

**CARBOCHIM**  
ABRAZIVE CLUJ  
PROFESIONALE

**GRINDING WHEELS**



## Generalities

The grinding wheels are hard crystal grinding tools with a lot of cutting edges. These crystals are held together by a bond, forming products with different shapes and dimensions.

Based on the nature of bond, Carbochim produce and sell the following groups of grinding wheels:

- vitrified bonded grinding wheels
- bakelite bonded grinding wheels
- magnesite bonded grinding wheels
- elastic bonded grinding wheels

## Marking



1. Trade mark
2. Quality Standard
3. Run number
4. Shape
5. Dimensions
6. Abrasive material
  - 11A Brown fused aluminium oxide
  - 41A Semifriable fused aluminium oxide
  - 33A White fused aluminium oxide
  - 66A Pink fused aluminium oxide
  - 21C Black silicon carbide
  - 22C Green silicon carbide
7. Grit size
 

Coarse	Medium	Fine	Very fine
16	46	120	280
↓	↓	↓	↓
36	100	240	800
8. Hardness
  - Very soft E,F,G
  - Soft H,I,J,K
  - Medium L,M,N,O
  - Hard P,Q,R,T
  - Extra hard Z
9. Structure
  - Very closed 1,2
  - Closed 3,4
  - Medium 5,6
  - Open 7, 8, 9
  - Very open 10, 11, 12
10. Bond type
  - V vitrified
  - B resinoid
  - M magnesite
  - E elastic
11. Maximum rotations per minute (RPM)/  
Maximum rotation speed permissible

The grinding wheels are high precision tools used for grinding and finishing of a wide range of materials. The quality of the surface obtained during grinding process depends on following factors:

- grinding wheel - characterised by the abrasive material, grit size, hardness, structure, bond type.
- grinding process parameters - passing speed, in-going feed, peripheral work speed.
- grinding machine - type, rate of wear, adjustments;



# Generalities

## Abrasive material type

Abrasive material type is selected based on the nature and the characteristics of the processed material :

### **Brown fused aluminium oxide- 11A.**

High hardness and toughness fused aluminium oxide containing 95-97%Al<sub>2</sub>O<sub>3</sub>.  
Recommended for low alloyed steel grinding on high power machines.

### **Semi friable fused aluminium oxide- 41A.**

Less hardness, toughness and more friable fused aluminium oxide than the brown one, containing 98% Al<sub>2</sub>O<sub>3</sub>  
Recommended for heat sensitive and hardened steel in precision grinding.

### **White fused aluminium oxide- 33A.**

High hardness and brittle fused aluminium oxide containing min. 99% Al<sub>2</sub>O<sub>3</sub>. These characteristics grant high self-sharpening features for grinding wheels and high protection of grinding surfaces.  
Recommended for mild steel, hardened steel, stainless steel, cast iron precise grinding and sharpening

### **Mono-crystalline fused aluminium oxide - 31A**

Abrasive material with min. 99%Al<sub>2</sub>O<sub>3</sub>, obtained by special proceeding.  
Each mono-crystalline fused aluminium oxide grain makes up a single crystal with a lot of edges which adhere strongly to bond bridges, that gives superior qualities to the grinding wheel from the point of view of efficiency and work precision.  
Recommended for rapid and tools steel processing, for high alloyed steels and thermo sensible steel rectifying that require removal of large material additions or even the full cutting (processing feed 2-3mm/pass)

### **Pink fused aluminium oxide - 66A.**

High hardness and toughness fused aluminium oxide superior than the white one containing 99% Al<sub>2</sub>O<sub>3</sub> and 0,25% Cr<sub>2</sub>O<sub>3</sub>  
Recommended for high-alloyed steel, stainless steel, cast iron grinding.  
It is used for manufacturing of grinding wheels for internal grinding, mounted points for steel and cast iron grinding.

### **Electroruby - 77A.**

High hardness and toughness fused aluminium oxide containing 99% Al<sub>2</sub>O<sub>3</sub> and 2,5% Cr<sub>2</sub>O<sub>3</sub>  
Recommended for low temperature of high-alloyed steel grinding.

### **Black silicon carbide - 21C.**

Hard abrasive material containing 97% SiC.  
Recommended for cast iron, brass, bronze, aluminum and low resistance materials grinding.

### **Green silicon carbide - 22C.**

High hardness and more friable abrasive material than the black silicon carbide, containing 99% SiC.  
Recommended for hard and very hard metals, cast iron, ceramics, glass, stone and concrete grinding.

## Generalities

### Grit size

**Grit size** is defined as the medium size of the abrasive grains, marked with numbers according to the FEPA F series standard.

In order to select the proper grinding wheels the following rules must be considered:

- coarse grits size – recommended for processes where a high stock removal rates is required:
  - big pieces;
  - soft materials ;
  - large contact areas;
  
- fine grits size - recommended for finishing processes:
  - hard and fragile materials,
  - small contact surface

Based on piece shapes, we recommend:

- coarse grit size for plane surfaces
- fine grit size for profiled surfaces

### Hardness

Hardness is defined as the bond strength against the tendency of external forces to remove grains from the grinding wheel during grinding processes.

Generally, grinding wheels hardness is marked with letters .

Based on hardness we divide grinding wheel in the following categories:

- Very soft: E, F, G
- Soft: H, I, J, K
- Medium: L, M, N, O
- Hard: P, Q, R, T
- Extra hard :Z

Select the hardness of the grinding wheel considering following rules:

- high hardness is recommended for :
  - soft materials
  - small contact area
  - roughing, deburring and cutting operations
  
- low hardness is recommended for:
  - hard materials;
  - large contact area.



## Generalities

### Structure

Structure is defined as the percentage ratio between abrasive materials, bond and pores volume.

The structure of Carbochim wheels are designated by numbers:

- very open : 10,11,12
- open: 7,8,9
- medium: 5,6
- closed: 3,4
- very closed: 1,2

Carbochim's standard structure for vitrified grinding wheels is 5, respectively 4 for bakelite bonded grinding wheels.

In order to select the proper grinding wheel the following rules must be considered:

- closed structures - recommended for :
  - profiled surfaces.
- medium structures- recommended for:
  - universal grinding and tools sharpening
- open structures- recommended for:
  - heat sensitive material grinding.
  - rubber and plastic materials grinding

### Bond

Carbochim use different types of bonds to manufacture grinding wheels which are designed as follow:

- V- vitrified bond
- B- bakelite bond
- M- magnesite bond
- E elastic bond

According to Carbochim's know-how these bond's symbols are followed by numbers indicating bonds subtypes suitable for different applications.

Select bonds type considering the following rules:

- vitrified bond - recommended for sharpening and grinding operations.
- bakelite bond - recommended for roughing, deburring and finishing operations proceeded at high working speed.
- magnesite bond - recommended for heat sensitive materials and large contact areas grinding.
- Elastic bond - recommended for finishing and super-finishing operations.

### Peripheral work speed

Peripheral work speed is an important parameter of grinding wheels that directly influence grinding quality.

Grinding wheels are used at peripheral work speeds between 20-80 m/s as follow:

- Vitrified bonded grinding wheels: 32, 35, 40, 63m/s
- Bakelite bonded grinding wheels: 32, 45, 50, 63, 80m/s
- Magnesite bonded grinding wheels: 16, 20m/s
- Elastic bonded grinding wheels: 20m/s


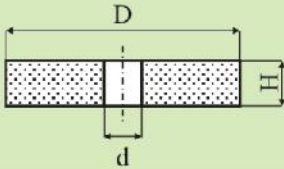

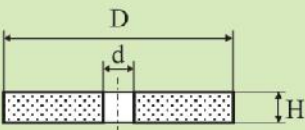

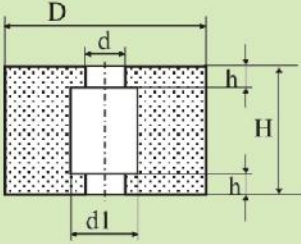

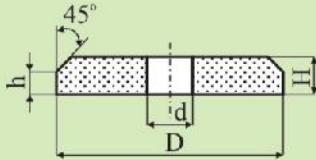

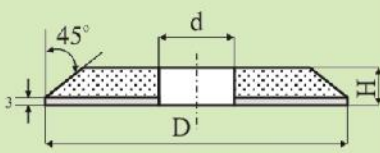
## Vitrified bonded grinding wheels - shapes and dimensions

Vitrified bonded grinding wheels are shaped products made of abrasive grains bonded with ceramic adhesive. They are the grinding wheels most widely used in industry, encountered in all types of rectifying operations. By combining the characteristics offered by the utilized abrasive material, the bond's properties and the porosity of the grinding wheel, any demands in the rectifying operations can be met.

Within these operations, an optimal balance is required between the profile of the grinding wheel and its self-sharpening, characteristics determined by the vitrified or sintered structure of the ceramic bond. Ceramic bonded grinding wheels have a natural porosity that can be artificially increased using pore agents. The porous structure allows an optimal cooling of the rectified pieces and the easy removal of the chipped material.

Vitrified bonded grinding wheels are recommended for precision rectifying of alloy steels, heat-sensitive pieces, hardened pieces and tool sharpening operations. When the rectifying process requires high precision and high surface quality, a vitrified bonded grinding wheel must be used. For internal rectifications in the bearing industry, sulfur-impregnated vitrified bonded grinding wheels are used to obtain a good surface and to counteract intense heat generating.

### Shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic size	Dimensions range
Straight wheel		1	ISO525 SR EN 12413		D x H x d	D=20-1065 mm H=4-300 mm D=6-406 mm
Straight wheel for crankshaft grinding		1 AC	ISO525 SR EN 12413		D x H x d	D=450-1100 mm H=17-50 mm d=127-304,8 mm
Straight wheel with symmetrical recessed bore		1 T1	ISO525 SR EN 12413		D x H x d/ d1 x h	D=350-600 mm H=125-300 mm D=127-406,4 mm
One side tapered straight wheel "C" profile		1 C	ISO525 SR EN 12413		D x H x d	D=80-300 mm H=8-15 mm d=16-127 mm h=0,5-3,2 mm
Plane with "C" profile of 2 layers		1 CTP	ISO525 SR EN 12413		D x H x d	D=80-300 mm H=8-15 mm d=16-32 mm

Other shapes and dimensions can be manufactured on customers request.




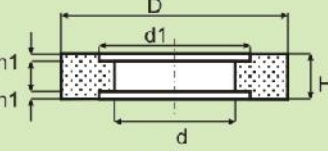

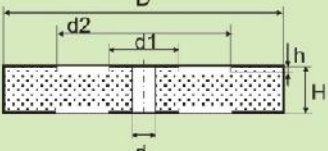

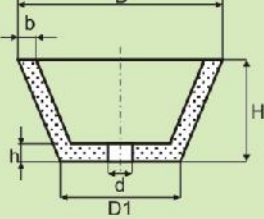

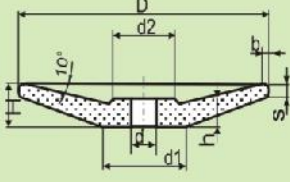

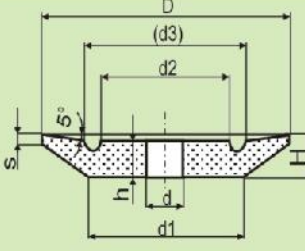

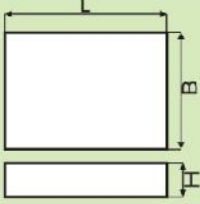

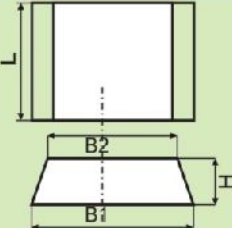
# Vitrified bonded grinding wheels - shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic sizes	Dimensions range
Cylindrical plane for roll ways		1CR	ISO525 SR EN 12413		D x H x d	D=8-1100 mm H=2-300 mm D=3-406 mm
Cylindrical plane for roll ways		38CR	ISO525 SR EN 12413		D x H x d/ D1 x h	D=150-600 mm H=4-20 mm d=203-304,8 mm D1=100-450 mm h=5-10 mm
Cylindrical wheel cemented or clamped		2	ISO525 SR EN 12413		B < D/6 D x H x d	D=100-500 mm H=30-100 mm d=60-400 mm
One side relieved wheel		20	ISO525 SR EN 12413		D/d1 x H/ h x d	D=350-600 mm H=60-100 mm d=127-304,8 mm d1=165-380 mm h=7-40 mm
Cylindrical One side relieved wheel		207	ISO525 SR EN 12413		D x H x d/ D1 x B	130/124x18/8x70 400/375x55/8x250 450/435x45/41x150 650/620x80/15x350 660/635x90/8x200
Tapered wheel		3	ISO525 SR EN 12413		D x H x d/ D1 x h	D=100-250 mm H=5-20 mm d=16-32 mm D1=30-125 mm h=2-4 mm
Both sides tapered wheel		4	ISO525 SR EN 12413		D x H x d/ D1 x h	D=100-400 mm H=20-100 mm d=16-127 mm D1=50-200 mm h=6-12 mm
Recessed one side wheel		5	ISO525 SR EN 12413		D x H x d/ d1 x H1	D=20-600 mm H=16-100 mm d=6-152,4 mm d1=13-380 mm H1=10-60 mm
Straight cup wheel		6	ISO525 SR EN 12413		D x H x d/ D1 x H1	80x40x20 / 60x30 100x50x20 / 80x40 150x80x20 / 130 x 65 175x100x20 / 140x80 200x80x25 / 160x65 250x100x152,4 / 200x80

Other shapes and dimensions can be manufactured on customers request.



## Vitrified bonded grinding wheels - shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic sizes	Dimensions range
Recessed both sides wheel		7	ISO525 SR EN 12413		$D \times H \times d / d1 \times h1$	$D=16-900$ mm $H=6-160$ mm $d=6-304,8$ mm $d1=6-600$ mm $h1=3-40$ mm
Cylindrical symmetric recessed wheel		7 E1	ISO525 SR EN 12413		$D \times H \times d / d1 \times d2 \times h$	$D=600-900$ mm $H=32-80$ mm $d=203,2-304,8$ mm
Taper cup wheel		11	ISO525 SR EN 12413		$D / D1 \times H \times d / b \times h$	100/75x32x20/9x7 125/92x40x20/9x7 150/114x50x20/9,5x12 250/200x140x76,2/27,5x38 250/200x140x100/27,5x38 350/300x125x76,2/40x30
Dish wheel		12A	ISO525 SR EN 12413		$D \times d1/d2 \times H/h \times d \times b \times s$	75x30/20x8/6x13x4x2 90x42/30x8/6x13x4x1,5 100x40/35x12/8x20x5x3 125x43/40x14/9x20x6x3 150x60/50x15/10x20x7x3 175x60/60x18/11x20x8x2 200x83/70x19/12x20x10x3 250x118/100x21/14x32x12x3
Dish wheel with step and canal		12M1	ISO525 SR EN 12413		$D \times d1/d2 \times H/h \times d \times s$	220x120/105x17/15x40x4 280x120/105x25/18x40x8
Rectangular segment		31 SegA	ISO525 SR EN 12413		$B \times L \times H$	$B = 60-90$ mm $L = 180-250$ mm $H = 25-35$ mm
Trapezoidal segment		31 SegB	ISO525 SR EN 12413		$B1 \times B2 \times L \times H$	$B1 = 54-110$ mm $B2 = 45-85$ mm $L = 80-160$ mm $H = 10-40$ mm

Other shapes and dimensions can be manufactured on customers request.

# Vitrified bonded grinding wheels - shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic size	Dimensions rage
Convex segment		31 SegC	ISO525 SR EN 12413		$B_1 \times B_2 \times L \times R \times r$	75x45x110x125x95 75x45x150x160x135
Rectangular section honing stone		54 HON A	ISO525 SR EN 12413		$B \times C \times L$	$B = 3-16\text{mm}$ $C = 12,5-13\text{mm}$ $L = 32-160\text{mm}$
Square section honing stone		54 HON B	ISO525 SR EN 12413		$B \times C \times L$	$B = C = 3-20\text{mm}$ $L = 35-200\text{mm}$
Square section manual stone		90 PMA	ISO525 SR EN 12413		$L \times a$	$L = 100-300 \text{ mm}$ $a = 8-35 \text{ mm}$
Rectangular section manual stone		90 PMB	ISO525 SR EN 12413		$L \times a \times b$	$L = 100-300 \text{ mm}$ $a = 8-40 \text{ mm}$ $b = 8-20 \text{ mm}$
Tapered file (scythe stone)		90 PMO	ISO525 SREN 7284		$L \times b \times b_1 \times h$	228 x 12 x 36 x 12,5

Other shapes and dimensions can be manufactured on customers request.

# Vitrified bonded grinding wheels - shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic size	Dimensions rage
Cylinder mounted point		52A	ISO 525 SR EN 12413		DxH/SxL	D = 5-50mm H = 8-50mm S = 3-8mm L = 25-40mm
Disc shape mounted point		52A-C	ISO 525 SR EN 12413		DxH/SxL	D = 10-50mm H = 2-13mm S = 3-6mm L = 25-40mm
Cylinder-conical mounted point		52E	ISO 525 SR EN 12413		DxH/xSxL	D = 5-50mm H = 20-40mm S = 3-8mm L = 25-40mm
Cylinder-spherical mounted point		52D	ISO 525 SR EN 12413		DxH/SxL	D = 5-25mm H = 10-32mm S = 3-6mm L = 25-40mm
Conical mounted point		52G	ISO 525 SR EN 12413		DxH/SxL	D = 10-32mm H = 10-40mm S = 3-6mm L = 25-40mm
Ogival mounted point		52H	ISO 525 SR EN 12413		DxH/SxL	D = 5-8mm H = 10mm S = 3mm L = 25mm
Spherical mounted point		52J	ISO 525 SR EN 12413		D/SxL	D = 13-32mm S = 3-6mm L = 25-40mm

Other shapes and dimensions can be manufactured on customers request.



# Vitrified bonded grinding wheels - general recommendations

## Carbochim's vitrified bonded grinding wheels general recommendations

Recommendations are based on usual grinding parameters:

- stock removal rate -max.0,5 mm,
- peripheral work speed -40 m/s
- feed -max. 0,2 mm

### 1. Surface grinding

- use 1, 5, 7, 2, 6, 11, 31SegA, 31SegB and 31SegC shapes grinding wheels:

Work material	Shape 1, 5, 7			
	Grinding wheel external diameters			
	< Ø 250 mm	Ø 250-400 mm	> Ø 400 mm	
Mild carbon steel, uncured Tensile strength < 80Kgf/mm <sup>2</sup>	33A46(K-M)5V	50A36(K-M)5V	50A30(K-M)5V	
High-alloyed steel, uncured Tensile strength > 80Kgf/mm <sup>2</sup>	33A46K7V	33A46(I-K)7V	33A46(H-J)9V	
Stainless steel (with Ni-Cr with austenitic structure) uncured	90A54K7V	90A46(J-K)7V	90A46(I-J)9V	
Stainless steel (with Ni-Cr with austenitic structure) cured	90A54J7V	90A46(I-K)8V	90A46(H-J)9V	
Rapid steel	< 45 HRC	33A60(L-M)5V	33A60(L-M)5V	33A46(L-M)5V
	> 45 HRC	90A60J7V	33A60K5V	33A54K5V
Cast iron and chilled iron		33A46K7V	33A46K8V	
		21C54K7V	21C54K8V	
Stellite		22C54M7V	22C54L7V	
		33A54L8V	33A54K8V	
Bronze, aluminum and their alloys		33A46J8V	33A46J9V	
		21C54K8V	21C54K9V	
Plastic materials	21C36J5V		21C30J5V	

Work material	Shape:2, 6, 11		31Seg Shape
	Grinding wheel sidewall thickness		
	< 25 mm	> 25 mm	
Mild carbon steel, uncured Tensile strength < 80Kgf/mm <sup>2</sup>	33A60(K-M)5V	33A46(K-M)5V	33A(46-60)M5V
High-alloyed steel, uncured Tensile strength > 80Kgf/mm <sup>2</sup>	33A60(K-M)5V	33A46(K-M)V	33A(46-60) (K-M)5V
Stainless steel (with Ni-Cr with austenitic structure) uncured	90A60(J-K)7V	90A46(K-L)8V	33A(36-60) (K-L)7V
Stainless steel (with Ni-Cr with austenitic structure) cured	90A60(J-K)7V	90A46(J-K)8V	90A36(K-L)(8-9)V
Rapid steel	<45 HRC	33A60(K-M)5V	33A(46-60) (K-M)5V
	>45 HRC	33A60K5V	33A(46-60) (J-L)5V
Cast Iron and chilled iron		33A46 K5V	33A36K5V
		21C54K5V	21C46K5V
Bronze, aluminum and their alloys		33A46 J5V	33A46J5V
		21C54K5V	21C54K5V
Marble , natural stones, concrete and mosaic's floors		21C24M5V	21C24Q5V

# Vitrified bonded grinding wheels - general recommendations

## 2. External cylindrical grinding

- use 1, 5, 7 and 1T1 shapes grinding wheels

Work material		Between centers external grinding Shape: 1, 5, 7	Centerless grinding Shape: 1, 1T1
Mild carbon steel, unhardened		50A(46 - 60)(M - P)5V	11A(46 - 60)(M - N)V
Mild carbon steel, hardened		50A(46 - 80)(K - L)5V	33A(46 - 80)K4V
Mild carbon steel, unhardened		33A(46 - 60)(L - O)5V	50A(46 - 60)M4V
Mild carbon steel, hardened		33A(54 - 80)(K - L)5V	50A(54 - 80)K4V
Rapid steel	<63 HRC	33A(60 - 80)(K - L)5V	50A(60 - 80)(K - L)4V
	>63 HRC	33A(60 - 80)(J - K)5V	50A(60 - 80)(J - K)4V
Stainless steel unhardened		66A(54 - 60)K5V	33A60(K - L)4V
Stainless steel hardened		66A60L5V	21C60M4V
Nitralloy steel		22C80I4V	-
Aluminum and bronze alloys, brass and copper		21C(36 - 46)(K - L)5V	21C(54 - 60)(K - M)5V
Cast iron		22C60K5V	33A60(K - L)5V
Metal carbides		22C60K7V	22C60J4V
Rubber		33A(46 - 60)H10V	-
Stellite		66A60K4V	-
Porcelain		21C(46 - 60)L5V	21C36K4V

## 3. Internal cylindrical grinding

- use 1, 5 and 7 shapes grinding wheels

Work material	Grinding wheel external diameter			
	Ø < 20 mm	Ø 21 - 40 mm	Ø 41 - 80 mm	Ø > 80 mm
Unhardened steel, tensile strength 50-120Kg/mm <sup>2</sup>	50A80L5V	50A60L5V	50A54K5V	50A46K5V
Unalloyed steel, hardened up to 63 HRC	33A80K5V	33A60K5V	33A54K5V	33A46J5V
High alloyed steel, hardened up to 63 HRC	90A80K5V	90A60K5V	90A54K5V	90A46J5V
Rapid steel	< 63 HRC	33A80J5V	33A60J5V	33A54I5V
	> 63 HRC	66A80J5V	66A60J5V	66A54I5V
Nitralloy steel with hardness > 63 HRC	22C100K4V	22C80K4V	22C60J4V	22C60J4V
Extra hard alloys	22C100J4V	22C80I4V	22C60I4V	22C60H4V
Stainless steel, unhardened	22C60J4V	22C54J4V	22C46I4V	22C46I4V
Stainless steel containing over 12%Cr, martensitic structure	66A80J5V	66A60J5V	66A54I5V	66A46I5V
	92A80J5V	92A60J5V	92A54I5V	92A46I5V
Cast iron and chilled iron	33A60 J5V	33A60 J5V	33A54 I5V	33A46 I5V
	21C60K5V	21C60K5V	21C54J5V	21C46J5V
Hard chromium	90A80J5V	90A60J5V	90A54I5V	90A46I5V
Bronze, aluminium and their alloys	33A60I5V	33A60 I5V	33A54 I5V	33A46 I5V
	21C60J5V	21C60J5V	21C54J5V	21C46J5V
Plastics and bakelite materials	21C60I5V	21C46I5V	21C46I5V	21C36I5V



# Vitrified bonded grinding wheels - general recommendations

## 4. Tools sharpening

- use 1 and 5 shapes grinding wheels

Work material	External diameter (mm)	Specification	
		Rough grinding	Finishing
Tool steel or rapid steel tools	< 150	33A(46-60)(L-M)5V	33A120J5V
	150 - 175		33A100J5V
	200 - 250	33A54L5V	33A80K5V
	>250	33A46K5V	33A80J5V
Hard metals tools	< 150	22C(46-60)(L-M)5V	22C120I5V
	150 - 200	22C54L5V	22C100K5V
	250 - 300	22C46K5V	22C80K5V

- use 1C and 1CTP shapes grinding wheels

Work material	Dimensions (mm)		Specification
	D	H	
Band saw	125; 150	4, 6, 8	33A60M5V
	175; 200	8, 10, 13	33A60O5V
Linear and circular saws for wood industry	200; 250	8, 10, 13	33A60M5V
Rapid and high alloyed steel circular saw	200; 250	8, 10, 13	33A60M5V
High alloyed and rapid steel saws for metallurgy	125; 150	6, 8, 10	33A60(M-O)5V
	175; 200	8, 10, 13	33A60M5V
	250; 300	10, 13	33A60(K-M)5V

- use 3 and 12 shapes grinding wheels

Work material	External diameter (mm)	Specification	
		Rough grinding	Finishing
Rapid steel tools	100-125	33A60(K-M)5V	33A80K5V
			33A120J5V
	150-175	33A46(J-M)5V	33A60K5V
			33A80J5V
	200	33A46(I-K)5V	33A60J5V
		33A80I5V	
Tools equipped with hard metal plates	100-125	22C60I5V	22C80J5V
			22C100I5V
Milling cutters equipped with hard metal plates	150-200	22C60J5V	22C80J5V

- use 6 and 11 shapes grinding wheels

Work material	External diameter (mm)	Specification	
		Rough grinding	Finishing
Rapid steel tools	50-125	33A60J5V	33A120I5V
		33A60K5V	33A100J5V
Rapid steel chisels and cutting tools	100-150	33A60J7V	
		33A80J8V	
		33A80K8V	
Sharpening tools and conical milling cutters	< 125	33A46K5V	33A80J5V
	125-150	33A46J5V	33A60K5V
Tools equipped with hard metal plates	< 100	22C60(J-K)5V	22C100(I-J)5V
	125-150	22C46(J-K)5V	22C80J5V
Hard metal knives	125-150	22C60(H-I)5V	-



# Vitrified bonded grinding wheels - general recommendations

## 5. Special grinding

### 5.1 Crankshaft grinding

- use 1AC and 7E1 shapes grinding wheels on 45-60 m/s peripheral work speed

Work material		Rough grinding	Finishing
<b>Cars crankshaft</b>			
Supporting axle grinding	Steel	50A46(O-P)4V	50A60(L-M)4V
	Cast iron	33A46(M-N)4V	33A60(L-M)4V
Connecting rods axle grinding	Steel	50A46M4V	50A60K4V
	Cast iron	33A46M4V	33A60K4V
<b>Trucks and tractors crankshaft</b>			
Supporting axle grinding	Steel	50A46N4V 33A46M5V	50A70L4V 66A60(K-M)5V
	Cast iron	50A46M4V 33A46M5V	33A70L4V 66A60K5V
Connecting rods axle grinding	Steel	50A46P4V 33A46M5V	50A70L4V 66A60(L-M)5V
	Cast iron	50A46M4V 33A46M5V	33A70L4V 66A60L5V

### 5.2 Camshaft grinding

- use 1AC shape grinding wheels

Work material		Rough grinding	Finishing
Axle grinding	Steel	50A46M4V	50A60(K-L)4V
	Hard cast iron	33A46N4V	90A60(K-L)4V
Cam grinding	Steel	50A46P4V	33A80K4V
	Hard cast iron	33A46P4V	33A70K4V
Shaft grinding	Steel	90A60(K-L)4V	
	Hard cast iron	33A60K4V	

### 5.3 Rolls grinding

- use 1 and 1AC shapes grinding wheels

Work material		Rough grinding	Finishing
Hard chromium plated rolls		50A60(K-L)5V	66A(80-100)J4V
Manganese steel rolls		33A24(N-O)5V	33A(60-80)(K-L)5V
Rolls for paper		33A60J10V	33A100I10V
Rubber rolls		33A46J10V	22C80J10V
Plastic covered rolls		33A60K8V	33A60K8V
Graphite rolls		22C20K5V	-

### 5.4 Gear wheels

#### 5.4.1. Gear wheel grinding using MAAG system machines

- use 12M1 shape grinding wheels

Work material	Specification			
	Modules			
	1-1,5	1,5-2,5	2,5-5	> 5
Rapid steel with hardness above 64 HRC	92A100I5V	92A80I5V	92A60I5V	92A46I5V
Hardened high-alloyed tool steel > 64 HRC	33A100I5V	33A80I5V	33A60I5V	33A46I5V
Hardened steel (eg. 18 Mn Cr 15)	90A100J5V	90A80J5V	92A60J5V	92A46K5V
Nitralloy steel with hardness of 63 HRC	22C100I4V	22C80I4V	22C60J4V	22C60J4V
Tensile strength up to 120 kg/mm <sup>2</sup> steel	66A100K5V	66A80J5V	66A60K5V	66A46J5V
Grey cast iron and chilled iron	33A100K7V	33A80J7V	33A60J5V	33A46J75V

## Vitrified bonded grinding wheels - general recommendations

### 5.4.2 Gear wheels grinding using NILES system

- use 3 and 4 shapes grinding wheels

Work material	Specification		
	Module		
	0,75 - 2	2,5 - 4	> 4
Hardened high-alloyed tools steel over 64 HRC	33A100I5V	33A80I5V	33A46I5V
Hardened steel (e.g. 16 Mn Cr 15)	33A120H5V	33A70I5V	33A54J5V
Nitralloy with hardness over 64 HRC	22C100J4V	22C80K4V	22C60K4V
Steel with tensile strength up to 120 kg/mm <sup>2</sup>	33A100K5V	33A70K5V	66A54J5V
Grey cast iron and chilled iron	33A100K7V	33A70J7V	33A54J7V

### 5.5. Superfinishing

- use 1, 90PMA and 90PMB shapes grinding wheels:

Work material	Specification
Unhardened steel with tensile strength < 70 kg/mm <sup>2</sup>	22C(400-800)I4V
Mild carbon steel with tensile strength approx. 100 kg/mm <sup>2</sup>	22C(400-800)H4V
Hardened steel with hardness < 63 HRC	22C(400-800)I4V
Hardened steel with hardness > 63 HRC	22C(400-800)H4V
Chromium coated materials	33A(400-800)H5V -S
Grey cast iron, chilled iron	22C(400-800)I4V
High-alloyed steel for ball bearing rollway superfinishing	33A600E5V -S
	22C800G5V

### 5.6 Honning

- use 54HONA and 54HONB shapes grinding stones

Work material	Process	Specification	
		Honing file dimensions (B,C) < 10 mm	Honing file dimensions (B,C) > 10 mm
Unhardened steel with tensile strength < 50 kg/mm <sup>2</sup>	Rough grinding	50A(100-120)M5V-S	50A(80-120)N5V-S
	Finishing	33A(240-400)L5V-S	33A(180-320)L5V-S
Unhardened steel with tensile strength - 50-70 kg/mm <sup>2</sup>	Rough grinding	50A(120-180)L5V-S	50A(100-180)M5V-S
	Finishing	22C(240-400)L5V	22C(180-320)L5V
Hardened steel with tensile strength near 100kg/mm <sup>2</sup>	Rough grinding	33A(120-180)L5V	33A(100-120)L5V
	Finishing	33A(280-400)L5V	33A(220-320)L5V
Alloyed steel with hardness < 60 HRC	Rough grinding	33A(150-180)K5V	33A(120-180)K5V
	Finishing	33A(280-400)K5V	33A(220-320)K5V
Alloyed steel with hardness > 60 HRC	Rough grinding	33A(150-220)K5V	33A(120-180)K5V
	Finishing	33A(280-400)K5V	33A(220-320)K5V
Nitralloy steel, stainless and anticorrosive steel	Rough grinding	22C(120-180)M5V	22C(80-120)M5V
	Finishing	22C(240-400)L5V	22C(220-320)L5V
Chromium plated materials	Rough grinding	33A(180-240)K5V-S	33A(120-180)K5V-S
	Finishing	33A(360-500)K5V-S	33A(240-400)K5V-S
	Finishing	21C(280-400)M5V	21C(180-240)M5V
Grey cast iron with hardness HB 250 - 300	Rough grinding	22C(120-180)M5V	22C(80-120)L5V
	Finishing	22C(280-400)M5V	22C(180-280)L5V
Bronze, brass, aluminum and alloys	Finishing	21C(120-180)M5V	21C(100-150)M5V
	Rough grinding	21C(280-400)L5V	21C(220-320)L5V



# Vitrified bonded grinding wheels - general recommendations

**Grit size choosing recommendation** for ceramic bonded wheels depending on the roughness needed after the grinding process:

Rt	Rz	Ra	Abraziv wheel grit size												
			30	46	60	80	100	120	150	180	220	280			
5.0	6.4	1.60	█												
4.5	6	1.50	█	█											
3.5	4.4	1.10	█	█	█										
2.5	3.2	0.80	█	█	█	█									
2.1	2.68	0.67		█	█	█	█								
1.7	2.16	0.54			█	█	█	█							
1.3	1.6	0.40				█	█	█	█						
1.1	1.36	0.34					█	█	█	█					
0.88	1.08	0.27						█	█	█	█				
0.65	0.80	0.20							█	█	█	█			
0.55	0.68	0.17								█	█	█	█		
0.45	0.56	0.14									█	█	█	█	
0.35	0.40	0.10										█	█	█	█
0.29	0.32	0.08											█	█	█
0.24	0.28	0.07												█	█

Note:

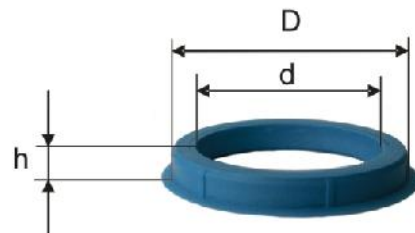
1. The general recommendations are adequate for: (V=40 m/s; materials=all; medium grinding condition, grinding depth/pass - max. 0,1-0,2 mm )
2. For **special applications** please send all data regarding grinding process to technical department of CARBOCHIM S.A.
3. For Rz roughness it is used the **Rz=4xRa** formula

## Bore adapters

Dedicated to adapt the grinding wheels bores to the axles of the grinding machines.

### RV - vitrified bonded grinding wheels bore adapters

CODE	DIMENSIONS (mm)		
	D	d	h
RV1310	13	10	4
RV1613	16	13	4
RV2013	20	13	4
RV2016	20	16	4
RV2520	25	20	4
RV3020	30	20	3,2
RV3220	32	20	5
RV3225	32	25	5
RV5132	51	32	9
RV7651	76,2	51	5




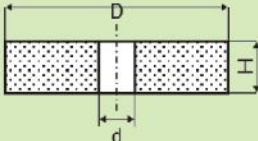

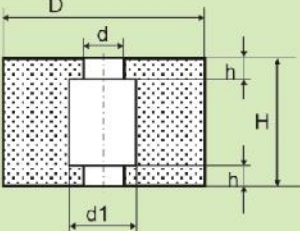

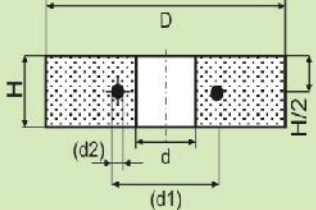

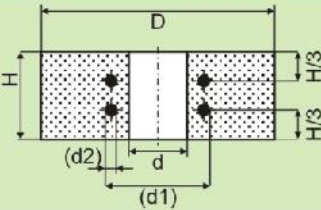

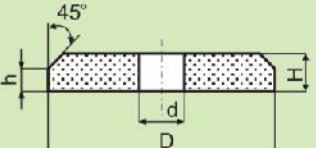
# Bakelite bonded grinding wheels - shapes and dimensions

Bakelite bonded grinding wheels are shaped products made of abrasive grains included in an organic bond based on reticulated phenol resins. The bond contains fillers that help to cool the contact area between the grinding wheel and the processed piece, as well as to remove splinters. Some grinding wheels contain materials which form artificial pores. According to the application requirements and in order to increase the peripheral speed resistance, bakelite bonded grinding wheels may contain metallic reinforcements, glass fiber inserts or fixing nuts.

Bakelite bonded grinding wheels are suitable for grinding processes requiring a high stock removal rate.

Although in many applications bakelite bonded grinding wheels are complementary to vitrified bonded grinding wheels, there are applications where productivity is an important parameter, like spring and baring industry, where they represent the only alternative.

## Shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic size	Dimensions rage
Straight wheel		1	ISO525 SR EN 12413		D x H x d	D=80-1065 mm H=6-300 mm d=20-304,8 mm
Straight wheel with symmetrical recessed bore		1 T1	ISO525 SR EN 12413		D x H x d/ d1 x h	D=300-800 mm H=100-300 mm d=127-406,4 mm
Straight wheel reinforced with steel ring		109	ISO525 SR EN 12413		D x H x d	D=350-600 mm H=40-63 mm d=40-304,8 mm
Straight wheel reinforced with 2 steel rings		110	ISO525 SR EN 12413		D x H x d	D=500-600 mm H=80 mm d=203,2-304,8 mm
One side tapered straight wheel "C" profile		1 C	ISO525 SR EN 12413		D x H x d	D=125-300 mm H=4-18 mm d =12,7-127 mm

Other shapes and dimensions can be manufactured on custom request.


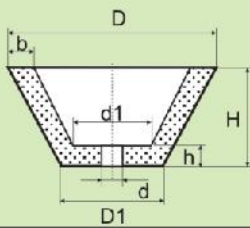

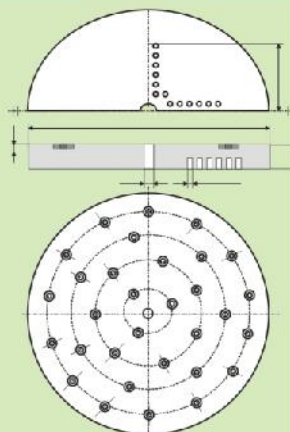
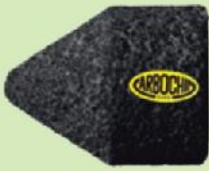
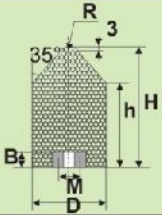

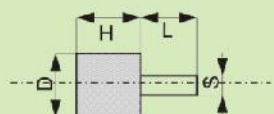


# Bakelite bonded grinding wheels - shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic size	Dimensions rage
Cylindrical plane for roll ways		1CR	ISO525 SR EN 12413		D x H x d	D=180-508 mm H=3,5-25 mm d=32-305 mm
Cylindrical wheel cemented or clamped		2	ISO525 SR EN 12413		D x H x d B < D/6	D=180-660 mm H=10-300 mm d=127-480 mm
Cylindrical symmetric recessed wheel		21	ISO525 SR EN 12413		D / D1 x H/h x d	D=750-915 D1=400-610 H=60-152 h=9-25 d=304.8-508
Rectangular segment		31 SegA	ISO525 SR EN 12413		B x L x H	B=80-90 mm L=150-180 mm H=25-32 mm
Trapezoidal segment		31 SegB	ISO525 SR EN 12413		B1 x B2 x L x H	B1 = 80-100 mm B2 = 65-85 mm L = 150 mm H = 25-35 mm
Straight cup wheel		6	ISO525 SR EN 12413		D x H x d/ D1 x H1	80x40x20 / 60x30 100x50x20 / 80x40 150x80x20 / 130 x 65 175x100x20 / 140x80 200x80x25 / 160x65 250x100x152,4 / 200x80
Straight cup wheel with inserted nut		6GB	ISO525 SR EN 12413		DxHxM14/ b x h	100 x 50 x M14/ 20 x 18
Taper cup wheel		11	ISO525 SR EN 12413		D/D1 x H x d/b x h	250/200 x 140 x 100/27,5 x 38
Taper cup wheel with inserted lock-nut		11GB	ISO525 SR EN 12413		D/D1 x H x M14/b x h	110/92 x 50 x M14/ 20 x 18

Other shapes and dimensions can be manufactured on customers request.

## Bakelite bonded grinding wheels - shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic size	Dimensions rage
Taper cup wheel		11BT1	ISO525 SR EN 12413		D/D1 x H x d/b x h	110/90 x 55 x 22,2/ 20 x 12
Straight wheel with lock-nuts with or without cooling hole or cooling canals		36P 36T 37S	ISO525 SR EN 12413		D x H x d	D = 125-900mm H = 40-80mm d = 19-350mm  Filet piuliță M8, M10, M12, M16, M16x1,5
Cylindro-conical mounted points with inserted lock-nut		19	ISO525 SR EN 12413		D x H / M x B	40 x 75 / M12 x 20
Cylinder mounted point		52A	ISO525 SR EN 12413		DxH/SxL	D = 25-40mm H = 20-50mm S = 6-8mm L = 40mm

Other shapes and dimensions can be manufactured on customers request.





# Bakelite bonded grinding wheels - general recommendations

## Carbochim's bakelite bonded grinding wheels general recommendations

### 1. Rectifying

#### 1.1 Surface grinding

- use 31SegA and 31SegB shapes grinding segments:

Operation	Machine	Shape	Products	Remarks
Surface grinding	Segments grinding machine	31SEGA	31SEGA 50x150x25 50A30L4B52	For mild carbon steel - use 11A grinding wheels
		31SEGB	31SEGB 100x85x150x35 11A46M4B52	For hardened steel - use 33A or 50A grinding wheels

#### 1.2 Both side grinding

- use 36T and 36P shapes grinding wheels:

Operation	Machine	Shape	Products	Remarks
Ring, bearing rolls, springs, roves and rods simultaneous grinding	Simultaneous plane grinding machine	36T, 36P	36T13 600x80x301,5 11A120M5B0RU	T - with inserted threaded nuts
			36P1 585x75x19,5 33A60P4B2RU	P - with perforations and cooling channels
			36P10 765x76x355,6 25AC20Q 4B2	Recommended bonds are coolant resistant. Grinding wheels dimensions and nuts layout is determined by machine types
			36T52 750x80x304,8 11A120M4B8RU	

#### 1.3 Centerless grinding for bolts and rodes

- use 1T1 shape grinding wheels:

Operation	Machine	Shape	Products	Remarks
Bars and bolts centerless grinding	Centerless grinding machine	1T1	1T1 500x250x304,8/308x55	Active grinding wheel
			11A60N4B2	Driving grinding wheel
			1T1 300x250x127/130x55	
			11A80R4B2	

#### 1.4 Rolls grinding

- use 21 shape grinding wheels:

Operation	Machine	Shape	Products	Remarks
Rolling mill rolls grinding	Special grinding machine	21	21-915/610x152/25x508 21C 36I5B0	Use 21C for chilled iron rolls Use 33A and 11A for steel rolls

## Bakelite bonded grinding wheels - general recommendations

### 2. Grinding

#### 2.1 Cast pieces grinding

- use 109 and 110 shapes grinding wheels:

Operation	Machine	Shape	Products	Remarks
Cast pieces grinding	Fixed grinder	109, 110	109 -500x63x203,2 11A24Q5B90	For 50m/s work speed use 109 shapes
			109 - 400x50x50,8 11A24Q5B90 110-600x80x304,8 11A16Q5B90	For 63m/s work speed use 110 shapes

#### 2.2 Welded work pieces grinding

-use 11GB, 11BT1, 52A and 19 shapes grinding wheels:

Operation	Machine	Shape	Products	Remarks
Welded sections grinding	Hand power tool	11GB, 11BT1, 52A,19	11GB 110/92x50x14/18 11A16P5B2 11BT1-110/90x55x22,2/14 11A16R5B2 52A-40x40/8x40 11A24Q4B0 19-40x75/12x20 11A24Q4B0	For regular angle grinder fix with M14 threaded nut

#### 2.3 Rails and railway mechanisms grinding

- use 1, 5 and 37S15 shapes wheels:

Operation	Machine	Shape	Products	Remarks
Rails grinding	Mobile machine for rail grinding	1,5, 37S15	1-200x20x20 11A24Q4B90 5-250x32x25,4/150x13 11A14Q4B2 37S15-150x70x57 11A16Q4B2	Fix shape 37S15 with 4 inserted threaded nuts

#### 2.4 Grindings in mechanical shops

- use 1 shape grinding wheels:

Operation	Machine	Shape	Products	Remarks
Various grinding in mechanical workshops	Fixed grinder	1	1-150x25x20 11A60P5B90 1-150x25x20 11A36N5B90	For mild carbon steel

#### 2.5 Ingot mould grinding

- use 109 shape grinding wheels:

Operation	Machine	Shape	Products	Remarks
Internal ingot mould grinding	Mobile grinder	109	109-350x50x50,8 55AC12R2B2 109-300x32x30 55AC12R2B90	Reinforced with steel ring



## Bakelite bonded grinding wheels - general recommendations

### 3. Sharpening

#### 3.1 Saw blade sharpening

- use 1 and 1C shapes grinding wheels:

Operaion	Machine	Shape	Products	Remarks
Saw sharpening	Saw grinding machine	1, 1C	1-125x6x12,7 53A54S4B2 1C-150x6x20 50A60T3B0 1-300x8x32 33A80Q4B2RU	For normal saws use Q-T hardness wheels . For stellite saws use L-N hardness wheels

#### 3.2 Guillotine knives sharpening

- use 2, 6 and 37S18 shapes grinding wheels:

Operation	Machine	Shape	Products	Remarks
Guillotine knives sharpening	Knives sharpening machine	2, 6, 37S18	2-200x80x160 33A54J6B0RU 6-200x80x25/160x65 33A54J6B0RU 37S18-255x100x205 33A46H6B2	For steel knives

#### 3.3 Cutting of canals and relieving on drills and thread cutters

- use 1CR shape grinding wheels:

Operation	Machine	Shape	Products	Remarks
Cutting of canals and relieving on drills and thread cutters	Canal cutting machine	1CR	1CR-450x6,3x203,2 91AC100Q3B2	The thickness of the grinding wheel is made in precise tolerances

### 4. Floor grinding

#### 4.1 Floor grinding with mobile machines

- use 1, 37S8 and 37S15 shapes grinding wheels:

Operation	Machine	Shape	Products	Remarks
Concrete and epoxy floors grinding	Mobile machine	1	1-400x40x207 21C16N6B0	To remove concrete milk use 11A
		37S8	37S8-255x85x145 21C24P4B2	
		37S15	37S15-150x70x57 21C24Q4B0 11A24Q4B2	

#### 4.2 Floor grinding with hand power tools

- use 11BT1, 11GB1 and 6GB shapes grinding wheels:

Operația	Mașina (utilajul)	Forma	Produse	Observații
Concrete and epoxy floors grinding	Hand tool	11BT1 11GB 6GB	11GB-110/92x50x14/18 21C16N4B0 11BT1-110/90x55x22,2/12 21C24Q4B2 6GB-100x50x14/20x18 21C60N4B0	To remove concrete milk use 11A

# Magnesite bonded grinding wheels - shapes and dimensions

Magnesite bonded grinding wheels are products with mineral bond and that are used for processing heat-sensitive materials. Their main applications are:

- file processing
- stainless steel knives processing
- frame saw sides processing
- processing of concrete, composite and ornamental surfaces using segments
- thick spring ends processing
- equipping husking and grinding machines in the food industry

Magnesite bonded grinding wheels are suitable for wet grinding processes. The maximum peripheral speed permissible for magnesite bonded grinding wheels is 25 m/s for diameters up to 1000 mm and 16 m/s for higher diameters.

## Shapes and dimensions

Shape	Image	Shape symbol	Sketch	Basic size	Dimensions range
Straight wheel		1		D x H x d	D=300-350 mm H=20-80 mm d=127 mm
Cylindrical plane reinforced with two steel rings		111		D x H x d	D=1200-1700 mm H=180-300 mm d=300-550 mm
Cylindrical wheel cemented or clamped		2		D x H x d	D=450-600 mm H=125; 150 mm d=304,8; 390 mm
Cylindrical wheel with tapered flaring		2SA		D x H x d / D1 x alpha	D=290-710 mm H=80-150 mm d=190-400 mm D1=312-715 mm alpha=20-45°
Triangle Segment type 1		S19*		B x C x H	100x60x55 85x78x50

Other shapes and dimensions can be manufactured on customers request.



# Magnesite bonded grinding wheels - shapes and dimensions

Shape	Image	Shape symbol	Sketch	Basic size	Dimensions range
"Kidney" type segment		S20*		B x C x H	B = 120 mm C = 45 mm L = 65 mm
Triangle segment type 2		S21*		B x C x H x d	85x78x50x18
"Frankfurt" type segment		S22**		B x C x H	B = 100 mm C = 100 mm H = 55 mm

Other shapes and dimensions can be manufactured on customers request.

\*Shape S19, S20 and S21 grit size designation:

Number	0	1	2	3
Grit size	20	36	100	180

\*\*Shape S22 grit size designation:

Number	00	0	1	2	3	4	5
Grit size	24	60	120	220	280	400	500



## Elastic bonded grinding wheels - shapes and dimensions


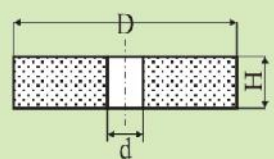

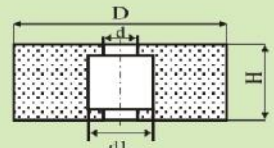

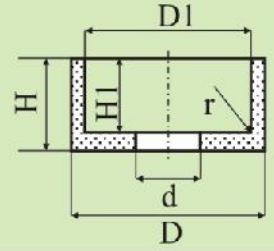

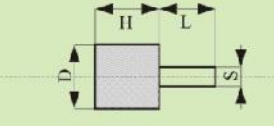

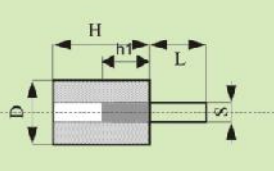
Elastic bonded grinding wheels are shaped products made of abrasive grains included in polyurethane, epoxy or polyester bond.

By polishing with this type of grinding wheels there are obtained very good qualities of processed surfaces due to the bond matrix elasticity.

Applications are very divers from polishing to precise rectifying, finishing and super-finishing. An important operation is centerless grinding with leading and finishing grinding wheels.

Maximum peripheral work speed for elastic bonded wheels is 35m/s.

### Shapes and dimensions

Shape	Image	Shape symbol	Standard	Sketch	Basic size	Dimension range
Straight wheel		1	ISO525 SR EN 12413		D x H x d	D = 80-900mm H = 6-300mm d = 20-304,8mm
Straight wheel with symmetrical recessed bore		1T1	ISO525 SR EN 12413		D x H x d / d1 x h	D = 250-660mm H = 100-300mm d = 127-304.8mm
Straight cup wheel		6	ISO525 SR EN 12413		D x H x d / D1 x H1	80x40x20 / 60x30 100x50x20 / 80x40 150x80x20 / 130x65 175x100x112/140x80 200x80x25 / 160x65 250x100x152/200x80
Cylinder mounted point		52A	ISO525 SR EN 12413		D x H / S x L	D = 25-40mm H = 20-50mm S = 6-8mm L = 40mm
Special cylinder mounted points		52S13	SR EN 12413		D x H / S x L	D = 20mm d = 6mm H = 40mm h1 = 20mm S = 6mm L = 40mm

Other shapes and dimensions can be manufactured on customers request.



## Elastic bonded grinding wheels - general recommendations

### Carbochim's elastic bonded grinding wheels general recommendations:

Operation	Machine	Shape symbol	Products	Remarks
Centerless grinding for calibrated draw bars	Centerless grinding machine	1T1	1T1 660x254x406.4/409x55 50A280QE21	Finishing grinding wheel for bars
			1T1 406x254x280/283x55 11A80RE01	Driving grinding wheel
Removing of the metal coating of the LOW-E glass	Hand tools or CNC	1, 52S13	1 - 125x8x22.2 21C100KE35	Used on power hand tool max. 35 m/s
			52S13 - 20x40/6x40 21C100KE35	Used on power hand tool or CNC machine
Grinding of spheres for valves	Grinding machine with broach	6	6 - 45x60x20/28x48 21C80QE17	
Grinding	Work bench grinder, hand power tool	1	1 - 150x20x20 22C150QE35	
Ajusting of lenses rims	Fixed grinder	1	1 - 300x32x32 21C80QE17	



## Safety rules

According to the SR EN 12413 standard , the following requirements must be observed in order to ensure the safe use of grinding wheels employed in a rotation movement:

- the user must verify the integrity of grinding wheel by means of a visual inspection. The use is forbidden if cracks or other mechanical defects are detected.
- the user must handle the grinding wheels with care, taking into account the fact that they are fragile products.

Grinding wheels must not be dropped or hit.

It is forbidden to roll the grinding wheels on any surface with the exception of special rubber surfaces.

- the user must ensure that the revolution or peripheral speed of the machine on which the grinding wheel is mounted does not exceed the revolution or maximum peripheral speed specified on the grinding wheels.

Do not exceed the maximum peripheral speed specified on the grinding wheel !

- the user must verify the sound produced by ceramic bonded grinding wheels as follows: hang on the grinding wheel and hit it with a plastic or wooden hammer in two locations placed symmetrically with respect to the vertical axis. The resulting sound must be crystalline and similar for both strikes. If the sound is stuffy or hollow, the grinding wheel may be cracked and must be verified by a trial speed according to the standard.

- prior to mounting the grinding wheel, the user must ensure that the machine on which it is mounted is in functioning condition and all the safety elements (shields (fenders) , electric limiters, emergency stop systems) are in function.

- when mounting the grinding wheels on rectifying machines , the user must observe the following conditions: the cardboard flanges supplied with the grinding wheel must be inserted between the machine's flanges and the grinding wheel.

The width of the cardboard lining must cover the entire flange tightening ring surface and exceed its circumference by 1-2 mm.

After mounting, the ensemble consisting of the metallic flange and the grinding wheel must be compulsory balanced using the device provided by the rectifying machine belongings.

- the cardboard flanges delivered with the grinding wheel must be obligatory used when mounting it on fixed grinders.

The grinding wheel must be mounted with the lighter side (indicated by a radial line or arrow on its flat surface) facing downwards.

- the user must establish a grinding and cooling regime that does not overstrain the grinding wheels.

The grinding wheels must be properly selected for its use. If there are special requirements related to the rectified materials, grinding regime or cooling liquids, recommendations regarding the proper specification must be requested from the producer.

- the user must ensure proper ventilation of the work place in order to eliminate dust, vapors and smoke resulting from the grinding process.

The waste resulting from the use of grinding wheels does not affect the environment, is not toxic and is biodegradable.

Grinding wheels can be stored or buried under normal conditions. They may be used as filler in the production of bricks and refractory concrete.





Over 60 years experience

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