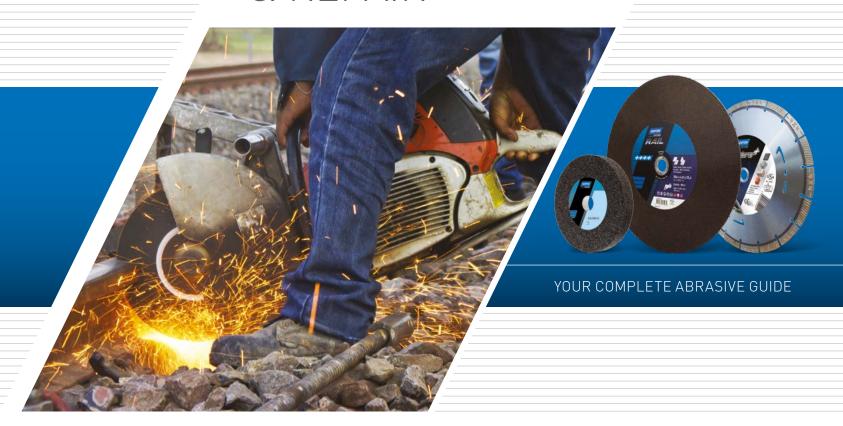


RAIL TRACK MAINTENANCE & REPAIR











FOR OVER 100 YEARS OUR CUSTOMERS HAVE BENEFITED FROM NORTON'S HIGH PERFORMANCE ABRASIVE SOLUTIONS RIGHT ACROSS THE WORLD; FROM INNOVATIVE STOCK PRODUCTS TO HIGHLY ENGINEERED LINES FOR BESPOKE APPLICATIONS.

NORTON FOR EXTREME RAIL ENVIRONMENTS.





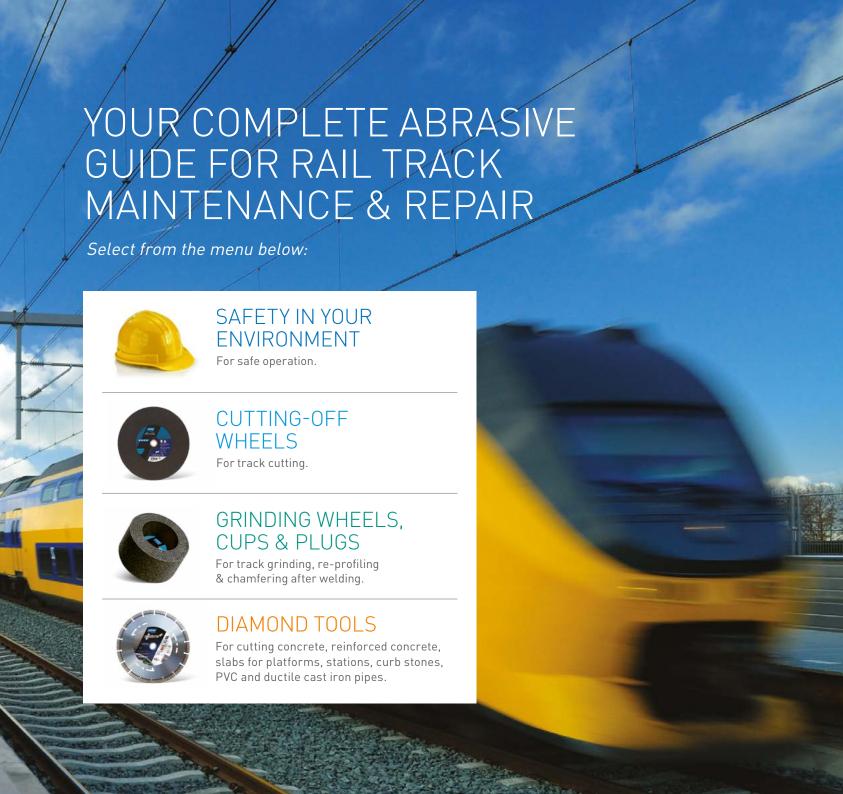
As rail track technology continues to make major advances, Norton is generating powerful, innovative, user friendly solutions to cut, shape and grind heavy duty steels.

Steel used in the manufacture of rail tracks is purer 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, as well as cutting tools needed in the building and repair of platforms, sleepers, stations and curb stones.

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







OPERATING SPEEDS

Norton products are designed and tested for certain applications and operating speeds. Suitable materials are indicated on the wheel label. Before mounting cutting-off or grinding wheels on the machine, ensure that the operating speed of the machine does not exceed the maximum operating speed as marked on the product.

WHEEL DIAMETER	MAXIMUM OPERATING SPEED IN METERS PER SECOND CONVERTED TO REVOLUTIONS PER MINUTE								
(mm & inches)	35 m/s	50 m/s	80 m/s	100 m/s					
115mm (4.1/2")	5850	8350	13300	-					
125mm (5")	5350	7650	12250	-					
150mm (6")	4500	6400	10200	-					
180mm (7")	3750	5350	8500	-					
200mm (8")	3350	4800	7650	-					
230mm (12")	2950	4200	6650	-					
250mm (10")	2700	3850	6150	-					
300mm / 305mm	-	-	5100	6400					
350mm / 356mm	-	-	4400	5500					
400mm / 406mm	-	-	3650	4800					

PERSONAL PROTECTION

Safety goggles, ear defenders, safety gloves, dust masks and, if conditions are severe, additional face protection. Leather aprons and safety shoes must be worn.



Respiratory Protection



Wear Gloves



Eye Protection



Protection



Read Instructions



Damaged Wheel – Do not use

GENERAL PRECAUTIONS

Safety instructions provided by the machine manufacturer must be followed. Where fitted, all guards, covers and hoods must be in place on the machine during cutting, and should not be modified in any way. Abrasives should not be used near inflammable material or in an environment where there is a risk of explosion. Use original machine flanges that come with the machine, do not use flanges of smaller or odd size.

Sparks should be directed away from the face and body, if possible towards the floor. The workpiece must be firmly fixed before cutting or grinding starts. Check all abrasives visually before use and make certain that the product is suitable for the application. No modifications should be made to abrasive products after delivery. When using a portable machine always switch it off and allow the spindle to stop completely before putting the tool down.



CUTTING-OFF WHEELS FOR RAIL TRACK

The Norton Rail range is a complete program of cutting wheels providing precision, speed and power on any rail type (subway, tram, train) and any rail cutting machine with a clamping device (electrical and petrol).

Four types of wheel are available, defined by the hardness and composition of the wheel (grain type):

NORTON RAIL A24P

A24Q

A24T

NORTON RAIL ZA24Q LATEST INNOVATION IN CUTTING WHEELS

NORTON RAIL WHEEL ZA24Q

Thanks to advances in Saint-Gobain's research and development, the new ZA24Q rail cutting wheel features innovative new bond technology and a special combination of premium aluminium oxide and zirconia alumina grain.

The new bond technology, which retains the grain inside the wheel longer than any other, allows better cutting power and reduced wear for wheels which last longer and cut more than any other.

INNOVATIVE BOND **TECHNOLOGY**



FASTER CUTTING LONGER LIFE

SAVING YOU TIME AND MONEY!



ZA24Q: WHAT DOES IT MEAN FOR YOU?

FEATURES

- Sharp high performance premium grain & optimised bond technology
- Optimized bond and wheel density
- Four specifications available
- Glass cloth reinforcement

BENEFITS

- Fast cutting speed (UIC60 can be cut in 75 90 seconds)
- Achieves a precise cut
- White and free cutting
- Optimized for use on steel & railway track
- Perfect straight cut (less than 1% horizontal and vertical deviation)
- Vast reduction in wheel wear for long product life
- Low vibration on the machine for improved user comfort
- Consistent performance for improved cut quality
- Covers all rail machine horsepower and all rail types: subway, tram, train
- Suitable for use on powerful machines running at 100m/s for 350mm wheels and 80m/s for 300mm wheels
- Maximum operator safety

"IT REALLY 'GRABS' THE METAL EASILY WITHOUT BOUNCING ON THE STEEL OR REQUIRING A LOT OF PRESSURE. IT'S COMFORTABLE TO USE, IT OPERATES LIKE A SOFT WHEEL, WITH THE PRODUCT LIFE OF A HARD WHEEL."

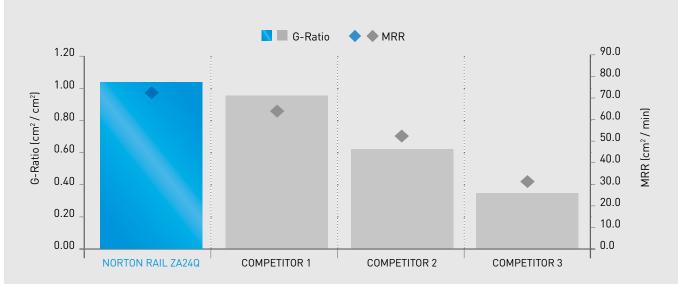
Derk Vruwink, Product Manager, Saint-Gobain Abrasives

NORTON RAIL ZA24Q CUTTING TEST

In a cutting test, four wheels including Norton Rail ZA24Q and three closest competitors each made three cuts in a piece of UIC60 – UIC rail 170 track.



THE RESULTS SPEAK FOR THEMSELVES...



TEST PARAMETERS:

Machine: 356 MM HUSQVARNA K 1250

Material: UIC60 – UIC rail 170 Measuring: 3 cuts per wheel NORTON RAIL ZA24Q LASTED 20% LONGER & CUT 15% QUICKER THAN THE CLOSEST COMPETITOR.



SELECTING THE RIGHT WHEEL

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

	300mm ZA24Q INNOVATION	300mm A24T MEDIUM	350mm ZA24Q MEDIUM	350mm A24T MEDIUM	350mm A24P S0FT	350mm ZA24T HARD	350mm A24Q MEDIUM	400mm ZA24Q INNOVATION	400mm A24P S0FT
MATERIAL									
Rail Bar 54 E1	•	•							
Rail Bar 60 E1	•	•	•	•	•	•	•	•	•
ATTRIBUTE									
Comfortable cut	•		•		•			•	•
Fast cut	•		•		•		•	•	•
Long life	•	•	•			•		•	
Less rework on burrs	•		•		•		•	•	
Straight cutting	•	•	•	•	•	•	•	•	•
No blueing	•	•	•	•	•			•	•
MACHINE									
Husqvarna K1260 5,8kW	•	•	•	•	•	•	•	•	•
Robel 5,8kW	•	•	•	•	•	•	•	•	•
Geismar MTZ	•	•	•	•	•	•	•	•	•

PRODUCT INDEX

WHEEL TYPE	DIAMETER (mm)	THICKNESS x BORE (mm)	SPECIFICATION	PACK QUANTITY	ART NO.
	300	4.0x25.4	ZA24Q	10	66252833664
41	350	4.0x25.4	ZA24Q	10	66252830924
	400	4.0x25.4	ZA24Q	10	66252833665
RAIL METAL					
	300	3,5x20,0	A 24 T	10	66252829589
	300	3,5x22,23	A 24 T	10	66252829585
		4,0x20,0	A 24 T	10	66252829586
		4,0x22,23	A 24 T	10	66252829587
41	350		ZA 24 T	10	66252832744
		4,0x25,4	A 24 T	10	66252829588
			A 24 P	10	66252828620
	350	4,0x25,4	A 24 Q	10	66252833554
	400	4,0x25,4	A 24 P	10	66252919130



CUTTING-OFF WHEELS

TECHNICAL INFORMATION

BF 41

FLAT CUTTING-OFF WHEELS

Rail cutting-off 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 350mm and 400mm.

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

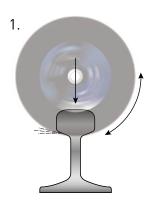
UNDERSTANDING THE PRODUCT

- 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-OFF

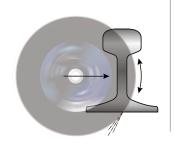
Arrange the workpiece so that a uniform section can be cut



2.



3.



KEY:

Direction of cut



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

TROUBLESHOOTING

CUTTING-OFF WHEELS

WHEEL DOES NOT CUT

Cause	In case of blue cutting: wheel too hard or too thick
Solution	Use softer wheels, check peripheral speed
Cause	Peripheral speed too low
Solution	Increase rpm up to max. (80m/sec 300mm, 100m/sec 350 & 400mm)

EXCESSIVE WEAR

Cause	In case of white cutting edge: wheel too soft
Solution	Use harder wheel
Cause	Operating speed too low
Solution	Increase rpm up to max. (80m/sec)
Cause	Decrease of rpm during cutting
Solution	Use machine with more power, reduce pressure on the machine, clean machine filter and tighten machine belt

CRUMBLED WHEEL EDGE

Cause	Workpiece is moving
Solution	Clamp the workpiece properly
Cause	Too much side-pressure
Solution	Add only the radial pressure to the wheel



GRINDING RAIL TRACK

Norton offers an assorted range of organic grinding wheels, cups and plugs 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 grades P (soft), Q (medium), R (hard). The bond (B) has been configured specifically for rail grinding applications.

PREMIUM ZIRCONIA / ALUMINIUM OXIDE BLEND (AZ)

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)

FEATURES

 General purpose aluminium oxide, suitable for most operations

BENEFITS

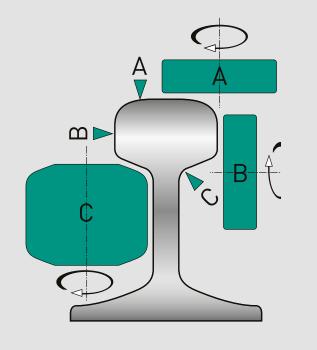
- Good compromise between wheel life and metal removal rate
- Cool and burn free grinding

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.)



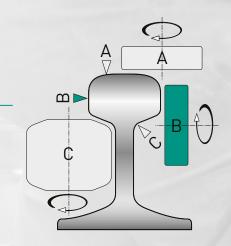
Portable hand-held machine



Track mounted machine

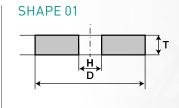
GRINDING THE LATERAL EDGE OF THE TRACK (AREA B)

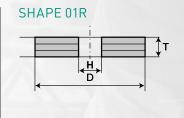
Organic wheels, cups and plugs for grinding the lateral edge of the track.



STRAIGHT GRINDING WHEELS







KEY: D = Diameter T = Thickness H = Bore hole

MADE TO ORDER

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	BORE HOLE (H) (mm)	SPEED (m/s)
01	125 to 200	18 to 25	16 / 20 / 25.4	
01	175	25	20	50 to 63 / 80 (with reinforcements)
01	230	8.5	22.5	(man reimereemente)

PRODUCT INDEX

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	BORE HOLE (H) (mm)	SPECIFICATION	ART NO.
01	175	25	20	A16PBF	66243480471
01	230	23	25	AZ16RBF	66253145385

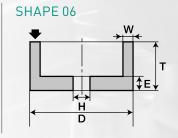
NOTE: Products which include 'BF' in the specification include fiber reinforcement.

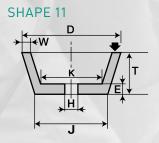
For dimensions not available contact your local representative.



STRAIGHT & TAPER CUPS







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 26).

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)	NUT TYPE*	SPEED (m/s)
06	50	60	13.5	18	5′ 8 W	50
06	73	60	18	23	5′ 8 W	50
06	90	50	20-15	18	5′ 8 W	50
06	115	50	32.5	18	5′ 8 W	50
06	127	65	36	15	5' 8 W	50
11	110	56	20	22	M14	50
11	120	56	30	18	M14	50

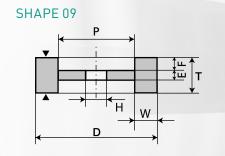
^{*}Other nut types are available e.g.: M20

PRODUCT INDEX

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	BORE HOLE (H) (mm)	RIM WIDTH (W) (mm)	BACK THICKNESS (E) (mm)	INTERNAL DIAMETER (K) (mm)	EXTERNAL DIAMETER (E) (mm)	SPECIFICATION	ART NO.
06	90	50	5/8	20	18	-	-	A16QB	69083107074
06	115	50	5/8	32	18	-	-	A16QB	69083110027
06	127	65	M20	36	15	-	-	A16QB	69083122218
11	120	56	5/8	30	18	96	45	A20RB	66243469976

DOUBLE CUP GRINDING WHEELS





KEY:

D = Diameter

T = Thickness

H = Bore hole

P = Recess

W = Rim width

E = Back thickness

F = Recess depth

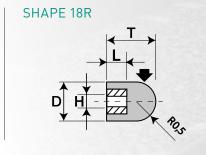
PRODUCT INDEX

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	BORE HOLE (H) (mm)	RECESS (P) (mm)	RIM WIDTH (W) (mm)	BACK THICKNESS (E) (mm)	RECESS DEPTH (F) (mm)	SPEC	SPEED (m/s)	ART NO.
09	254	40	76.2	166	44	20	10	A14QB	50	66243581507

Type 05 wheels are also available (recess on one side only) for the same application. For dimensions not available contact your local representative.

PORTABLE PLUGS





KEY:

D = Diameter

T = Thickness

H = Bore hole

L = Nut length

Plugs can be used during maintenance of track during mounting of repaired rails.

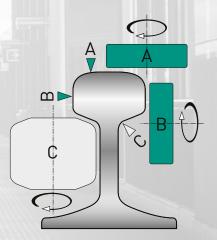
PRODUCT INDEX

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	BORE HOLE (H) (mm)	SPECIFICATION	SPEED (m/s)	ART NO.
18R	75	100	M20	AZ16SB	50	66243471943



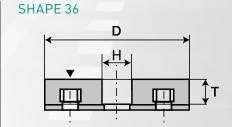
GRINDING THE HEAD & LATERAL EDGE OF THE TRACK (AREAS A & B)

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





KEY:

D = Diameter T = Thickness

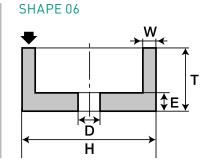
H = Bore hole

PRODUCT INDEX

CHARE CORE	DIMENSIONS (mm)			NO. INSERT		CDEOLEIGATION	CDEED (/)	ADT NO	
SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	BORE HOLE (mm)	& SIZE		SPECIFICATION	SPEED (m/s)	ART NO.	
36	150	73	55.2	4	М8	A14QB	50	69083102298	
36	200	80	130	4	M10	A24PB	50	69083102296	

STRAIGHT CUPS WITH STEEL BACKING





KEY:

D = Diameter

T = Thickness

H = Bore hole

E = Back thickness

W = Rim width

MADE TO ORDER

SHAPE CO	DE DIAMETER (D) (mm)	THICKNESS (T) (mm)	RIM WIDTH (W) (mm)	BACK THICKNESS (E) (mm)	HOLE (H)- NUT (OTHERS AVAILABLE)	SPEED (m/s)
06	150	40-80	40-55	18-20	5/8" - M20	40-50

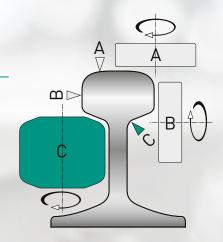
PRODUCT INDEX

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	RIM WIDTH (W) (mm)	BACK THICKNESS (E) (mm)	BORE HOLE (H) (mm)	SPECIFICATION	ART. NO.
06	150	40	50	18	5/8"	A16RB	69083122221
06	150	65	40	20	M20	A14PB	69083122263



GRINDING THE WEB OF THE TRACK (AREA C)

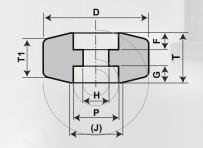
Wheels with a special profile are needed for grinding connection chambers and the web of the track.



ORGANIC GRINDING WHEELS



SHAPE 07X



KEY:

D = Diameter

T = Thickness

H = Bore hole

P = Recess width

G = Recess depth

F = Recess depth

PRODUCT INDEX

SHAPE CODE	DIAMETER (D) (mm)	THICKNESS (T) (mm)	BORE HOLE (H) (mm)	T1 (mm)	RECESS WIDTH (P) (mm)	J (mm)	RECESS DEPTH (G) (mm)	RECESS DEPTH (F) (mm)	SPECIFICATION	ART NO.
07X	135	95	25,4	67,7	55	60	32.5	32.5	A24QB	66243480461

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		



CUTTING BUILDING MATERIALS

Norton offers a number of diamond products and machines for cutting concrete, reinforced concrete, slabs for platforms, stations, curb stones, platform edges as well as the installation of utilities (lighting, air conditioning), signage and cable brackets.

4x4 EXPLORER+

A multipurpose blade with laser welded segments for dry or wet cutting, Norton 4x4 Explorer+ provides high performance, long life and high speed cutting in a wide range of construction materials. Featuring a patented depth indicator for monitoring blade life and cutting direction, and 'anti-crack' gullets for enhanced safety.

APPLICATIONS

- Reinforced concrete
- Concrete lintels
- Limestone concrete
- Concrete roof tiles
- Paviours and blocks
- Granite & natural stones

- Asphalt
- Asphalt over concrete
- Breeze blocks
- Gridstone
- Sandstone
- Steel parts up to 5mm thickness

ITEM NO	EAN 13 CODE	MACHINE	DIAMETER (mm)	BORE (mm)	SEGMENT H/W
701846 25307	5450248 345329	\$ -	115	22,23	10/2,2
701846 47279	5450248 557234	3 —	125	22,23	10/2,2
701846 43654	5450248 512516	3 —	180	22,23	10/2,5
701846 47280	5450248 557241	3-	230	22,23	12/2,5
701846 46881	5450248 549994	%	300	20	12/3,0
701846 46870	5450248 548898	ST H ST	300	25,4	12/3,0
701846 46154	5450248 538448	ST H ST	350	25,4	12/3,2
701846 46571	5450248 545538	%	350	20	12/3,2
701846 47348	5450248 558804	ST H ST	400	25,4	12/3,2
701846 47374	5450248 559399	Ó ₩⊳	400	20	12/3,2
701846 47349	5450248 558811	F 03	450	25,4	12/3,2
701846 94008	5450248 587248	F: 03	500	25,4	10/3,8



IN BENCHMARK
TESTS, 4x4 EXPLORER+
OUT PERFORMED
ALL COMPETITOR
MULTIPURPOSE
BLADES, PROVING
AN EXCELLENT
INVESTMENT IN
ANY APPLICATION.



NORTON SILENCIO

With up to 17mm high segments and a bespoke specification for each application, Norton Silencio is an efficient diamond blade for granite, concrete and general purpose materials, while protecting the surrounding area from disturbing cutting noise.

FOR HANDHELD CUT-OFF SAWS:

- Noise reduction up to -11dB(A): 13 times less noise than a conventional blade!
- Extremely fast cutting and long lasting, thanks to a bespoke segment specification.
- Applications: concrete, reinforced concrete, kerb stones, block paviours, granite, natural stones, and general purpose building materials.

Caution: this version is especially designed for use on handheld cut-off saws.

ITEM No.	EAN 13 CODE	MACHINE	DIAMETER (mm)	BORE (mm)	SEGMENT H/T
701846 29000	5450248 398226	Ó ™	300	20	15/3,1
701846 42421	5450248 498308	%	300	25,4	15/3,1
701846 47780	5450248 570998	%	350	20	15/3,1
701846 28999	5450248 398219	%	350	25,4	15/3,1
701846 94504*	5450248 688518	ॐ	400	20	15/3,1
701846 43510	5450248 510604	ॐ	400	25,4	15/3,1

^{*}Available on request

Norton Silencio is also available in bespoke versions for all typical light construction cutting machines: angle-grinders, floor saws and masonry saws, from diameter 230mm up to 900mm.

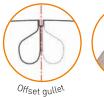






THE QUIETEST DIAMOND BLADE ON THE MARKET, WITH PREMIUM CUTTING PERFORMANCE.

Norton Silencio patented offset-gullet design prevents any air flow to go through the steel-centre and completely cancels out the whistling effect you hear on standard diamond blades.





CLIPPER PRO MULTI-RUNNER

A reliable, precise and fast cut across a wide variety of building materials, the Clipper Pro Multi Runner is a vacuum-brazed diamond blade for drycutting on angle-grinders and handheld cut-off saws. Provides a smooth, fast cut with long life and constant cutting depth, compared to conventional abrasive wheels.

APPLICATIONS

- General purpose building materials Roof shingles
- Concrete and reinforced concrete
- Paving and slabs
- Stones

- Plastics, PVC
- Fibreglass composites, GFK
- Ductile cast iron and non-ferrous metals

ITEM No.	EAN 13 CODE	MACHINE	DIAMETER (mm)	BORE (mm)	THICKNESS (mm)
701846 94459	5450248 687894	\$	115	22,23	2,8
701846 94460	5450248 687900	3	125	22,23	2,8
701846 94461	5450248 687917	\$-	180	22,23	2,8
701846 94462	5450248 687924	\$-	230	22,23	3,1
701846 94463	5450248 687931		300	20	3,4
701846 94464	5450248 687948		350	25,4	3,4

























GRINDING BUILDING MATERIALS

CLIPPER PRO CG-Z

Diamond grinding wheels for concrete repair work have an innovative segment shape with self-sharpening diamond segments to ensure fast and smooth material removal. New enhanced specification for longer product life and better productivity.

APPLICATIONS

For the rectification of surface defects in concrete, bricks and natural stone. Dry grinding only with 125mm right angle-grinders or dedicated grinder power tools. The use of dust extraction systems is highly recommended for this application.

ITEM No.	EAN 13 CODE	MACHINE	DIAMETER (mm)	BORE (mm)	SEGMENT H / T
701846 46192	5450248 575399	\$	125	22,23	7





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