# GROUP **235** GRINDING WHEELS

## How a Grinding Wheel is Defined

Any grinding wheel is defined by three specific pieces of information:

## (1) The Wheel Size

Wheel size is the measure of the overall diameter, wheel thickness and hole diameter quoted in mm:

### Diameter (D) x Thickness (T) x Bore (B)

Diameter and thickness are usually represented as nominal dimensions but the bore size is given to two decimal places.

#### (2) The Shape and Minor Dimensions

Grinding wheels are available in a vast range of shapes. Below are several examples of International Standard Shapes:





**POWER TOOLS** oð (3) Designation ABRASIVES The specification of a grinding wheel is given by the designation mark which is made up of six basic parts:

ALUMINIUM OXIDE Friable White WA 41A Pink Ruby 46A Pink 48A А Regular RA Rubernite MA (WA+A) Mixtures SILICON CARBIDE С Regular \*Black BC



# Abrasive Types

## **Regular Aluminium Oxide**

Tough form of aluminium oxide which contains 3% titanium oxide. Further oxidation of the titanium oxide occurs at temperatures above 1250°C causing the colour to change from the usual brown to a grey-blue. Suitable for grinding high tensile strength materials.

#### White Aluminium Oxide

Produces wheels with high friability (the ability to fracture, exposing sharp cutting edges) due to the highly refined aluminium oxide containing over 99% pure alumina. Suitable for precision grinding hardened or HSS materials.

#### Semi-Friable Aluminium Oxide

Produces wheels using an abrasive with friability, toughness and free cutting characteristics. With good form holding and a high degree of versatility making 48A abrasive suitable for cylindrical, centreless, crankshaft and angle head grinding.

## **Pink Aluminium Oxide**

Produces wheels that have highly refined aluminium oxide containing less than 0.3% of chromium oxide. A pink colour wheel, tougher and less friable than white abrasive while still retaining free cutting properties. Suitable for grinding high alloyed tool steels especially when a cooler grinding action is required.

#### Rubenite Aluminium Oxide

High performance aluminium oxide abrasive used on shank mounted points and wheels. With free cutting characteristics. Suitable for general purpose grinding of steels and most metals.

## Silicon Carbide

Wheels that are harder than aluminium oxide type abrasives but brittle. Suitable for grinding low tensile strength materials such as cast iron, non-ferrous metals and non-metallic materials. Silicon carbide is available in three varieties with very similar physical properties. They are distinguished by colour; dark green (DC) the most commonly used, black silicon carbide (BC) is for roughing operations and light green carbide (GC) for specific applications.













#### Abrasive Mixtures

By mixing different types of abrasives a large range of wheels can be produced with very different characteristics to meet specific needs.

#### **Grain Size**

The grain or grit size is important for determining a wheel's ability to produce the required surface finish and stock removal. Grain size is denoted by a number which increases as grain sizes decrease, i.e. 10 grit, grain size = 2.00mm, 60 grit, grain size = 0.25mm. Standard sizes are used for all wheels in Europe as specified in the European Standards laid down by FEPA (Federation of European Producers of Abrasive Products)

#### A wheel will have the following characteristics as the grit size is made progressively finer:

- It will cut more slowly.
- It will produce a finer surface finish.
  It will be more resistant to dressing by the component being ground.
- It will be more likely to produce chatter marks if the grade is too hard.
   The minimum form radius that can be ground will decrease.
   A coarser grit wheel will act in the following way:

- It will be freer cutting. .
- It will produce a coarser surface finish.
- It will be less resistant to dressing by the workpiece.
- The minimum form radius that can be ground will increase.

#### Bond Type

Vitrified Bond: These wheels have a porous structure of abrasive particles bonded together by bridges of glass or similar vitreous material. Other fusible materials are used in formulating bonds to produce a wide range of structures each with its own characteristics. The wheels are kiln fired at temperatures exceeding 1000°, because of this they are unaffected by heat generated during normal grinding processes. Suitable for precision grinding due to their high rigidity, they can be fractured by mechanical forces.

Organic Bonds: Organic bonds such as resinoid, rubber and shellac are cured at relatively low temperatures, when compared to vitrified bonds. Their resistance to mechanical forces can be affected by the heat generated when grinding causing the wheel to wear quickly or fracture easily. This can be altered by controlling the heat resistance of the bond

Resinoid Bond: Based on thermosetting phenolic resin, to which fillers may be added to improve the mechanical properties of the wheel. As these wheels are tougher and less rigid than vitrified wheels, they are suitable for heavy stock removal. They also produce finer finish.

Rubber Bond: Rubber bonded wheels are suitable for grinding operations where a fine finish is necessary and on wet cutting off operations where a high degree of accuracy and quality of cut are required. Used for most centreless control wheels.

## Shellac Bond

These wheels are cool cutting and produce very fine finishes. this makes them particularly suitable for applications with minimal heat generation or for grinding very soft materials such as copper.

# **PRODUCTS ARE ONLY AVAILABLE VIA YOUR DISTRIBUTOR**







Type 1 Plain

Vitrified bond for precision grinding. Unaffected by water, acid and oils. All  $1^{1/4}$ " bore, supplied with 1",  $7_8$ ",  $3_4$ ",  $5_8$ " and 1/2" bore nylon bushes.





All York grinding wheels are supplied in a unique storage box, which helps prevent chipping and other accidental damage. Spare cases available below.



Spare Storage Box		
Туре	Order Code YRK-235	Price/1 TB
For up to 8"/200mm grinding wheels	-9000K	200.00
Reducing Bush Set		
Contents	Order Code YRK-235	Price/1 TB
1/2", 5/8", 3/4" & 1"	-9010K	177.00

Diameter x Thickness	Grade		Weight each	Order Code YRK-235	Price/1 TB	-
100 x 6		Mod	<u>1<sup>1</sup>/4" Bore</u>	00201/	242.00	-
100 x 6	WA80KV	Med	0.25Kg	-0030K	243.00	-
127 x 6	WA100KV	Med	0.30kg	-0045K	347.00	
127 x 13	GC80KV	Med	0.40kg	-0050K	413.00	-
150 x 6	WA60KV	Med	0.30kg	-1110K	413.00	
	A46NV	Med	0.55kg	-1530K	319.00	-
	AGONV	Med	0.55kg	-1550K	313.00	
150 x 13	A80NV	Med	0.55kg	-1580K	313.00	-
200 / 20	WA60KV	Med	0.55kg	-1620K	472.00	
	GC60JV	Soft	0.55kg	-1630K	583.00	
	A46NV	Med	0.65kg	-1730K	602.00	
150 x 16	A60NV	Med	0.65kg	-1750K	602.00	
	GC60JV	Soft	0.65kg	-1780K	649.00	
	A360V	Med	0.80kg	-2010K	666.00	-
	A36PV	Hard	0.80kg	-2020K	666.00	
	A46NV	Med	0.80kg	-2030K	666.00	-
150 x 20	AGONV	Med	0.80kg	-2050K	666.00	
130 x 20	ABONV	Med	0.80kg	-2070K	666.00	
	WA60KV	Med	0.80kg	-2090K	666.00	
	GC60JV	Soft	0.80kg	-2110K	666.00	
	GC100IV	Soft	0.80kg	-2120K	767.00	
150 × 05	AGONV	Med	1.10kg	-2350K	825.00	·
150 x 25	GC60JV	Med	1.10kg	-2380K	825.00	-
180 x 6	WA60KV	Med	0.40kg	-2400K	354.00	
	A46NV	Med	0.40kg	-2410K	560.00	
	GC60JV	Soft	0.80kg	-2460K	560.00	Ä
	GC100IV	Soft	0.80kg	-2470K	560.00	· Þ
	WA46HV WA46IV	SOTT Med	0.80kg	-2480K -2490K	560.00	N
180 x 13	WA46KV	Med	0.80kg	-2500K	572.00	2
	WA60JV	Soft	0.80kg	-2510K	649.00	П
	WA60KV	Med	0.80kg	-2520K	649.00 649.00	<b>V</b>
	WA80KV	Med	0.80kg	-2520K	649.00	· 80
	WA100KV	Med	0.70kg	-2540K	649.00	
	AGONV	Med	1.20kg	-2550K	666.00 666.00	Ŏ
180 x 20	WA40KV WA60KV	Med	1.20kg	-2570K	666.00	Š
	WA80KV	Med	1.20kg	-2580K	666.00	
	GC60JV	Soft	1.20kg	-2590K	885.00	· 🛪
200 x 13	WA46KV WA60KV	Med	0.90kg	-2596N -2600K	767.00	-
	WA80KV	Med	0.90kg	-2610K	767.00	Ö
	A36NV	Med	1.40kg	-2616K	825.00	Ŏ
	A36PV A46NV	Med	1.40Kg 1.40kg	-2620K -2630K	825.00	
	A46PV	Hard	1.40kg	-2640K	825.00	. •
200 x 20	AGONV	Med	1.40kg	-2650K	825.00	
		Med	1.40Kg	-2660K	825.00	-
	WAGOKV	Med	1.40kg	-2700K	825.00	
	GC60JV	Soft	1.40kg	-2710K	882.00	
	A36PV	Hard	1.80kg	-2820K	885.00	
	A46NV	Med	1.80kg	-2830K	1002.00	
-	AGONV	Med	1.80kg	-2850K	1002.00	-
200 x 25	A60PV	Hard	1.80kg	-2860K	1002.00	
200 x 20	A80NV	Med	1.80kg	-2870K	1061.00	-
	GC80JV	Soft	1.80kg	-2910K -2920K	1120.00	
	GC100IV	Soft	1.80kg	-2930K	1120.00	
	GC120JV	Soft	1.80kg	-2940K	1120.00	-
250 × 20	WAAGKV	Mod	3" Bore	22401/	1474.00	-
256 x 20	WA40KV	Med	2.50kg	-3260K	1474.00	-
	A36MV	Med	3.05kg	-3300K	1768.00	-
	A36NV	Hard	3.05kg	-3320K	1768.00	
-	AGOMV	Med	3.05kg	-3340K	1768.00	-
	WA46JV	Med	3.05kg	-3420K	1768.00	
256 x 25	WA46KV	Med	3.05kg	-3440K	1768.00	-
_	WAGUKV	Med	3.05kg	-3460K -3500K	1945.00 1945.00	
	GC60KV	Med	3.05kg	-3520K	<u>19</u> 45.00	_
-	GC80JV	Med	3.05kg	-3540K	1945.00	
	GC100IV	Soft Mod	3.05kg	-3580K	1945.00	-
300 x 25	WA60KV	Med	3.65kg	-4280K	2947.00	
	WA100KV	Med	3.65kg	-4320K	2947.00	_
	A36NV	Hard	5.20kg	-4520K	4126.00	
300 x 33 -	AGOMV	Med	5.20kg	-4600K	4126.00	-

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