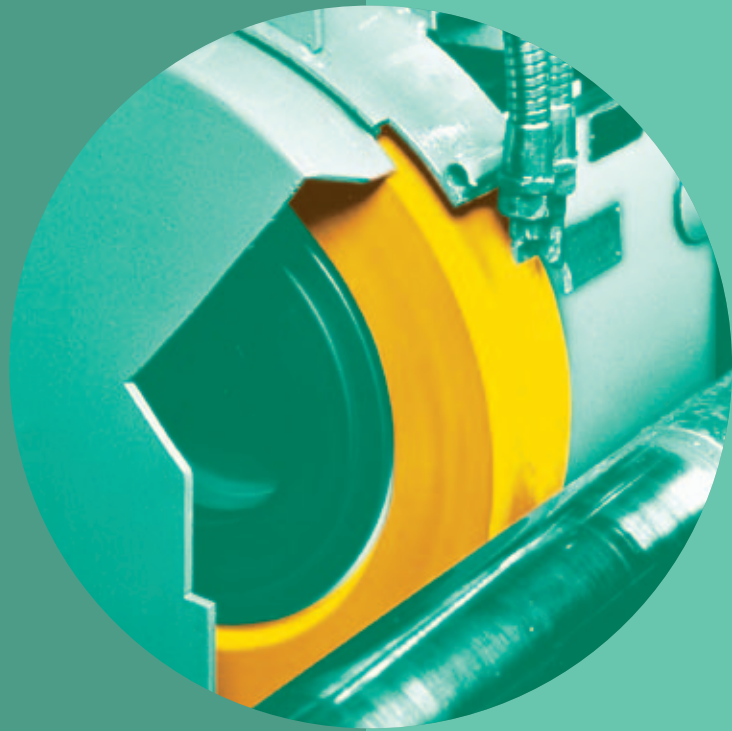
Cylinder

Type 02

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
127 X 50 X 101.6	02	WA 46 JVL	25	2	66243548749	3157625628908

Bonded Abrasives

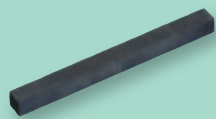
Dressing Sticks



Bonded Abrasives



For sharpening
grinding wheels



For sharpening
grinding wheels



Ideal for dressing conventional
vitrified grinding wheels

flexovit

Dressing Sticks

Conditioning

RECTANGULAR



Dimensions (mm) W x H x L	Specification	Quantity	Article Number	Barcode	Used with
13 x 5 x 76	Flexbide	5	66243581709	3157625647121	Abrasive wheel
25 x 50 x 200	C 24 TV	20	66243580390	3157625630949	Abrasive wheel
13 x 25 x 150	WA 150 HV	20	66243580434*	3157625630963	CBN wheel
13 x 25 x 150	WA 220 HV	20	66243580367	3157625630925	CBN wheel
13 x 25 x 150	WA 320 HV	20	66243580381*	3157625630932	CBN wheel

* Made-to-order

SQUARE



Dimensions (mm) H x L	Specification	Quantity	Article Number	Barcode	Used with
20 x 200	C 30 TV	20	66243581003*	3157625631069	Abrasive wheel
25 x 200	C 30 TV	20	66243581004*	3157625631076	Abrasive wheel
13 x 100	WA 150 JV	20	66243580335*	3157625630901	CBN wheel
20 x 200	WA 150 HV	20	66243580999	3157625631045	CBN wheel
13 x 150	C 320 HV	20	66243580984	3157625631007	CBN wheel

* Made-to-order

Sharpening

SQUARE



Dimensions (mm) H x L	Specification	Quantity	Article Number	Barcode	Main Usage
13 x 150	C 80 MV	20	66243580342*	3157625630918	Sharpening
13 x 150	C 100 RV	20	66243580983	3157625630994	Sharpening
13 x 150	C 150 LV	20	66243580982*	3157625630987	Sharpening

* Made-to-order

TRIANGULAR



Dimensions (mm) H x L	Specification	Quantity	Article Number	Barcode	Main Usage
13 x 150	C 100 RV	20	66243581005	3157625631083	Sharpening

Crystolon stone

Dimensions (mm) W x H x L	Specification	Quantity	Article Number	Barcode	Main Usage
15 x 30 x 115	SC 20 R	1	66243538877	8711479206184	Profiling
25 x 50 x 150	SC 20 Q	1	66243538878	8711479206191	Profiling
25 x 50 x 200	GC 60 KV	20	66243580994	3157625631014	Profiling
25 x 50 x 200	GC 80 KV	20	66243580996	3157625631021	Profiling
25 x 50 x 200	GC 120 KV	20	66243580997	3157625631038	Profiling

Diamond Dressing Tools

MULTI POINT

Type	Shank (mm)	Grit	Carat	Quantity	Article Number	Barcode
MP250	MK1	D426	2.5	1	69014171502	8711479425769
	Z10 x 50	D426	2.5	1	69014170804*	8711479425783
	MK1	D1001	2.5	1	66260390005*	8711479425813
	Z10 x 50	D1001	2.5	1	66260393806*	8711479425851
	MK1	D2240	2.5	1	69014160913*	8711479425837
	Z10 x 50	D2240	2.5	1	69014173011*	8711479425806
	Z11 x 50	D1001	2.5	1	69014158054*	8711479425776

* Made-to-order



- Ideal for straight dressing at high speed with low technical demands
- Economical & robust tool

SINGLE POINT

Type	Shank (mm)	Carat	Quantity	Article Number	Barcode
SP	MK1	0.1	1	69014162116*	8711479425752
	Z10 x 50	0.1	1	66260396717	8711479425738
	MK1	0.25	1	66260390118	8711479425714
	Z10 x 50	0.25	1	69014166419	8711479425691
	Z11 x 50	0.25	1	69014166052*	8711479425653
	MK1	0.5	1	66260399421	8711479425639
	Z10 x 50	0.5	1	69014173220	8711479425615
	MK1	1	1	69014164523*	8711479425608
	Z10 x 50	1	1	66260394422*	8711479425684
	Z11 x 50	1	1	69014157953*	8711479425585

* Made-to-order



- Ideal for applications where it's difficult to measure the performance of the dressing tool
- Suitable for dressing conventional abrasive wheels

HAND DRESSER

Type	Shank (mm)	Grit	Carat	Quantity	Article Number	Barcode
HD150	13 x 200	18/25 SPC	1.6	1	66260396924	8711479425561



- High diamond concentration
- High wear resistance & long lifetime
- Suitable for face & side dressing

Bonded Abrasives

Stones



Bonded Abrasives



Abrasive files ideal when a close tolerance is more important than the speed of cut

Aluminium oxide

A100 (Coarse India) and A240 (Medium India)

for coarse/medium sharpening

A320 (Fijn India) for fine stoning



Stones

Bench

RECTANGULAR



Dimensions (mm) W x H x L	Specification	Quantity	Article Number	Barcode
1.6 x 13 x 100	A 240	20	66243548555*	3157625627703
5 x 25 x 127	A 240	10	66243548648*	3157625628106
6 x 25 x 100	A 240	5	66243548465*	3157625627178
13 x 25 x 100	A 240	5	66243548468	3157625627185
13 x 25 x 100	A 320	5	66243548647*	3157625628083
13 x 38 x 150	A 240	50	66243548471*	3157625627208
13 x 45 x 100	A 240	50	66243548457*	3157625627147
16 x 50 x 150	A 240	10	66243548472*	3157625627215
25 x 50 x 150	A 240	5	66243548473	3157625627222
25 x 50 x 150	A 320	5	66243548650	3157625628113
25 x 50 x 200	A 240	5	66243548475	3157625627246
25 x 50 x 200	A 320	5	66243548651*	3157625628137

* Made-to-order

SQUARE



Dimensions (mm) H x L	Specification	Quantity	Article Number	Barcode
8 x 100	A 240	20	66243548533*	3157625627581
8 x 100	A 320	20	66243548728*	3157625628748
10 x 100	A 240	20	66243548547*	3157625627659
10 x 100	A 320	20	66243548736*	3157625628809
10 x 150	A 240	20	66243548550	3157625627673
10 x 150	A 320	20	66243548739*	3157625628847
13 x 100	A 240	20	66243548554*	3157625627697
13 x 100	A 320	20	66243548741*	3157625628861
13 x 150	A 240	20	66243548556*	3157625627727
13 x 150	A 320	20	66243548743	3157625628885
16 x 150	A 100	20	66243548564*	3157625627789
16 x 150	A 240	20	66243548557*	3157625627734
16 x 150	A 320	20	66243548748*	3157625628892
20 x 150	A 100	20	66243548562*	3157625627772
20 x 150	A 240	20	66243548558*	3157625627741
20 x 150	A 320	20	66243548751*	3157625628915
20 x 200	C 280	20	66243581002*	3157625631052

* Made-to-order

Shaped

HALF-ROUND



Dimensions (mm) H x L	Specification	Quantity	Article Number	Barcode
8 x 100	A 240	20	66243548544*	3157625627635
10 x 100	A 320	20	66243548731*	3157625628779
10 x 100	A 240	20	66243548546*	3157625627642

* Made-to-order

ROUND



Dimensions (mm) D x L	Specification	Quantity	Article Number	Barcode
3 x 100	A 320	20	66243548705*	3157625628571
6 x 100	A 320	20	66243547795*	3157625626874
6 x 100	A 240	20	66243548524*	3157625627536
8 x 100	A 320	20	66243548709*	3157625628595
8 x 100	A 240	20	66243548529*	3157625627567
10 x 100	A 320	20	66243548712*	3157625628618
10 x 100	A 240	20	66243548531	3157625627574
13 x 100	A 240	20	66243548536*	3157625627598
13 x 150	A 240	20	66243548538*	3157625627604
16 x 150	A 240	20	66243548541*	3157625627611
20 x 150	A 240	20	66243548542*	3157625627628

* Made-to-order

TRIANGULAR



Dimensions (mm) H x L	Specification	Quantity	Article Number	Barcode
6 x 100	A 320	20	66243548652	3157625628144
8 x 100	A 320	20	66243548653*	3157625628151
8 x 100	A 240	20	66243548483*	3157625627291
10 x 100	A 320	20	66243548444*	3157625627048
10 x 100	A 240	20	66243548442	3157625627024
10 x 150	A 320	20	66243548655	3157625628168
10 x 150	A 240	20	66243548485*	3157625627307
10 x 100	A 100	20	66243548566*	3157625627802
13 x 100	A 320	20	66243548699*	3157625628519
13 x 100	A 240	20	66243548491	3157625627345
13 x 150	A 320	20	66243548700*	3157625628526
13 x 150	A 240	20	66243548496	3157625627369
16 x 150	A 320	20	66243548701	3157625628533
16 x 150	A 240	20	66243548441	3157625627017
16 x 150	A 100	20	66243548565*	3157625627796
16 x 203	A 240	20	66243548513*	3157625627499
20 x 150	A 320	20	66243548703	3157625628557
20 x 150	A 240	20	66243548511*	3157625627475
20 x 203	A 240	20	66243548514*	3157625627505
25 x 150	A 240	20	66243548512*	3157625627482
25 x 254	A 240	20	66243548517*	3157625627512

* Made-to-order

Bonded Abrasives



Slipstones for
sharpening knives

Stones

Combination

RECTANGULAR



Dimensions (mm) W x H x L	Specification	Quantity	Article Number	Barcode
16 x 45 x 100	A 320 / 100	5	66243548567*	3157625627819
20 x 50 x 127	A 320 / 100	5	66243548439	3157625626973
25 x 50 x 150	A 320 / 100	5	66243548440	3157625626997
25 x 50 x 178	A 320 / 100	5	66243548570*	3157625627833
25 x 50 x 200	A 320 / 100	5	66243548571	3157625627857
25 x 50 x 200	C 280 / 100	5	66243548528	3157625627543
25 x 63 x 150	A 320 / 100	5	66243548569*	3157625627826

* Made-to-order

CYLINDRICAL



Dimensions (mm) D x W	Specification	Quantity	Article Number	Barcode
100 x 38	C 320 / 100	10	66243548549	3157625627666

SLIP STONES



Dimensions (mm) W x H x L	Shape	Specifi- cation	Article Number	Barcode
6 x 45 x 115	ME157880	A 240	66243548574*	3157625627871
6 x 45 x 115	ME157880	A 320	66243548758*	3157625628939
8 x 25 x 127	ME157878	A 240	66243548572*	3157625627864
10 x 45 x 115	ME157877	A 240	66243548641	3157625628052
13 x 45 x 115	ME157881	A 240	66243548644	3157625628076
3/1.6 x 25 x 100	ME157994 – knife blade shape	A 240	66243548560	3157625627758
3/1.6 x 25 x 100	ME157994 – knife blade shape	A 320	66243548755*	3157625628922

* Made-to-order

Hand stones

WHET STONES

Dimensions (mm) W x H x L	Specification	Quantity	Article Number	Barcode
20 x 50 x 100	EW 280/ER 120 V	1	66243538860	8711479205842
25 x 50 x 125	EW 280/ER 120 V	1	66243538857	8711479205811
25 x 50 x 150	EW 280/ER 120 V	1	66243538858	8711479100161
25 x 50 x 200	EW 280/ER 120 V	1	66243538859	8711479205835
20 x 50 x 100	CG 320/CD 120 V	1	66243538861	8711479205873
20 x 50 x 125	CG 320/CD 120 V	1	66243538862	8711479205880
25 x 50 x 150	CG 320/CD 120 V	1	66243567213	4007739006361
25 x 50 x 200	CG 320/CD 120 V	1	66243567224	4007739400022
25 x 75 x 250	CG 360/CG 100 V	1	66243538865	8711479205927
13 x 33/10 x 230	SCYTHE SHARPENER CD 100 V	1	66243567215*	8711479359514

* Made-to-order

GOUGE WHETSTONE

Dimensions (mm) W x H x L	Specification	Quantity	Article Number	Barcode
6/1.5 x 45 x 115	CG 180 V	1	66243567002	8711479373138
115 x 45 x 6/1.5	CG 320 V	1	66243567251*	8711479364235

* Made-to-order

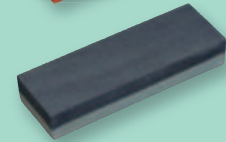
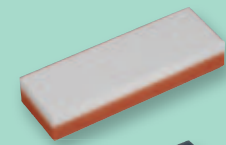
NATURAL WHETSTONE

Dimensions (mm) W x H x L	Quantity	Article Number	Barcode
NR 4 FINE BELGIAN BLOCK	1	7660738917	8711479206030
NR 5 FINE BELGIAN	1	7660738918	8711479206047

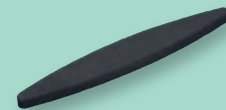
HAND STONES

Dimensions (mm) W x H x L	Specification	Quantity	Article Number	Barcode
50 x 50 x 150	SCG 16/20 KE	1	66243538868	8711479206061
25 x 50 x 200	SCG 16/20 KE	1	66243538869	8711479206078
50 x 50 x 200	SCG 16/20 KE	1	66243538870	8711479206085
50 x 50 x 150	CD 60 PV	1	66243538872	8711479206108
25 x 50 x 200	CD 60 PV	1	66243538917	4007739400169
50 x 50 x 200	CD 60 LV	1	66243567196	8711479177712
50 x 50 x 150	SD 120 LV	1	66243538875*	8711479206146
50 x 50 x 200	SD 120 LV	1	66243538876	8711479206160

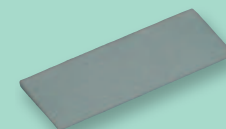
* Made-to-order



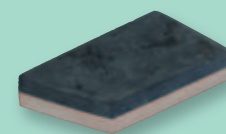
Whetstones
for all kinds of cutting tools



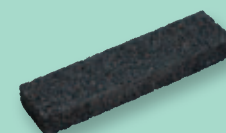
Scythe scharpener
Oval whetstone for sharpening scythes, domestic tools and garden tools.



Gouge whetstone
For wood bits, gouge bits and forming tools



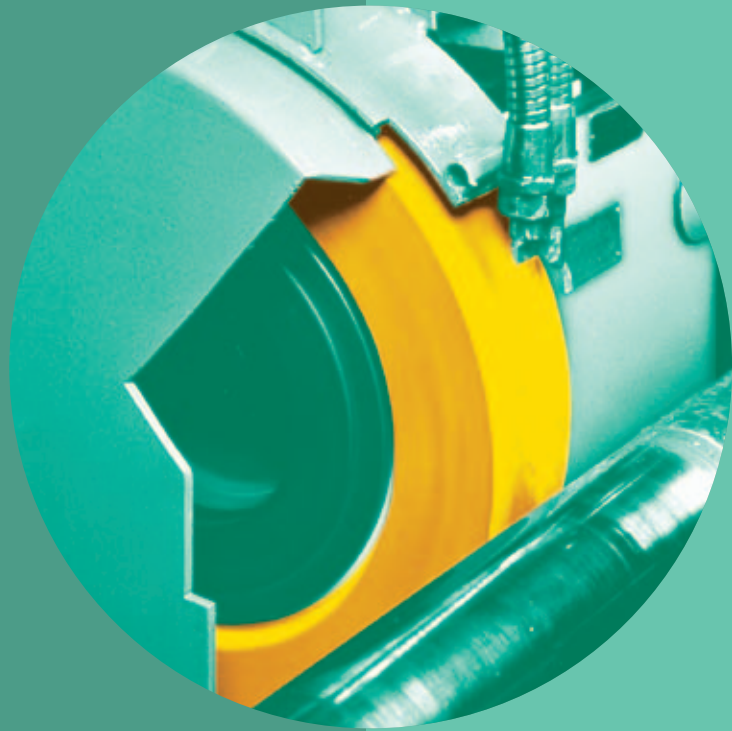
Natural whetstones
Soft natural whetstone



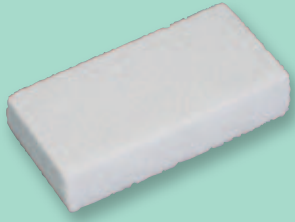
Hand stones
For smotthing floors and walls

Bonded Abrasives

Segments



Bonded Abrasives



Surface grinding segments are generally used to grind flat stock or flat surfaces within a workpiece. Applications can vary from heavy, rapid stock removal to precision tolerance operations.

- Grinding large moulds & dies
- Sharpening knives, blades, cutlery

WA

- Abrasive: High purity white aluminium oxide
- Cool & burn free cutting
- Ideal for heat-sensitive applications with light to moderate feed rates

Other sizes available on request

Segments

Type 31



Dimensions (mm) W x H x L	Shape	Specification	Quantity	Article Number	Barcode
42 x 20 x 90	31	WA 46 GVL	2	69936683209*	3564653698153
50 x 25 x 110	31	73A 60 FVL	2	69936657500*	3157625631168
60 x 22 x 110	31	WA 36 GVL	2	69936683211*	3564653698603
103 x 38 x 150	31	WA 30 H11VM	2	66243548693*	3157625628458
103 x 38 x 200	31	WA 30 I11VM	2	66243548694	3157625628465
117 x 44 x 150	31	WA 30 I11VM	2	66243548696*	3157625628489
117 x 44 x 200	31	WA 30 H11VM	2	66243548697	3157625628496

* Made-to-order

Bonded Abrasives

Mounted Points & Wheels





41A

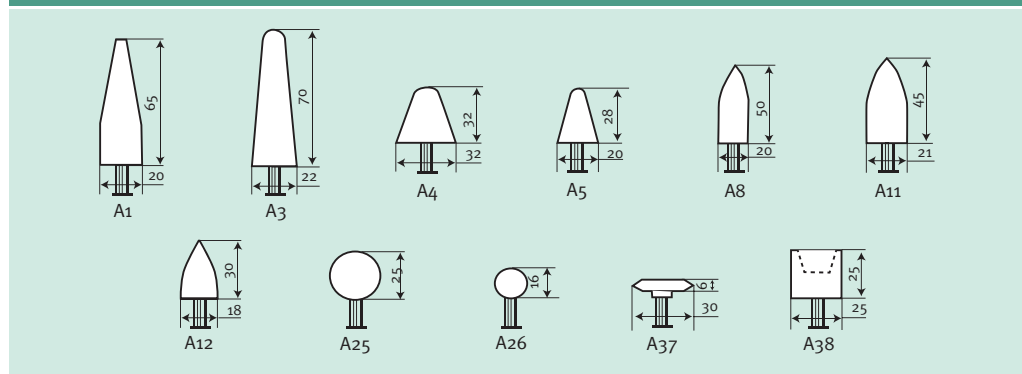
- Abrasive: Pink aluminium oxide
- For deburring, blending and finishing

Mounted Points & Wheels

Mounted Points (Type A)

Dimensions (mm) D x L	Spindle (mm) S x L	Shape	Specification	RPM	Quantity	Article Number	Barcode
20 x 65	6 x 40	A1	41A 36 PV	15000	20	66243538967	8711479165047
25 x 32	6 x 40	A2	41A 36 PV	20000	20	66243538973	8711479165092
22 x 70	6 x 40	A3	41A 36 PV	14000	20	66243538971	8711479165085
22 x 70	6 x 40	A3	41A 60 PV	14000	20	66243538539	8711479164385
32 x 32	6 x 40	A4	41A 36 PV	17000	20	66243566869	8711479165269
20 x 28	6 x 40	A5	41A 46 PV	30000	20	66243538968	8711479165054
20 x 50	6 x 40	A8	41A 36 PV	18000	20	66243538966	8711479165030
21 x 45	6 x 40	A11	41A 36 PV	18000	20	66243538969	8711479165061
18 x 30	6 x 40	A12	41A 46 PV	30000	20	66243538962	8711479164972
25	6 x 40	A25	41A 36 PV	25000	20	66243538939	8711479164804
16	6 x 40	A26	41A 46 PV	54000	20	66243538960	8711479164941
30 x 6	6 x 40	A37	41A 60 PV	30000	20	66243566866	8711479165238
25 x 25	6 x 40	A38	41A 36 PV	25000	20	66243566862	8711479165153

MOUNTED POINTS SHAPE KEY



Mounted Points (Type W)

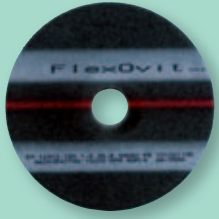


Dimensions (mm) D x L	Spindle (mm) S x L	Shape	Specification	RPM	Quantity	Article Number	Barcode
10 x 13	6 x 40	W176	41A 60 PV	54000	20	66243538891	8711479164101
10 x 20	6 x 40	W177	41A 60 PV	41000	20	66243538496	8711479164118
10 x 32	6 x 40	W179	41A 60 PV	25000	20	66243538943	8711479164842
13 x 20	6 x 40	W186	41A 60 PV	48000	20	66243538942	8711479164835
13 x 25	6 x 40	W187	41A 60 PV	30000	20	66243538957	8711479164903
16 x 20	6 x 40	W195	41A 46 PV	47000	20	66243538893	8711479164125
16 x 25	6 x 40	W196	41A 46 PV	35000	20	66243538533	8711479164354
16 x 32	6 x 40	SPEC.	41A 46 PV	25000	20	66243538894	8711479164132
20 x 20	6 x 40	W204	41A 46 PV	42000	20	66243538554	8711479164989
20 x 25	6 x 40	W205	41A 46 PV	32000	20	66243538896	8711479164149
20 x 32	6 x 40	W206	41A 46 PV	30000	20	66243538497	8711479164156
20 x 40	6 x 40	W207	41A 46 PV	24000	20	66243538898	8711479164163
25 x 25	6 x 40	W220	41A 36 PV	25000	20	66243538899	8711479164170
25 x 40	6 x 40	W221	41A 36 PV	19000	20	66243538900	8711479164187
32 x 20	6 x 40	W228	41A 36 PV	24000	20	66243538901	8711479164194
32 x 32	6 x 40	W230	41A 36 PV	17000	20	66243538503	8711479164200
40 x 13	6 x 40	W236	41A 36 PV	25000	20	66243566871	8711479165283
40 x 25	6 x 40	W237	41A 36 PV	19000	20	66243538910	8711479164224
40 x 40	6 x 40	W238	41A 36 PV	12000	20	66243538510	8711479164231

Bonded Abrasives

Organic Cut-Off Wheels





Organic Cut-Off Wheels

Plain – Type 41

- Non-reinforced products for toolroom applications

Dimensions (mm) D x T x B	Shape	Specification	Quantity	Article Number	Barcode
100 x 1.6 x 13	41	44A 60 PB	25	66243547741	3157625626782
125 x 1 x 20	41	44A 60 PB	25	66243547738*	3157625626768
150 x 1.6 x 13	41	44A 60 PB	25	66243547745	3157625626812
150 x 1.6 x 25.4	41	44A 60 PB	25	66243547748	3157625626836
150 x 1.6 x 32	41	44A 60 PB	25	66243547749	3157625626843
180 x 1.6 x 32	41	44A 60 PB	25	66243547747*	3157625626829
200 x 1.6 x 25.4	41	44A 60 PB	25	66243547744*	3157625626805
200 x 1.6 x 32	41	44A 60 NB	25	66243547750*	3157625626867
508 x 5 x 25.4	41	A24S BF7	10	66243450473	8711479298233
508 x 5.4 x 25.4	41	A242 QBF	10	66243450474	8711479118487

* Made-to-order

Depressed Centre – Type 42

- Reinforced

Dimensions (mm) D x T x B	Shape	Specification	Quantity	Article Number	Barcode
400 x 5 x 76.2	42	ZA 24 Z0BF4	20	66243547742*	3157625626799
508 x 5.5 x 76.2	42	A24SBF7	8	66243450461	3564659127459

* Made-to-order

Bonded Abrasives

Foundry



Bonded Abrasives



Non-reinforced organic stones

- For use on portable grinding machines or machines with a flexible shaft.



Reinforced organic cups

- A – Suitable for grinding metal
- C – Suitable for grinding stone

Foundry

Plain – Type 01

Dimensions (mm) D x T x B	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
51 x 16 x 10	01	A 30 TB	50	100	66243450432	8711470000651
65 x 13 x 10	01	A 24 RBF	50	100	66243471152	3157625631274
76 x 13 x 10	01	A 30 TB	50	20	66243450434	8711479262487

Taper Cups – Type 11

Dimensions (mm) D x T x Th	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
100/80 x 50 x M14 Rim 20 - Back 20	11	A 16 PB	50	18	66243567204	8711479404801
100/80 x 50 x M14 Rim 20 - Back 20	11	A 16 QB	50	18	66243538886	8711479397127
100/80 x 50 x 5/8UNC Rim 20 - Back 20	11	A 16 QB	50	18	66243538821*	8711479396816
100/80 x 50 x M14 Rim 20 - Back 20	11	A 30 NB	50	18	07660738783	8711479416446
100/80 x 50 x M14 Rim 20 - Back 20	11	A 36 PB	50	18	66243566925	8711479404030
100/80 x 50 x 5/8UNC Rim 20 - Back 20	11	A 36 PB	50	18	66243566965*	8711479404061
125/100 x 50 x M14 Rim 25 - Back 20	11	A 16 PB	50	10	66243567216	8711479406287
125/100 x 50 x M14 Rim 25 - Back 20	11	A 16 QB	50	10	66243567220	8711479406348
125/100 x 50 x 5/8UNC Rim 25 - Back 20	11	A 16 QB	50	10	66243567004*	8711479404351
125/100 x 50 x 5/8UNC Rim 25 - Back 20	11	A 20 OB	50	10	66243538920	8711479403996
125/100 x 50 x 5/8UNC Rim 25 - Back 20	11	A 30 QB	50	10	66243566975	8711479404191
125/100 x 50 x 5/8UNC Rim 25 - Back 20	11	A 36 PB	50	10	66243567116	8711479404740
125/100 x 50 x M14 Rim 25 - Back 20	11	A 36 PB	50	10	66243538823	8711479396823
125/100 x 50 x M14 Rim 25 - Back 20	11	C 20 PB	50	10	66243538887	8711479397134
125/100 x 51 x M14 Rim 25 - Back 20	11	C 20 QB	50	10	66243567222*	8711479406362
127/100 x 51 x 5/8UNC Rim 25 - Back 20	11	A 16 PB	50	10	66243567026	8711479404382
127/100 x 50 x 5/8UNC Rim 25 - Back 20	11	A 36 MB	50	10	66243567226*	8711479407116
150/120 x 50 x 5/8UNC Rim 40 - Back 20	11	A 16 PB	50	8	66243567205*	8711479404818
150/120 x 50 x 5/8UNC Rim 40 - Back 20	11	A 16 QB	50	8	66243566960	8711479404047
150/120 x 50 x 5/8UNC Rim 40 - Back 20	11	A 16 RB	50	8	66243567061	8711479404528
150/120 x 50 x 5/8UNC Rim 40 - Back 20	11	A 36 PB	50	8	66243567012	8711479404368
150/120 x 50 x 5/8UNC Rim 40 - Back 20	11	C 16 QB	50	8	66243538897*	8711479397158
150/120 x 50 x M14 Rim 40 - Back 20	11	C 20 PB	50	8	66243567221*	8711479406355

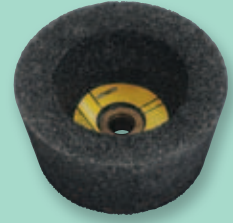
* Made-to-order

Taper Cups – Type 11



Dimensions (mm) D x T x Th	Shape	Specification	MOS (m/s)	Quantity	Article Number	Barcode
110 x 95 x 22.2	11	C 20 VE	50	1	66243538706	8711479197345
110 x 95 x M14	11	C 20 VE	50	1	66243538707	8711479197352
110 x 95 x 22.2	11	C 60 VE	50	1	66243538712	8711479197505
110 x 95 x M14	11	C 60 VE	50	1	66243538713	8711479197512

Bonded Abrasives



Reinforced organic cups

- C – Suitable for grinding stone

Bonded Abrasives

Organic Mounted Points & Wheels





- A**
- Abrasive: Aluminium oxide
 - For use on all steel types, cast iron & superalloys.

Organic Mounted Points & Wheels

Type A & B

Dimensions (mm) D x L	Spindle (mm) S x L	Shape	Specification	RPM	Quantity	Article Number	Barcode
20 x 63	6 x 40	A1	A36 QB	19800	50	07660739154	8711479394126
20 x 28	6 x 40	A5	A36 QB	45000	50	07660739227*	8711479394140
21 x 45	6 x 40	A11	A36 QB	19860	50	07660739229	8711479394164
40 x 10	6 x 40	A36	A36 QB	23520	50	07660739231*	8711479394188
13	6 x 40	B121	A46 QB	59680	50	07660739563*	8711479393983

* Made-to-order

Organic Mounted Wheels A 30 R

Dimensions (mm) D x L	Spindle (mm) S x L	Shape	Specification	RPM	Quantity	Article Number	Barcode
10 x 20	6 x 40	100	A30 R	82200	25	07660738812	8711479147685
10 x 30	6 x 40	100	A30 R	56900	25	07660738814	8711479147708
10 x 40	6 x 40	100	A30 R	47500	25	07660738816	8711479147722
15 x 20	6 x 40	100	A30 R	58500	25	07660738819	8711479147760
15 x 30	6 x 40	100	A30 R	39600	25	07660738820	8711479147777
20 x 20	6 x 40	100	A30 R	44800	25	07660738827	8711479147838
20 x 30	6 x 40	100	A30 R	30000	25	07660738831	8711479147920
20 x 40	6 x 40	100	A30 R	24200	25	07660738840	8711479148026
20 x 50	6 x 40	100	A30 R	19100	25	07660738830	8711479147883
25 x 25	6 x 40	100	A30 R	30100	25	66243450527	8711479148170
25 x 30	6 x 40	100	A30 R	24200	25	07660738849	8711479148224
30 x 30	6 x 40	100	A30 R	20100	25	07660738859	8711479148323
40 x 30	6 x 40	110	A30 R	15200	25	07660738879	8711479148637
40 x 40	6 x 40	100	A30 R	12200	25	07660738881	8711479148651
50 x 25	6 x 40	110	A30 R	15200	25	66243472934	8711479148729

Organic mounted wheels W A36QB

Dimensions (mm) D x L	Spindle (mm) S x L	Shape	Specification	RPM	Quantity	Article Number	Barcode
10 x 32	6 x 40	W179	A36 QB	45000	50	07660739232*	8711479394201
13 x 40	6 x 40	W188	A36 QB	30370	50	66243567290*	8711479408090
20 x 25	6 x 40	W205	A36 QB	34500	50	66243567291	8711479408106
25 x 25	6 x 40	W220	A36 QB	25500	50	66243567292	8711479408113
32 x 13	6 x 40	W227	A36 QB	25500	50	66243567246	8711479407611
32 x 32	6 x 40	W230	A36 QB	24000	50	66243567296	8711479408120

* Made-to-order

Organic mounted wheels A 46 Q - ironfree

Dimensions (mm) D x L	Spindle (mm) S x L	Shape	Specification	RPM	Quantity	Article Number	Barcode
10 x 20	6 x 40	100	A46 QB	82200	50	07660738813	8711479147692
10 x 25	6 x 40	100	A46 QB	69800	50	07660739277*	8711479393884
10 x 30	6 x 40	100	A46 QB	56900	50	07660738815	8711479147715
10 x 32	6 x 40	100	A46 QB	56900	50	07660739323*	8711479393860
13 x 40	6 x 40	100	A46 QB	36600	50	07660739350*	8711479393907
15 x 30	6 x 40	100	A46 QB	39600	50	07660738821	8711479147784
16 x 25	6 x 40	100	A46 QB	46200	50	07660739543	8711479393921
16 x 50	6 x 40	100	A46 QB	23800	50	07660739545*	8711479393945
20 x 20	6 x 40	100	A46 QB	44800	50	07660738825	8711479147814
20 x 25	6 x 40	100	A46 QB	37400	50	07660739538	8711479393969
20 x 40	6 x 40	100	A46 QB	24200	50	07660738838	8711479147999
25 x 25	6 x 40	100	A46 QB	30100	50	07660738844	8711479148187
25 x 40	6 x 40	100	A46 QB	19400	50	07660739106	8711479394027
30 x 20	6 x 40	110	A46 QB	30200	50	07660738858	8711479148279
32 x 20	6 x 40	100	A46 QB	28400	50	07660739120	8711479394041
32 x 32	6 x 40	100	A46 QB	19800	50	07660739148*	8711479394065
40 x 13	6 x 40	100	A46 QB	23800	50	07660739149	8711479394089
50 x 25	6 x 40	110	A46 QB	15200	50	07660738882	8711479148682

* Made-to-order



A 46 Q

- Abrasive: Aluminium oxide
- For use on all steel types, cast iron & superalloys.
- Specially suited for stainless steel applications