

# Surface Finishing Solutions



***NORTON***

SAINT-GOBAIN

ABRASIVE TECHNOLOGICAL EXCELLENCE

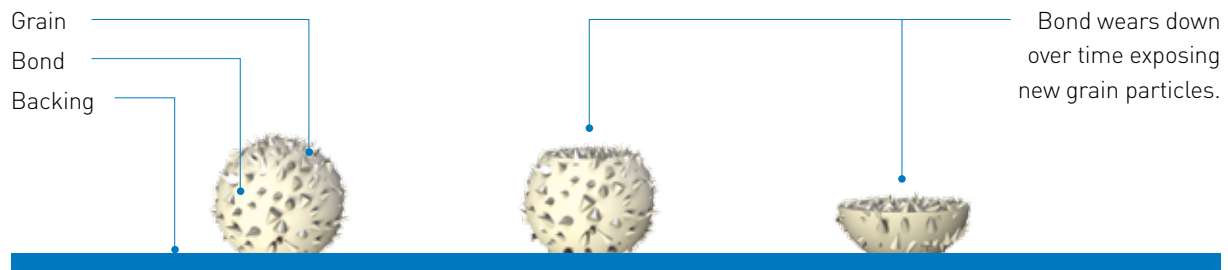


# SURFACE FINISHING SOLUTIONS

## 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

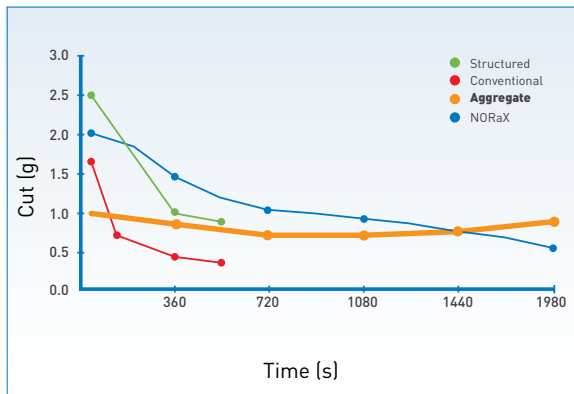
- Consistent stock removal throughout product life
- Consistent surface finish
- Longer life than conventional abrasives

### Applications

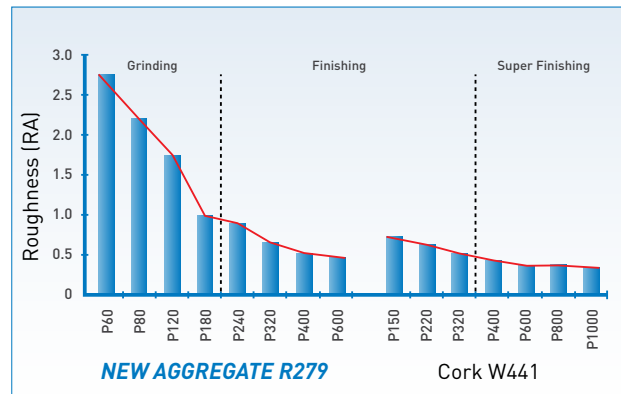
- Centreless Grinding
- Coils
- Medical Prosthesis
- Bar, Tube & Plate Grinding

### 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

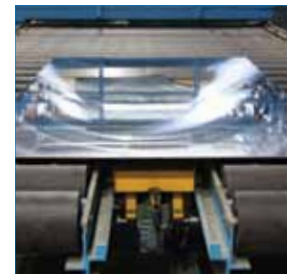
Inox	Good	Better	Best
Roughing P40-P80	R275	<b>NEW R279</b>	Blueforce R874
Semi-Finishing P100-P240	-	R275	<b>NEW R279</b>
Finishing P320 - P800	-	-	<b>NEW R279</b>
Exotic Alloys	Good	Better	Best
Roughing P40-P80	<b>NEW R279</b>	RX66	Red-X R976
Semi-Finishing P100-P240	-	R275	<b>NEW R279</b>
Finishing P320 - P800	-	-	<b>NEW R279</b>
Titanium	Good	Better	Best
Roughing P40-P80	<b>NEW R279</b>	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	<b>NEW R279</b>
Finishing P320 - P800	-	-	<b>NEW R279</b>

**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	<b>NEW R279</b>
Finishing P320 - P800	-	-	<b>NEW R279</b>
Exotic Alloys	Good	Better	Best
Roughing P40-P80	Blueforce R872	RX84	Red-X R976
Semi-Finishing P100-P240	-	R275	<b>NEW R279</b>
Finishing P320 - P800	W445	W441	<b>NEW R279</b>
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	<b>NEW R279</b>
Finishing P320 - P800	-	-	<b>NEW R279</b>

**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.

	<b>NEW R279</b>	R270	R275
<b>Grain</b>	Aluminium oxide	Aluminium oxide	Aluminium oxide
<b>Coat</b>	Closed coat	Closed coat	Open coat
<b>Bonding System</b>	New	Old	-
<b>Grits Available</b>	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
<b>Backing</b>	Y-Polyester	Y-Polyester	Y-Polyester
<b>Market / Application</b>	Cylindrical and flat surface grinding	Cylindrical and flat surface grinding	Cylindrical and flat surface grinding
<b>Pressure</b>	Medium to high	Medium to high	Low to medium
<b>Additional Information</b>	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)



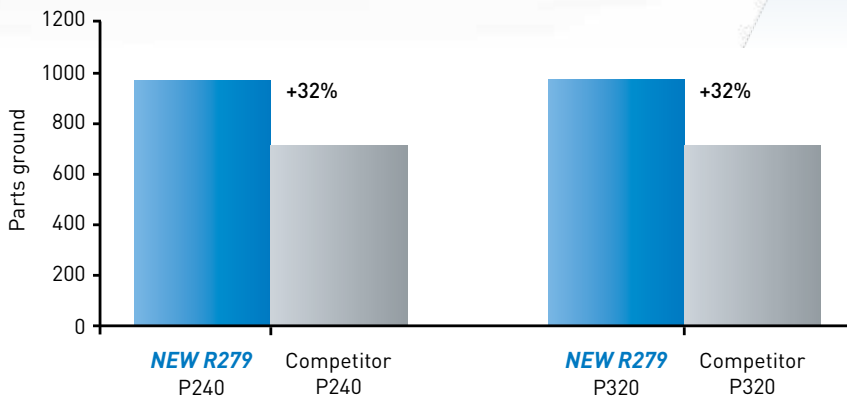
Aggregate belts are designed to continue cutting until the backing is visible. To make the most of aggregate products use all the way down to the backing.



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

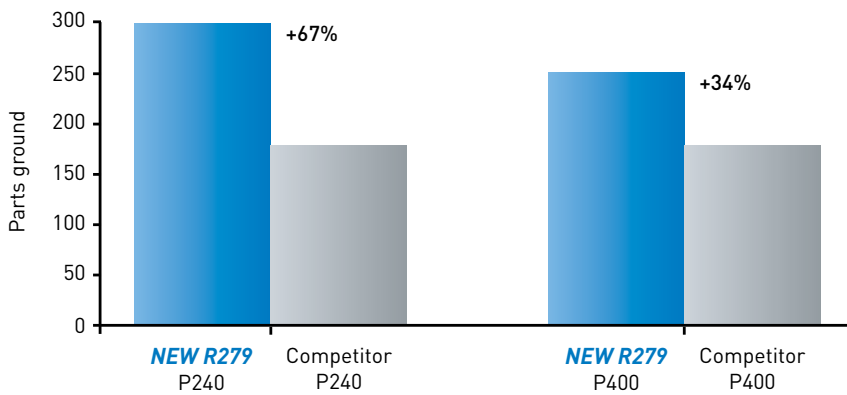
**Pressure:** High

#### 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

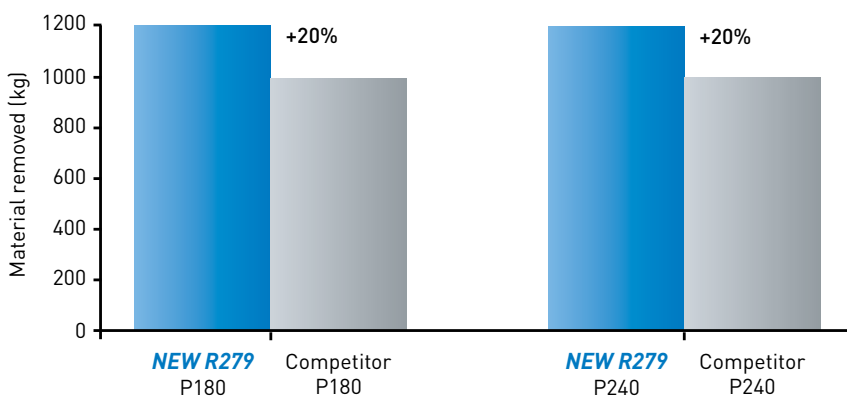
**Pressure:** High

#### 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.

	<b>NEW R423</b>	<b>R473</b>
<b>Grain</b>	Silicon carbide	Silicon carbide
<b>Coat</b>	Closed	Closed
<b>Grits Available</b>	P100, P120, P180, P320	P100, P180, P320
<b>Backing</b>	Flexible J-Cotton	Y-Polyester
<b>Application</b>	Cylindrical and flat surface grinding	Cylindrical and flat surface grinding
<b>Pressure</b>	Medium to high	Medium to high
<b>Additional Info</b>	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.

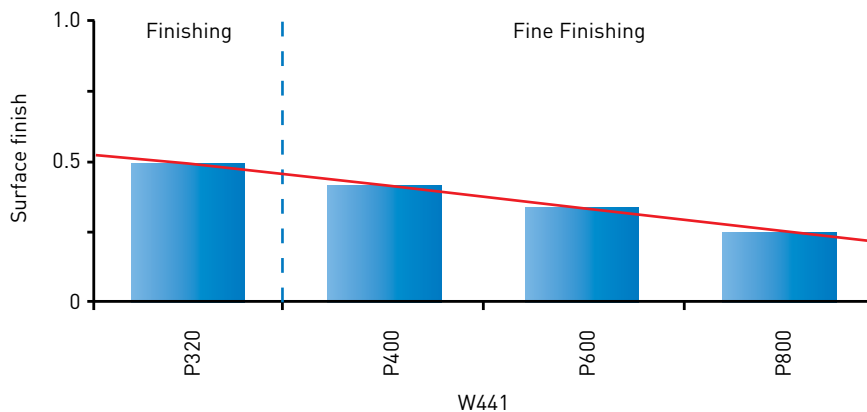
The elasticity in the cork grain enables grinding at a much lower pressure. Cork belts provide lower stock removal than conventional aggregates making them ideal for very fine finishing.



Create a very fine finish with cork belts.

	W441	W445
<b>Material</b>	Cork and silicon carbide	Cork
<b>Backing</b>	X-Cotton waterproof	Y-Polyester
<b>Grits Available</b>	P400, P600 and P800	Cork
<b>Application</b>	Very fine polishing for a bright surface finish	Very fine finish
<b>Pressure</b>	Low	Low
<b>Additional Info</b>	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

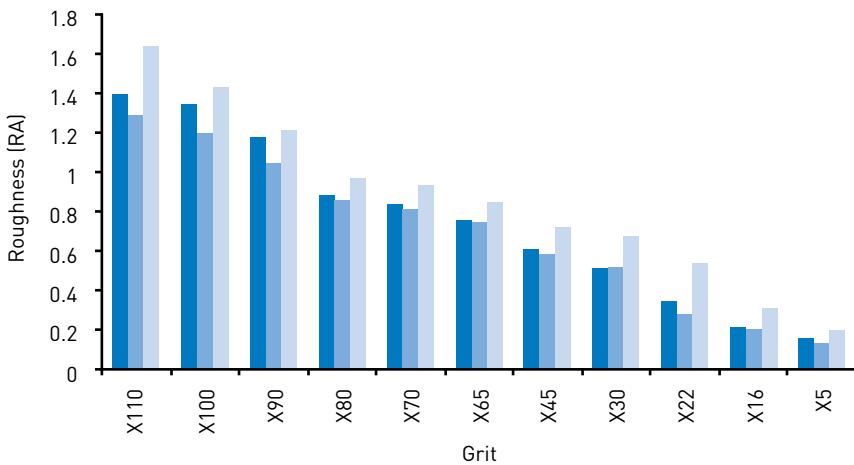
NORaX can be used for a wide variety of applications from backstand to centreless grinding. Its 3D microstructure provides a consistent cut and surface finish through out the product life.

	NORaX U936	NORaX U366
<b>Grain</b>	SG <sup>®</sup> ceramic	Aluminium oxide
<b>Backing</b>	Y-Polyester	Y-Polyester
<b>Grits Available</b>	X200, X100, X65, X45, X30, X16	X100, X45, X30, X22, X16, X5
<b>Application</b>	Cylindrical and flat surface grinding on hard materials	Cylindrical and flat surface grinding
<b>Pressure</b>	Medium to high	Medium to high
<b>Additional Info</b>	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.

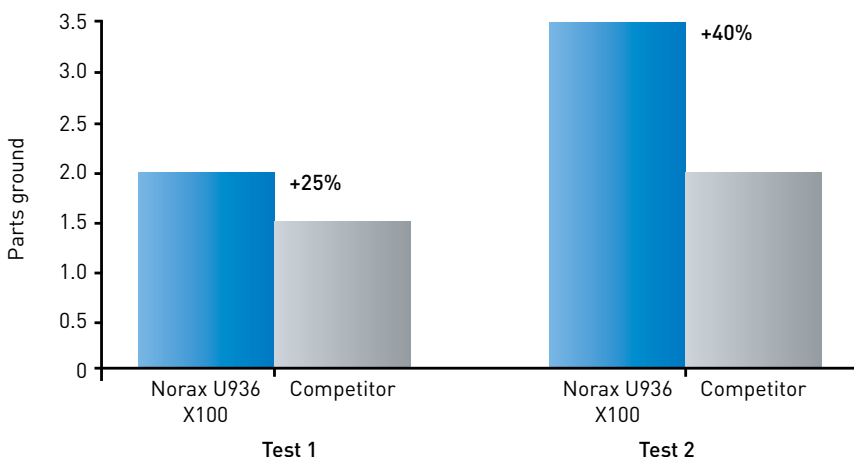
## NORaX Roughness Guide



**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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