

**NORTON**

**RAIL**

SAINT-GOBAIN

Reshaping  
your  
world.

# RAIL TRACK MAINTENANCE & REPAIR

YOUR COMPLETE ABRASIVE GUIDE

  
SAINT-GOBAIN



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As rail track technology continues to make major advances, Norton is generating powerful, innovative, user friendly solutions to cut, shape and grind heavy duty steels.

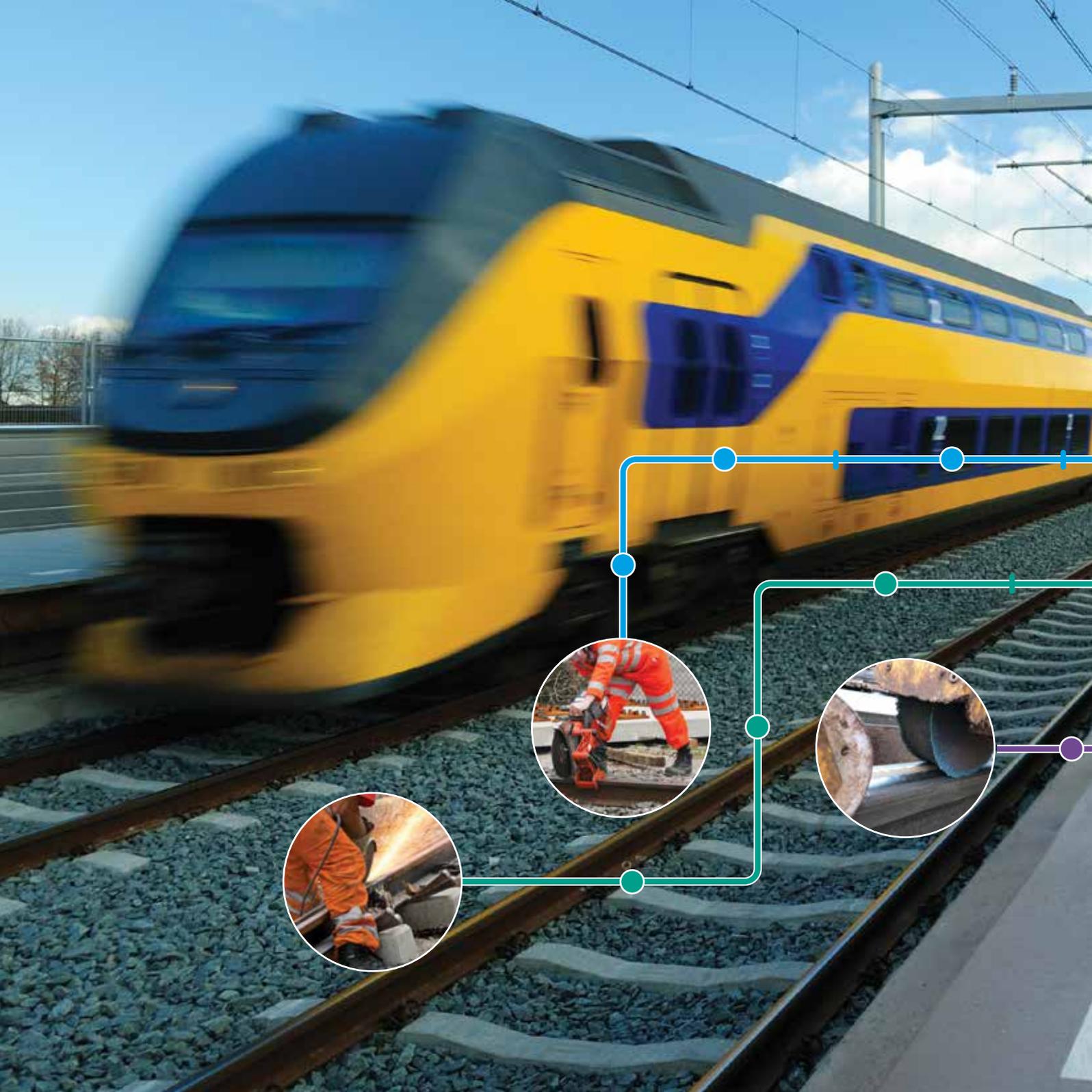
Steel used in the manufacture of rail tracks is tougher and harder than ever, to cope with increasing axel weight and total tonnage of new rail services. Heat treatment combined with high levels of carbon, manganese and silicon used in manufacturing make cutting and grinding operations tough. Norton offers a full range of products specially designed to handle any applications in the maintenance and repair of rail, underground and tram tracks taking into account the hardness of the metal used and the unique shape of rail track.

Norton's continued investment in R&D is reshaping the world of cutting and grinding in the rail industry, by driving down costs and increasing productivity.

## CUSTOMERS COUNT ON NORTON TO...

- Improve productivity, reduce total cost
- Protect people in their environment
- Improve rail environment







**NORTON**

SAINT-GOBAIN

# YOUR COMPLETE ABRASIVE GUIDE FOR RAIL TRACK MAINTENANCE & REPAIR



## CUTTING WHEELS

For track cutting.

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## GRINDING WHEELS & CUPS

For track grinding, re-profiling  
& chamfering after welding.

13



## CLEANING WHEELS

For cleaning track heads.

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Think safe

Act safe

Be safe

## SAFETY IN YOUR ENVIRONMENT

Rail applications require the highest safety standards where abrasives are used in the toughest environments and under time pressure. Worker safety is one of Saint-Gobain's top priorities so Norton products comply with all expectations of European health, safety and environmental standards. **FEPA**, the Federation of European Producers of Abrasives, is dedicated to the promotion of safety in the use of abrasives and is actively involved in the preparation and implementation of the European (EN) and International Standards (ISO) for Abrasives and Grinding machines. Norton products also adhere to the global safety standard 'oSa', the Organisation for Safety of Abrasives who pursues, in close collaboration with **FEPA**, the objectives of supporting both the currently attained safety standards for abrasive products and their further developments.



THE INTERNAL TESTING AND CERTIFICATION IS BASED ON THE FOLLOWING STANDARDS:

- Safety requirements for Bonded Abrasive products (EN12413)
- Safety requirements for Diamond Blades (EN13236)
- Safety requirements for Cutting-off wheels (EN12413).

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# CUTTING WHEELS FOR TRACK REPAIR & MAINTENANCE

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# THE ONE AND ONLY CERAMIC RAIL CUTTING DISC! FASTER, SAFER, LONGER LASTING.

+++++



## INNOVATION

### NORTON QUANTUM NQ24Q

- Longest life
- Most comfortable
- Fastest cut
- Least vibration



Best

++++



### NORTON RAIL ZA24Q (ZIRCONIA)

The perfect combination  
of life and comfort

++++



### NORTON RAIL SOFT - A24P (ALUMINIUM OXIDE)

- Fast cut
- Comfortable
- Less vibration

### NORTON RAIL MEDIUM - A24Q (ALUMINIUM OXIDE)

- Long life
- Comfortable
- For all applications

### NORTON RAIL HARD - A24T (ALUMINIUM OXIDE)

- Long life

Performance

Very Good



# WHAT'S IN IT FOR YOU?



- 1 OPERATOR COMFORT**
- 2 LESS GRINDING TIME**
- 3 LESS DOWNTIME & WASTE**

## PROBLEM:

- 1. Slow throughput**
  - High labour costs
  - Significant time pressure (particularly on nightshifts)
- 2. Difficult and uncomfortable**
  - White finger and general physical discomfort
  - Lack of control over the cut and wrenching the disc through the material
- 3. Low efficiency**
  - Bad quality cutting results, that cause delays
  - Semi finished products in the rail processes
- 4. Short product life**
  - High material removing products generally wear down too quickly
  - High cost of frequently replacing worn down cutting wheels.

## SOLUTION:

- 1.** The disc has the **highest speed** versus other abrasives. More material can be cut in a shorter period of time
- 2.** The **ceramic grain** and **new bond system** provide better comfort and control to cut straight and not to blue or overheat the material. Disc reduces vibrations, which means lower hand-arm vibration (white finger disease)
- 3.** NQ3 competes on price and performance. The price-performance ratio is optimized by a far **longer wheel life (more cuts with one wheel)**. The disc delivers straight cuts that reduce deburring time
- 4.** These discs have a longer product life than competing products, therefore fewer wheels are needed throughout the process and **reducing costs and time lost** by changing wheels

# CUTTING WHEELS

## TECHNICAL INFORMATION

BF 41

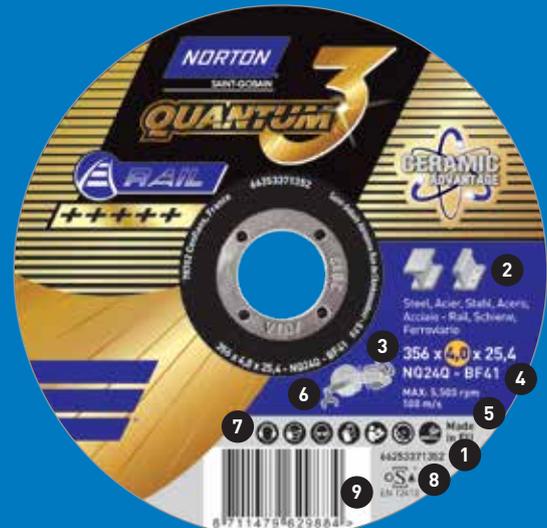
### FLAT CUTTING WHEELS

Rail cutting wheels are available in 300mm for clamped rail cutting machines that operate at 80m/s. For clamped rail cutting machines that operate on 100m/s wheels are available in 356mm and 406mm.

Bore dimensions of the cutting wheel can be adjusted using reduction rings that come with the original machine.

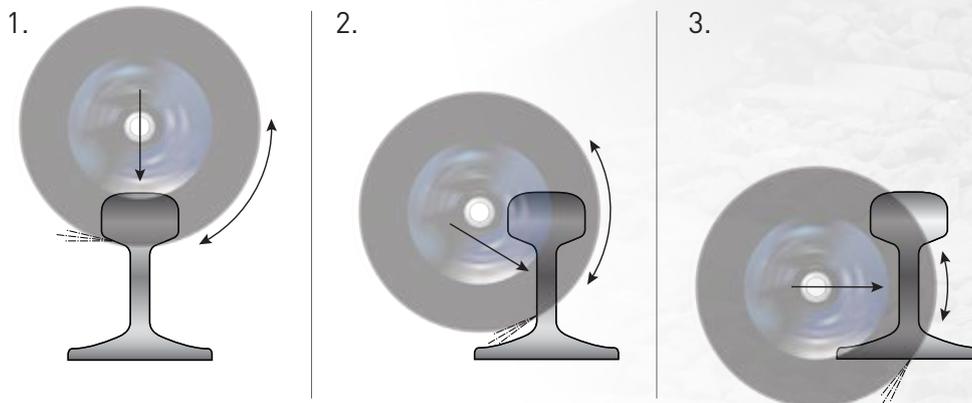
## UNDERSTANDING THE PRODUCT

- 1 Product code
- 2 Application material
- 3 Diameter x Thickness x Hole
- 4 Product specification
- 5 Maximum peripheral speed
- 6 Machine cutting
- 7 Safety pictograms
- 8 OSA certification
- 9 EN standard



## CUTTING

Arrange the workpiece so that a uniform section can be cut



### KEY:

Direction of cut



Oscillate the wheel, swing the machine for quickest & cleanest cut

# SELECTING THE RIGHT WHEEL



USE THE GUIDE BELOW TO SELECT THE BEST WHEEL FOR YOUR NEEDS:

	356mm NQ24Q CERAMIC ADVANTAGE	406mm NQ24Q CERAMIC ADVANTAGE	300mm ZA24Q	300mm A24T MEDIUM	356mm ZA24Q	356mm A24T MEDIUM	356mm A24P SOFT	356mm ZA24T HARD	356mm A24Q MEDIUM	406mm ZA24Q	406mm A24P SOFT
MATERIAL											
Rail Bar 54 E1	👍👍👍	👍👍👍	👍👍	👍							
Rail Bar 60 E1	👍👍👍	👍👍👍			👍👍	👍	👍	👍👍	👍👍	👍👍	👍
ATTRIBUTE											
Comfortable cut	👍👍👍	👍👍👍	👍👍		👍👍		👍			👍👍	👍
Fast cut	👍👍👍	👍👍👍	👍👍		👍👍		👍		👍👍	👍👍	👍
Long life	👍👍👍	👍👍👍	👍👍	👍	👍👍			👍👍		👍👍	
Less rework on burrs	👍👍👍	👍👍👍	👍👍		👍👍		👍		👍👍	👍👍	
Straight cutting	👍👍👍	👍👍👍	👍👍	👍	👍👍	👍	👍	👍👍	👍👍	👍👍	👍
No blueing	👍👍👍	👍👍👍	👍👍	👍	👍👍	👍	👍			👍👍	👍

- 👍👍👍 highly recommended / best cutting performance
- 👍👍 recommended / very good cutting performance
- 👍 recommended / comfort and quick cutting / for older machines

Norton Quantum3 discs have been tested successfully on a new generation of rail cutting machines that work on electrical power. The ceramic grain makes sure to keep the wheel cutting on all machines, now and in the future.

# PRODUCT INDEX

WHEEL TYPE	DIAMETER (mm)	THICKNESS x BORE (mm)	SPECIFICATION	PACK QUANTITY	ART NO.
41 	356	4.0x25.4	NQ24Q (CERAMIC ADVANTAGE)	10	66252845406
	356	4.0x22,23	NQ24Q (CERAMIC ADVANTAGE)	10	66252845405
	406	4.0x25.4	NQ24Q (CERAMIC ADVANTAGE)	10	66252846183
41 	300	4.0x25.4	ZA24Q (ZIRCONIA)	10	66252833664
	356	4.0x25.4	ZA24Q (ZIRCONIA)	10	66252830924
	406	4.0x25.4	ZA24Q (ZIRCONIA)	10	66252833665

WHEEL TYPE	DIAMETER (mm)	THICKNESS x BORE (mm)	SPECIFICATION	PACK QUANTITY	ART NO.
41 	300	3,5x20,0	A24T (MEDIUM / HARD)	10	66252829589
	300	3,5x22,23	A24T (MEDIUM / HARD)	10	66252829585
	356	4,0x20,0	A24T (MEDIUM / HARD)	10	66252829586
	356	4,0x22,23	A24T (MEDIUM / HARD)	10	66252829587
	356	4,0x25,4	ZA24T (HARD)	10	66252832744
	356	4,0x25,4	A24T (MEDIUM / HARD)	10	66252829588
	356	4,0x25,4	A24P (SOFT)	10	66252828620
	356	4,0x25,4	A24Q (MEDIUM)	10	66252833554
	406	4,0x25,4	A24P (SOFT)	10	66252919130

# TROUBLESHOOTING

## CUTTING WHEELS

WHEEL DOES NOT CUT			
CAUSE	SOLUTION	CAUSE	SOLUTION
In case of blue cutting: wheel too hard or too thick	Use softer wheels, check peripheral speed	Peripheral speed too low	Increase rpm up to max. (80m/sec 300mm, 100m/sec 350 & 400mm)

EXCESSIVE WEAR					
CAUSE	SOLUTION	CAUSE	SOLUTION	CAUSE	SOLUTION
In case of white cutting edge: wheel too soft	Use harder wheel	Operating speed too low	Increase rpm up to max. (80m/sec 300mm, 100m/sec 350 & 400mm)	Decrease of rpm during cutting	Use machine with more power, reduce pressure on the machine, clean machine filter and tighten machine belt

CRUMBLD WHEEL EDGE			
CAUSE	SOLUTION	CAUSE	SOLUTION
Workpiece is moving	Clamp the workpiece properly	Too much side-pressure	Add only the radial pressure to the wheel



GRINDING WHEELS AND  
CUPS FOR TRACK REPAIR  
& MAINTENANCE

# GRINDING RAIL TRACK

Norton offers an assorted range of organic grinding wheels, cups for all rail track repair and maintenance operations.

Product tiers differentiates by abrasive family, providing specific benefits in rail grinding applications.

Products are available in a range of grits 14, 16, 20, 24, and different grades. The bond (B) has been configured specifically for rail grinding applications.

## PREMIUM ZIRCONIA / ALUMINIUM OXIDE BLEND (AZ)

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### FEATURES

- Medium concentration of zirconia oxide abrasive

### BENEFITS

- Superior metal removal rate if high pressure is applied
- Perfect for technical applications for premium performances

## ALUMINIUM OXIDE (A)

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### FEATURES

- General purpose aluminium oxide, suitable for most operations

### BENEFITS

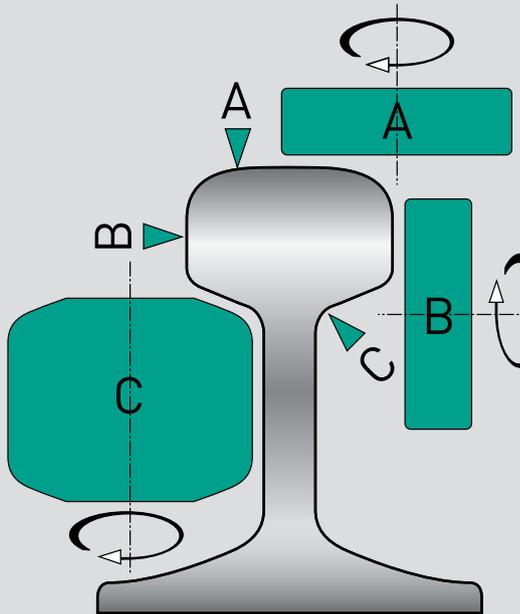
- Good compromise between wheel life and metal removal rate
- Cool and burn free grinding

This catalogue only lists the most common items found in Rail Maintenance Industry. Please contact us for any items not listed.

# GRINDING RAIL TRACK



The diagram below shows the different areas of rail track where grinding wheels are used:



## KEY:

- Area 1: Track head (A)
- Area 2: Lateral edge of track (B)
- Area 3: Web (C)

Two different types of grinding machine are commonly found for grinding and removing welds and re-profiling track; portable hand held and track mounted machines (fixed to the track and move along it).



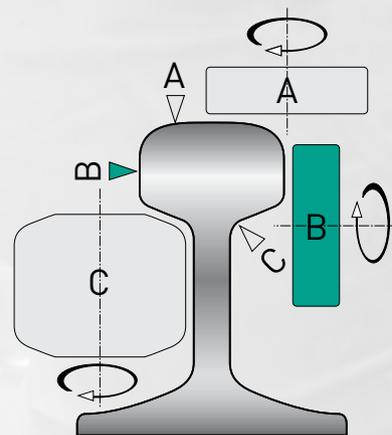
Portable hand-held machine



Track mounted machine

# GRINDING THE LATERAL EDGE OF THE TRACK (AREA B)

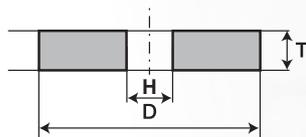
Organic wheels, cups for grinding the lateral edge of the track.



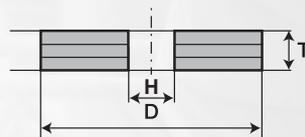
## STRAIGHT GRINDING WHEELS



SHAPE 01



SHAPE 01R



KEY:

D = Diameter  
T = Thickness  
H = Bore hole

### MADE TO ORDER

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	HOLE (H) (mm)	SPEED (m/s)
01	100 to 300	15 to 30	16 / 18 / 20 / 25,4 / 32	50 to 63 / 80 with reinforcement

### PRODUCT INDEX

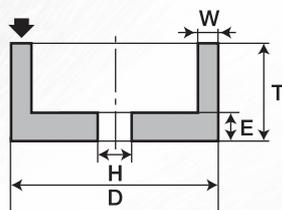
SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	HOLE (H) (mm)	SPECIFICATION	SPEED [M/S]	ART NO.
01	175	25	20	A16PBF	80	69078669610
01	230	23	25	AZ16SBF	63	66253145385

NOTE: Products with "BF" in specification include fiber reinforcement.  
For dimensions not available contact your local representative.

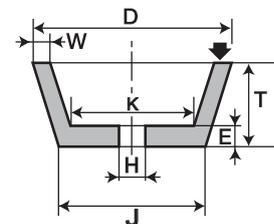
## STRAIGHT & TAPER CUPS



SHAPE 06



SHAPE 11



Cups with inserted nuts are used on angle grinders to prepare old rail surfaces for welding and for finishing grinding welds. In addition the cups are used on track mounted machines to reprofile the head of the rail (see page 21).

### KEY:

D = Diameter  
T = Thickness  
H = Bore hole  
E = Back thickness  
W = Rim width

K = Internal diameter  
(flat spot)  
J = External diameter  
(flat spot)

### MADE TO ORDER

SHAPE CODE	DIAMETER (D) [mm]	THICKNESS (T) [mm]	RIM WIDTH (W) [mm]	BACK THICKNESS (E) [mm]	INTERNAL DIAMETER (K) [mm]	EXTERNAL DIAMETER (J) [mm]	NUT TYPE	SPEED [m/s]
06	90 to 150	40 to 85	20 to 50	up to 20	-	-	5/8" / M14 / M20	50
11	100 to 154	50 to 60	20 to 40	up to 20	40 to 65	70 to 120	5/8" / M14 / M20 / 22	50

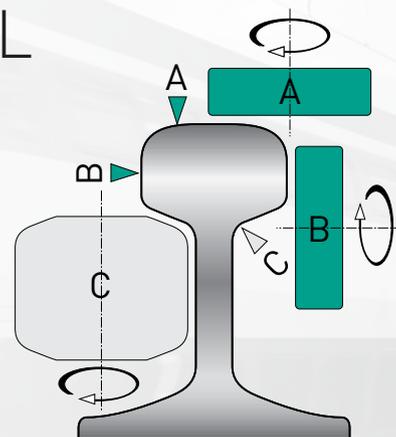
### PRODUCT INDEX

SHAPE CODE	DIAMETER (D) [mm]	THICKNESS (T) [mm]	RIM WIDTH (W) [mm]	BACK THICKNESS (E) [mm]	INTERNAL DIAMETER (K) [mm]	EXTERNAL DIAMETER (J) [mm]	NUT TYPE	SPEED [m/s]	SPECIFICATION	ART NO.
06	90	50	25	18	-	-	5/8"	50	A16NB	66243449878
06	108	50	29	18	-	-	M14	50	A16PB	66243449872
06	115	50	32,5	18	-	-	5/8"	50	A16QB	66243449871
11	125	50	25	19	58	94	M14	50	AZ160B	66243578052

For dimensions not available contact your local representative. Please remember to include drawing with nut type in the request.

# GRINDING THE HEAD & LATERAL EDGE OF THE TRACK (AREAS A & B)

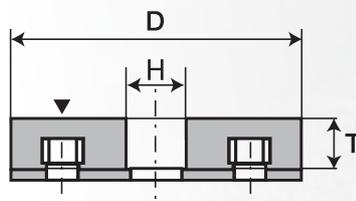
Organic disc wheels and straight cups for grinding the head and lateral edge of the track are used on track mounted machines.



## INSERTED NUT DISC WHEELS



SHAPE 36



### KEY:

D = Diameter  
T = Thickness  
H = Bore hole

### PRODUCT INDEX

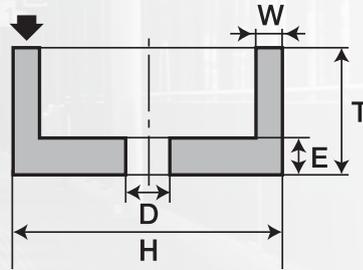
SHAPE CODE	DIAMETER (D) [mm]	THICKNESS (T) [mm]	HOLE (H) [mm]	NO. INSERT & SIZE	SPECIFICATION	SPEED [m/s]	ART NO.
36	150	75	57	4 M8	AZ24QB	50	69083145794
36	150	73	55,2	4 M8	A16NB	50	66243449939
36	200	80	130	4 M10	A24TB	50	66253488718

For dimensions not available contact your local representative. Please remember to include drawing with nut type in the request.

## STRAIGHT CUPS WITH STEEL BACKING



SHAPE 06



**KEY:**

- D = Diameter
- T = Thickness
- H = Bore hole
- E = Back thickness
- W = Rim width

### MADE TO ORDER

SHAPE CODE	DIAMETER (D) [mm]	THICKNESS (T) [mm]	RIM WIDTH (W) [mm]	BACK THICKNESS (E) [mm]	NUT TYPE	SPEED [M/S]
06	150	40 to 80	40 to 55	18 to 20	5/8" / M14 / M20	50

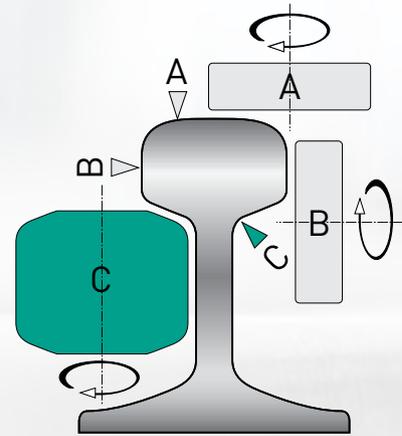
### PRODUCT INDEX

SHAPE CODE	DIAMETER (D) [mm]	THICKNESS (T) [mm]	RIM WIDTH (W) [mm]	BACK THICKNESS (E) [mm]	NUT TYPE	SPECIFICATION	SPEED [m/s]	ART NO.
06	150	65	40	20	M20	A14PB	50	69083122263

For dimensions not available contact your local representative. Please remember to include drawing with nut type in the request.

# GRINDING THE WEB OF THE TRACK (AREA C)

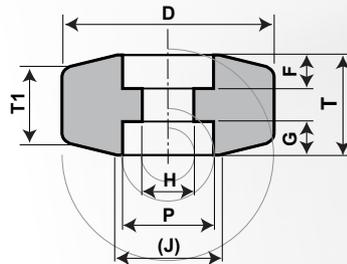
Wheels with a special profile are needed for grinding connection chambers and the web of the track.



## ORGANIC GRINDING WHEELS



SHAPE 07X



### KEY:

- D = Diameter
- T = Thickness
- H = Bore hole
- P = Recess width
- G = Recess depth
- F = Recess depth

For product dimensions, please contact your local Norton representative. Please remember to include drawing in the request.

# TECHNICAL INFORMATION

Several operational factors can influence the wheel specification required for the application. General guidelines can be found below:

## SELECT A SOFT GRADE FOR:

- Hard to grind materials
- Large contact areas
- Rapid stock removal
- Low power machines (less than 5 kW)

## SELECT A HARD GRADE FOR:

- Softer steel, gray iron
- Small contact areas
- Longer wheel life
- High power machines

## SELECT THE RIGHT ABRASIVE:

- Use a durable abrasive for grinding low tensile steel
- Use a friable abrasive for grinding tough and durable steel
- When finish is not important use coarse grit (14-16) because it increases wheel life and material removal rate
- Use zirconia abrasive when machine power is high enough

# TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SUGGESTED CORRECTION
Poor stock removal	Insufficient pressure applied Wheel too coarse or hard	Increase pressure to use all available power Use finer grit and / or softer grade wheel
Excessive wheel wear	Wheel acting too soft	Use coarser and / or harder wheel
Wheel load or glazing	Grade too hard Grit too coarse	Try a softer grade Try a finer grit
Wheels are 'dusty'	Wheel too soft	Try a harder grade
Wheel doesn't hold corner	Wheel too coarse Wheel too soft	Use finer grit Use harder grade
Burning the workpiece	Wheel too hard	Use a softer grade
Surface finish too rough	Wheel too coarse	Try a finer grit



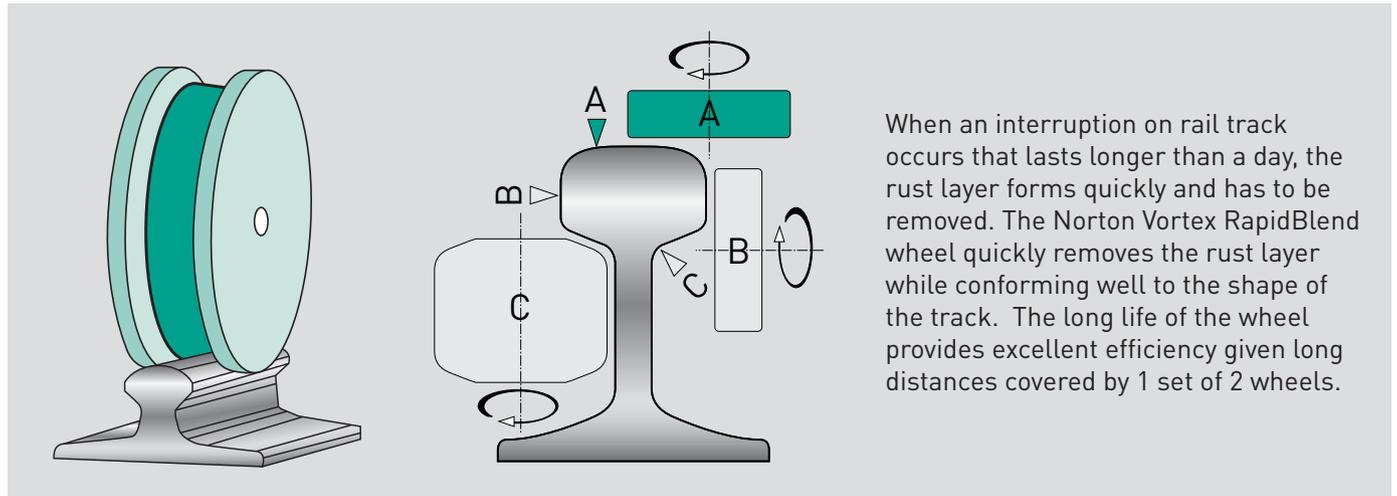
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# CLEANING WHEELS

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# TRACK HEAD CLEANING WITH NORTON VORTEX RAPIDBLEND WHEELS (AREA A)



## PRODUCT INDEX

DIM DxWxB(mm)	CAP CODE	GRADE	PK QTY	RPM	ART. NO.
200x25x25	U2305	VTX-5AM	1	4000	66623395151

The wheel is mounted as a pair on below portable machine



Norton Vortex Rapid Blend

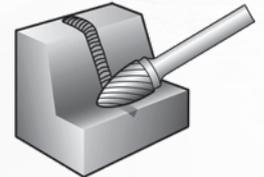
NORTON ALSO OFFERS ADDITIONAL SOLUTIONS FOR HEAVY AND DEMANDING STEEL OPERATIONS, SUCH AS:



CORE DRILLS



BRUSHES



TUNGSTEN  
CARBIDE BURRS

For more information, please contact your local Norton representative.

EXPLORE THE ENTIRE NORTON ABRASIVES PRODUCT PORTFOLIO WITH OUR COMPREHENSIVE CATALOGUE.



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