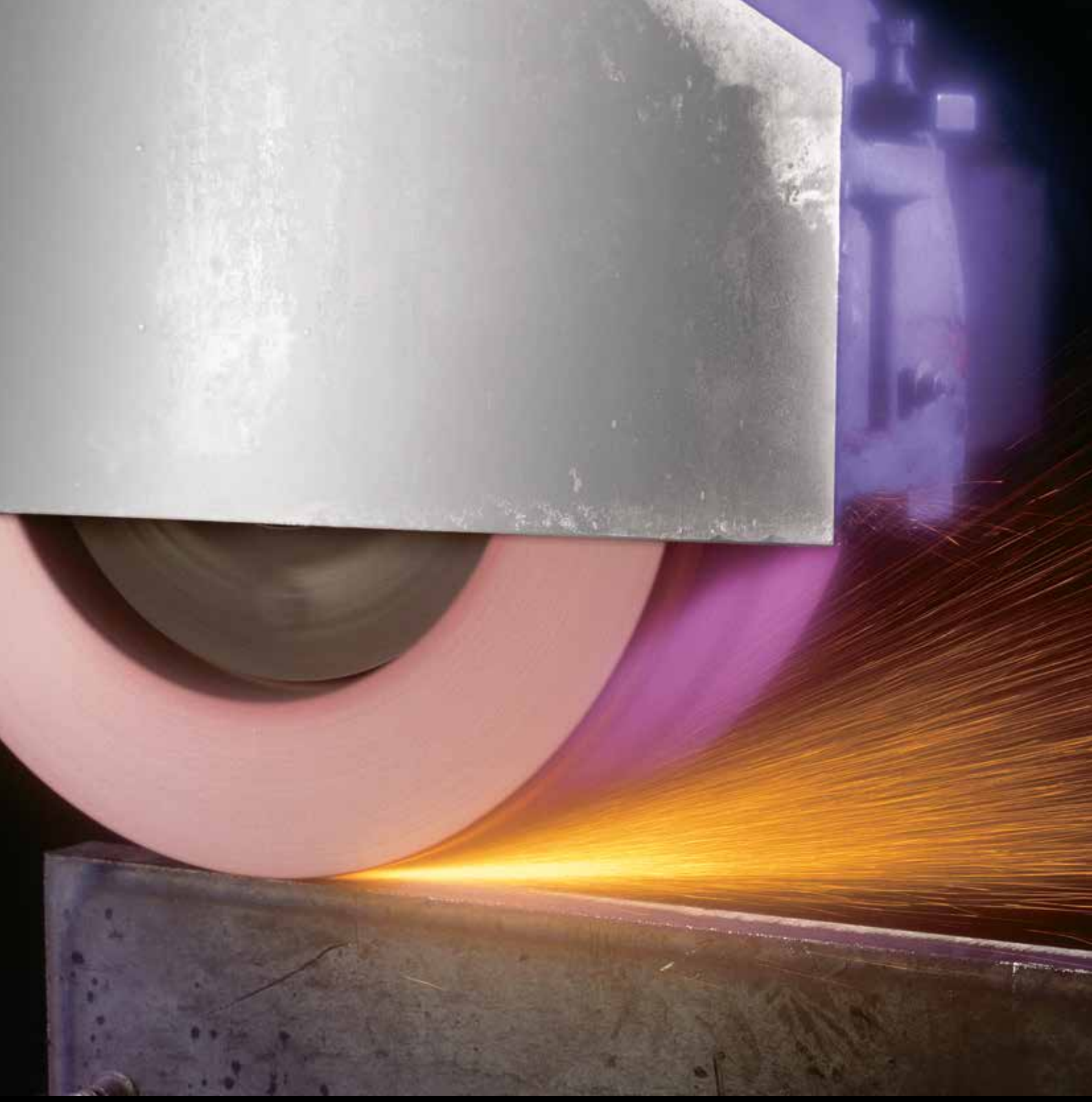


PRECISION GRINDING

PRODUCT CATALOGUE

CAMEL GRINDING WHEELS

Our Values

Professional excellence

We strive for the highest quality in our products and our service.

Integrity and fairness

We are transparent and reliable in our interactions with all our business partners.

Strategic partnerships

We work diligently to make our customers, our suppliers, and our employees our "strategic partners".

Creative innovation

We harness technological leadership, individual and company initiatives, and the will to change, to keep the organization moving forward.

Contents

VB-0002-04-20-07

Company Profile

CGW Company Profile

For more than 60 years, CGW - Camel Grinding Wheels - Israel's only abrasives manufacturer, has been the first choice in grinding and cutting products for both locally and internationally.
CGW's ceramic (vitrified) bond and organic (resinoid) bond products are available in more than 75 countries throughout North and South America, Europe, Africa, Asia and Australia, in locations from small machine shops to advanced manufacturing centers. In North America, our subsidiary in Chicago,IL, CGW-USA, maintains a large warehouse and manufacturing facility, and our converter of coated abrasives is located in Los Angeles.
We take pride in developing and producing high-quality, high-performance products to meet the technological challenges of grinding conventional metals and today's sophisticated alloys.
CGW products are manufactured under strict quality control. CGW is certified by the highest industrial standards: EN 12413, EN 13743, ANSI B7.1, ISO 18001, ISO 14001 and OSA.

CGW's 5-Point Manufacturing & Operating Philosophy

1 Advanced in-house development and production

Our in-house R&D and engineering teams, supported by laboratories and testing facilities, allow us to continually improve the existing products and develop high-precision solutions to meet customers needs.

2 Efficient planning and scheduling

Our streamlined system of coordinating between the sales and production departments allows a quick turnaround and a fast response to unexpected schedule changes.

3 Ongoing, stringent quality control

The manufacturing processes and maintenance of our production facilities comply with strict international quality, safety and environmental standards.

4 On-time, error-free shipments

We work diligently to prevent delays in shipment from the time an order is placed until it is shipped.

5 "The best service in the world"

Our industry leadership is based on decades of commitment to exceptional customer service. Through this unconditional dedication, we have forged long-standing partnerships with customers throughout the world.

Our attention to details and commitment to excellence is reflected in our products which have earned a worldwide reputation for high quality, consistency and cost-effectiveness.

An Industry Leader in Abrasive Products

CGW manufactures thousands of products for use in the aerospace, automotive, gas turbine, oil rig, construction and other industries.

Our broad range of products includes wheels for surface grinding | centerless grinding | cylindrical grinding | off-hand grinding | creep-feed grinding

About the Catalogue

We are pleased to present our complete catalogue of standard vitrified bonded abrasive products.
The technical guide at the beginning of the catalogue contains detailed explanations on a number of subjects, including types of abrasive grains, bonds, and structures. Each section shows initial recommendations for choosing the most suitable specifications for various applications.

Leading corporations in over 75 countries around the world choose CGW brand because of the company's quality and cost-effective products.
CGW's application engineers provide fast and effective technical support to customers with innovative technology which sets CGW apart from other abrasives manufacturers.

CGW specializes in the production of grinding wheels for various industries:

- Aerospace
- Land-based turbine
- Gear grinding

CGW products are manufactured under strict quality control. We are committed to achieve and maintain a comprehensive Quality & Environmental Management System compliant with and certified to the highest industrial standards including EN 12413, EN 13743, ANSI B7.1, ISO 18001, ISO 14001, OSA and EAC.

Wheel Specifications

Abrasive

A	Brown Aluminium Oxide
BAS	High performance Aluminium Oxide
WA	White Aluminium Oxide
WAB	White Aluminium Oxide+Blue Bond
WAR	White Aluminium Oxide+Red Bond
WAY	White Aluminium Oxide+Yellow Bond
WAG	White Aluminium Oxide+Special Bond I
WAP	White Aluminium Oxide+Special Bond II
WAL	Special grain and bond for improved surface integrity
PA	Pink Aluminium Oxide
RA	Ruby Aluminium Oxide
AS1	10% Ceramic Aluminium Oxide
AS2	20% Ceramic Aluminium Oxide
AS3	30% Ceramic Aluminium Oxide
AS5	50% Ceramic Aluminium Oxide
DA	White and Brown Aluminium Oxide
SA	Semi-friable Aluminium Oxide
HA	Monocrystal Aluminium Oxide
KA	Bubble alumina
GC	Green Silicon Carbide
C	Black Silicon Carbide

Grain Size

Coarse	24, 30, 36
Medium	46, 54, 60
Fine	80, 100, 120, 150
Very Fine	180, 220, 240

Grade

Soft	B, C, D, E, F, G, H
Medium	I, J, K, L
Hard	M, N, O, P, Q

Structure

Medium/Standard				**Open/Porous**					
6	7	8	9	10	11	12	13	14	15

Bond

V	Vitrified
B	Resinoid
BF	Reinforced Resinoid

Wheel Dimensions

External Diameter	up to 635mm / 25"
Width	up to 500mm / 20"
Internal diameter (bore)	up to 406mm / 16"

The CGW grinding wheels are made of abrasive grains held together by a bond. The innumerable grinding characteristics are successfully achieved by varying the type of bond and the structure of the wheel.

Abrasive Grain

There are two main categories of grain:

Aluminium Oxide for grinding material of high tensile strength, such as alloy steel, high-speed steels.

Silicon Carbide for grinding low-tensile steels, cast iron, carbides, and non-ferrous metals.

CGW Grain Types

A - Brown Aluminium Oxide - The most common of all grains, for heavy-duty generalpurpose work.

BAS - High performance Aluminium Oxide - Blue Fired Aluminium Oxide, specially made for centerless grinding.

WA - White Aluminium Oxide - White Aluminium Oxide, the high friability of this grain enables fast and cool cutting. Suitable for light grinding of steels of all kinds, particularly tool steel.

WAB - White Aluminium Oxide+Blue Bond - Particularly suited for grinding HSS over 55 RC. Provides exceptionally cool, fast cutting action. Requires minimum dressing. Also available in WAR.

WAR - Aluminium Oxide+Red Bond - Particularly suited for grinding HSS over 55 RC. Provides exceptionally cool, fast cutting action. Requires minimum dressing. Also available in WAR.

WAY - White Aluminium Oxide+Yellow Bond - Are primarily used in wheels that require a very open structure. For creep-feed grinding with continuous dressing.

WAG - White Aluminium Oxide+Special Bond I - Are primarily used in wheels with a very open structure. Excellent for creepfeed grinding with non-continuous dressing.

WAP - White Aluminium Oxide+Special Bond II - for special wheels with cutting speed of 80 M/S. Designed to perform light, fast passes over the blade or other workpiece.

WAL - Special grain and bond for improved surface integrity - Special wheel designed for creep-feed grinding. Contains a unique combination of special grain and bond which enables the improved form holding and longer life span. The wheel is characterized by interconnected pores, allowing maximum cooling action and stock removal.

WALB - Eliminates visible burn. Ensures no white layer. Reduces wheel consumption.

PA - Pink Aluminium Oxide - A tough but friable grain for general-purpose wheel. Excellent on large surface areas.

RA - Ruby Aluminium Oxide - harder than PA and WAB, this grain is good for use on highchromium steel.

AS1 - 10% Ceramic Aluminium Oxide - Ceramic Aluminium Oxide, a ceramic grain, blended with white aluminium oxide, creates a wheel with maximum grinding performance, excellent for form holding and cool cut. Available in AS1, AS2, AS3, AS5.

AS2 - 20% Ceramic Aluminium Oxide - Ceramic Aluminium Oxide, a ceramic grain, blended with white aluminium oxide, creates a wheel with maximum grinding performance, excellent for form holding and cool cut. Available in AS1, AS2, AS3, AS5.

AS3 - 30% Ceramic Aluminium Oxidel - Ceramic Aluminium Oxide, a ceramic grain, blended with white aluminium oxide, creates a wheel with maximum grinding performance, excellent for form holding and cool cut. Available in AS1, AS2, AS3, AS5.

Grain Size

The grain size is the physical size of the abrasive grains used in making a wheel. It relates to the number of meshes per linear inch of the screen in which the grains will pass through when they are graded. The higher the numbers of grain, the smaller openings in the screen the grains pass. There are four different groups of the grain size - coarse, medium, fine and very fine. A larger grain size allows fast cutting on a poor surface quality finish. Ultra-fine grain sizes are for fine finishes.

Grade (Hardness)

The grade of a grinding wheel refers to the strength of the bond to hold the abrasive grains together. The range of grade is represented in alphabetical form - A (soft) to Z (hard). The higher the letter the stronger the bond. A soft grain wheel tends to release grains quickly to expose new, sharper grains where hard wheels retain the abrasive grains longer.

Structure

Wheel structure refers to the spacing between grain particles within the bond and is measured in terms of the volume content of the abrasive in the wheel. In open structure wheel, the grains are relatively far apart, in close structure, the pores are small and the grains are close together.

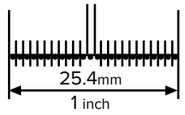
Bond

The function of the bond is to hold the abrasive grains together. Most commonly used are the vitrified and resinoid bonds.

Vitrified Bond are the various clays or ceramics used to form bonds, allowing a wide range of structures with special properties and grinding characteristics. Their strength is developed by firing in kilns to temperatures of up to 1,000°C. The vitrified-bonded wheels are excellent for precision grinding and fast stock removal due to their rigidity and friability.

$$1_{mm} \simeq = \frac{25.4}{24} = \text{grit } 24$$

MESH



Hardness-Structure Diagram

Grade		Closed ← Structure → Open						
		5	6	7	8	9	10	11
Soft	H	H5	H6	H7	H8	H9	H10	H11
	I	I5	I6	I7	I8	I9	I10	I11
	J	J5	J6	J7	J8	J9	J10	J11
	K	K5	K6	K7	K8	K9	K10	K11
	L	L5	L6	L7	L8	L9	L10	L11
Hard	M	M5	M6	M7	M8	M9	M10	M11

Structures 6-9:
medium/standard

Structures 10-15:
open/porous

Selecting Grinding Wheels

Factors to be considered when selecting a grinding wheel:

Workpiece

Type and hardness of the material: the harder the material, the softer the grade of the wheel required.

Aluminium Oxide: most efficient for grinding high-tensile materials such as steel and ferrous castings. The more friable types of alumina are preferred for use on harder steels.

Silicon Carbide: for materials with low tensile strength, carbides, and non-ferrous metals.

Stock removal

The stock removal rate depends on the grain size of the abrasive material and bond type:

- A coarse grit (24-46 MESH) is suitable for high stock removal rates.
- Fine grits are best for fine finishes and tight tolerances.

Surface finish

High surface finish is achieved by using a fine grit. High quality surface finish results require using a dense or close structure wheel.

Grinding machine

- The power available defines the rate of stock removal. The greater the power available, the harder the grade of wheel required for efficient operation.
- Deterioration in machine condition leads to vibration and early breakdown of the wheel.

Grinding fluids

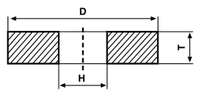
- Grinding fluids provide cooling and/or lubrication. A proper use is an important factor in achieving satisfactory results.
- Coolants and lubricants are capable of reducing heat formation. The relative importance of cooling vs. lubrication determines whether a water-based coolant or an oil-based lubricant is used. Coolants are usually able to transfer the heat away from the workpiece, but are unable to prevent the development of heat.
- In dry grinding, the temperature at the grinding point is not much higher than in wet grinding, but the rate of heat formation is much higher.

For maximum efficiency in grinding operation, it is essential to have the right wheel for the job.

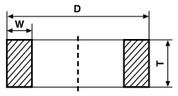
Standard Types and Shapes of Abrasive Wheels

Types and profiles of CGW abrasives are marked in accordance with international standards.

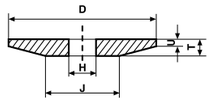
D	Outer diameter
E	Thickness around bore
F	Depth of recess
G	Depth of second recess
H	Diameter of bore
J	Diameter of flat outer surface
K	Diameter of flat inner surface
L	Length of segment or abrasive wheel
N	Depth of release on one side
O	Depth of release on other side
P	Diameter of recess
R	Radius
T	Thickness (general)
U	Thickness of edge
V	Angle of profiles
V1	Second angle of (profiles)
W	Width of wall



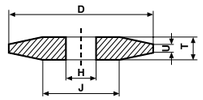
1 DxTxH



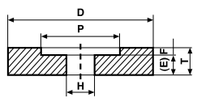
2 DxTxW



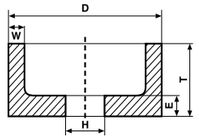
3 D/JxT/UxH



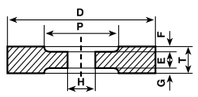
4 D/JxT/UxH



5 DxTxH-PxF



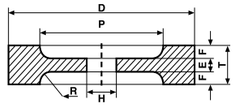
6 DxTxH-W..E..



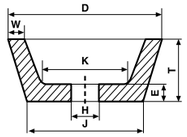
7 DxTxH-PxF

or if recesses are not the same size:

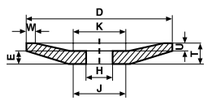
DxTxH-PxF/G



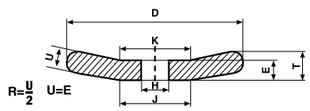
9 DxTxH-PxF R..



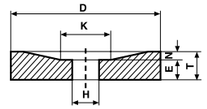
11 D/JxTxH-W..E..



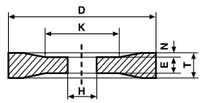
12 D/JxT/UxH



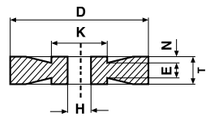
13 D/JxT/UxH



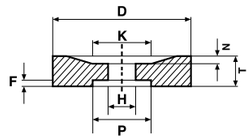
20 D/KxT/NxH



21 D/KxT/NxH

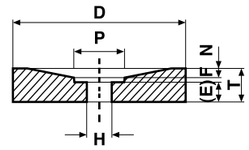


21A D/KxT/NxH

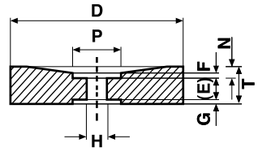


22 D/KxT/NxH-PxF

Standard Types and Shapes of Abrasive Wheels (cont.)



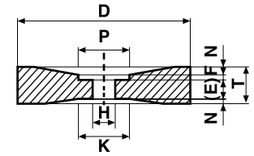
23 DxT/NxH-PxF



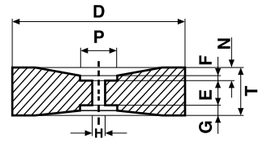
24 DxT/NxH-PxF

or if recesses are not the same size:

DxT/NxH-PxF/G



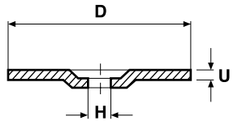
25 DxT/NxH-PxF



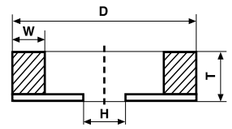
26 DxT/NxH-PxF

or if recesses are not the same size:

DxT/NxH-PxF/G

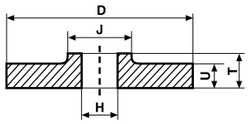


27 DxUxH

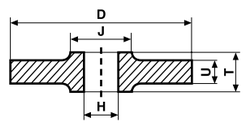


35 DxTxH-W

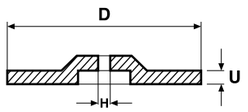
attached to plate



38 D/JxT/UxH

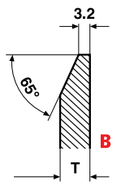


39 D/JxT/UxH

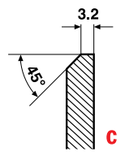


43 DxUxH

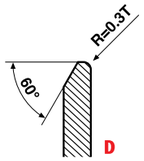
Standard Profiles



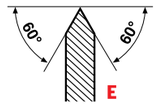
B



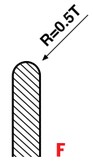
C



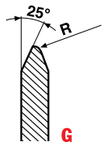
D



E

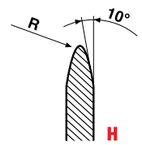


F



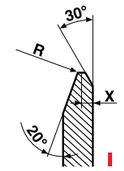
G

R=T/8



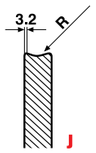
H

R=T/8



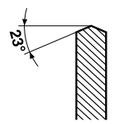
I

R=T/8 X=T/3

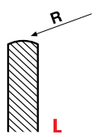


J

R=7T/10

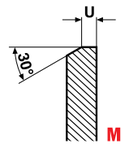


K



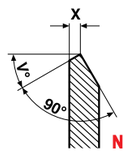
L

R=T

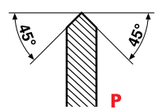


M

U=T/3



N



P

Safety Guide for the Use of Abrasive Wheels

Bonded abrasive products are fragile and must be handled with utmost care. Follow these safety rules to prevent injury.

Do

- Always handle and store wheels in a careful manner.
- Before mounting, visually inspect and ring test all wheels for possible damage (ILL. 1 and 2).
- Check machine speed against the maximum safe operating speed marked on the wheel.
- Check mounting flanges for equal and correct diameter (ILL. 3).
- Use mounting blotters when supplied with wheels (ILL. 3).
- Be sure work rest is properly adjusted: leveled with or above the center of wheel; no more than 1/8” away from wheel (ILL. 4).
- Always use a safety guard covering at least one-half of the grinding wheel (ILL. 4).
- Allow newly-mounted wheels to run at operating speed, with guard in place, for at least one minute before grinding.
- Always wear safety glasses or any type of eye protection when grinding.
- Be sure to employ dust controls and/or protective measures appropriate to the material being ground.
- When shutting down a wet grinding operation, the fluid must be first shut off and allowing the wheel to rotate until the coolant has been spun out.

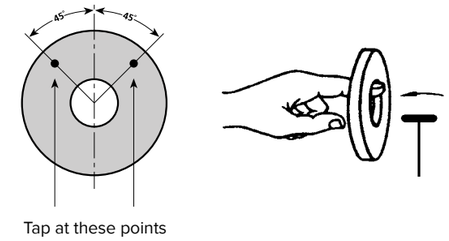
Don't

- Don’t use a cracked wheel or one that has been dropped or damaged.
- Don’t force a wheel onto the machine or alter the size of the mounting hole.
- Don’t alter the shape of the wheel in any way.
- Never exceed the maximum operating speed marked on wheel.
- Don’t use mounting flanges on which the bearing surfaces are not clean, flat and free of burrs.
- Don’t tighten the mounting nut excessively.
- Don’t stand or allow another person to stand directly in front of or in line with a grinding wheel when the grinding machine is started.
- Don’t grind on the side of the wheel (see safety code for exception).
- Don’t start the machine until the wheel guard is in place.
- Don’t forcefully jam the workpiece into the wheel.
- Don’t force grinding so that the machine noticeably slows down or the workpiece becomes overheated.

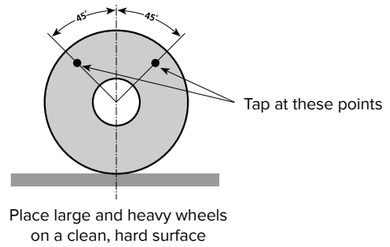
Ring Test

A visible difference between the sharp, clean tone produced by an intact abrasive wheel, and the dull tone producd by a cracked wheel, makes it possible to further examine the wheel, in addition to visual inspection, by performing a ring test on it before mounting (ILL. 1 and 2).

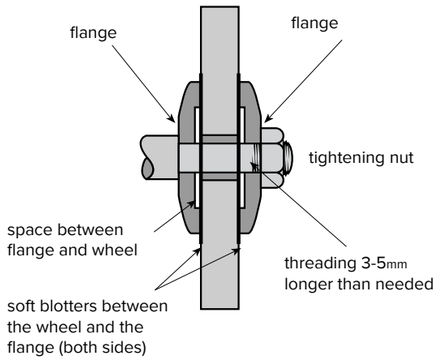
1) Ring testing small wheels



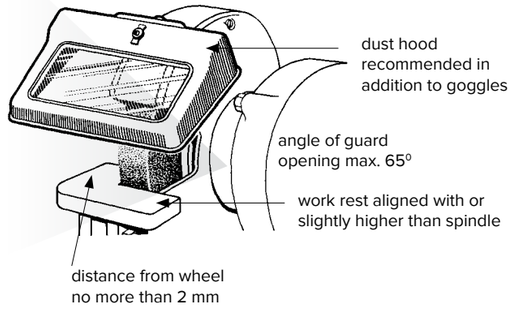
2) Ring testing large wheels



3) Mounting



4) Guard, work rest and dust hood



Safety Guide

Wheels for the Aerospace & Gas Turbine Industries

Wheels for grinding blades & vanes

The Innovative vitrified technology for grinding blades and vanes by CGW are especially designed for the aerospace industry. The wheels are made with CGW special new bond for creep feed grinding applications using either continuous or non-continuous dressing. The open structure wheels allow cool grinding and are able to achieve the delicate balance between self-sharpening and form holding.

- Cool grinding
- Excellent form holding
- Continuous dressing

Wheels for grinding gas turbine blades

CGW open structure creep feed grinding wheels are Ideally suited for high efficiency production of gas turbine blades.

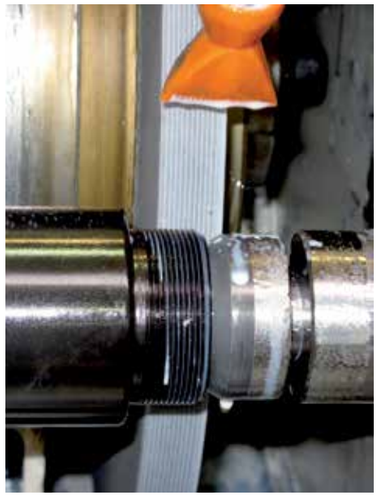
Blades and vanes can be found in their hundreds in just one turbine - in the compressor stage, the combustion stage, and the turbine stage. CGW's advanced technology of soft grinding wheel provides an excellent burn prevention in sensitive inconel parts, espceially in large turbine blades.

- Cool grinding
- Excellent form holding
- High output of blades per wheel

Wheels for Thread Grinding

Superior corner holding with high material removal rates

CGW new generation of thread grinding wheels offers cool cutting with excellent form holding to meet the strict tolerance required by the industry.
Based on the high-performance AZ grain and special designed bond, CGW thread wheels are made to optimize the grinding process of hard material and to achieve high surface reequipments.
• Up to 80 m/s wheel speed



Wheels for Gear Grinding

Multi-rib "Warm" Pofile Wheel

The latest generation of high-performance ceramic abrasives composition developed by CGW for the Worm Grinding application. The open-structure, highly homogenous wheel reduces temperature allowing cooler operation, without burning the wheel and work-piece

- Operating speed up to 80 M/S
- Reduced grinding cycle time
- Cool grinding capability

CGW Gear Grinding wheels are available in a wide variety of sizes and grains

- Standard or ceramic grain
- Open or close structure wheel
- For all standard bore sizes
- Up to 635mm diameter size
- For all required thickness for Gear Grinding

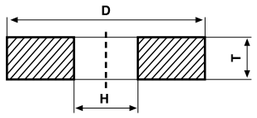
Single Rib Gear Grinding Wheel

The Innovative technology by CGW using high-performance ceramic abrasives with the new developed bonding system was especially designed for the Single Rib Grinding application. The Single Rib Gear Grinding uses a flexible technique where each tooth flank is ground individually. The open-structure wheel ensures maximum safety against burning:

- Operating speed up to 50 M/S
- High stock removal rate
- Excellent in form holding

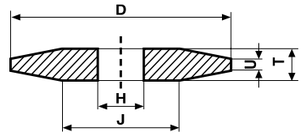
Standard Wheel Types:

Type 1



D·Diameter | T·Thickness | H·Bore

Type 4



D·Diameter | T·Thickness | H·Bore
U·Rim thickness | J·Flat surface diameter

A new designed product representing a special grain combination that result in an excellent shape holding with good self-sharpening, enabling the maximum stock removal rate.

Gear Grinding

Grinding Wheels for the Bearing Industry

CGW grinding wheels for the Bearing industry has proven to meet engineering processing high requirements for these steel products including roundness and fine surface finishes at a low temperature.

CGW Bearing grinding wheels are available in various specifications to meet customer needs and expectations.

Centerless grinding - an outer diameter grinding process is for the outer ring bearing housing

- General purpose – DA60K7V
- Premium production – PA60-120K-M7VN

Internal grinding for the inner ring housing.

- General purpose – DA80K7V
- Premium production - PA80K7V

Outside Diameter inner ring grinding

- General purpose – DA100K7V
- Premium production - PA100K7VN

Bearing rib grinding – PA80-120K9VN

Wheels for the Automotive Industry

The automotive industry and its derivatives are characterized by a large assembly of parts that require grinding and finishing, from the body of the engine to engine valves, pistons, cylinders, fuel injection units and transmissions.

CGW’s offering solutions for the automotive industry consist of vitrified bonded grinding wheels in a variety of compositions and diameters. It includes fine-grained wheels for good finishes and clean smooth surfaces.

CGW's wide range of solutions for all aspects of the automotive industry is based on the need for precision and consistency.

CGW provides a comprehensive product range to suit the individual needs of each customer. Our engineers will find the best solution to match each specific application.

- Wheels for centerless grinding
- Wheels for cylindrical grinding (external & internal)
- Wheels for camshaft & crankshaft applications. Our newly developed PASP 60 K8-VD is formulated for these types of precision grinding applications

Wheels for Grinding Natural and Synthetic Rubber

Wheels for Turbine blade root form

CGW KA wheels are especially designed for grinding natural and synthetic rubber including polyurethane, ebonite, silicone, and other soft materials

A new development of CGW technical department, using innovative materials at high grade purity

Application:
Particularly suitable for the grinding of coated rollers for the paper, timber and textile industries

Features and Benefits:
Excellent cost-benefit ratio in comparison to traditional silicon carbide wheels
extra low weight Provide grinding without vibration marks
High induced porosity to ensure grinding in low temperature
No diamond tools for dressing is required

Available specifications:
• KA 2-1 fine: for excellent finish, suitable especially for slots face grinding
• KA 3-2 medium: to achieve high stock removal rate and good surface finish
• KA 5-3 coarse: for extra high removal rates.

Diameters: from 100 mm (4 ") to 600 mm (24")

Wheels for Diamond and CBN Dressing

Surface Grinding Wheels

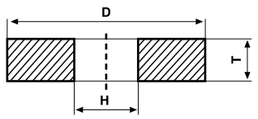
Horizontal Surface Grinding

The edge of the wheel is in contact with the workpiece.

35 M/S

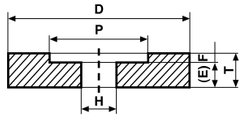
Horizontal
Surface
Grinder

Type 1 (straight wheel)



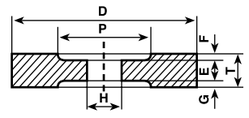
D-Diameter | T-Thickness | H-Bore

Type 5 (recess one side)



D-Diameter | T-Thickness | H-Bore
P-Diameter of recess | F-Depth of recess
E-Thickness around bore

Type 7 (recess two sides)



D-Diameter | T-Thickness | H-Bore
P-Diameter of recess | F-Depth of recess
E-Thickness around bore

Recommended Specifications:

General Purpose	WA46H8V
Steel < 55Hrc	WA46K7V
Steel > 55Hrc	AS46H8V
Stainless Steel (soft) 300 series	PA46J8V
Stainless Steel (hard) 400 series	AZ46H8V
Nickel Alloys	WAG60F15V
HSS & Tool Steel	AS360I13V
Carbides / Tungsten	GC60J7V
Non-ferrous Metals	GC60J7V

WA	The most friable grain - easy cutting action
WAB (AZ)	Fast and cool cutting
PA	Tough but friable
RA	Tougher than PA - good for chromium steel
WAG	Excellent form holding - cool grinding
GC	For carbide and non-ferrous applications
AS	Submicron crystal structure gives long life with maximum performance

Standard Dimensions:

	Diameter (D)		Recess Dimensions (P)		Thickness (T)		Bore (H)	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Type 1	6	150	-	-	1/4 | 1/2	6.3 | 12.7	1 1/4	31.75
	7	177	-	-	1/4 | 3/8 | 1/2	6.3 | 10 | 12.7	1 1/4	31.75
	8	203.2	-	-	1/4 | 1/2	6.3 | 12.7	1 1/4	31.75
	10	250	-	-	3/4 | 1	19 | 25.4	2 | 3 | 5	50.8 | 76.2 | 127
	12	305	-	-	1	25.4	3 | 5	76.2 | 127
	14	356	-	-	1 | 1 1/2	25.4 | 38	3 | 5	76.2 | 127
	16	406	-	-	1 1/2 | 2 | 2 1/2	38 | 51 | 63	5	127
	20	508	-	-	1 | 1 1/2 | 2 4 | 6 | 8	25.4 | 38 | 51 102 | 150 | 203	5 | 8 | 10	127 | 203.2 254
Type 5	7	177	3x1/4	78x6.3	3/4	19	1 1/4	31.75
	7	177	3x1/2	78x12.7	1	25.4	1 1/4	31.75
	8	203.2	3x1/2	78x12.7	3/4	19	1 1/4	31.75
	8	203.2	3x1/2	78x12.7	1	25.4	1 1/4	31.75
	12	305	7 1/2x1/2	190x12.7	1 1/2 | 2	38 | 51	3, 5	76.2 | 127
	14	356	8x1/2	200x12.7	1 1/2	38	5	127
	14	356	8x1	200x25.4	2	51	5	127
	20	508	by request	by request	1 | 1 1/2 | 2 4 | 6 | 8	25.4 | 38 | 51 102 | 150 | 203	5 | 8 | 10	127 | 203.2 254
Type 7	12	305	7 1/2x1/2	190x12.7	2	51	3 | 5	76.2 | 127
	14	356	8x3/8	200x10	2	51	5	127
	18	455	11 1/2x1/2	290x12.7	2	51	8	203.2
	20	508	by request	by request	1 | 1 1/2 | 2 4 | 6 | 8	25.4 | 38 | 51 102 | 150 | 203	5 | 8 | 10 | 12	127 | 203.2 254 | 304.8

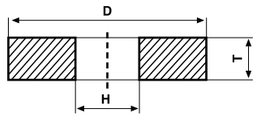
Surface Grinding

Cylindrical Grinding

A cylindrical part rotates while a wheel grinds along its length.

Cylindrical Grinder

Type 1



D·Diameter | T·Thickness | H·Bore

Standard Dimensions:

Diameter		Thickness		Hole	
Inches	mm	Inches	mm	Inches	mm
12	305	1 | 1½ | 2	25.4 | 38 | 51	3 | 4 | 5	76 | 101.6 | 127
14	356	1 | 1½ | 2 | 3	25.4 | 38 | 51 | 76	3 | 4 | 5	76 | 101.6 | 127
16	406	1 | 1½ | 2 | 3	25.4 | 38 | 51 | 76	5 | 8	127 | 203.2
18	455	1 | 1½ | 2 | 3	25.4 | 38 | 51 | 76	5 | 8	127 | 203.2
20	508	1 | 1½ | 2 | 3 | 4	25.4 | 38 | 51 | 76 | 102	5 | 8 | 12	127 | 203.2 | 304.8
24	610	1 | 1½ | 2 | 3 | 4	25.4 | 38 | 51 | 76 | 102	8 | 12	203.2 | 304.8

Recommended Specifications:

General Purpose	SA60K7V
Steel < 55Hrc	PA60M7V
Steel > 55Hrc	SA60K7V
Stainless Steel (soft) 300 series	SA60M7V
Stainless Steel (hard) 400 series	SA60K7V
Nickel Alloys	WAG80H8V
HSS & tool steel	SA60K7V
Carbides / Tungsten	GC60J7V
New designed composition	PA/WAB 120 F11V

SA	Semi-friable aluminium oxide
WAG	Highly friable grain
PA	Tough but friable aluminium oxide
GC	For non-ferrous metals

Centerless Grinding

In centerless grinding, the workpiece is held between two wheels - the grinding wheel and the feed-regulating wheel. CGW's centerless grinding solutions give a precision fine finish while maintaining accuracy and control over the process.

Centerless Grinder

Standard Dimensions:

Diameter		Thickness		Bore	
Inches	mm	Inches	mm	Inches	mm
12	305	3 - 5	76 - 127	5	127
14	356	3 - 5	76 - 127	5	127
16	406	3 - 8	76 - 203	5 | 8 | 10	127 | 203.2 | 254
20	508	3 - 10	76 - 250	12	304.8
24	610	3 | 4 | 6 | 8 | 10	76 - 250	12	304.8

Recommended Specifications:

General Purpose	BAS60K7V
Steel < 55Hrc	BAS60M7V
Steel > 55Hrc	BAS60L7V
Stainless Steel (soft) 300 series	BAS60M7V
Stainless Steel (hard) 400 series	BAS60K7V
Nickel Alloys	BAS60K7V
HSS & Tool Steel	BAS60K7V
Carbides / Tungsten	GC60J7V

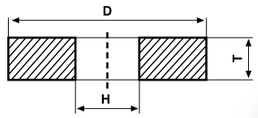
BAS	Improved aluminium oxide grain, specially prepared for centerless grinding

Wheels for High Speed Steel (HSS)

For sharpening teeth of HSS saws (circular and belt).

Tool Room Grinder

Type 1



D·Diameter | T·Thickness | H·Bore

Standard Dimensions:

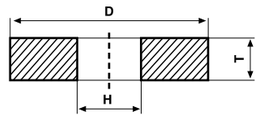
Diameter		Thickness		Hole	
Inches	mm	Inches	mm	Inches	mm
6	150	1/16 | 5/64 | 3/32 | 1/8 9/64 | 5/32 | 3/16	1.5 | 2.0 | 2.5 3 | 3.5 | 4 | 5	20mm | 1 1/4 | 32mm	20 | 31.75 | 32
7	177	3/32 | 1/8 | 5/32 | 3/16	2.5 | 3.0 | 3.2 | 4 | 5	1 1/4 | 32mm | 2	31.75 | 32 | 50.8
8	200	3/64 | 1/16 | 5/64 | 3/32 | 7/64 1/8 | 9/64 | 5/32 | 4.5 | 3/16	1.3 | 1.5 | 1.7 | 2.0 | 2.5 2.7 | 3 | 3.5 | 3.75 | 4 | 5	1 1/4 | 32mm	31.75 | 32
10	254	1/16 | 5/64 | 3/32 | 1/8 9/64 | 5/32 | 3/16	1.3 | 1.5 | 1.7 | 2.0 | 2.5 2.7 | 3 | 3.5 | 3.75 | 4 | 5	1 1/4 | 32mm	31.75 | 32

Tool Room Grinding

For maintenance, re-sharpening and repair of the cutting tools

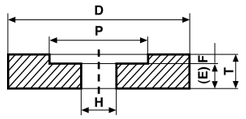
35 M/S

Type 1 (straight wheel)



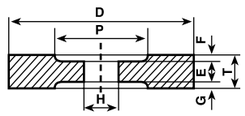
D·Diameter | T·Thickness | H·Bore

Type 5 (recess one side)



D·Diameter | T·Thickness | H·Bore
P·Diameter of recess | F·Depth of recess
E·Thickness around bore

Type 7 (recess two sides)



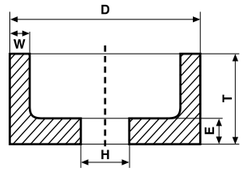
D·Diameter | T·Thickness | H·Bore
P·Diameter of recess | F·Depth of recess
E·Thickness around bore

Standard Dimensions:

	Diameter (D)		Recess Dimensions (P)		Thickness (T)		Bore (H)	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Type 1	6	150			1/4 | 1/2	6.3 | 12.7	1 1/4	31.75
	7	177			1/4 | 3/8 | 1/2	6.3 | 10 | 12.7	1 1/4	31.75
	8	203.2			1/4 | 1/2	6.3 | 12.7	1 1/4	31.75
	10	254			3/4 | 1	19.05 | 25.4	2 | 3 | 5	50.8 | 76.2 | 127
	12	305			1	25.4	3 | 5	76.2 | 127
	14	356			1 | 1 1/2	25.4 | 38	3 | 5	76.2 | 127
Type 5	7	177	r/1/s3x1/4	r/1/s76.2x6.3	3/4	19.05	1 1/4	31.75
	7	177	r/1/s3x1/2	r/1/s76.2x12.7	1	25.4	1 1/4	31.75
	8	203.2	r/1/s3x1/4	r/1/s76.2x6.3	3/4	19.05	1 1/4	31.75
	8	203.2	r/1/s3x1/2	r/1/s76.2x12.7	1	25.4	1 1/4	31.75
	12	305	r/1/s7 1/2x1/2	r/1/s190x12.7	1 1/2 | 2	38 | 50.8	3 | 5	76.2 | 127
	14	356	r/1/s8x1/2	r/1/s200x12.7	1 1/2	38	5	127
	14	356	r/1/s8x1	r/1/s200x25	2	50.8	5	127
Type 7	12	305	r/2/s7 1/2x1/2	r/2/s190x12.7	2	50.8	3 | 5	76.2 | 127
	14	356	r/2/s8x3/8	r/2/s200x10	2	50.8	5	127

Tool Room Grinding (cont.)

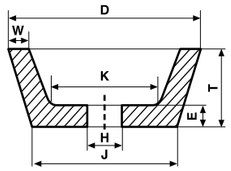
Straight Cup Wheels | Type 6



D-Diameter | T-Thickness | H-Bore | P-Diameter of recess | E-Thickness of base | W-Thickness of wall

D		T		H		W		E	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
4	102	1½ | 2	38 | 51	¾ | 1¼	20 | 31.75	5/16, 3/8	8 | 10	3/8	10
5	127	1½ | 2	38 | 51	1¼	31.75	3/8	10	3/8	10
6	150	2	51	1¼	31.75	½	12.7	½	12.7

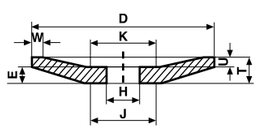
Flared Cup Wheels | Type 11



D-Diameter | T-Thickness | H-Bore | P-Diameter of recess | E-Thickness of base | W-Thickness of wall

D		T		H		W		E		J		K	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
4	102	1½ | 2	38 | 51	¾ | 1¼	20 | 31.75	5/16	8	½	12.7	3¼	82	2⅝	67
5	127	1¾ | 2	45 | 51	1¼	31.75	5/16	8	½	12.7	3¾	95	3	78
6	150	2	51	1¼	31.75	3/8	10	½	12.7	4½	115	3¾	95

Dish Grinding Wheels | Type 12



D-Diameter | T-Thickness | H-Bore | P-Diameter of recess | E-Thickness of base | W-Thickness of wall

D		T		H		W		E		J/K		U	
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
4	102	½	12.7	½ | ¾ | 1¼	12.7 | 20 | 31.75	3/16	5	¼	6.5	2	51	⅛	3
5	127	½	12.7	1¼	31.75	¼	6.5	¼	6.5	2½	63	⅛	3
6	150	½	12.7	1¼	31.75	3/8	10	5/16	8	3	78	⅛	3.2
7	177	½	12.7	1¼	31.75	½	13	5/16	8	3½	90	⅛	3.2

Recommended Specifications:

	Type of Grinding	Specification
End Mills	Sharpening	WA100K7V
	Grinding	WA100K7V
Milling Cutters	Sharpening	WA60K7V
	Grinding	PA80K7V
Carbide Tools	Grinding & Sharpening	GC60I7V
HSS & Tool Steel	Grinding & Sharpening	PA46J7V

Internal Grinding

Internal Grinding Wheels

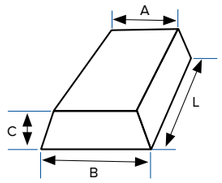
Grinding inside dimensions of bearings, rings, cylindrical workpiece.
The recommended diameter is ⅔ of the final bore required.

35 M/S

Internal Grinder

Surface Grinding Segments

Vertical
Surface
Grinder



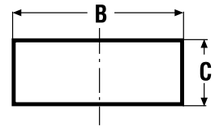
B·Large width | A·Small width | C·Height | L·Length

Recommended Specifications:

General Purpose	PA30D9V
Steel < 55Hrc	WA36G10V
Steel > 55Hrc	AZ36D12V
Stainless Steel (soft) 300 series	WA36I8V
Stainless Steel (hard) 400 series	AZ36D12V
Nickel Alloys	AZ46D12V
HSS & Tool Steel	AS336D13V
Carbides / Tungsten	GC36H8V
Non-ferrous Metals	GC60J7V

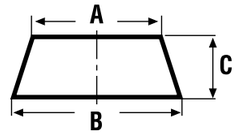
Standard Shapes & Dimensions:

Type ST



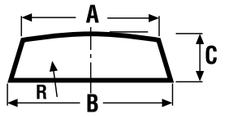
Type	Dimensions (mm) LxBxC
ST-1	210x120x30
ST-2	150x80x30
ST-30	150x90x35
ST-31	150x80x25
ST-32	150x60x25
ST-33	100x50x16
ST-34	100x50x12
ST-35	150x90x30

Type TR



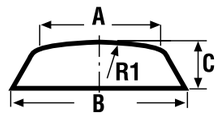
Type	Dimensions (mm) LxBxC
TR-36	100x43/38x20
TR-37	70x65/57x20
TR-38	125x64/45x20
TR-39	150x70/64x25
TR-85	150x60/55x22

Type OR/C



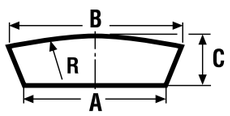
Type	Dimensions (mm) LxBxC
OR/C-14	203x103/83x38
OR/C-71	150x103/83x38
OR/C-72	150x60/50x22
OR/C-73	127x90/70x30
OR/C-74	100x66/57x25

Type OR/B



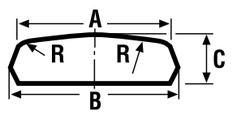
Type	Dimensions (mm) LxBxC
OR/B-12	203x118/78x45

Type OR/E



Type	Dimensions (mm) LxBxC
OR/E-89	150x56/9x28

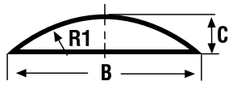
Type OR/F



Type	Dimensions (mm) LxBxC
OR/F-16	150x118/94x44

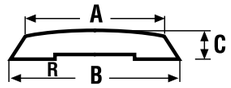
Surface Grinding Segments

Type OR/G



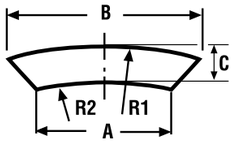
Type	Dimensions (mm) LxBxC
OR/G-11	203x150x48
OR/G-13	286x146x62
OR/G-13 (L)	286x203x62

Type IR/H



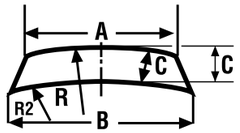
Type	Dimensions (mm) LxBxC
OR/H-86	100x65/61x18

Type IR/A



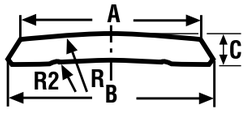
Type	Dimensions (mm) LxBxC
IR/A-22	150x76/61x18
IR/A-23	200x115/90x26
IR/A-46	150x73/38x27
IR/A-52	120x95/72x25
IR/A-54	150x97/72x25
IR/A-55	150x75/50x25

Type IR/C



Type	Dimensions (mm) LxBxC
IR/C-53	100x55/46x20
IR/C-80	80x51/45x15
IR/C-82	100x50/45x20
IR/C-83	110x51/45x15

Type IR/E



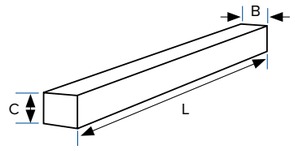
Type	Dimensions (mm) LxBxC
IR/E-20	155x127/105x37
IR/E-21	182x120/114x30

Sharpening Stones

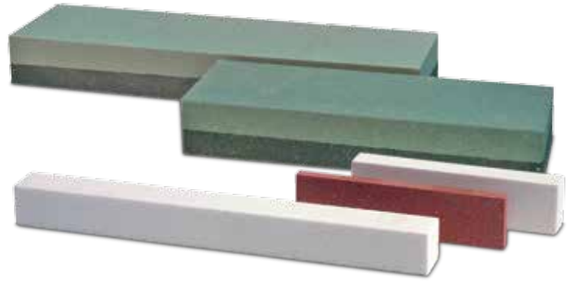
Sharpening Sticks for Diamond and CBN Wheels and Combination Grit Sharpening Stones

For the sharpening of knives and various cutting tools.

Manual Work



B·Width | C·Height | L·Length



Dimensions (LxCxB)		
Inches	mm	Specification
4x1x1/4	100x25x6	WA280E8V
4x1x1/2	100x25x13	WA220J8V
4x1x1/2	100x25x13	WA280E8V
		WA280E8V
		WA320G8V
		WA400H8V
6x3/4x3/4	160x20x20	WA150I7V
8x3/4x3/4	200x20x20	WA150I7V

• Other dimensions and specifications are available by request.

Dimensions (LxCxB)			
Inches	mm	Grit	Specification
6x1x2	152x25.4x50.8	C46/GC150	Coarse/Fine
		C80/GC150	Medium/Fine
		C180/GC280	Fine/very Fine
8x1x2	200x25.4x50.8	C46/GC150	Coarse/Fine
		C80/GC150	Medium/Fine
		C180/GC280	Fine/very Fine

Bench & Pedestal Wheels

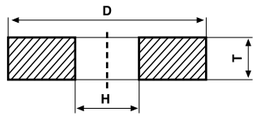
General purpose wheels 5” (127mm) – 18” (455mm)

35 M/S

Pedestal Grinder

Bench Grinder

Type 1



D·Diameter | T·Thickness | H·Bore

Recommended Specifications:

	Coarse	Medium	Fine	Very Fine
Metal / Steel	A24Q5V	A36P5V / A46N6V	A60M6V / A80M6V	A100M6V
Tungsten Carbide		GC60J7V	GC80J7V	GC100J7V
HSS & Tool Steel	WA46K	WA60K	WA80K	WA100K

A	Aluminium Oxide for general purpose off-hand sharpening
GC	Silicon Carbide for non-ferrous metals, carbide tools
WA	White Aluminium Oxide for HSS & Tool Steel

Standard Dimensions:

Diameter		Thickness		Bore		R.P.M.
Inches	mm	Inches	mm	Inches	mm	
5	127	½ | ¾ | 1	12.7 | 19 | 25.4	½ | ⅝ | ¾ | 1 | 1¼	12.7 | 15.88 | 19 | 25.4 | 31.75	6,350
6	150	½ | ¾ | 1	12.7 | 19 | 25.4	½ | ⅝ | ¾ | 1 | 1¼	12.7 | 15.88 | 19 | 25.4 | 31.75	4,500
7	177	½ | ¾ | 1	12.7 | 19 | 25.4	½ | ⅝ | ¾ | 1 | 1¼	12.7 | 15.88 | 19 | 25.4 | 31.75	3,750
8	200	¾ | 1 | 1¼	19 | 25.4 | 31.75	½ | ⅝ | ¾ | 1 | 1¼	12.7 | 15.88 | 19 | 25.4 | 31.75	3,350
10	254	1 | 1¼ | 1½	25.4 | 31.75 | 38	¾ | 1 | 1¼	19 | 25.4 | 31.75	2,700
12	305	1 | 1¼ | 1½ | 2	25.4 | 31.75 | 38 | 51	¾ | 1 | 1¼	19 | 25.4 | 31.75	5,100
14	356	1 | 1½ | 2 | 3	25.4 | 38 | 51 | 76	1 | 1¼ | 1½	25.4 | 31.75 | 38.1	4,400
16	406	1 | 1½ | 2	25.4 | 38 | 51	1½	38.1	3,850
18	455	3	76	1½	38.1	1,500

Telescopic Plastic Adaptors:

To fit wheel bore to machine arbor.

Bag Qty. 50/100 pcs

EAN No.	Bore Dimensions		Height	
	Inches	mm	Inches	mm
000746	1 ↔ ¾ ↔ ⅝ ↔ ½	25.4 ↔ 19.05 ↔ 15.88 ↔ 12.7	½	12.7
000777			¾	19
000852			1	25.4
	1¼ ↔ 1 ↔ ¾	31.75 ↔ 25.4 ↔ 19.05	½	12.7
000814			¾	19
000890			1	25.4
	1¼ ↔ 1 ↔ ¾ ↔ ⅝ ↔ ½	31.75 ↔ 25.4 ↔ 19.05 ↔ 15.88 ↔ 12.7	½	12.7
551828			¾	19
551811			1	25.4
	1½ ↔ 1¼ ↔ 1	38 ↔ 31.75 ↔ 25.4	½	12.7
			¾	19
000913			1	25.4

Bench & Pedestal

Speed Conversion Table

Recommended operating speed for various wheel diameters

Wheel Diameter		Cutting Speed (M/S)					
Inch	mm	10	16	20	25	32	35
1/4	6	31,900	51,000	64,000	80,000	102,000	112,000
5/16	8	24,000	38,200	48,000	60,000	76,500	84,000
3/8	10	19,100	30,600	38,200	48,000	61,200	67,000
1/2	13	14,700	23,550	29,500	35,600	47,100	51,500
5/8	16	11,950	19,100	23,900	29,850	38,200	41,800
3/4	20	9,550	15,300	19,100	23,900	30,600	33,500
1	25	7,650	12,300	15,300	19,100	24,500	26,800
1 1/2	40	4,800	7,650	9,550	11,950	15,300	16,750
2	50	3,850	6,150	7,650	9,550	12,250	13,400
2 1/2	63	3,050	4,850	6,100	7,600	9,750	10,650
3	78/80	2,400	3,850	4,800	6,000	7,650	8,400
4	100/102	1,950	3,100	3,850	4,800	6,150	6,700
4 1/2	115	1,700	2,700	3,350	4,200	5,350	5,850
5	125	1,550	2,450	3,100	3,850	4,900	5,350
6	150/155	1,300	2,050	2,550	3,200	4,100	4,500
7	175/180	1,100	1,700	2,150	2,700	3,400	3,750
8	200/205	955	1,550	1,950	2,400	3,100	3,350
9	230	830	1,350	1,700	2,100	2,700	2,950
10	250/254	765	1,250	1,550	1,950	2,450	2,700
12	300/305	640	1,050	1,300	1,600	2,050	2,250
14	350/356	550	875	1,100	1,400	1,750	1,950
16	400/406	480	765	960	1,200	1,550	1,700
18	450/457	425	680	850	1,100	1,400	1,500
20	500/508	385	615	765	960	1,250	1,350
24	600/610	320	510	640	800	1,050	1,150
30	750/762	255	410	510	640	820	895
32	800/813	240	385	480	600	765	840
36	900/914	215	340	425	535	680	750
40	1000/1015	195	310	385	480	615	670

Equation for converting cutting speed (M/S) to and from R.P.M.

$$\frac{\text{cutting speed (M/S)} \times 60{,}000}{\text{wheel diameter (mm)} \times 3.14} = \text{R.P.M.}$$

$$\frac{\text{R.P.M.} \times \text{wheel diameter (mm)} \times 3.14}{60{,}000} = \text{cutting speed (M/S)}$$

- mm sizes are approximate
- cutting speed = peripheral operating speed.

Cutting Speed (M/S)						Wheel Diameter	
40	50	63	80	100	125	Inch	mm
128,000	160,000	201,000				1/4	6
95,500	120,000	150,500	191,000			5/16	8
76,500	95,500	120,500	153,000	191,000		3/8	10
58,800	73,500	92,100	118,000	147,000	184,000	1/2	13
47,800	59,700	75,200	95,500	120,000	150,000	5/8	16
38,200	47,800	60,200	76,500	95,500	120,000	3/4	20
30,000	38,200	48,200	61,200	76,500	95,500	1	25
19,100	23,900	30,100	38,200	47,200	59,700	1 1/2	40
15,300	19,100	24,100	30,600	38,200	47,750	2	50
12,150	15,200	19,100	24,300	30,250	37,900	2 1/2	63
9,500	12,000	15,100	19,100	23,900	29,850	3	78/80
7,650	9,550	12,100	15,000	19,100	23,900	4	100/102
6,650	8,350	10,500	13,300	16,650	20,800	4 1/2	115
6,150	7,650	9,650	12,250	15,300	19,100	5	125
5,100	6,400	8,050	10,200	12,700	16,000	6	150/155
4,250	5,350	6,700	8,500	10,650	13,300	7	175/180
3,850	4,800	6,050	7,650	9,300	11,650	8	200/205
3,350	4,200	5,250	6,650	8,350	10,400	9	230
3,100	3,850	4,850	6,150	7,650	9,400	10	250/254
2,550	3,200	4,050	5,100	6,400	8,000	12	300/305
2,200	2,750	3,450	4,400	5,500	6,850	14	350/356
1,950	2,400	3,050	3,850	4,800	6,000	16	400/406
1,700	2,150	2,700	3,400	4,250	5,350	18	450/457
1,550	1,950	2,450	3,100	3,850	4,800	20	500/508
1,300	1,600	2,050	2,550	3,200	4,000	24	600/610
1,050	1,300	1,650	2,050	2,550	3,200	30	750/762
960	1,200	1,550	1,950	2,400	3,000	32	800/813
850	1,100	1,350	1,700	2,150	2,700	36	900/914
765	960	1,250	1,550	1,950	2,400	40	1000/1015

Technical Information

Grain Size Conversion Table

Mesh	Inches	Microns
4	.2577	6848
6	.2117	5630
8	.1817	4620
10	.1366	3460
12	.1003	2550
14	.0830	2100
16	.0655	1660
20	.0528	1340
24	.0408	1035
30	.0365	930

Mesh	Inches	Microns	Radius (from - to)
36	.0280	710	
46	.0200	508	xx - 0.5
54	.0170	430	0.43 - 0.5
60	.0160	406	0.4 - 0.5
70	.0131	328	
80	.0105	266	0.25 - 0.5
90	.0085	216	
100	.0068	173	0.2 - 0.25
120	.0056	142	0.12 - 0.2
150	.0048	122	0.1 - 0.15

Mesh	Inches	Microns	Radius (from - to)
180	.0034	86	
220	.0026	66	0.07 - 0.12
240	.00248	63	
280	.00175	44	
320	.00128	32	
400	.00090	23	
500	.00065	16	
600	.00033	8	
900	.00024	6	

Minimum Quantities for Production of Vitrified Abrasive Products

Product	Qty
Segments, blocks	50
Sticks	100
Mounted points	200
Wheel diameter less than 3”	100
Wheel diameter 4” - 5”	50
Wheel diameter 6”, 7”, 8”	40

Product	Qty
Wheel diameter 10” - 12”	10
Wheel diameter 14” - 16”	5
Wheel diameter 18”- 48”	2
Non-reinforced cutting discs	200
Reinforced cutting discs	500
Wheel thickness up to 5mm, diameter up to 250mm	50

Inch/Millimeter Conversion Table

Inches	mm
1/64	0.397
1/32	0.794
3/64	1.190
1/16	1.587
5/64	1.984
3/32	2.381
7/64	2.778
1/8	3.175
9/64	3.571
5/32	3.968
3/16	4.762
7/32	5.556
1/4	6.350
9/32	7.144
5/16	7.937
11/32	8.731
3/8	9.525
13/32	10.319
7/16	11.112
15/32	11.906
1/2	12.700
17/32	13.494

Inches	mm
9/16	14.287
5/8	15.875
11/16	17.462
3/4	19.050
13/16	20.637
7/8	22.225
15/16	23.812
1	25.400
1 1/16	26.987
1 1/8	28.575
1 3/16	30.162
1 1/4	31.750
1 5/16	33.337
1 3/8	34.925
1 7/16	36.512
1 1/2	38.100
1 9/16	39.687
1 5/8	41.275
1 11/16	42.862
1 3/4	44.450
1 13/16	46.037
1 7/8	47.625

Inches	mm
1 15/16	49.212
2	50.800
2 1/8	53.975
2 1/4	57.150
2 3/8	60.325
2 1/2	63.500
2 5/8	66.675
2 3/4	69.850
2 7/8	73.025
3	76.200
3 1/8	79.375
3 1/4	82.550
3 3/8	85.725
3 1/2	88.900
3 5/8	92.075
3 3/4	95.250
3 7/8	98.425
4	101.600
4 1/4	107.950
4 1/2	114.300
4 3/4	120.650
5	127.000

Inches	mm
6	152.400
7	177.800
8	203.200
9	228.600
10	254.000
11	279.400
12	304.800
13	330.200
14	355.600
15	381.000
16	406.400
17	431.800
18	457.200
19	482.600
20	508.000
21	533.400
22	558.800
23	584.200
24	609.600
25	635.000
26	660.400
27	685.800

Technical Information

Cutting and Grinding Discs

CGW's comprehensive line of quality products for cutting and grinding iron, steel, concrete, stainless steel, and aluminium, provide the ideal solution for skilled professionals and amateurs alike.

Our wide range of discs is available in diameters from 100-400 mm (4" to 16"), suitable for all grinders and saws.

For more information visit us at:

www.cgwheels.com

CAMEL GRINDING WHEELS

Worldwide Headquarters:
Kibbutz Sarid 3658900, Israel

Tel. 972 4 6507216
Fax. 972 4 6540899

sales@cgwheels.com
www.cgwheels.com

U.S.A.
7525 N Oak Park Ave. Niles, IL 60714

Tel. 800-447-4248
Fax. 800-447-3731

www.cgwabrasives.com