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Technical Information

Technical Brush information

TECHNICAL INFORMATION



The selection of the right type of brush depends on the type of finishing required (fine or coarse) and the characteristics of the surface to be brushed (stainless steel, carbon steel, aluminum, etc.)

Also, if the brush is fixed in a machine, it is necessary to know the main features of the machine in order to choose the correct brush type:

- The maximum diameter allowed.
- The machine's max RPM.
- The arbor hole diameter or the thread type required.

Crimped vs. Knotted Wire



Crimped wire brushes, because of their flexibility, are better suited to work on uneven surfaces and they offer a more regular and fine finishing.

Twist knot wire brushes, offer longer life and a higher removal capacity but offer a rougher finish.

Wire Diameter

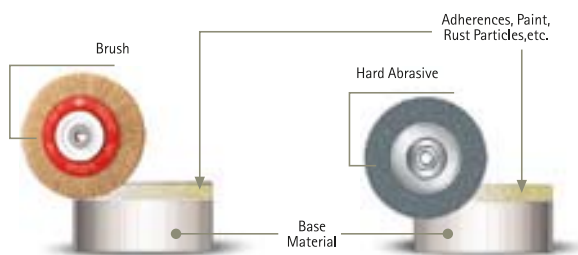
The wire gauge of a brush determines the type of surface finishing:

- A thicker wire provides a more aggressive brushing action.
- A finer wire provides a less aggressive brushing action with a finer finish.

Trim Length

- A shorter trim length makes the brush face rigid and consequently the brush removal capacity is higher.
- With a longer trim length the brush becomes more flexible, providing a uniform brushing even on irregular surfaces.

Wire Brushes vs. Hard Abrasives



Wire brushes act as an impact tool removing oxide, paint or other adherence from the surface without damaging the base material, as opposed to hard abrasives which will remove the base material along with the surface adherence.

Wire brushes are much more flexible, which allow the end user to clean areas difficult to reach and adapt to irregular surfaces, which bonded and coated abrasives cannot.

MACHINE Normal Speed	MOST COMMON BRUSHES	MODEL	BRUSH DIAMETER
Bench Grinders	Crimped & Knotted Wheels	CT, CU, CAM, CCA, DNA, CTP	75 mm (3") TO 350 mm (14")
Angle Grinders (5,000 – 8,500 RPM)	Crimped & Knotted Wheels	CT, CAM, CPL, CCA, CTP	100 mm (4") TO 175 mm (7")
	Crimped & Knotted Cups	TO, TT, TCA, TOG, TTG, TCAG, TNA, TOP, TTP	80 mm (3.1/4") TO 150 mm (6")
	Flap Discs	DLZ, DLO	
Mini Angle Grinders (10,000 – 12,500 RPM)	High Speed Cups, Discs & Wheels	HSC, HST, HSD, HSK, HSP, HSR, HCA, HSCG, HSTG, HCAG, HSKG, HSDG, HSCP, HSTP, HSRP	65 mm (2.9/16") TO 115 mm (4.1/2")
	Flap Discs	DLZ, DLO	
Drill & Pneumatic Tools (15,000 – 20,000 RPM)	Wheels & End Brushes with Shank	CDE, CAE, B	12 mm (1/2") TO 75 mm (3")
	Flap Wheels	AL	
Drills (4,500 RPM)	Wheels, Cups & End Brushes with Shank	BDER, BTE, BBC, BDOR, CNA	26 mm (1") TO 100 mm (4")
	Flap Wheels	AL	

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Brush Usage Recommendations

The brushing operation must be performed with the wire ends. Excessive pressure causes over-bending to the wires, which increases their flexing fatigue causing premature breaking and reduces significantly the brushes working life.

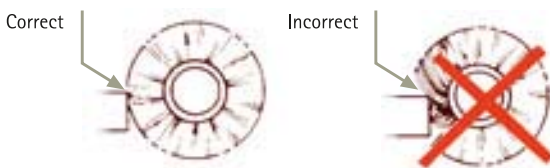
If you need higher removal capacity, rather than putting more pressure on the brush, we suggest the following:

- Use a more aggressive brush: A Brush with a thicker wire with less trim length or a twist knot wire instead of a crimped wire brush.
- Increase the brushing speed with a brush that can satisfy the required MAX R.P.M.
- Select a brush with a larger diameter.

IMPORTANT: Never exceed the recommended "MSFS" (Maximum Safe Free Speed) or the MAX R.P.M. rating of the brush.



FAILURE TO OBSERVE SAFETY PRECAUTIONS MAY RESULT IN INJURY



Safety Warnings

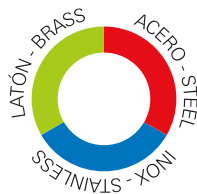
The European Standard EN 1083-2 regarding Safety Requirements for the use of Power-Driven brushes states the safety instructions that all brush operators must observe.

These requirements and common safety practices will reduce the likelihood of physical injury and brush failure:

- Wear safety goggles, protective clothing and equipment.
- Observe all speed restrictions indicated on the brushes, containers and/or packaging, labels, or printed in pertinent literature.
- Do not exceed "M.S.F.S" Maximum Safe Free Speed (MAX R.P.M.) under any circumstances.
- Keep all machine guards in place.
- Do not use deteriorated brushes.
- Oxidation or any other chemical alteration in the wire may cause malfunctioning.
- Store brushes in original packaging, in a clean and dry location protected from dust, humidity and other environmental effects.

JAZ's Color Coding System

JAZ's Color Coding System (JCCS) allows many of our brushes to be easily identified. The symbol (right) will be shown throughout the catalog. Red are carbon steel, blue are stainless steel and green are made with solid brass wire. This color coding system helps reduce the chances of cross contamination, which is a common error in the industry.



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RPM

The power tool speed influences the performance of the brush and the safety of the operator. If load speed marked on the power tool is higher than the brush MAXIMUM RPM, do not mount the brush. Maximum RPM are indicated on brush side plates and shall never be exceeded. MAXIMUM RPM are the maximum RPM at which the brush could be run with no work applied (spinning free). It is merely a safety indication for the user, not the recommended operating speed.

Peripheral Speed (m/s)

REMOVAL	STEEL	STAINLESS STEEL AND BRASS	NYLON
Burr	25-35m/s	20-25m/s	15-20m/s
Weld pass	40-45m/s	35-35m/s	
Oxides, varnishes, corrosion	30-35m/s	20-25m/s	15-20m/s
Paints and scales	40-45m/s	35-35m/s	

Converting m/sec in ft/min: 1 m/sec = 197 ft/min
1ft/min=5,08 m/sec

n	Brush Ø d1 [mm]															
[r.p.m.]	25	30	40	50	60	75	80	100	115	125	150	175	200	250	300	
1.000	1	2	2	3	3	4	4	5	6	7	8	9	10	13	16	
1.250	2	2	3	3	4	5	5	7	8	8	10	11	13	16	20	
1.500	2	2	3	4	5	6	6	8	9	10	12	14	16	20	24	
1.750	2	3	4	5	5	7	7	9	11	11	14	16	18	23	27	
2.000	3	3	4	5	6	8	8	10	12	13	16	18	21	26	31	
2.500	3	4	5	7	8	10	10	13	15	16	20	23	26	33	39	
3.000	4	5	6	8	9	12	13	16	18	20	24	27	31	39	47	
3.500	5	5	7	9	11	14	15	18	21	23	27	32	37	46	55	
4.000	5	6	8	10	13	16	17	21	24	26	31	37	42	52	63	
4.500	6	7	9	12	14	18	19	24	27	29	35	41	47	59	71	
5.000	7	8	10	13	16	20	21	26	30	33	39	46	52	65	79	
5.500	7	9	12	14	17	22	23	29	33	36	43	50	58	72		
6.000	8	9	13	16	19	24	25	31	36	39	47	55	63	79		
6.500	9	10	14	17	20	26	27	34	39	43	51	60	68			
7.000	9	11	15	18	22	27	29	37	42	46	55	64	73			
7.500	10	12	16	20	24	29	31	39	45	49	59	69	79			
8.000	10	13	17	21	25	31	34	42	48	52	63	73				
10.000	13	16	21	26	31	39	42	52	60	65	79					
12.000	16	19	25	31	38	47	50	63	72	79						
14.000	18	22	29	37	44	55	59	73								
16.000	21	25	34	42	50	63	67									
20.000	26	31	42	52	63	79										
22.000	29	35	46	58	69											
25.000	33	39	52	65	79											

Example
Brush diameter d₁=150mm
R.P.M.: 3,000 r.p.m
Cutting Speed: 24m/s
R.P.M: 5,000 r.p.m.
Cutting speed (v) = $\frac{d_1 \times \pi \times n}{1.000 \times 60}$

MATERIAL	Ø mm	Ø "	WIRE CODE	
Temp. Steel	0,12	.005	A	
	0,15	.006	B	
	0,20	.008	C	
	0,25	.010	D	
	0,30	.012	E	
	Brass Coated Steel	0,35	.014	F
		0,40	.016	G
		0,50	.020	H
		12 x 0,23	12 x .009	#
6 x 0,353 + 3 x 0,20		6 x .014 + 3 x .008	@	
Stainless Steel	0,15	.006	M	
	0,20	.008	N	
	0,30	.012	Z	
	0,40	.016	P	
	0,50	.020	Q	
	7 x 0,35	7 x .013	@Z	
Brass	0,08	.003	U	
	0,30	.012	V	
	0,40	.016	X	
Grey Steel	0,37	.015	J	
	0,50	.020	K	
	0,80	.032	L	
German Silver	0,08	.003	O	
Flat Steel	0,90 x 0,50	.035 x .020	T	
Galvanised Steel	0,43	.017	S	
Laminated Wire	3 x 0,20 + 6 x 0,35	3 x .008 + 6 x .014	W	
	0,50	.020	Y	



CONVERSION TABLE mm / Inches					
Ø Brush	mm		Ø Wire		I.S.W.G
	mm	Inches	mm	Inches	
25	1"		0,08	0,003"	44
50,8	2"		0,1	0,004"	42
76,2	3"		0,12	0,005"	40
101,6	4"		0,15	0,006"	38
127	5"		0,2	0,008"	36
152,4	6"		0,25	0,01"	33
177,8	7"		0,3	0,0118"	31
203,2	8"		0,35	0,0138"	29
228,6	9"		0,4	0,016"	27
254	10"		0,5	0,02"	25
279,4	11"		0,8	0,0315"	21

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Brass Coated Steel

High Performance and flexible

Anti-corrosion material.

Suitable for a large range of finishing.

Traction resistance 230-250 Kgs/mm².

Carbon content 0,75%.

Available thickness (in): .006" - .008" - .010" - .012" - .014" - .016" - .020"

We have the following cable crimped wire range:
6 x .009" - 12 x .009"
(3 x .008") + (6 x .014")



Brass

Anti-sparkling wires.

Suitable for soft finishing in non-ferrous materials.

Traction resistance 80-95 Kgs/mm².

Available thickness (in): .003" - .012" - .016"



Cable Crimped Wire. High Performance

High Performance and flexible.

50% longer life than standard crimped-wire.

Similar finish as .012" wire.

Traction resistance 230-250 Kgs/mm².

Carbon content 0,75%.

Available thickness (in): .006" - .008" - .010" - .012" - .014" - .016" - .020"

We have the following cable crimped wire range:
6 x .009" - 12 x .009"
(3 x .008") + (6 x .014")



Laminated Wire Brush

The laminated wire is a novelty in the metal brushware industry and it provides an element of comfort and security to the handling of wire brushes. The coating of the wires prevents from being wounded too.

It provides a high performance as a result of the reduced level of breakings of the laminated wires compared to an equivalent wireuncoated.



Tempered Steel

Suitable for twist-knotted brushes and a high removal capacity.

Non suitable for stainless steel surfaces.

Traction resistance 180-200 Kgs/mm².

Carbon content 0,50-0,60%.

Available thickness (in): .005" - .008" - .012" - .015" - .020" - .032"

We have .004" mm Bessemer wire.

Material Information

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Stainless Steel

These wires are used for the brushing of stainless steel, aluminium or non ferrous metal surfaces.

Stainless steel turned into wire becomes slightly magnetic.

Traction resistance 200-220 Kgs/mm² following AISI 302 regulations.

Available thickness (in): .006" - .008" - .012" - .016" - .020"

We have stainless steel wire following AISI 316 regulations and stainless steel cable 7 x .014".



German Silver

Suitable for soft polishing in silver color surfaces.

Copper content 60-65%, Zinc 22-25% and Nickel 11-13%. Available thickness: .003".



Abrasive Nylon

Abrasive nylon trims regenerate constantly and offer a uniform finishing during its lifetime.

We have 2 sorts of filaments:

Nylon 6-12 with silicon carbide grains for industrial applications and with 120,180 and 320 grains.

Nylon 6 with aluminium oxide for DIY and with 80 and 150 grains.

Application Information

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Please, consider the following criteria when selecting a brush:

To choose the kind of brush:

- The work to be done.
- Application surface.
- RPM parameters of the machine.

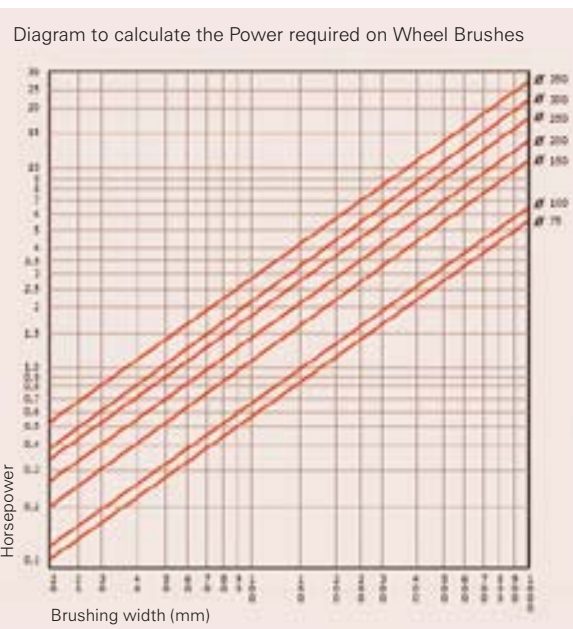
To decide on the type of material, wire or nylon abrasive:

- The material of the application surface.
- Desired Finishing.
- RPM parameters for machine.

Work efficiency increases as a brush diameter increases.

To calculate the biggest possible diameter, it is necessary to consider the maximum RPM of the power tool or machine being used (i.e. for an electric tool with maximum RPM of 6,000, the brush should not exceed 7" diameter). A shorter trim length provides a more aggressive brushing action, whereas flexibility to adapt to irregular or uneven surfaces increases as trim length increases.

In contrast to abrasives and cutting tools, wire brushes do not remove the base material of a treated surface. Herein, brushes serve as an essential tool for a wide range of industrial processes.



Application Information

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Troubleshooting Guide

Several factors can influence a brush application. If the selected brush does not achieve the expected result, the following table may provide solutions for the most common problems faced by the user.

For further information, please contact our Technical Department by calling 1-877-529-8721.

PROBLEM	SUGGESTED SOLUTIONS
Brush is too aggressive	Increase trim length. Decrease wire diameter. Work at lower speed.
Finish too coarse	Increase trim length. Decrease wire diameter. Choose a nylon abrasive brush.
Action of brush is not uniform	Decrease brushing pressure. Decrease wire diameter. Work at lower speed.
Life of the brush is too short	Decrease wire diameter. Increase brush diameter. Decrease brushing pressure.

Multithreads and Adapters

The exclusive and patented JAZ threaded nut provides for a number of advantages:

- Easier tighten and loosen on and off angle grinders.
- Greater strength and higher resistance to torque and "brush back off."
- The multi-thread nut allows the use of one brush on machines with different spindle thread sizes:
 - R88 threaded nut: fits both 5/8"-11" and M14-2 machines.
 - R77 threaded nut: fits both M10x1.25 and M10 x 1.50.

The main advantage of the multi-thread nut is to aid the distributor in better managing their inventory by reducing the number of SKU's. At the same time their inventory is reduced by half yet can still satisfy the end user's accessory needs by having a brush that can accept two spindle sizes.



W-5/8"



M14

Multi-thread adapters: JAZ is offering a variety of thread adapter options for 5/8"-11 nuts:

- Catalog #99001 - Multi M10 adapter converts a 5/8"-11 thread to both M10 x 1.25 and M10 x 1.50
- Catalog #99009 - 3/8"-24 adapter converts a 5/8"-11 thread to fit a 3/8"-24 thread

NOTE: When using catalog #99001 (Multi M10 adapter) in conjunction with our multithread nut, this brush can fit 4 threads: 5/8"-11, M14 x 2.0, M10 x 1.25 and M10 x 1.50. Making it a four-in-one brush!



Technical Brushing

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From our Technical Department we offer brushing solutions for different industrial processes and needs posed by the different sectors which demand customized products and rely on our experience gained over our history of more than 90 years dedicated to the brushware industry.

Manufacturing of technical brushes requires direct collaboration between manufacturer and user. In JAZ ZUBIAURRE S.A. we have specialized personnel and appropriate technical resources, for answering your queries and provide the best solution to your request. We offer a complete service that covers the definition of form and materials, making necessary tooling (shafts or rotors), end user training and even automatization the process of brushing. Knowledge of the different wires and materials is very important in defining the ideal brush for each requirement. JAZ offers high resistance steel wire between 0.08 and 0.80 mm., Stainless steel wires, brass, nickel silver, nylon abrasives,. We also offer high performance steel and stainless steel. JAZ can also supply brushes with different arbor holes: plain hole or with keyway .

Markets

The markets we serve are very diverse. Among them are the following:

- Construction
- Tube deburring
- Rubber - Metal Injection
- Packaging
- Cleaning of continuous saws
- Treatment in stone
- Wood Texturing
- Food industry
- Turning
- Rod cleaning
- Retreading
- Mold cleaning
- Automotive parts deburring



CT-1507E

MADE IN
SPAIN

PROTEJA SUS OJOS
WEAR EYE PROTECTION

6500
MAX. RPM

ACERO
STEEL

