



125^{YEARS}

NORTON



**NORTON
RUBBER GRINDING
TECHNOLOGY**

ABRASIVE TECHNOLOGICAL EXCELLENCE SINCE 1885

PRODUCT SELECTOR

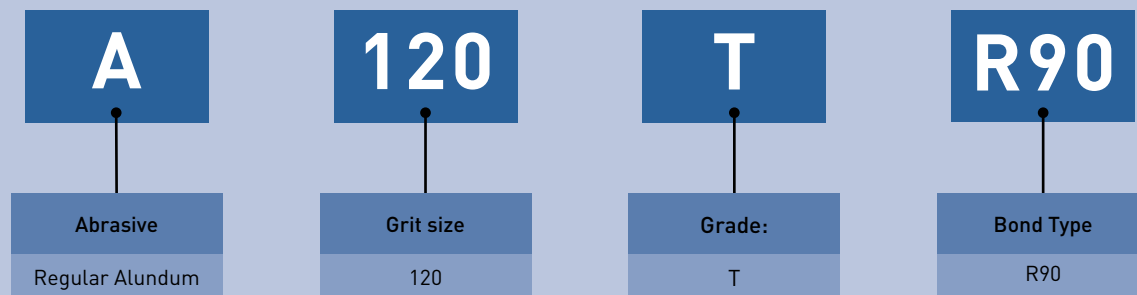
AVAILABILITY

Wheel sizes:	Diameter - 50 - 510mm
	Thickness - 12 - 610mm
Wheel type (FEPA):	01, 05, 07
Wheel shape:	Not normally shaped periphery except for some plunge grinding operations.
Specials:	Core mounted wheels
Grain type:	Regular Aluminum Oxide. Other abrasives are available if required but are not normally necessary.
Grit:	80 - 220#
Grade:	R, S, T, U
Bond:	R90
End Use Code:	'08



MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

Grade is a simple progression of hardness scales, structure is automatically chosen from the grade and so is not shown.

1ST CHOICE SPECIFICATION SELECTION

In order to meet the modern technical requirements of many operations it is necessary to have many options available.

Technically better feed wheels are essential for high performance centreless grinding. As the thrufeed speed increases it is necessary to have a wheel which is harder to maintain the correct presentation of the part to the grinding wheel.

High thrufeed rates: When increasing the feed rate the pressure of the part on the wheel is raised. In order to maintain good part roundness and sizing by allowing the part to maintain 'spark out' characteristics it is important to have a wheel which deforms less under pressure. It must also retain the ability to provide grip and turn the component.

Small diameter parts: As parts reduce in diameter the contact length increases and this again reduces the ability of the process to give good roundness and sizing. Harder wheels reduce the contact length and improve the presentation of the part to the wheel.

Irregular shaped components (e.g. bi-metal welded shock absorber rods): Any thrufeed action (normally first process roughing operation) with a part with a weld mark or similar can have a marked effect on standard feed wheels and they will require regular dressing and replacement. Harder wheels are much less prone to excessive wear and offer significant life improvements and reduced down time.

High quality surface finishes: When extremely fine surface finishes are required even the relatively low contact from a standard feed wheel can leave marks (even more prevalent with Rz or Rt measurements). Finer grit sizes in the feed wheel can reduce this and often allow for faster throughfeed rates.

Multi specification wheel sets: These are often used to reduce the number of passes and usually incorporate 3 or more specifications from fairly rough premium abrasives to fine finishing specifications. It is vital that a hard feed wheel is used to maximise the potential improvements required.

Many operations now have combinations of 2 or more of these features and for these selection is more critical than ever.

Improved life: Frequently harder feed wheels are used as a way of improving life and reducing down time. Due to the nature of the wheels it is possible to reduce the frequency and depth of dressing as wheel shape is maintained much longer.

SUGGESTED FIRST CHOICE SPECIFICATIONS

Standard operation:	A 80 R R90
Improved life or sizing:	A 80 S R90
Fast throughfeed rates:	A 100 T R90
Irregular shapes:	A 120 U R90

NB. If the process has combinations of these needs you may require a grade harder to get optimised performance. Making the grit size finer can also stiffen the wheel so theoretically the hardest wheel available is A 220 UR90

MAXIMUM OPERATING SPEED

Standard operating speed is marked at 20m/s.
Higher speeds are available if required but need to be requested.

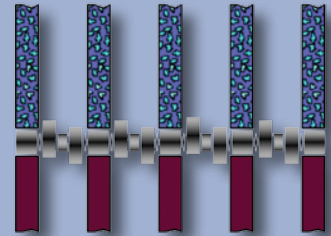
All special requests will be considered and made available if at all possible.
Contact ASEproducts@saint-gobain.com for confirmation.



PRODUCT SELECTOR

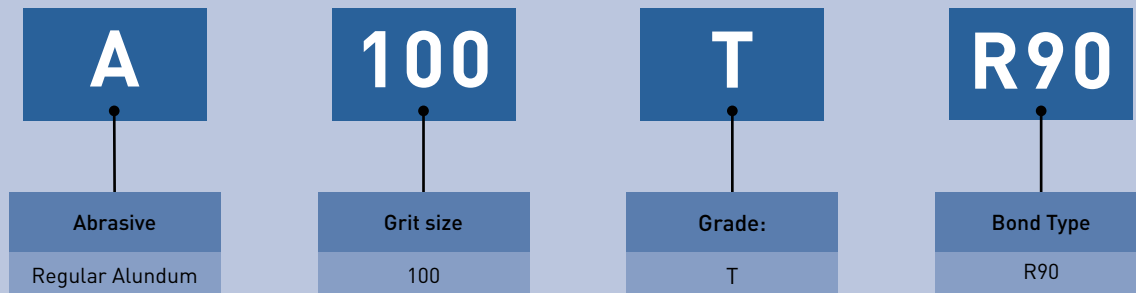
AVAILABILITY

Wheel sizes:	Diameter - 250 - 410mm (wider range available if needed)
	Thickness - 10 - 120mm (wider range available if needed)
Wheel type (FEPA):	01, 05, 07
Wheel shape:	Not normally shaped periphery but available if required.
Grain type:	Regular Aluminum Oxide. Other abrasives are available if required but are not normally necessary.
Grit:	80 - 220#. Others can be considered on request
Grade:	T, U
Bond:	R90
End Use Code:	'08



MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

Though the full range of Grades are available it is not recommended to use the R or S grades. 'T' & 'U' should always be first choice, structure is automatically chosen from the grade.

1ST CHOICE SPECIFICATION SELECTION

Normally used for multi wheel centreless for cam journal roughing, requires very hard wheels, often relatively fine to resist wear and offer best life.

SUGGESTED FIRST CHOICE SPECIFICATIONS

Standard operation: (Including finishing ops)	A 100 T R90
**For location bearing wheels: (roughing op)	A 120 U R90

*** When roughing chilled cast iron camshafts (~ 5mm stock) there are normally 2 bearing locations which are slightly bigger than the others to allow good location in the machine.*

The wheels on these two bearings wear more and so normally dictate dress depth and frequency as they have significantly more work to do and have to absorb the initial 'shock' of contact in this very high powered operation. For this reason it can often be helpful to identify the wheels involved and to use harder wheel specifications.

MAXIMUM OPERATING SPEED

Standard operating speed is marked at 20m/s.
Higher speeds are available if required but need to be requested.

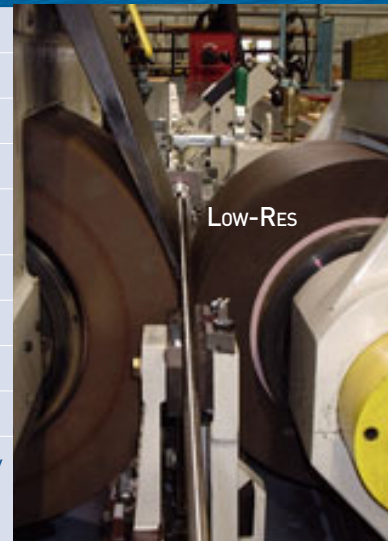
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PRODUCT SELECTOR

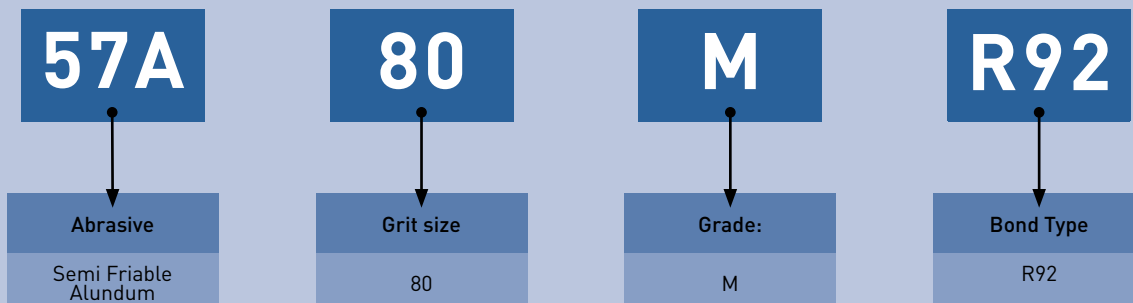
AVAILABILITY

Wheel sizes:	Diameter - 400 - 660mm (smaller diameter available if needed)
	Thickness - 100 - 610mm (thinner wheels available if needed)
	For set part creation, please contact Customer Service.
Wheel type (FEPA):	01, 05, 07
Wheel shape:	Not normally shaped periphery except for some plunge grinding operations.
Grain type:	A, 57A, 38A, 1SG, 3SG (others may be available if required)
Grit:	46 - 220#.
Grade:	L, M, R, S.
Bond:	R92
End Use Code:	09 A large majority of these wheels are used in the bearing industry for grinding needle and taper rollers. Also used for grinding / polishing diameters.



MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

Varies by application and operation:

For customers whose process has been adapted to use the Carbo wheels we use the more free cutting, L & M grade, the structure for these is more open than standard wheels.

Some customers prefer to use the harder, denser wheels - R & S grade.

Multiple specifications within a wheel is available upon request.

For irregular forging stocks or when trying to remove a grinding pass from the process -(normally larger diameter rollers) it can be cost effective to use SG at 10% or 30%.

1ST CHOICE SPECIFICATION SELECTION

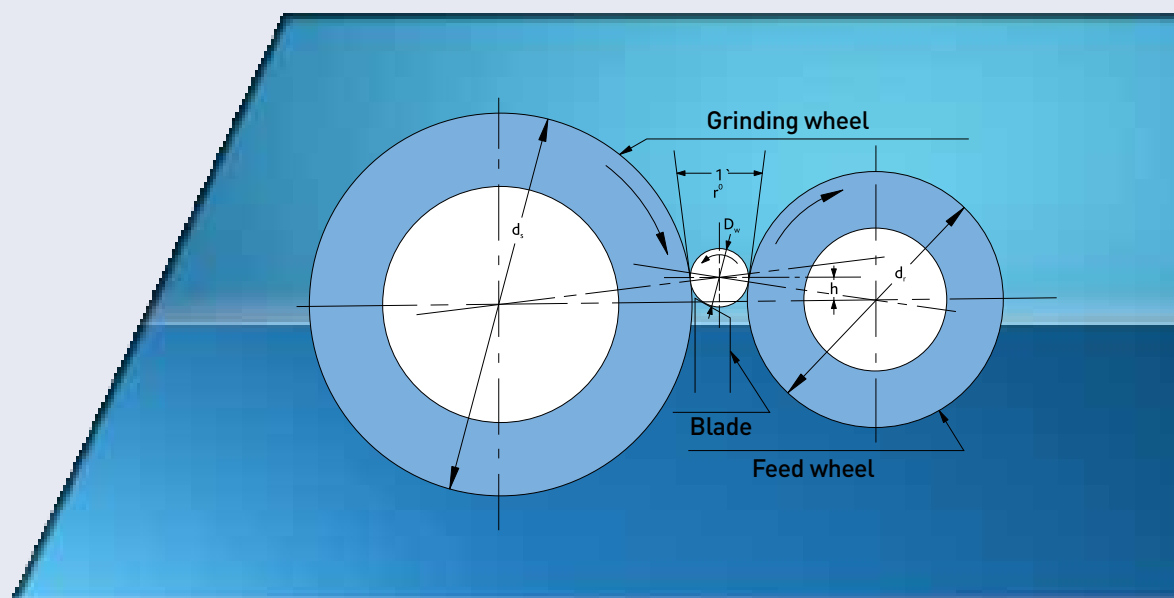
SUGGESTED FIRST CHOICE SPECIFICATIONS

Free Cutting specification:	57A 80 M R92
Harder, Denser specification:	57A 80 S R92
High stock removal/less passes:	3SG 80 S R92
Polishing operations only	A 150 S R92

MAXIMUM OPERATING SPEED

Standard operating speed is marked at 50m/s.
Higher speeds are available if required but need to be requested.

All special requests will be considered and made available if at all possible.
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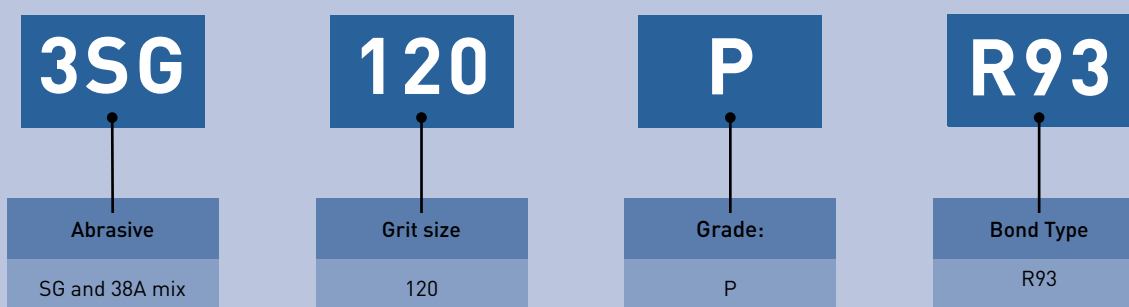
PRODUCT SELECTOR

AVAILABILITY

Wheel sizes:	From 150 to 500mm diameter 1.5 to 50mm thickness
Wheel type (FEPA):	01, 05, 07
Wheel shape:	Standard and non Standard profiles - Full range of Faces available.
Grain type:	19A, 23A, 57A, 38A and 3SG
Grit:	60, 80, 100, 120, 150, 180, and 240#
Grade:	M to S
Bond:	R93
End Use Code:	37

MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

The table below shows the range of grades and structures available depending on the thickness of the wheel.

THICKNESS RANGE (mm)	GRADE						
	M	N	O	P	Q	R	S
< 1.7							
1.70 - 3.19							
3.20 - 8.09							
8.10 - 16.09							
16.10 - 40.09							
40.10 - 55.00							

1ST CHOICE SPECIFICATION SELECTION

Drill Fluting	Wheel thickness 1.5 to 2.5mm - 3SG or 19A 120 R R93
Tap Fluting	All sizes 3SG or 38A 100 Q R93
Drill clearance grind	Wheel thickness Up to 12mm - 3SG, 23A or 57A 100 P R93
	Wheel thickness 12 - 16mm - 3SG or 19A 100 O R93
	Wheel thickness 20 - 25mm - 3SG or 19A 80 N R93
Drill pointing	Wheel thickness >25mm - 3SG or 19A 80 M R93
	All sizes 19A 80 S R93

MAXIMUM OPERATING SPEED



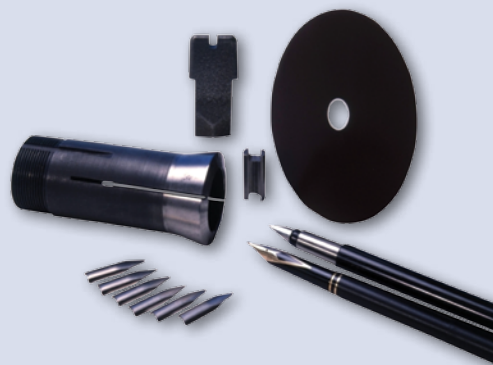
The M Grade is available only for 63m/s MOS
The N, O, P, Q, R and S grade are all available for 80m/s MOS

All special requests will be considered and made available if at all possible.
Contact ASEproducts@saint-gobain.com for confirmation.



PRODUCT SELECTOR

Rubber Bond wheels are manufactured to extremely close thickness and flatness tolerances. This gives the ultimate precision cut-off or slotting performance. These wheels are ideally suited for applications where fast and accurate cutting is required for consistently clean, burr free surface without altering the characteristics of the material by cutting with the minimum heat build. These are particularly suited to sample cutting and preparation of medical materials such as hypodermic needles.

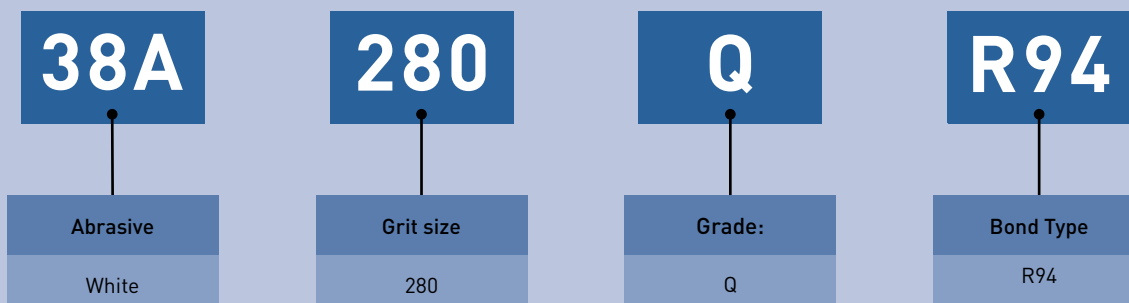


AVAILABILITY

Wheel sizes:	Diameter - 25 to 610 mm
	Thickness - .08 to 5mm see chart for diameter constraints
Wheel type (FEPA)	01, 41
Wheel shape	'01, 41: A few specialised products have a shaped periphery.
Grain type:	A, 57A, 38A, 1SG, 3SG, 37C, 39C (Non Ferrous)
Grit:	24 - 600#.
Grade:	R94 P - T
	R95 P - S
Bond:	R94 - General purpose bond for most applications
	R95 - Specialist bond for Non-Magnetic stainless tubes, tungsten and similar materials
End Use Code:	12

MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

THIN AND ULTRA THIN WHEELS

THICKNESS	GRIT	DIAMETER AVAILABILITY (MM)															
		25	63	80	90	100	115	125	150	180	200	230	305	356	406	457	510
0,08	400#																
0,12	320#																
0,2	240#																
0,3	180#																
0,4	150#																
0,5	120#																
0,6	100#																
0,75	80#																
1	60#																
2	46#																
3 TO 5	24#																

R95 ONLY																	
0,3	180#																
0,4	150#																
0,5	120#																
0,6	100#																
0,75	80#																
1	60#																
2	46#																

OPERATION AND 1ST CHOICE SPECIFICATION SELECTION

Rubber wheels are used for specialised areas where a high quality cut and minimal or no burr is allowed

- * Coarse grains (24 - 60#) are usually used for general purpose work normally 300-600mm diameter
- * Often used for tube cutting, from hypodermic to large diameter industrial stainless tubes.

Remember that finer grains reduce burring.
 NB It is recommended that coolant or good extraction is used when rubber cutting off takes place.



SUGGESTED FIRST CHOICE SPECIFICATIONS

Fountain Pen Nib Slitting	A320 S R94
General Purpose	A 80 R R94
Hypodermic Needle Tubes	38 A 380 S R94
Large Diameter Tubes	A 46 Q R94
Silicon Wafers	37C 120 Q R94



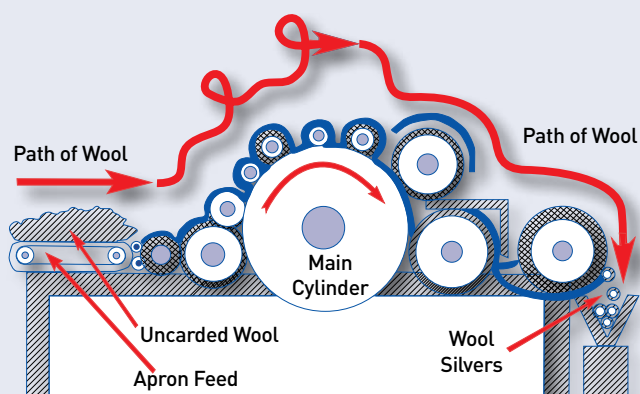
MAXIMUM OPERATING SPEED

Standard operating speed is marked at 60 m/s, 63m/s or 80m/s.
 Please ensure you specify speed required.

All special requests will be considered and made available if at all possible.
 Contact ASEproducts@saint-gobain.com for confirmation.



Wool Carding Machine



Wool and cotton carding machine prepare the raw material for texturing and aligning the fibres.

Central drum contains wires which have to be sharpened to correct shape



SIDE



FRONT



PRODUCT SELECTOR

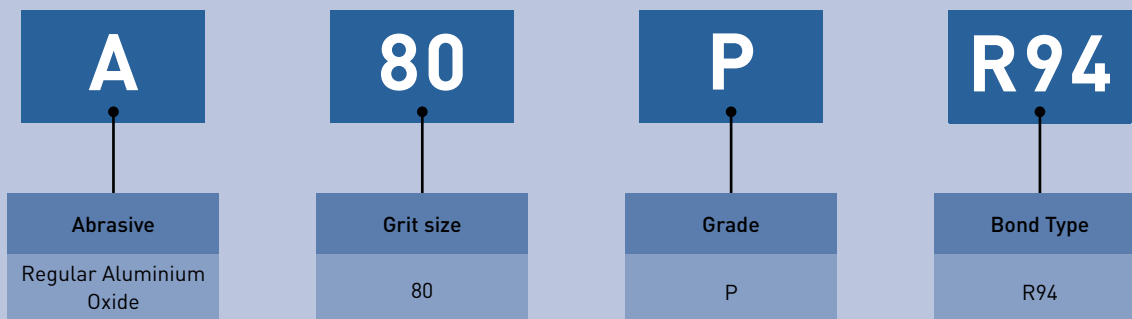
AVAILABILITY

Those wheels are a selected choice of wheel for slitting and they belong to the same family

Dimensions:	Diameters from 150 mm to 250 mm
	Thickness from 0.8 mm to 2 mm
Shape:	Type 41 and also with profile if requested
Grain type:	A (37C is also available but seldom requested)
Grit:	60 # - 600 #.
Grade:	F to R (O, P and R are commonly used)
Bond:	R 94

MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

(A 80 P R94) STAGE 1	A 120 P R94 STAGE 2	A 180 PR94 STAGE 3	A 240 R R94 stage 4
A 400 R R94 STAGE 5	A 240 R R94 STAGE 6		

All special requests will be considered and made available if at all possible.
 Contact ASEproducts@saint-gobain.com for confirmation.



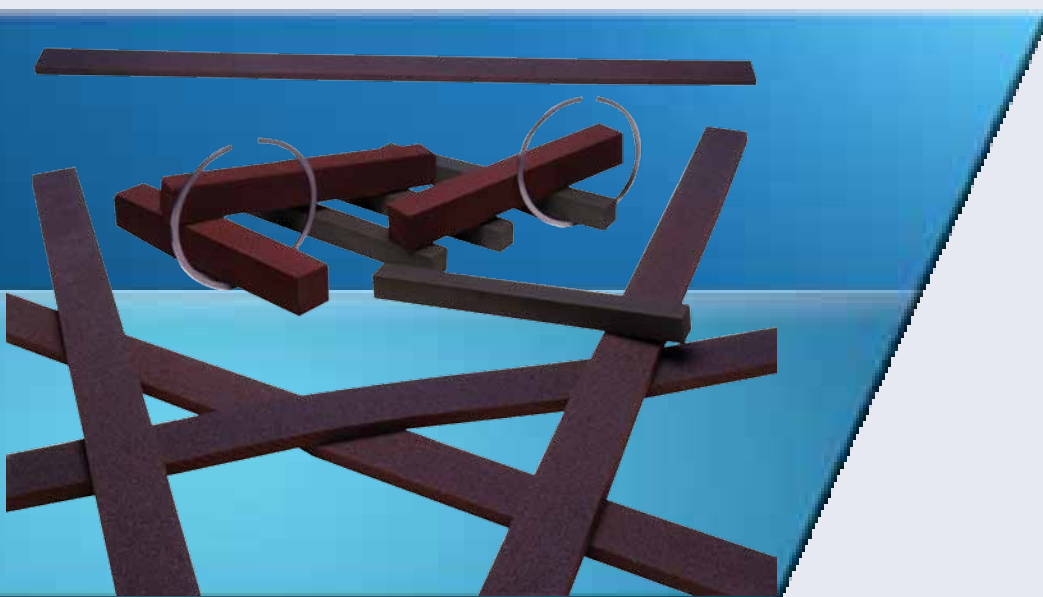
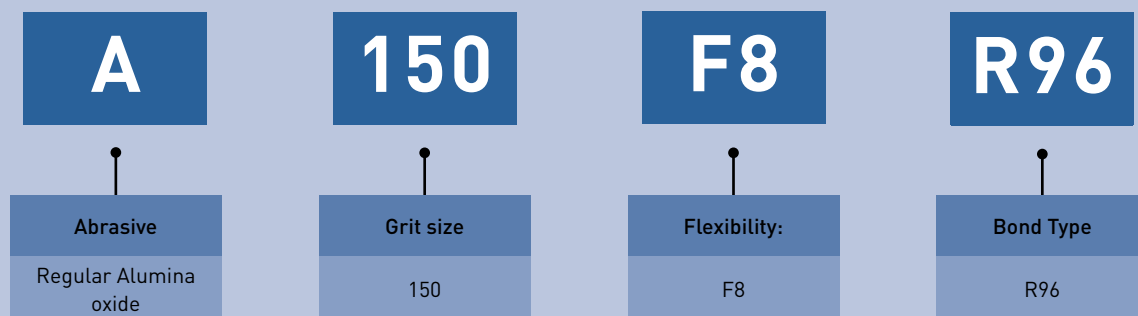
PRODUCT SELECTOR

AVAILABILITY

Dimensions:	3mm - 50mm (Height/Width)
	< 320mm long
	Nearly all sticks are cut from blocks so most sizes can be considered
Type (FEPA):	54 - Dressing sticks
Shape:	54A (square) - 54B - (Rectangular)
Grain type:	A or 37C
Grit:	60# - 280#. (120# and finer for most applications)
Grade:	F
	'F' with 6 degrees of flexibility as standard (F6-stiffest - F11 most flexible).
Bond:	R96
End Use Code:	04: These are often supplied as a slab and cut up by end user or local supplier to suit individual requirements, typical size would be: 165 wide; 320 long; depth up to 32mm. Or can be made to requirements.

MARKING

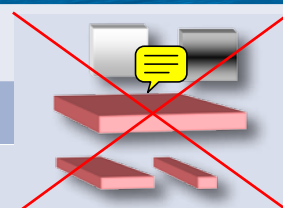
This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

All sticks are classified as 'F' grade (flexible). The degree of flexibility required is obtained by altering the number which follows

F6 F7, F8	Fairly stiff, used where high work levels are required as it will permit higher work loads. If coarser grains are required they are usually used in F6, F7 or F8 formulations
F9 F10, F11	Quite flexible, used for minor blemishes or corrections and for high surface finish requirements.



F6



F9



F11

1ST CHOICE SPECIFICATION SELECTION

Used for:

hand polishing of machine tools and dies, refurbishing and cleaning of hand tools. Repairing glass edges. Removing excess glaze from ceramic products. Hand finishing of parts (including turbine blades).

NB for polishing operation, SiC should be used for roughing, but fine finishes needs regular alundum as it is much less likely to scratch.

SUGGESTED FIRST CHOICE SPECIFICATIONS

Heavily tarnished materials:	A 80 F7 R96
Standard for toolrooms etc:	A 100 F9 R96
Ceramic/Glass repair - roughing:	37C 150 F8 R96
Ceramic/Glass repair - finishing:	A 240 F8 R96

All special requests will be considered and made available if at all possible.
Contact ASEproducts@saint-gobain.com for confirmation.

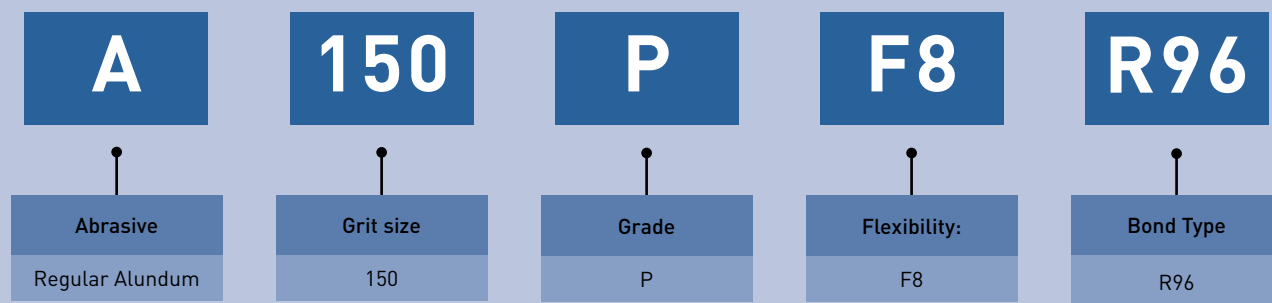
PRODUCT SELECTOR

AVAILABILITY

Dimensions:	From 25 to 610mm diameter - common diameters are 75 mm to 300 mm
	3 to 300mm thickness - common thickness range from 3 mm to 50 mm
Type (FEPA):	01, 05, 07
Shape:	'Standard and non Standard profiles -Full range of Faces available.
Grain type:	A or C
Grit:	60# - 280#. (120# and finer for most applications)
Grade & Structure:	'F' with 6 degrees of flexibility as standard (F6-stiffest - F11 most flexible).
Bond:	R96

MARKING

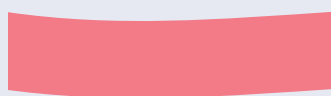
This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

All wheels are classified as 'F' (flexible). The degree of flexibility required is obtained by altering the number which follows:

F6	Rigid, used where high work levels are required as it will permit higher work loads. If coarser grains are required they are usually used in F6, F7 or F8 formulations
F9	Semi Flexible - used where stock removal and finish are required in a single operation. Semi Flexible wheels allow the operator greater control over the level of stock removal and quality of finish.
F11	Very Flexible, used for minor blemishes or corrections and for high surface finish requirements. Rubber bonded wheels have consistent flexibility and porosity throughout the wheel - they offer a high quality alternative to polyurethane wheels which have variable porosity and life.



F6



F9



F11

APPLICATIONS

Flexible Rubber wheels are used where finish and control of stock removal are required. Widely used within the aerospace and medical implant industries. Flexible rubber wheels are used to remove blemishes, flash, burrs and to radius corners. Specifications are offered for a range of alloys, including Inconel, Titanium, Cobalt and Stainless Steel. Flexibility range allows for stock removal (F6), blend and polish (F9) and super finish (F11). Specifications are available with both regular alumina oxide and silicon carbide, or a combination of both. For glass polishing SiC is used for roughing, but fine finishes need regular aluminum oxide as it is less likely to scratch. When required, glass polishing grades with cerium oxide can be provided.

SUGGESTED FIRST CHOICE SPECIFICATIONS (Popular Sizes)

Flute Polishing (150 x 10 x bore /150 x 6 x bore)	A 120 F7 R96
Implant Polishing (150 x 6 x bore)	A 120 F9 R96
Toolroom offhand polisher e.g. 250 x 32 x 32	A 100 F6 R96 or A 220 F8 R96
Cutlery e.g. Fork Polishing (356 x 6 x 32)	A 120 F8 R96
Cam profile polishing e.g. 610 x 25 x 304.8	A 80 F6 R96
Centreless e.g. 508 x 203 x 304.8	A 100 F6 R96
Glass Polishing	A 120 F10 R96
TURBINE BLADE :	
-Stainless - Blend and Polish (75 x 10 x bore)	37C 120 F11 R96
-Titanium - Blend + Polish	AC 601 F8 R96
-Fir Tree - Radius work (150 x 3 x bore)	A 602 F9 R96
-Blade Repair - weld removal (150 x 13 x bore)	A 80 F7 R96
-Blade Repair - weld blending (150 x 13 x bore)	A 46/100 F6 R96

MAXIMUM OPERATING SPEED

NB Due to the flexibility of these products high work speeds are impossible to achieve, centrifugal force will force the wheel out of shape and if too high the wheel will start to show large imbalance problems. For this reason the Maximum Operating Speeds vary directly with the flexibility of the wheel. Glass cloth and other supports are used for higher speeds but their use will reduce the polishing effects of the wheel. Wheels are available with side, centre and side + centre reinforcing.

FLEXIBILITY RANGE

Grade & Structure	MOS (m/s)
F6 & F7	40
F8	30
F9 & F10	25
F11	20



All special requests will be considered and made available if at all possible.
Contact ASEproducts@saint-gobain.com for confirmation.



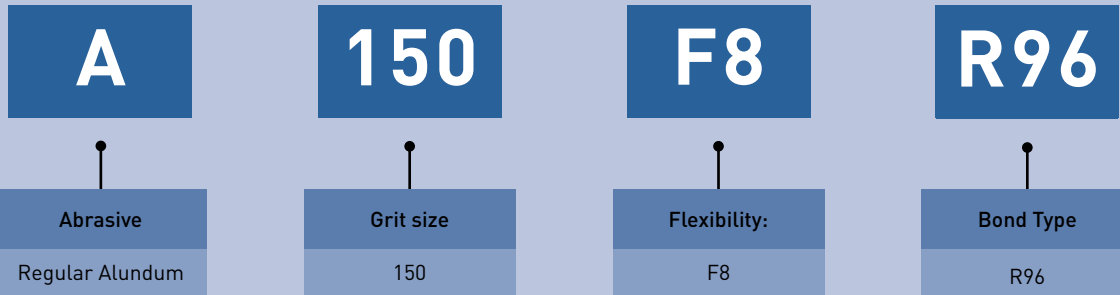
PRODUCT SELECTOR

AVAILABILITY

Dimensions:	25 to 75 mm Diameter
Type:	Quick Change Discs (QCD) (Standard mounting attachments are available, including R and S. Please specify.)
Shape:	QCD - various mounting options
Grain type:	A, 37C
Grit:	36 to 240
Grade:	F8 .
	More, or less flexible specifications are available if required for specialist applications
Bond:	R96 - Standard (Brown colour)

MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

Available in Aluminium Oxide & Silicon Carbide

36 Grit	Fairly stiff, used where high work levels are required as it will permit higher work loads. If coarser grains are required they are usually used in F6, F7 or F8 formulations
80 Grit	Quite flexible, used for minor blemishes or corrections and for high surface finish requirements.
120 Grit	Light stock removal with polished finish

APPLICATIONS

Used for: De-burring, cleaning and final finishing of parts. Suitable for use on Titanium, Stainless Steel, Carbon Fibre, Aluminum and steel.

NB for polishing SiC should be used for roughing, but fine finishes needs regular alumina oxide as it is much less likely to scratch.

SUGGESTED FIRST CHOICE SPECIFICATIONS

Heavily tarnished materials:	A 36 F8 R96
Titanium finishing:	37C 80 F8 R96

MAXIMUM OPERATING SPEED

12000 RPM

All special requests will be considered and made available if at all possible.
Contact ASEproducts@saint-gobain.com for confirmation.



PRODUCT SELECTOR

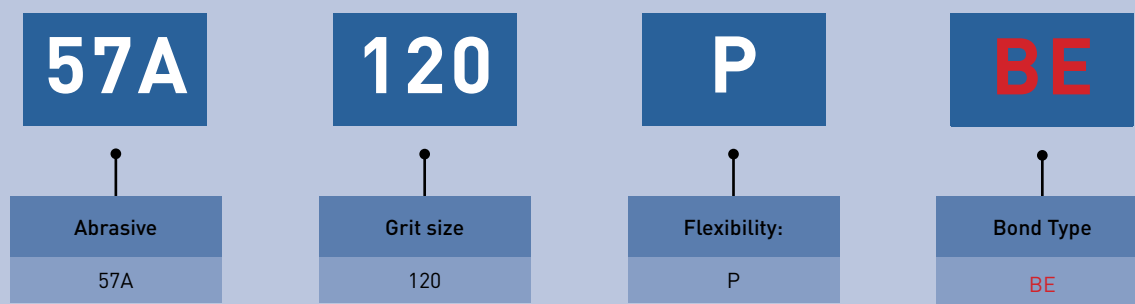
AVAILABILITY

Wheel sizes:	From 50 to 710 mm diameter 3 to 300 mm thickness
Wheel type (FEPA)	01, 02, 05, 06, 07, 52.
Wheel shape	Standard and non Standard profiles
Grain type:	19A, 23A, 57A, 38A and 37C
Grit:	60 to 2000
Grade:	F to R
Bond:	BE (EPOXY)
End use	various



MARKING

This is how the specification will appear on the wheel and commercial documents:



AVAILABILITY

Specifications are available for Hollow and Flat grinding of Knife blades.
 Special wheels are available with an outer zone in.
 Wheels are manufactured in grits sizes to 2000 for super finishing and needle pointing applications.

1ST CHOICE SPECIFICATION SELECTION

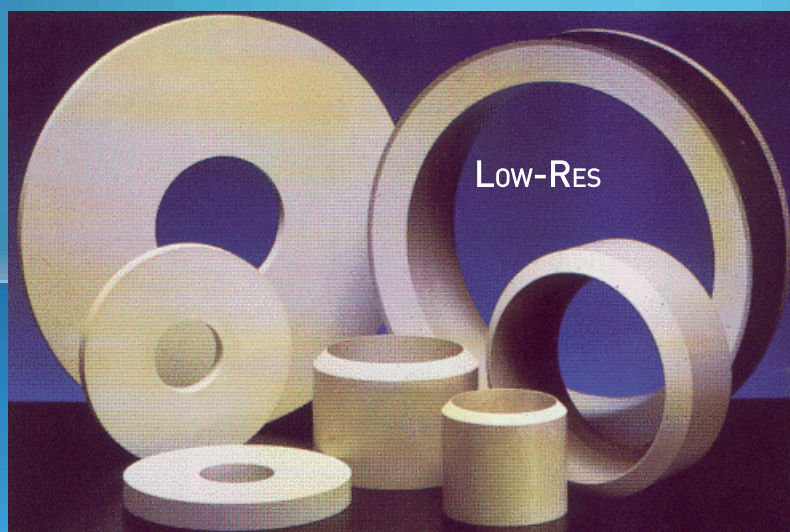
SUGGESTED FIRST CHOICE SPECIFICATIONS

Hollow Grinding	38A120 M BE
Hollow Grinding with Inserts	23A120 G BE / 37C120 F11 R97
Flat Grinding	38A1202 P BE
Flat Grinding - Zoned	38A120 P BX/37C120 F11 R97
Strip Blade Grinding	38A120 H BE

MAXIMUM OPERATING SPEED

Maximum Operating Speed of 50 m/sec

All special requests will be considered and made available if at all possible.
 Contact ASEproducts@saint-gobain.com for confirmation.



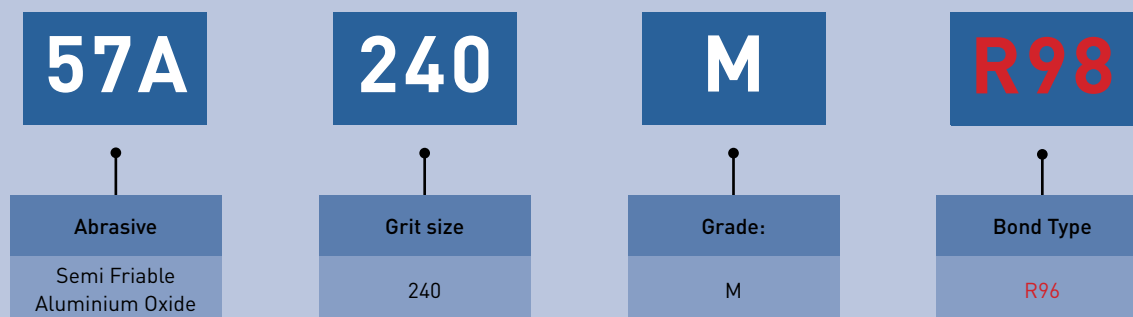
PRODUCT SELECTOR

AVAILABILITY

Wheel sizes:	Diameter - 400 - 660mm (smaller diameter available if needed)
	Thickness - 100 - 610mm (thinner wheels available if needed)
	All are available in 1 piece, but can be supplied in 2 or more pieces if customer prefers (usually for ease of handling and mounting.)
	NB for wheels in 2 or more pieces contact ASE for specialised part creation.
Wheel type (FEPA):	01, 05, 07
Wheel shape:	Not normally shaped periphery except for some plunge grinding operations.
Grain type:	A, 57A, 38A, 37C (others may be available if required)
Grit:	60 - 600 #.
Grade:	L, M, R, S, T
R98	R98
End Use Code:	Mainly 08: Wheels are used in the bearing industry for grinding needle and taper rollers. Also used for grinding /polishing diameters of Shock Absorbers, Piston Pins, Chrome Plated Bars and Stainless steel parts. Also produced for other End Uses in shape 01 for polishing operations for example on saw blades and slitting blades for paper roll cutting and slitting blades for paper roll cutting

MARKING

This is how the specification will appear on the wheel and commercial documents:



GRADE AND STRUCTURE AVAILABILITY

Varies by application and operation:

Multiple specifications within one wheel is available upon request.

1ST CHOICE SPECIFICATION SELECTION

SUGGESTED FIRST CHOICE SPECIFICATIONS

Shock Absorbers	AC 240/400-L-R98
Needle & Taper Rollers	57A 180/240/320-M-R98
Stainless Steel	37C 180-L-R98
Super Finishing	57A 600-L-R98
Stainless Steel Saw Blades	A 801-R-R98

Standard operating speed is marked at 30 m/s. Higher speeds are available if required but need to be requested.

All special requests will be considered and made available if at all possible.
Contact ASEproducts@saint-gobain.com for confirmation.





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ABRASIVES

Saint-Gobain Abrasifs
European Headquarters
Rue de l'Ambassadeur - B.P.8
78 702 Conflans Cedex
France

Tel: +33 (0)1 34 90 40 00
Fax: +33 (0)1 39 19 89 56
www.norton.eu

Saint-Gobain Abrasives Ltd.
Doxey Road
Stafford
ST16 1EA
United Kingdom
Tel: +44 (0) 1785 222 000
Fax: +44 (0) 1785 213 487
www.norton.eu

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