The innovation in the world of abrasive wheels

...since 1961

GLOBE

TABLE OF CONTENTS

FROM I.A.P. IMPRESA AUTOFFICINE PARMENSE (manufacturers of racing cars) TO I.A.P. INDUSTRIA ABRASIVI PARMENSE… 60 YEARS OF RACING

Eng. Paolo Ficai on FICAI-IAP 750 - Bolzano-Mendola 1954

Via La Spezia, 160
43126 Parma - ITALY
Tel: +39.(0)521.293943
Fax: +39.(0)521.293743
www.globeabrasives.com
info@globeabrasives.com

Dr. Prof. Celestino Ficai

Impresa Autofficine Parmense was established in 1950 to design and build racing cars, then the company abandoned this activity to become Industria Abrasivi Parmense, later represented by the Globe brand, by the Ficai brothers Paolo and Pietro. They acquired the experience from their father Celestino, Professor of Applied Chemistry at the University of Bologna (Faculty of Engineering) as well as co-founder and director or the Ceramics Centre linked to the Faculty.
Prof. Ficai's researches mainly focused on industrial ceramics, which at the time was growing in the Modena area, on special cements, on the sintering of aluminum oxides to produce abrasive and refractory elements.
The experience of these studies led to the idea of manufacturing abrasive wheels and this project was accomplished with the opening of the factory in La Spezia street, on the outskirts of Parma.

From 1961 until 1971 production was all manual and manufactured with rotary distribution presses. Polymerization was already made through continuous ovens, really original (the first ones in the world), designed by engineer Paolo Ficai. In fact, since its inception the company invested many substantial resources to develop the continuous baking cycle, at the time a revolutionary concept aimed at ensuring consistent results in terms of polymerization and production quality.

In 1971 engineer Giovanni Ficai joined the company after his father, Paolo, had left to hold important appointments in the glass-making industry. In the same year the company moved premises to Via La Spezia, 160 and reached the present dimensions of approximately 8000 sq m.
From 1972 on, Eng. Giovanni and Dr. Pietro gave life to a continuous and dynamic expansion geared to enhancing and automating production whilst preserving a high standard of quality. The new presses bought in Germany, Italy and Canada represented an important turning point for the process of automation.

However, all the automatic equipment, the continuous tunnel ovens and mixing systems installed afterwards were, and still are, designed and engineered by Eng. Giovanni.

Together with wheel technology, a company automation was developed, featured by a strong design originality thanks to the deep knowledge of production problems.
Today our company can boast completely automated and computer-controlled mixing systems, three tunnel ovens providing an output capacity of more than 30 million pieces/year as well as a set of automatic presses allowing to produce any type of resin-bonded wheels with diameters from 50 up to 800 mm.

The company did not neglect the environment protection and installed a thermal regenerative oxidizer (latest generation system representing the best technology that can be applied for emissions treatment) treating the emissive flow by purifying it from any form or pollution.
Continuous effort still goes into research and development with the aim of constantly enhancing products, advancing automation systems and productivity, this process is supported and consolidated by newly hired staff and family members (Eng. Paolo, son of Eng. Giovanni Ficai).

Dr. Eng. Paolo Ficai

Dr. Eng. Pietro Ficai

Dr. Eng. Giovanni Ficai

Dr. Eng. Paolo Ficai

THE EXPERIENCE CERTIFIED...GLOBE.


Membership Certificate

The Organization for the Safety of Abrasives (oSa®)

herewith grants to the company

INDUSTRIA ABRASIVI PARMENSE - GLOBE S.r.l.

as of 14 February 2002

based on the Application Form, oSa®-Constitution and Conditions of Use for the oSa® Trademark the right until withdrawn to use the oSa® mark in the described colours for the abrasives notified.

This right applies to the designation of the registered tools as well as their packaging or labelling.

Bonn, 10 November 2010 _____ Executive Board _____

Organization for the Safety of Abrasives (oSa®) - Oxfordstraße 8 - D-53111 Bonn - Germany


CERTIFICATO

I.A.P. GLOBE S.r.l.

UNI EN ISO 9001:2008

Globe can rightfully be included among the top world manufacturers of high quality abrasive wheels. The whole production is manufactured in Parma, 100 Km south of Milan.
Globe has only one range of high quality products, manufactured with raw materials supplied by ISO certified companies based in the European Community.

The utmost care is devoted to mechanical and chemical safety of products to safeguard users. Globe products are the result of staff commitment and accountability, also thanks to an original product identification system. This systems makes it possible to trace the following information for each wheel until expiry: day, month and year of manufacture, name of worker in charge of pressing, pressing check, oven feeding, finished product check and shipping.
Also the following data are always available: environmental data of the production day, mixtures data and physical-chemical checks made on the raw materials used.

All data relating to ***each individual wheel*** are stored for three years, that is for the whole period that the product can be used, in the company files together with the manufacturing and test sheets.

Globe's quality system is certified by TUV according to UNI EN ISO 9001: 2008 standards.

The selected range of products offered by Globe is wide and many of them are patented, such as: Turbotwister, Combo, ZAC cutting discs, HT flap discs and packaging systems.
Globe has always been committed to study advanced and satisfying solutions enabling the user to achieve shorter working times and improved products'performance; aspects that allow cost reduction.

Safety has always been a primary priority of Globe products, from the beginning certified by DSA (Deutscher Schleifscheibenausschuss), SUVA (Schweizerische Unfallversicherungsanlait) and KDM (Bundesministerium für Arbeit und Soziales Zentral-Arbeitsinspektorat) and today certified by OSA (Organization for Safety of Abrasives).
Specific safety products'regulations (UNI EN 12413), Italian laws (Law 320 of November 5th, 1990, Decree 554 of December 3rd 1992), are scrupulously observed and the checks foreseen are regularly carried out and registered.

For the most sophisticated applications, such as special steels, titanium, special alloys, etc., high-quality raw materials and the most advanced technologies are used. Special cutting wheels are produced for cutting with coolants, such as those for cutting metal test pieces, chromed, cemented or hardened bars, etc.
Thanks to its flexibility and expertise, Globe can supply in a short time top quality products especially conceived for the customers' special needs (in the wide ranges between 50 and 800 mm).

STRUCTURE OF THE WHEEL ...THE SECRET OF SAFETY IN THE HEART OF THE WHEEL!

Globe wheels are manufactured in the maximum respect of safety rules and are severely tested in order to grant a safe operation, even in the most difficult conditions. Layers of abrasive mixture are alternated with fiberglass cloths (European production) impregnated with resins. The strong adhesion between the reinforcing elements and the mixture binder gives the wheel convenient strength features.

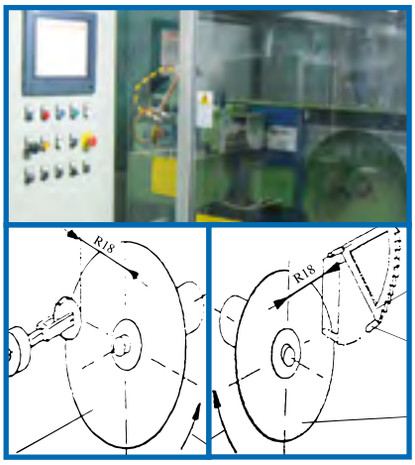
Special care is given to wheels'balancing that in Globe products always comply with still more strict values than those of the UNI EN ISO 6103 reference norm.
An accurate balancing is achieved thanks to the original cross filling of the mixture up to diameter 230 mm and rotary distribution for diameters higher than 230 mm.
Tolerance limits for the bore conform to UNI EN ISO 525. Bores that are too small prevent proper mounting and bores that are too large cause vibrations due to the eccentric rotation of the wheel.
The wheels assembled with their individual components, layers of abrasive mixture alternated with reinforcement cloths (fiberglasses impregnated with phenolic resins) are pressed into fully automatic machines, transferred on baking stands, loaded on trolleys that are then pushed into polymerization process tunnels.

Globe grinding wheels are structurally conceived with a fine grit top layer, to better absorb impact and maintain even wear around the edge, and with coarse grit bottom layers to maximize removal capacity.

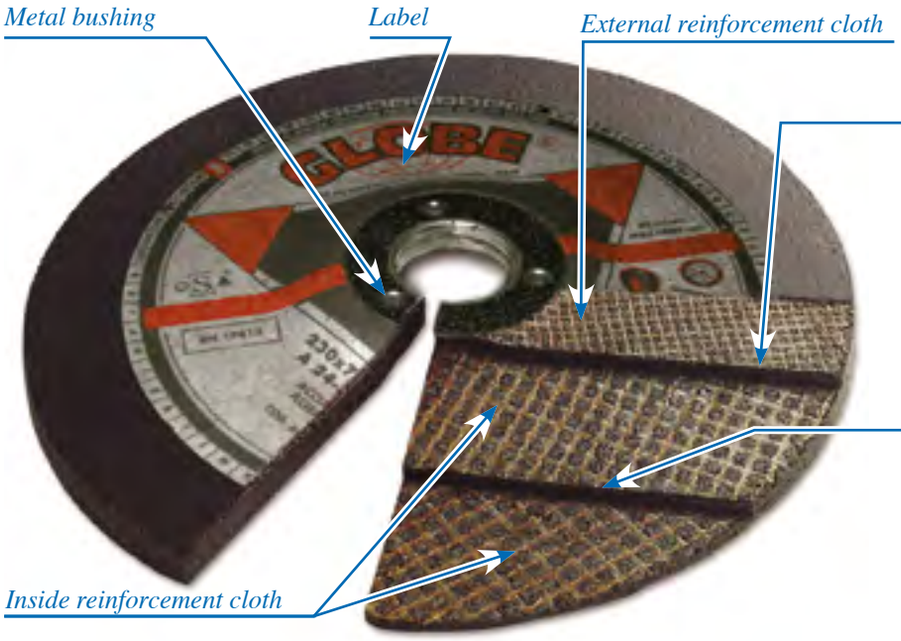
Controlled by sophisticated electronic instruments, our tunnels generate a precise cycle of temperatures that are gradually increased up to 180°C.

The constancy of this cycle ensures the wheels receive a perfect thermal treatment, resulting in optimal polymerization and performance.
The label is also pressed together with the wheel to enable identification and guarantees that the product is original.

Burst test machine



Side load test and impact test



Abrasive grains used in the layer of fine grit mixture enlarged 4 times

Abrasive grains used in the layer of coarse grit mixture enlarged 4 times

READING THE LABEL.

1) Manufacturer (name, address and declaration of origin):
IAP - GLOBE srl. Via La Spezia, 160 - 43126 Parma - Italia

2) OSA: Membership brand
Organization for the Safety of Abrasives

3) Sizes of the wheel:
external diameter, thickness and bore.

4) Colored stripe:
green: 100 m/s peripheral speed
red: 80 m/s peripheral speed
yellow: 63 m/s peripheral speed
blue: 45 m/s peripheral speed

5) Wheel's operating speed:
in RPM and m/s

6) Content specifications:
Iron, Sulphur, Chlorine

7) Type of abrasive:
A-Corundum (Aluminium oxide)
C-Silicon carbide
Z-Alumina zirconia
SG-Sol Gel (ceramic abrasive)

8) Grit size:
coarse: 16/24
medium: 30/60
fine: 70/120

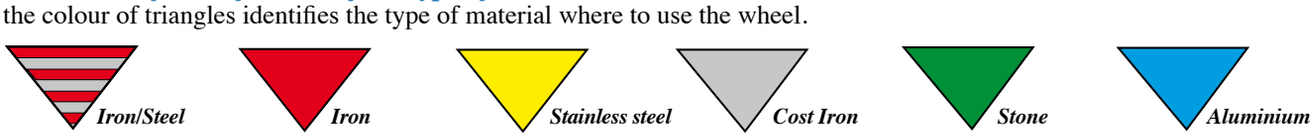
9) Hardness:
P-Q: medium
R-S: hard
T: very hard

10) Directions for specific applications:
Al: Alumimium
X: Stainless steel
G: Cast iron
E: Building materials

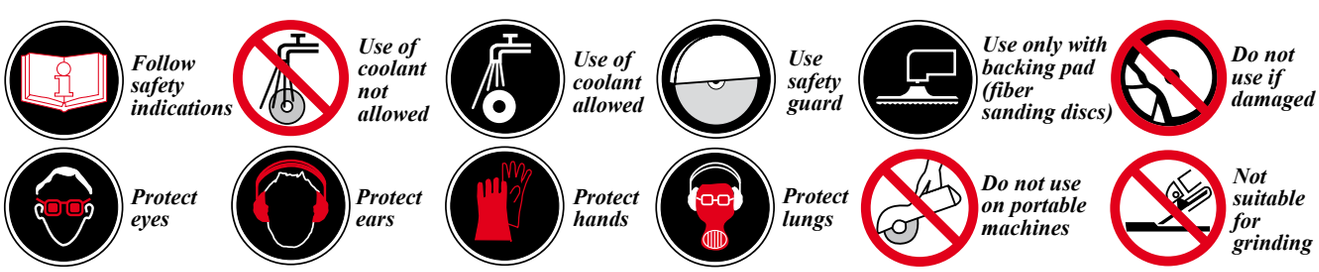
11) Type of binder:
B = phenolic resin

12) Type of reinforcements:
F = Fiberglass cloths

13) Colour of identification of the type of use:
the colour of triangles identifies the type of material where to use the wheel.



14) Safety pictograms:



15) Decoding production data through the "zero" point:
useful for decoding the cuts on the label's external diameter, showing the expiry date (dd,mm,yy) and the operator in charge of the pressing phase, through the use of a special template for decoding data. The template can be downloaded from our web site page: www.globeabrasives.com/recalls where instructions can be found for its correct use.
Wheels have a 3 year validity, therefore to trace the manufacturing year, 3 years have to be subtracted from the expiry year marked on the label (day and month of expiry correspond to day and month of production). Every operator in charge of wheels' manufacturing is univocally identified by a code: combinations of letters from a to v. The operator in charge of checks in the final stage of product's choice before boxing is identified by the initials printed on the box label, where also the production date and boxing date are shown.

16) Wheel's bushing:
the expiry date (V=validity), shown with month and year (mm, yy) is also printed on the wheel's bushing.

MARKING SYSTEM OF GLOBE PRODUCT.

Checking product conformity

For each single Globe wheel, at the moment of manufacturing, an individual label is prepared showing day, month and year of expiry (the same as those of manufacturing but with 3 years more) as well as identity of the operator in charge of pressing.
Labels are daily prepared through a special machine connected to the central computer system.
Daily production of each press is indicated in a production sheet where checks of weight, balancing and thickness of wheels are recorded.
These sheets also include characteristics of the mixture used. Thanks to this information it is possible to quickly trace the batches of raw materials used, their chemical-physical checks are stored both in computer and printed files.
Production sheets trace batches through baking up to the final product test and boxing.
When polymerization is over, the product is transferred to warehouse, where each ***single wheel*** is checked and, if approved, is boxed and packed.
The codes of the operators who made the checks are shown on the label of the box and of the packing.
All checks carried out (with the signature of who made them), also after manufacturing, are reported on the sheets and are electronically stored for the whole product's lifetime (three years after manufacturing date).
Simultaneously, other safety tests are made:

- ***burst speed test, whose results, in accordance with the current regulation, are entered in officially stamped registers,***
- ***side load test, carried out regularly, with a special machine whose results are stored in its memory.***

New and exclusive (patented) packaging of Globe products: stockable, cylindrical boxes in plastic or cardboard

1 *Operator in charge of closing the baking trolley*
2 *Operator in charge of wheels' unpiling*
3 *Operator in charge of wheels' check*
4 *Operator in charge of packaging*
P *Wheels' production date*
D *Boxing date*

UNBALANCE ACCEPTED, TOLERANCE OF BORES AND SPEED (RPM) OF GRINDING AND CUTTING WHEELS.

$m_a = K\sqrt{m_i}$

m_i = wheel mass in grams

v = external peripheral speed

D = disc diameter in mm

Where K is obtained from the following table

USE	MACHINES	Periph. Speed 63 m/sec <v<100 m/sec.	K
Grinding	Portable		0,25
	Swing-frame and other types		0,40
Cutting	Portable		0,25
	Stationary or swing-frame	D < 305 D > 305	0,32 0,40

MAXIMUM UNBALANCE ADMITTED.
The maximum unbalance admitted (m_a) is governed by the norm UNI ISO 6103 and is expressed in grams on the disc's periphery.

Grinding and cutting wheels

d= bore diameter

$d \leqslant 18$ Tolerance $^{+0,21\ mm}_{-0\ mm}$

d: >18 to $\leqslant 30$ $^{+0,21}_{-0}$; >30 to 50 $^{+0,25}_{-0}$; >50 to 80 $^{+0,30}_{-0}$

BORE TOLERANCE.
UNI ISO 525 norm, for cutting and grinding wheels.

Wheel diameter in mm	Peripheral speed			
	45 m/sec.	60 m/sec.	80 m/sec.	100 m/sec.
	RPM	RPM	RPM	RPM
50	17200	22800	30500	38210
75	11455	15300	20400	25470
100	8600	11450	15300	19100
115	7470	9965	13200	16600
125	6875	9200	12200	15280
150	5730	7640	10200	12730
178	4900	6450	8510	10675
200	4300	5730	7640	9550
230	3730	4980	6615	8300
250	3440	4575	6100	7640
300	2865	3820	5100	6360
350	2450	3275	4360	5460
400	2150	2870	3810	4770
500	1720	2290	3050	3820
600	1430	1910	2550	3185
800	1075	1430	1900	2380

TABLE OF CORRESPONDENCE PERIPH. SPEED/RPM/DIAM.

WORKING WITH ABRASIVE WHEELS…

Safecut: horizontal flush cut

Combi Speed: cutting and grinding 2 in 1

Double thickness grinding wheel with ventilating hub and threaded bore for a quick assembly and disassembly

Abrasive wheels still are the quickest and most versatile instrument that technology can offer for cutting and working different materials. With abrasive cutting discs the most different materials can be cut such as: metal profiles, sheet metal of all types, rails, railway sleepers and concrete beams, stones, marbles, granites, refractory material, tubes, fusion of different alloys, foundry feedheads, metal test pieces, etc…

These are only a small example of the possibilities of use offered by cutting wheels that can anyway give an idea of the extent of use that this tool still has.

If mounted on the suitable machines and chosen in the correct type, this tool does not find obstacles and limits of use. The continuous researches on improvement brought to widen the range of wheels by enhancing their performance in a selective way for the different jobs to be done and for different materials on which to use them.

An example of this, was the development of thin cutting wheels (thickness between 1,0 and 1,6 mm) that, thanks to their high penetration speeds and cooling power of some additives and fillers, allow to carry out a cold cut, thus avoiding the hardening of materials due to self-tempering (very common phenomenon with the use of thicker cutting wheels-normally wheels of 2.5 - 3,2 mm thickness were used).

The development of new products and new innovative solutions represent one of the most important aspects in the work in I.A.P.-Globe. An example of this is the ***patented*** boxing system of wheels (in cylindrical plastic or carton boxes), unique in the world, allowing to preserve and protect wheels from ageing and deterioration.

Many have been the new products introduced on the market in the latest years that are able to give innovative solutions for use and better performances for users:

- ***Safecut-depressed center thin cutting wheels:*** can grant excellent performances of thin, flat cutting wheels but also allowing to work in horizontal position thanks to the depressed center shape (CD). Moreover the aluminium cladding confers a high safety degree, protecting the convex part of the wheel from dangerous damaging during use.
- ***Combo-cutting and grinding wheels:*** : conceived for carrying out cutting and grinding operations with one only abrasive wheel in full safety.
- ***Wheels with Easy-Lock:*** wheels with a special threaded plastic hub allowing to easily assemble/disassemble the wheel in the grinder.
- ***Combi Speed-cutting and grinding wheels:*** born from the evolution of the combo wheel, they have very high cutting performances. Thanks to their low thickness (2,0 mm) and their special formulation, they allow a fast and cold cut. At the same time, the structure made of three reinforcement cloths, allows to carry out light grinding operations in full safety.
- ***Two-thickness grinding wheels with ventilating hub, high removal capacit:*** can remove very high quantities of materials (with very high performances, removal rate of 1:10 that is 1 gr of wheel per 10 grams of removed material). It was possible to reach this result thanks to the production of a fine grit layer, highly reinforced, in the back side, able to withstand the strong vibrations caused by the use of a very coarse grit in the front side (that is the one determining the high removal) and also able to get consumed regularly, without breakings on the edge with consequent ejection of abrasive material. The so conceived back side can keep the coarse grit abrasive grain in its position until it is totally consumed. For this reason the types of abrasive used are extremely important to obtain such high performances.

  The special threaded, ventilating hub allows a quick assembly/disassembly of the wheel and the cooling of the workpiece.

The diffusion of different, more and more performing types of abrasives was of prime importance in the development of wheels. Their combination inside the wheel gives it extremely different working features. The different features of toughness and friability are crucial for the cutting rate and cut quality.

Among the main types of abrasives there are:

Aluminium oxide or brown corundum (pic. 1):
it is the most common of abrasives and has a medium level of toughness and friability.

Ceramic-coated brown corundum (pic. 2):
the feature of this abrasive is to have a "cover" on abrasive grains able to increase adhesion between grain and binding resin.
Its hardness and friability are similar to those of brown corundum and thanks to special milling processes it is possible to give grains different shapes (more or less rounded, sharp etc..) that determine different cutting capabilities.

Alumina Zirconia (pic. 3):
has a high toughness and the special feature of "bursting" at high temperatures, in order that grain is regenerated with new cutting "edges". This type of abrasive is produced by introducing zirconium oxides during arc melting.
Alumina zirconia, if used correctly, is one of the most efficient and long-lasting type of abrasive on the market; it has a very high toughness and hardness besides a very high resistance to the most difficult stresses thanks to its ability to self-change its cutting edges.

Semi-friable corundum (pic. 4):
more friable than brown corundum and less tough. This determines better cutting capability but less resistance to mechanical stress (this means an easier and faster cut but with a quicker consumption). Also this type of abrasive can be ceramic-coated in order to increase adhesion between grain and binding resin.

White corundum (pic. 5):
even more friable than the semi-friable one, it is however a bit tougher. Its features are: high cutting capability and low resistance to mechanical stress.

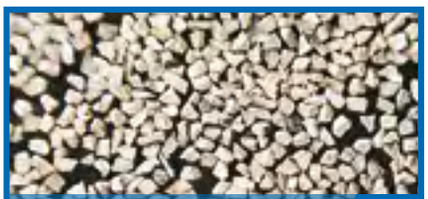
Silicon carbide (pic. 6):
among the most cutting abrasives, silicon carbide is the most suitable for working non-ferrous materials, stones, marbles, refractory materials, etc. Its high friability and hardness make this abrasive rather fragile but regular in consumption. Due to the sharpness and fragility of its crystals, this abrasive can be used only for some applications.

Sol gel or ceramic abrasive:
produced by sintering, it is absolutely the most precious abrasive and the most expensive. It is not much used for abrasive wheels as its capability of regenerating abrasive grain, that when breaking always bring out new cutting faces (even more than zirconium) does not enhance this type of use. Usually it is mainly used in abrasive papers and cloths, where it is possible to "glue" in a resistant way the grain to the cloth, thus enhancing the regeneration factor of grain, that is the main feature of this abrasive.

These are only some of the abrasives available on the market but there are also others such as monocrystalline, pink, ruby red ***(pic. 7)***, etc.
The combinations of these abrasives, agglomerated in resin matrix, usually phenolic resin (but also phenolic modified resin), with different powders and with specific additives, give the wheels their special working properties making them more or less suitable for the different applications.

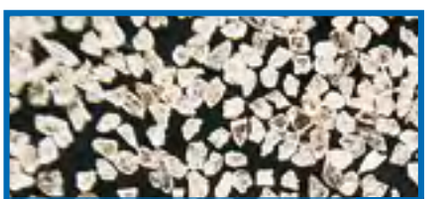
brown corundum grit 30 **1**

ceramic-coated brown corundum grit 36 **2**

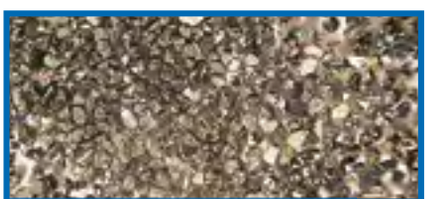


aluminia zirconia grit 30 **3**

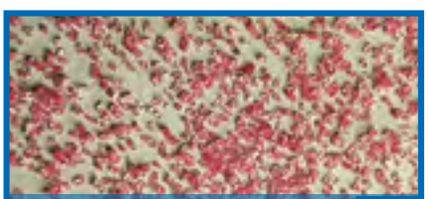
semi-friable corundum grit 30 **4**



white corundum grit 30 **5**

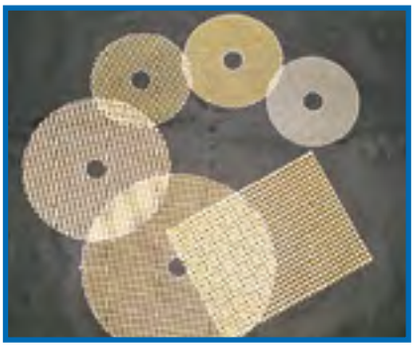


silicon carbide grit 30 **6**



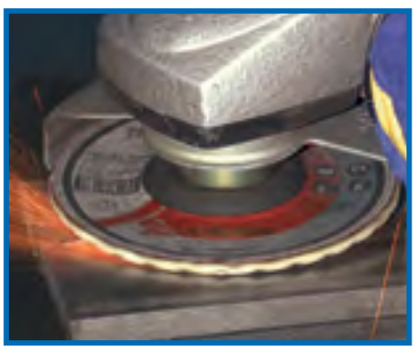
ruby red grit 60 **7**

Images of abrasives enlarged 4 times



Some types of wheel's fiberglass reinforcements

Combi with Easy Lock: quick assembly system



Turbotwister: the semiflexible grinding wheel

Safecut: depressed center cutting wheel with protective metal dome

Granulometry of the abrasive choosen for the mixture is of great importance to characterize the wheel, it can be divided as follows and is expressed in Mesh:

12-14-16-18-20-22-24	***coarse grit,***
30-36-40-46-50-54-60	***medium grit,***
70-80-90-100-120 and more	***fine grit***

Granulometry has to be choosen according to the wheel's thickness (for example very coarse grits cannot be used in very thin wheels) and to the features (penetration capacity, hardness and lifetime) that the wheels should have.

Abrasive grains are also characterized by: shape, thermal treatment and "coating". In fact the grain can be rounded ("cube-shaped"), can have live edges, more or less long shapes, can be coated with ceramic material to improve adhesion with binding resin or can be baked again at high temperatures to obtain a higher toughness.

Abrasive wheels increase their performances at higher peripheral speeds. Enough resistance to centrifugal force (peripheral speeds of 80-100 m/s) and to different mechanical stress cannot be obtained with organic resin binders alone, so fiberglass cloths (pre-impregnated with partially polymerized resins) are inserted into the wheel structure to achieve adequate safety values. There are several types of fiberglass cloths, varying in cloth per square meter, kind and weight of fibre (twisted or flat), closeness of mesh and quantity of impregnation (factor that guarantees adhesion to the mixture composing the wheel).
However considering that fiberglass has no cutting power, we try to limit the amount of reinforcements used to the level needed to achieve the required safety and resistance. Certainly, with higher peripheral speeds and more "severe" applications, more and heavier fiberglass reinforcements will have to be used.
Cloths can be added inside the wheel and/or on the sides but in special applications, such as laboratory wheels for cutting test pieces, no reinforcements are used at all and as the wheel is fragile, ***the safety of the system is obtained by completely enclosing the machine.***

Besides the components and types of raw material used for manufacturing abrasive wheels, the manufacturing technique is of primary importance. For example to obtain improved performance and a greater structure density of cutting wheels, they are pressed with rubberized discs (steel discs to which a layer of polyurethane is applied) which, under a pressure of around 300 Kg/cm^2 make the side surface of the cutting wheel very rough.
This roughness is extremely important, especially when cutting full sections, to achieve fast, cold and white cutting. Roughness is greater in discs that have no side reinforcements.

Cutting wheels pressed with rubberized discs can reach performances even 30% greater than wheels pressed with smooth steel moulds.
As a general rule, if cutting wheels are reinforced internally, the sides will have a very rough surface (in this case smaller diameter external cloths are often used) that allows a better penetration into the workpiece.
In case external reinforcements are on the full diameter, an improved resistance to side stresses will be reached but also a certain difficulty in penetrating, due to the friction caused by the reinforcing cloths applied to the sides.

One of the possibilities to minimize this problem is to use cutting wheels having a suitable thickness for the work that has to be carried out. Important information about the suitable use and the good operation of a cutting wheel can be obtained by observing the shape of the edge produced during cutting operations.

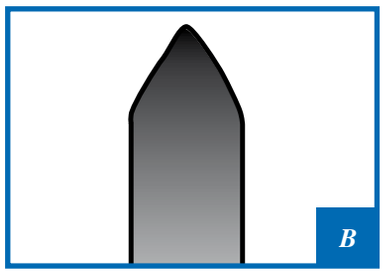
In fact:

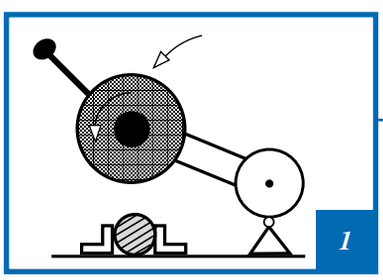
If the edge section is flat or slightly concave in the center (A) it means that there is a correct, well balanced ratio between cutting efficiency and disc wearing. The slight concavity that can arise in the middle, is usually due to the presence of a central reinforcement cloth that is subject to a faster wear.

If the edge section is pointed (B) and the edge is crumbled in some areas, the colour is dark and the wheel smells of burning, the wheel is too hard and not suitable for the type of cut it is making (usually not suitable to cut full sections or for the material that has to be cut). Proceeding with the cut may lead to jamming or even breaking of the disc.

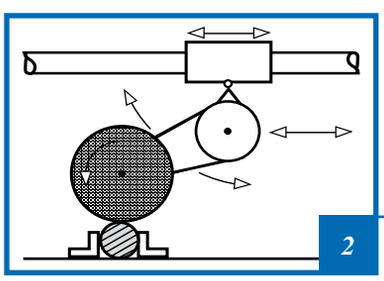
If the edge section is pointed and asymmetric (C) one of the following situations is occurring:
1) the workpiece to be cut or the wheel's positioning are misaligned,
2) the wheel, made with a mixture containing different grit size abrasives, suffered grit separation during distribution and pressing phase: fine grains have sunk to the bottom and coarse grains have remained on top.
The two sides of the wheel have therefore different density and hardness and this results in the wheel wearing out unevenly.

Caution: in both above-mentioned cases it will lead to straining and to possible breaking of the wheel.
The choice of the most suitable cutting wheel to be used for the work to carry out is also strictly tied to the cutting mode in which the cut will have to be made (machine operation and shape of the pieces to be cut). The objective is to achieve a fast and white cut (in the shortest time possible) thus limiting the heat developed in the process. Some examples of the most common working methods are:

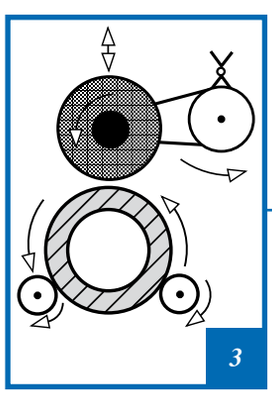




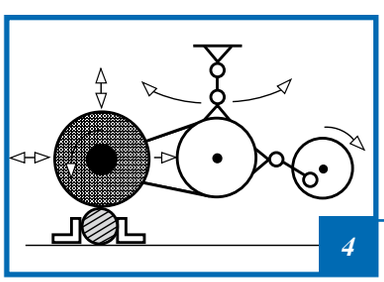
1) workpiece locked and cutting wheel going down vertically on the workpiece



2) workpiece locked on the bench of a bridge machine with stationary or swing-frame cutting wheel with horizontal movement; or stationary or swing-frame cutting wheel with horizontal moving of the piece on the mobile trolley



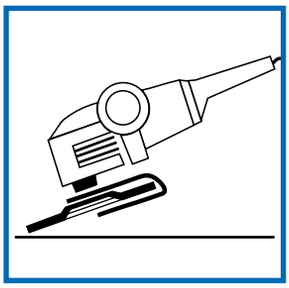
3) cutting wheel comes down vertically on the workpiece which is rotated by means of special mechanical equipment. The cutting wheel may also be swing-frame and swing from top to bottom

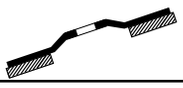


4) cutting wheel comes down vertically and swings horizontally (sometimes also vertically) on the workpiece locked on the bench.

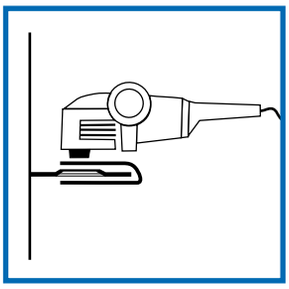
PRODUCTION PROGRAMME OF GLOBE WHEELS.

GRINDING WHEELS FOR PORTABLE ANGLE GRINDERS



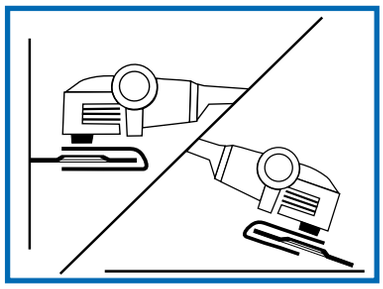
Type 27		SHEET 01	Grinding wheels
Type 28		SHEET 02	Saucer grinding wheels
Type 29 TURBO TWISTER		SHEET 03	Flexible grinding wheels
Flap discs		SHEET 11	
Fibre sanding discs		SHEET 12	

CUTTING WHEELS FOR PORTABLE ANGLE GRINDERS



Type 41 ZAC		SHEET 05	Flat thin cutting wheels
Type 42 SAFECUT		SHEET 05	Depressed center thin cutting wheels
Type 41		SHEET 04	Flat standard cutting wheels
Type 42		SHEET 04	Depressed center standard cutting wheels

CUTTING/GRINDING WHEELS FOR PORTABLE ANGLE GRINDERS



Type 41
COMBI and
COMBI SPEED

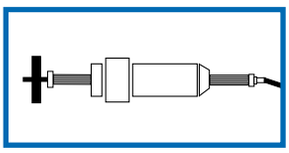
SHEET 04

Depressed center cutting and grinding wheels

GRINDING WHEELS FOR STRAIGHT GRINDERS

Type 01

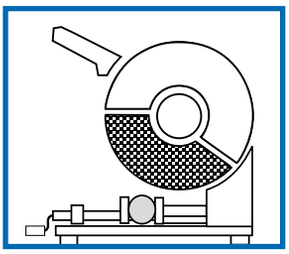
SHEET 06



CUTTING WHEELS FOR LIGHT STATIONARY MACHINES

Type 41
CHOPCUT

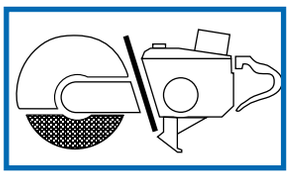
SHEET 07



CUTTING WHEELS FOR PORTABLE MACHINES WITH ELECTRIC OR COMBUSTION ENGINE: ∅ 300-350-400

Type 41
RAILCUT
and ALLCUT

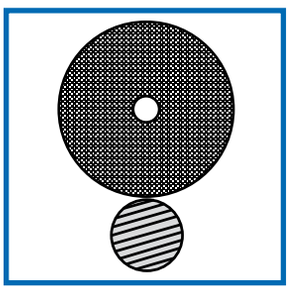
SHEET 08



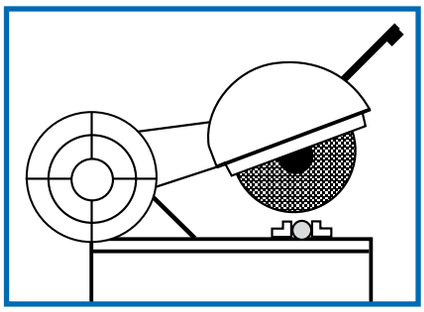
CUTTING WHEELS FOR LABORATORY MACHINES

Type 41
LABCUT

SHEET 08



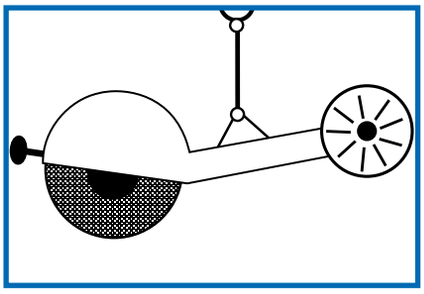
FLAT CUTTING WHEELS FOR STATIONARY MACHINES



Type 41

SHEET 09

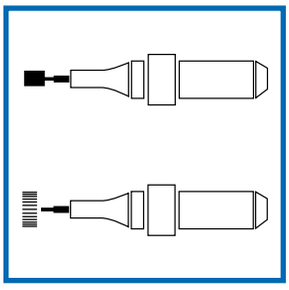
DEPRESSED CENTER CUTTING WHEELS FOR SWING-FRAME (OR STATIONARY) MACHINES



Type 42

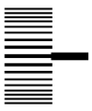
SHEET 10

GRINDING AND FINISHING WITH STRAIGHT GRINDERS



SHEET 13

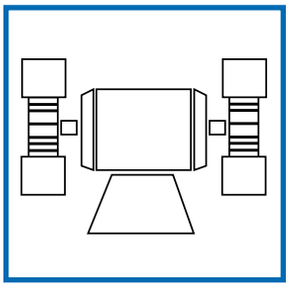
Shaft mounted abrasive wheels

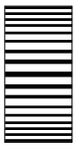


SHEET 14

Mounted flap discs

FINISHING WHEELS FOR BENCH GRINDERS





SHEET 15

Abrasive flap wheels

INFORMATION FOR CHOOSING THE RIGHT WHEEL.

Please fill in and fax to:
+39.(0)521.293743

* Compulsory fields. By sending the present sheet, the Company declares to have read the regulations overleaf regarding treatmnt of data and to accept them.

COMPANY DETAILS

***Company**		***Department**	
***Address**			***n°**
***Country**	***Town**		***Zip Code**
***Contact**		***Tel**	
***E-mail**			

MACHINE

Manufacturer/Year of Manufacture:			
Type:	☐ traditional	☐ rotary	☐ swing-frame
Power:	HP	kW	
Possib. of RPM adjust:	☐ yes	☐ no	
Max speed :	RPM	(m/s)	
Operation:	☐ semi-automatic	☐ automatic	☐ manual
Cutting:	☐ dry	☐ wet	
Suction:	☐ yes	☐ no	
Diameter of clamping flange:	mm		

WORKPIECES TO BE CUT

Size	(m/m)		
Type of material/ Temperature			Temp. of workpiece (°C)
	☐ Construction steel (%)		
	☐ Low-binder steel (%)		
	☐ High-binder steel (%)		
	☐ Other (%)		

CUTTING WHEEL

Size	Diam.	Thickness	Bore
Proposed spec.			(m/sec)
Yearly requirement			
Notes about use			
Manufacturer and specifications of currently used disc			
Position of reinforcements			

PARAMETERS

Cutting time	sec	cm^2/sections cut	
Power used (read Ammeter)			
Efficiency	Surface cut Wheel surface wear		$\frac{cm^2}{cm^2}$ =
Amount of burr	☐ small	☐ medium	☐ large
Cutting surface	☐ white	☐ blue	☐ very blue

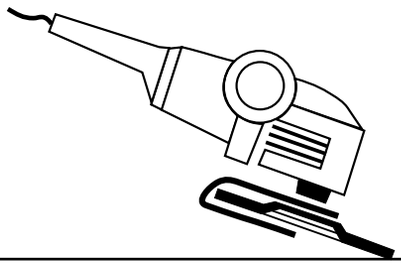
Confidentiality Guarantee and privacy protection L. 196/2003

Your personal data will be used by I.A.P. Globe srl, also with the help of electronic means, to send commercial information about new products.

Data will not be transmitted to third parties, if not for the necessary contractual fulfillment or for legal obligations. According to what is foreseen by art. 7 of the above mentioned Decree 196/03 you can exercise the right to check, update, modify, cancel and oppose to the treatment of your data. If you wish to cacel your data from our mailing list, please send us an e-mail to: ***info@globeabrasives.com***

GLOBE PRODUCT INDEX.

SHEET 01



Type 27

GRINDING WITH PORTABLE MACHINES: DEPRESSED CENTER WHEELS.

IRON AND STEEL

A 24-30-36 Q

For grinding iron and steel, good removal rate and medium durability. Wheel of medium hardness, especially suitable for not very heavy-duty jobs. Comfortable to use.

A 24-30-36 R

Excellent removal rate and long durability. Suitable for heavy-duty jobs such as jagged fins, sharp corners and welding of ferrous metals.

Z 24-30-36 S

Wheel containing alumina zirconia. Especially suitable for extremely heavy-duty jobs. High removal rate and long durability. Suitable for high-frequency grinders for specialized heavy structural works.

CAST IRON

A 24-30-36 QG

Medium-soft wheel for normal cast iron. Recommended for grinding dirty castings, where a high removal is needed to avoid that the wheel gets "clogged up".

Z 24-30-36 RG

Wheel containing alumina zirconia. Suitable for grinding hard cast iron, jagged fins and sharp corners.

The wide range of products offers different levels of hardness and different removal rates to give the operator the possibility of choosing the most suitable type for the work to be done. Globe wheels are manufactured in conformity with the strict unbalance limits to ensure minimum vibration during use. The quality of Globe wheels enhance their economic character, demonstrated by check tests and comparative laboratory tests.

STANDARD WHEELS FOR GRINDING IRON, STEEL AND CAST IRON

SHEET 01

IRON AND STEEL

Wheel type: A 24-30-36 Q	
SIZE (diam. - thick. -bore) mm	ART. CODE
100 X 6,0 X 16,0	G0111
115 X 6,5 X 22,23	G0112
125 X 6,5 X 22,23	G0113
150 X 7,0 X 22,23	G0114
180 X 7,0 X 22,23	G0115
180 X 8,5 X 22,23	5325155010100
230 X 7,0 X 22,23	G0117
230 X 8,0 X 22,23	G0118

IRON AND STEEL

Wheel type: A 24-30-36 R	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	G0122
125 X 6,5 X 22,23	G0123
150 X 7,0 X 22,23	G0124
180 X 7,0 X 22,23	G0125
180 X 8,5 X 22,23	5325155110100
230 X 7,0 X 22,23	G0127
230 X 8,0 X 22,23	G0128

IRON AND STEEL

Wheel type: Z 24-30-36 S	
SIZE (diam. - thick. -bore) mm	ART. CODE
180 X 8,0 X 22,23	G0136
230 X 8,0 X 22,23	5326054140100

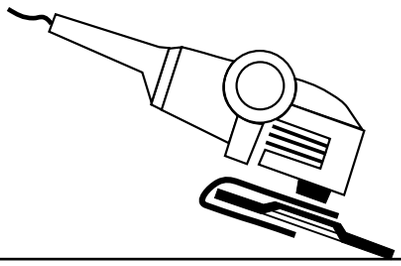
CAST IRON

Wheel type: A 24-30-36 QG	
SIZE (diam. - thick. -bore) mm	ART. CODE
180 X 7,0 X 22,23	G0211
230 X 7,0 X 22,23	G0213

CAST IRON

Wheel type: Z 24-30-36 RG	
SIZE (diam. - thick. -bore) mm	ART. CODE
125 X 6,5 X 22,23	5324248180100
180 X 8,0 X 22,23	G0222
230 X 8,0 X 22,23	G0224

SHEET 01



Type 27

DEPRESSED CENTER GRINDING WHEELS FOR PORTABLE GRINDERS.

STAINLESS STEEL

A 24-30-36 QX

Medium hardness and good removal rate. Ideal also for normal and hard stainless steel castings.

A 24-30-36 RX

Excellent removal rate and good resistance. Also suitable for food processing applications.

Z 24-30-36 SX

Wheel containing alumina zirconia, suitable for very heavy-duty jobs in heavy structural works. High removal rate and long durability. Suitable for high frequency grinders.

ALUMINIUM AND OTHER NON FERROUS MATERIALS

A 24-30-36 Qal

For grinding aluminium and other non ferrous materials (copper,brass…). The abrasive mixture used, especially lubricated, allows to obtain high removal rates without "clogging up".

STONE

C 24-30-36 QE

Applications in building industry for grinding stones, marbles, terracotta, concrete and other special building materials. High cutting capacity, medium durability.

All the wheels for stainless steel have contents of iron, sulphur and Chlorine lower than 0,1%, as shown on the label (certification available).
The wide range of Globe grinding wheels offers a high number of different specifications for the materials to be worked.
The choice of the right type is of basic importance to obtain maximum performance.

STANDARD WHEELS FOR GRINDING STAINLESS STEEL, NON FERROUS METALS AND SPECIAL MATERIAL

SHEET 01

STAINLESS STEEL

Wheel type: A 24-30-36 QX	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	G0311
125 X 6,5 X 22,23	G0312
150 X 7,0 X 22,23	G0313
180 X 7,0 X 22,23	G0314
230 X 7,0 X 22,23	G0315

STAINLESS STEEL

Wheel type: A 24-30-36 RX	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	G0321
125 X 6,5 X 22,23	G0322
180 X 7,0 X 22,23	G0324
230 X 7,0 X 22,23	G0325

STAINLESS STEEL

Wheel type: Z 24-30-36 SX	
SIZE (diam. - thick. -bore) mm	ART. CODE
180 X 8,0 X 22,23	G0334
230 X 8,0 X 22,23	5326051201100

STAINLESS STEEL

Wheel type: Z 24-30-36 QX-(HF)	
SIZE (diam. - thick. -bore) mm	ART. CODE
230 X 7,0 X 22,23	G0315 HF

HF = High Frequency

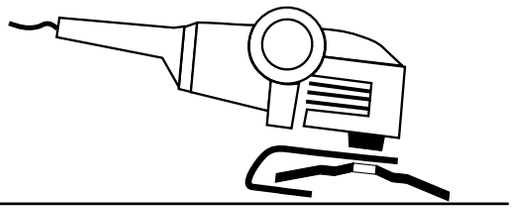
ALUMINIUM

Wheel type: A 24-30-36 Qal	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	G0411
125 X 6,5 X 22,23	G0412
150 X 7,0 X 22,23	G0413
180 X 7,0 X 22,23	G0414
230 X 7,0 X 22,23	G0415

STONE

Wheel type: C 24-30-36 QE	
SIZE (diam. - thick. -bore) mm	ART. CODE
100 X 6,0 X 16,0	G0511
115 X 6,5 X 22,23	G0512
125 X 6,5 X 22,23	G0513
150 X 7,0 X 22,23	G0514
180 X 7,0 X 22,23	G0515
230 X 7,0 X 22,23	G0516

SHEET 02



Type 28

SAUCER GRINDING WHEELS FOR PORTABLE GRINDERS.

IRON AND STEEL

A 24-30-36 Q

Grinding of iron and steel, for standard applications. Good removal rate, medium durability. Medium hardness wheel, suitable for not too heavy duty jobs. Comfortable in use.

A 24-30-36 R

Grinding of iron and steel. High removal rate and long durability. Ideal for heavy duty jobs such as grinding of weldings, jagged fins and sharp corners.

Z 24-30-36 S

Wheel containing alumina zirconia, suitable for extremely heavy duty jobs. High removal rate and long durability, for use with high frequency grinders in heavy structural work.

CAST IRON

Z 24-30-36 RG

Wheel containing alumina zirconia, high removal rate and long durability. Especially suitable for grinding hard cast iron, jagged fins and sharp corners.

Optimal solution for grinding flat surfaces.

Some operations, such as grinding of weld beads on level surfaces, often have to be carried out in horizontal position. With standard"Type 27" wheels, performance is not excellent as it is necessary to work with an angle of at least 15° with the work surface.
With "Type 28" saucer grinding wheels, it is possible to work also in horizontal position as they are manufactured with a natural angle of 15°, allowing flat grinding. These wheels also can be used for normal grinding operations.
The contact area of saucer grinding wheels is much larger than the one of a normal "Type 27" wheel, this results in a perfect planarity.

Advantages of saucer grinding wheels:

1. *possibility of working with the grinder in horizontal position and more comfortably for the operator,*
2. *perfect planarity of the surface grinded,*
3. *high performance.*

SAUCER GRINDING WHEELS FOR IRON AND STEEL WITH PORTABLE GRINDERS IN HORIZONTAL POSITION

SHEET 02

IRON AND STEEL STAINLESS STEEL

Always available:

Wheel type: A 24-30-36 Q (conical)	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	G0641
125 X 6,5 X 22,23	G0651
180 X 8,0 X 22,23	G0711
230 X 8,0 X 22,23	G0712

IRON AND STEEL

Available on request:

Wheel type: A 24-30-36 R (conical)	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	G0643
125 X 6,5 X 22,23	G0653
180 X 8,0 X 22,23	G0721
230 X 8,0 X 22,23	G0722

IRON AND STEEL

Available on request:

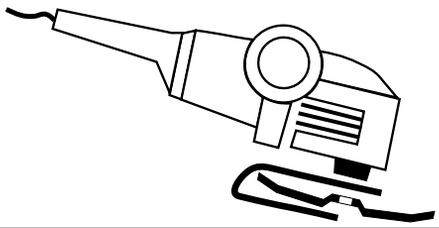
Wheel type: Z 24-30-36 S (conical)	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	-
125 X 6,5 X 22,23	-
180 X 8,0 X 22,23	-
230 X 8,0 X 22,23	-

CAST IRON

Available on request:

Wheel type: Z 24-30-36 RG (conical)	
SIZE (diam. - thick. -bore) mm	ART. CODE
115 X 6,5 X 22,23	-
125 X 6,5 X 22,23	-
180 X 8,0 X 22,23	-
230 X 8,0 X 22,23	-

SHEET 03



Type 29

DEPRESSED CENTER SEMI-FLEXIBLE GRINDING WHEELS FOR PORTABLE GRINDERS (TURBOTWISTER RANGE).

IRON, STEEL, STAINLESS STEEL

A 24 Q

Perfect for ferrous metal working and where a high removal rate is needed, without the wheel gets clogged up.

A 36 Q

For grinding steel and stainless steel. Excellent removal rate, medium degree of finishing and excellent durability.

A 60 Q

Good degree of finishing and medium removal rate.

A 100 Q

Excellent degree of finishing and moderate removal rate. Long durability, ideal for all types of steel.

ALUMINIUM AND OTHER NON FERROUS METALS

A 36 Alu

Grinding of aluminium and other soft non ferrous metals (copper, brass…). The abrasive mixture used, especially lubricated, allows high removal rates throughout the whole life of the wheel without it gets clogged up.

The grooved surface grants greater power and colder cutting on all metals.

Turbotwister is the semi-flexible wheel, patented, characterized by a working surface with grooves forming a diamond pattern that increase removal rate and cause a cooling effect thanks to the air being forced through the helicoidal grooves. The specification for metal , without iron, sulphur and chlorine compounds, is also suitable for stainless steel. The large contact surface guarantees an excellent planarity of the surface treated.

FOR FLAT GRINDING OF IRON, STEEL AND NON FERROUS METALS

SHEET 03

IRON, STEEL, STAINLESS STEEL

Wheel type: A 24 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
115 X 22,23	G0811
125 X 22,23	G0812
150 X 22,23	G0813
180 X 22,23	G0814

IRON, STEEL, STAINLESS STEEL

Wheel type: A 36 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
75 X 9,52	G0825
115 X 22,23	G0821
125 X 22,23	G0822
150 X 22,23	G0823
180 X 22,23	G0824

IRON, STEEL, STAINLESS STEEL

Wheel type: A 60 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
75 X 9,52	G0835
115 X 22,23	G0831
125 X 22,23	G0832
150 X 22,23	G0833
180 X 22,23	G0834

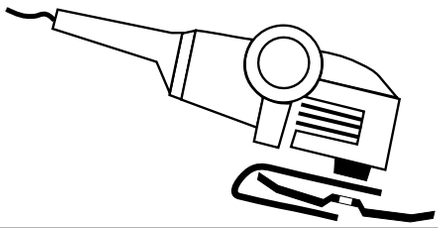
IRON, STEEL, STAINLESS STEEL

Wheel type: A 100 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
115 X 22,23	G0841
125 X 22,23	G0842
150 X 22,23	G0843
180 X 22,23	G0844

ALUMINIUM AND OTHER NON FERROUS METALS

Wheel type: A 36 Alu	
SIZE (diam. - bore) mm	ART. CODE
115 X 22,23	G0871
125 X 22,23	G0872

SHEET 03



Type 29

DEPRESSED CENTER SEMI-FLEXIBLE GRINDING WHEELS FOR PORTABLE GRINDERS. TURBOTWISTER RANGE).

STONE

C 24 Q

Especially suitable for working clogging material (such as fiberglass). High removal rate and medium durability.

C 36 Q

Especially suitable for the building industry to grind stone, marble, terracotta, concrete, etc. High cutting rate and good durability.

C 60 Q

Especially suitable for stone, marble, granite.
Good finishing, good removal rate, long durability.

C 100 Q

Suitable for stone, marble and granite. Excellent finishing, medium removal rate and long durability.

Blister pack of back spacer flange.

The mounting flange disappears completely into the wheel's cavity.

The cavity depth allows full housing of the mounting flange and the use of special back spacer flanges, so that nothing sticks out from the wheel's lower surface, making flat blending possible for a precise and ergonomically comfortable grinding.
The flexibility allows a perfect adhesion of the wheel to curved surfaces.

Back spacer flange.

FOR FLAT AND CURVED SURFACES GRINDING OF SPECIAL MATERIALS' WITH PORTABLE GRINDERS

SHEET 03

STONE

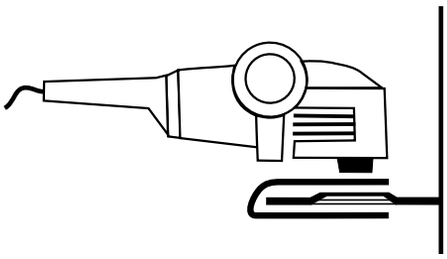
Wheel type: C 24 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
115 X 22,23	G0911
125 X 22,23	G0912
150 X 22,23	G0913
180 X 22,23	G0914

Wheel type: C 36 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
115 X 22,23	G0921
125 X 22,23	G0922
150 X 22,23	G0923
180 X 22,23	G0924

Wheel type: C 60 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
115 X 22,23	G0931
125 X 22,23	G0932
150 X 22,23	G0933
180 X 22,23	G0934

Wheel type: C 100 Q - HP	
SIZE (diam. - bore) mm	ART. CODE
115 X 22,23	G0941
125 X 22,23	G0942
150 X 22,23	G0943
180 X 22,23	G0944

SHEET 04



Type 42

DEPRESSED CENTER STANDARD CUTTING WHEELS FOR PORTABLE GRINDERS.

IRON AND STEEL

A 30-36 Q

For traditional use, it is suitable for cutting iron and steel. Good cutting capacity, medium durability.

A 30-36 R

Suitable for cutting iron and steel, combines a good cutting capacity with a long durability.

A 30-36 T

Wheel manufactured with special resins and abrasives to obtain excellent cutting capacity, very long durability and perfect resistance to the most heavy stresses.

STAINLESS STEEL

A 30-36 QX

For cutting standard stainless steel. Good cutting capacity and medium durability.
Especially suitable for light structural work.

Z 30-36 SX

Wheel containing alumina zirconia, especially conceived for alloy steel and stainless steel, as it contains no sulphur, chlorine or iron compounds (certification available). Excellent fast and cold cutting capacities. Long durability. Suitable for heavy structural work.

Globe offers a wide range of depressed center cutting wheels for portable machines.
The different thicknesses give the wheels different cutting speeds to be chosen according to the type of work to be carried out.
The range includes very thin wheels for fast cutting as well as wheels for both cutting and grinding, useful for example in cleaning weldings made in caulking.