

Surface Finishing Solutions



NORTON

SAINT-GOBAIN

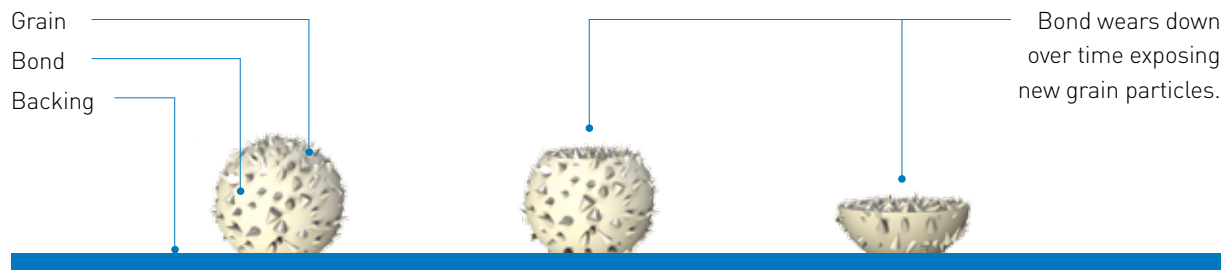
ABRASIVE TECHNOLOGICAL EXCELLENCE

SURFACE FINISHING SOLUTIONS

Aggregate Technology

Aggregate products are manufactured by binding treated grains together using an optimised bonding system. In comparison to traditional abrasives, where single solid grains are applied to a backing material, aggregate is made up of many smaller grain fragments (see diagram below).

Due to this unique formulation, new grain surfaces are presented to the workpiece throughout belt life, providing a consistent and uniform finishing solution. Use aggregate belts for consistent stock removal and where abrasive life is key.



Features

- Multiple layered abrasive grain
- Polyester or cotton backing
- Optimised aggregate bonding

Benefits

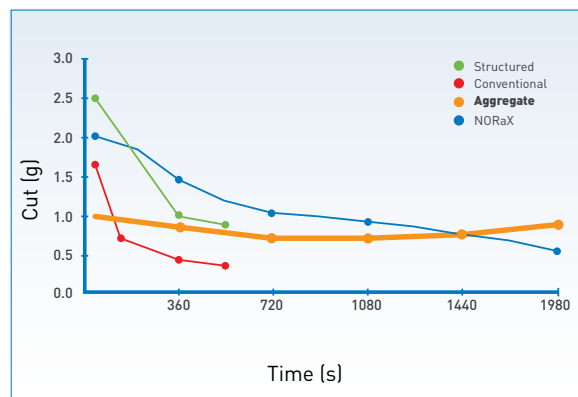
- Consistent stock removal throughout product life
- Consistent surface finish
- Longer life than conventional abrasives

Applications

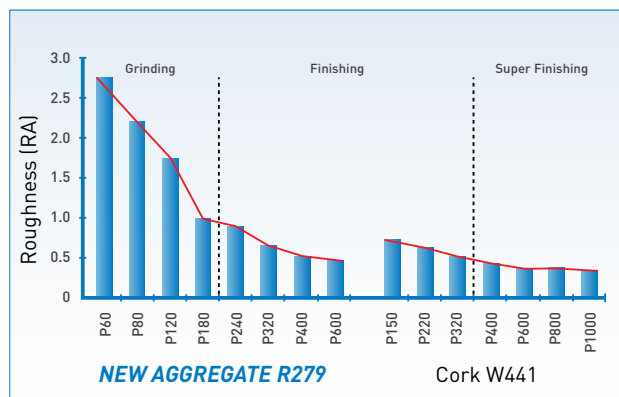
- Centreless Grinding
- Coils
- Medical Prosthesis
- Bar, Tube & Plate Grinding

Markets

- Metal Transformers
- Automotive
- Steel Mills
- Medical



The graph above shows aggregate and NORaX belts have exceptionally longer life and higher cut rate than structured and conventional abrasives.



The graph above is a surface finishing guide showing a roughness (RA) comparison for aggregate and cork belts.

Centreless Grinding & Plate and Sheet Grinding

Centreless Grinding

Centreless grinding machines are usually multi headed and a sequence of abrasive belts are used to give the required surface finish to a round or square tube. The machines are used both wet and dry and the coolant type is most often an oil and water combination.

Important machine parameters (when using **NEW R279**, R270, W441, W445, R473)

- Belt speed - 22 to 28 MPS
- Force - 12N to 20 N (in use)
- Contact wheel shore - 50 to 80 shore
- Contact wheel type - Rubber 2:1 L:G ratio
- Individual motor power - above 4 KW

Plate and Sheet Grinding

Plate and sheet grinding can take place using a manually operated machine or more usually a fixed machine, for example a timesaver machine. The machine can be single or multi headed very similar to a wide belt machine in the wood industry. The machines can be used wet and dry (normally wet) and the coolant can be neat oil down to a water and oil emulsion.

Important machine parameters (when using **NEW R279**, R270, W441, W445, R473)

- Belt speed - 22 to 26 MPS
- Force - 15N to 22 N (in use)
- Contact wheel shore - 40 to 70 shore
- Contact wheel type - Rubber 2:1 L:G ratio
- Individual motor power - above 10 KW

Product Recommendations

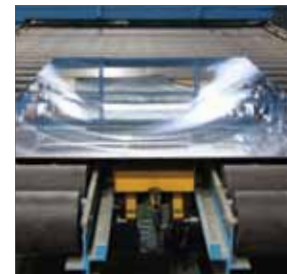
Inox	Good	Better	Best
Roughing P40-P80	R275	NEW R279	Blueforce R874
Semi-Finishing P100-P240	-	R275	NEW R279
Finishing P320 - P800	-	-	NEW R279
Exotic Alloys	Good	Better	Best
Roughing P40-P80	NEW R279	RX66	Red-X R976
Semi-Finishing P100-P240	-	R275	NEW R279
Finishing P320 - P800	-	-	NEW R279
Titanium	Good	Better	Best
Roughing P40-P80	NEW R279	RX66	Red-X R976
Semi-Finishing P100-P240	-	R445	R473
Finishing P320 - P800	-	R445	R473
Carbon Steel	Good	Better	Best
Roughing P40-P80	Blueforce R874	RX66	Red-X R976
Semi-Finishing P100-P240	Blueforce R872	Blueforce R874	NEW R279
Finishing P320 - P800	-	-	NEW R279

Notes:

RX66 and R976 to P120 only, after this use R279.



Wet centreless grinding for round tube surface finishing.



Metal sheet coming out from the sheet grinding finishing operation.

Coil Grinding

Coil grinding machines are designed to give a uniform finish across the width of the material, when used at high pressure we can remove scale and defects from the material surface, at lower pressure we are trying to achieve a given surface finish or simply refine the previous step in the process. Oil is the most common form of lubricant but we often see an oil and water emulsion.

Important machine parameters (when using **NEW R279**, R270, R473, W441, W445)

- Belt speed - 22 to 28 MPS
- Force - 15N to 22 N (in use)
- Contact wheel shore - 40 to 80 shore
- Contact wheel type - Rubber 2:1 L:G ratio
- Individual motor power - above 10 KW

Product Recommendations

Inox	Good	Better	Best
Roughing P40-P80	Blueforce R872	RX84	Red-X R976
Semi-Finishing P100-P240	-	R275	NEW R279
Finishing P320 - P800	-	-	NEW R279
Exotic Alloys	Good	Better	Best
Roughing P40-P80	Blueforce R872	RX84	Red-X R976
Semi-Finishing P100-P240	-	R275	NEW R279
Finishing P320 - P800	W445	W441	NEW R279
Titanium	Good	Better	Best
Roughing P40-P80	Blueforce R872	RX84	Red-X R976
Semi-Finishing P100-P240	-	R445	R473
Finishing P320 - P800	-	R445	R473
Carbon Steel	Good	Better	Best
Roughing P40-P80	Blueforce R872	RX84	Red-X R976
Semi-Finishing P100-P240	-	R275	NEW R279
Finishing P320 - P800	-	-	NEW R279

Notes:

RX84 if coolant is used, if dry RX66 would replace RX84 above. RX66/RX84 and R976 to P120 only after this use NEW R279.



Coil grinding operation.

Aluminium Oxide Aggregates



Small aluminium oxide particles are bonded together to create an aggregate grit.

Aluminium oxide aggregate belts are ideal for cylindrical and flat surface grinding. They can be used for wet or dry grinding due to the waterproof polyester backing, and should be used from low to high pressure on non-ferrous metals.

The **NEW R279** aluminium oxide aggregate belt has been engineered for extended life time and consistent stock removal on ferrous and non-ferrous metals.

	NEW R279	R270	R275
Grain	Aluminium oxide	Aluminium oxide	Aluminium oxide
Coat	Closed coat	Closed coat	Open coat
Bonding System	New	Old	-
Grits Available	P60, P80, P100, P120, P150, P180, P220, P240, P320, P400, P600, P800	P60, P80, P120, P180, P240, P320, P400	P60, P80, P120, P180, P240, P320, P400
Backing	Y-Polyester	Y-Polyester	Y-Polyester
Market / Application	Cylindrical and flat surface grinding	Cylindrical and flat surface grinding	Cylindrical and flat surface grinding
Pressure	Medium to high	Medium to high	Low to medium
Additional Information	Can be used wet or dry (resistant to water, emulsion, oil)	Can be used wet or dry (resistant to water, emulsion, oil)	Can be used wet or dry (resistant to water, emulsion, oil)



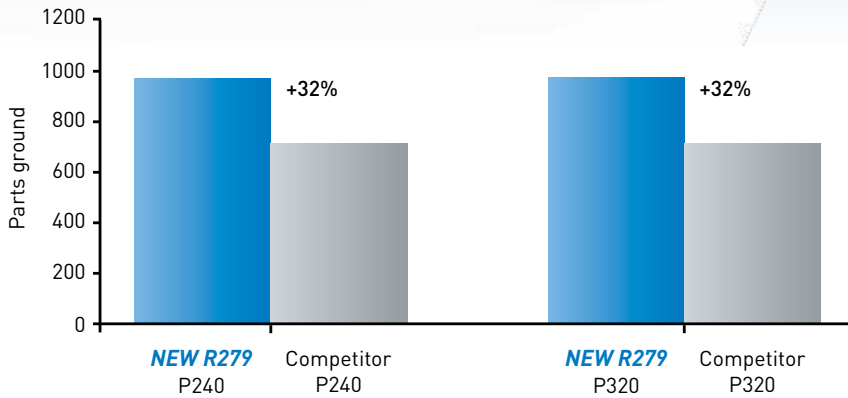
Aggregate belts are designed to continue cutting until the backing is visible. To make the most of aggregate products use all the way down to the backing.



Centreless grinding.

Case Studies: **NEW R279**

Centreless Wet Grinding: Stainless Steel Tube



Parameters:

Material: Stainless Steel tube

Contact wheel: 75 shore A

Belt size: 150 x 3500mm

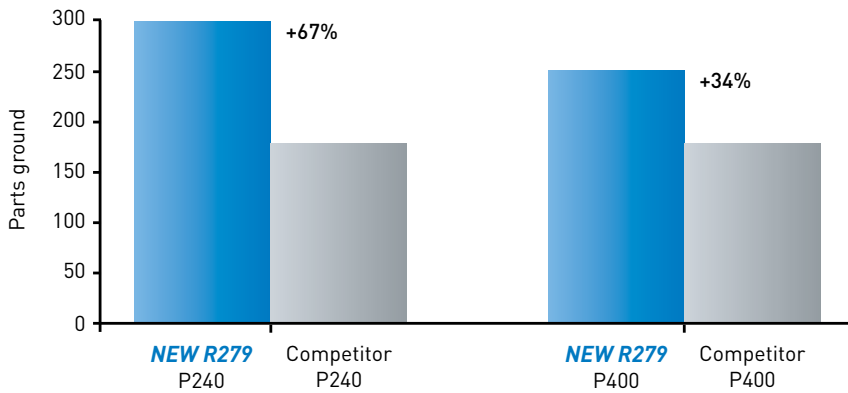
Pressure: High

Results: Parts finished during cycle

	NEW R279	Competitor
P240	990	770
P320	990	770

P240 product life increased by 32%
P320 product life increased by 32%

Centreless Wet Grinding: Stainless Steel Tube



Parameters:

Material: Stainless Steel tube

Contact wheel: 60 shore A

Belt size: 200 x 400mm

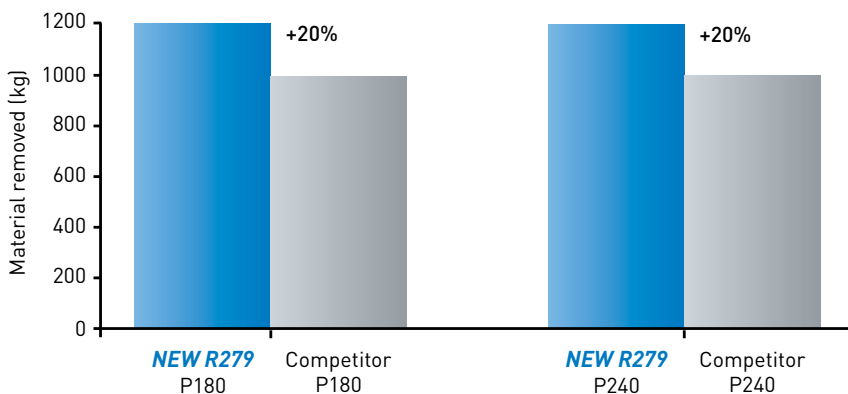
Pressure: High

Results: Parts finished during cycle

	NEW R279	Competitor
P240	300	180
P400	240	180

P240 product Life Increased By 67%
P400 product Life Increased By 34%

Wire Grinding



Parameters:

Material: Wire

Contact wheel: 60 shore A

Belt size: 150 x 2500mm

Results: Parts finished during cycle

	NEW R279	Competitor
P180	1200	1000
P240	1200	1000

P180 product Life Increased By 20%
P240 product Life Increased By 20%

Silicon Carbide Aggregates



Centreless application.

Silicon carbide aggregates can be used for a variety of applications, including cylindrical and flat surface. Use with medium to high pressure on non-ferrous metals.

The **NEW R423** silicon carbide aggregate belt has a flexible backing for use in semi-finishing and finishing steps of manual operations or on a backstand with a soft contact wheel to adapt to the shape of the product.

	NEW R423	R473
Grain	Silicon carbide	Silicon carbide
Coat	Closed	Closed
Grits Available	P100, P120, P180, P320	P100, P180, P320
Backing	Flexible J-Cotton	Y-Polyester
Application	Cylindrical and flat surface grinding	Cylindrical and flat surface grinding
Pressure	Medium to high	Medium to high
Additional Info	Use in dry applications only	Can be used wet or dry (resistant to water, emulsion, oil)



Using the correct contact wheel with aluminium oxide and silicon carbide belts achieves the best results.

- For high stock removal use a 90 Shore, 1:1 groove to land ratio serrated contact wheel.
- For medium stock removal use a 75-80 Shore contact wheel.
- For finishing, use a 60 Shore contact wheel.

Cork and Silicon Carbide



Magnified view of cork grain.

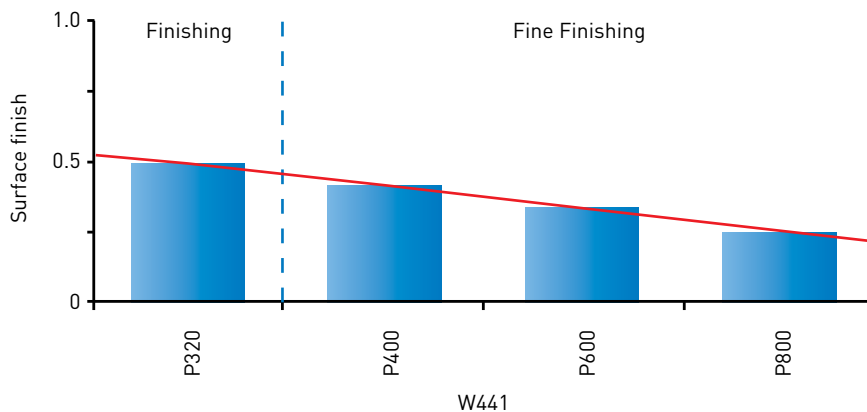
The elasticity in the cork grain enables grinding at a much lower pressure. Cork belts provide lower stock removal than conventional aggregates making them ideal for very fine finishing.



Create a very fine finish with cork belts.

	W441	W445
Material	Cork and silicon carbide	Cork
Backing	X-Cotton waterproof	Y-Polyester
Grits Available	P400, P600 and P800	Cork
Application	Very fine polishing for a bright surface finish	Very fine finish
Pressure	Low	Low
Additional Info	For wet or dry applications	For wet or dry applications

Cork Roughness Guide (RA) Low Pressure



To obtain a very low surface finish (under 0.5) and create a mirror effect shine use cork and silicon carbide in P400 to P800 grits.

NORaX

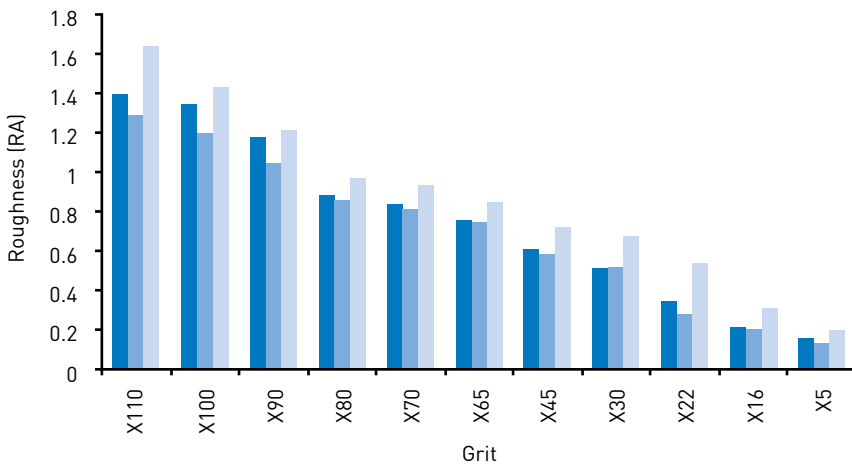
NORaX can be used for a wide variety of applications from backstand to centreless grinding. Its 3D microstructure provides a consistent cut and surface finish through out the product life.

	NORaX U936	NORaX U366
Grain	SG [®] ceramic	Aluminium oxide
Backing	Y-Polyester	Y-Polyester
Grits Available	X200, X100, X65, X45, X30, X16	X100, X45, X30, X22, X16, X5
Application	Cylindrical and flat surface grinding on hard materials	Cylindrical and flat surface grinding
Pressure	Medium to high	Medium to high
Additional Info	Can be used for wet or dry grinding (resistant to water, emulsion and oil)	Can be used for wet and dry grinding (resistant to water, emulsion and oil)



NORaX U936.

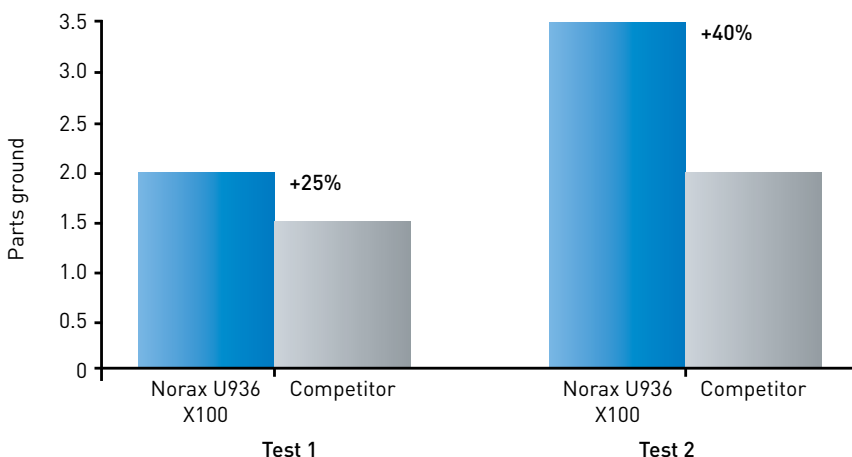
NORaX Roughness Guide



Key:

- Steel RA
- Stainless RA
- Brass RA

NORaX U936: Case Study



Parameters:

- Application:** Turbine blade
- Material:** High nickel content alloy
- Machine:** Automated machine
- Pressure:** Medium
- Contact wheel:** 45 shore
- Speed:** 35-40m/s
- Belt dimension:** 30mm x 3500mm

Results: Parts finished during cycle

	U936	Competitor
Test 1: X100	2	1.5
Test 2: X100	3.5	2

Test 1: U936 X100 product life increased by 25% on X5 CrNiMoV

Test 2: U936 X100 product life increased by 40% on X20 CrNiMoV

Availability

Aggregates

CAP Code	Grit Availability												
	No Grit	P60	P80	P100	P120	P150	P180	P220	P240	P320	P400	P600	P800
R270													
R275													
R473													
<i>NEW R423</i>					+								
<i>NEW R279</i>													

Cork and Silicon Carbide

CAP Code	Grit Availability												
	No Grit	P60	P80	P100	P120	P150	P180	P220	P240	P320	P400	P600	P800
W441													

Cork

CAP Code	Grit Availability												
	No Grit	P60	P80	P100	P120	P150	P180	P220	P240	P320	P400	P600	P800
W445													

NORaX

CAP Code	Grit Availability										
	No Grit	X200	X100	X80	X65	X45	X30	X22	X16	X5	
U936											
U366											

Key: Grit Availability

- Generic backprint
- Standard Norton product
- + Planned





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