

A detailed close-up photograph of a grinding operation. A dark, textured grinding wheel is shown in contact with a metal workpiece. The workpiece has a bright, polished surface on one side and a dark, oxidized or rusted surface on the other. The grinding process is creating a fine, granular texture on the metal surface. The image is high-contrast, with deep blacks and bright whites, emphasizing the textures and the precision of the manufacturing process.

MIRKA

Tool manufacturing

ABOUT US

Mirka's journey began in Finland in 1943, and we have been driving innovation in the coated abrasives industry ever since. In 2009 we set our sights on the precision industry field, with a focus on industrial customers demanding high performance, high quality, reliable products and solutions. This shaped our strategy of gaining competence through the careful acquisition of companies that augment the Mirka brand and product portfolio. A key aspect of joining Mirka is sharing common values – Responsibility, Innovation, Respect and Dedication. In addition their acquisition should open up new markets and opportunities. In 2017, this led to the acquisition of

Cafro – a family-owned Italian producer of superabrasive grinding wheels with a perfect portfolio match. In 2021, the acquisition of Italian superabrasive dressing roll manufacturer Urma Rolls was a natural next step. In 2022 the Mirka family grew even larger when the Finnish robotics company Flexmill was acquired, allowing us to offer complete solutions and integration services for automated and robotized sanding and grinding operations. Our focus remains on providing customers with a complete solution to their industrial needs, and Mirka's upcoming acquisitions stand to further improve our market position.



Contact / Visit

Mirka Head Office
Pensalavägen 210
FI-66850 Jeppo
Finland

**Customer Service
(Central)**
Phone +358 (0)20 760 2111
customerservice@mirka.com

CONTENT

TOOL MANUFACTURING INTRODUCTION & WEBSITE.....4

Mirka Bond system for superabrasives 5

FEPA Shapes6-7

ROUND TOOL MANUFACTURING8

 Flute Grinding9

 Gashing10

 Clearance Grinding11

 Cut-off 12

SAW GRINDING AND RESHARPENING13

Circular saws

 Facing.....14

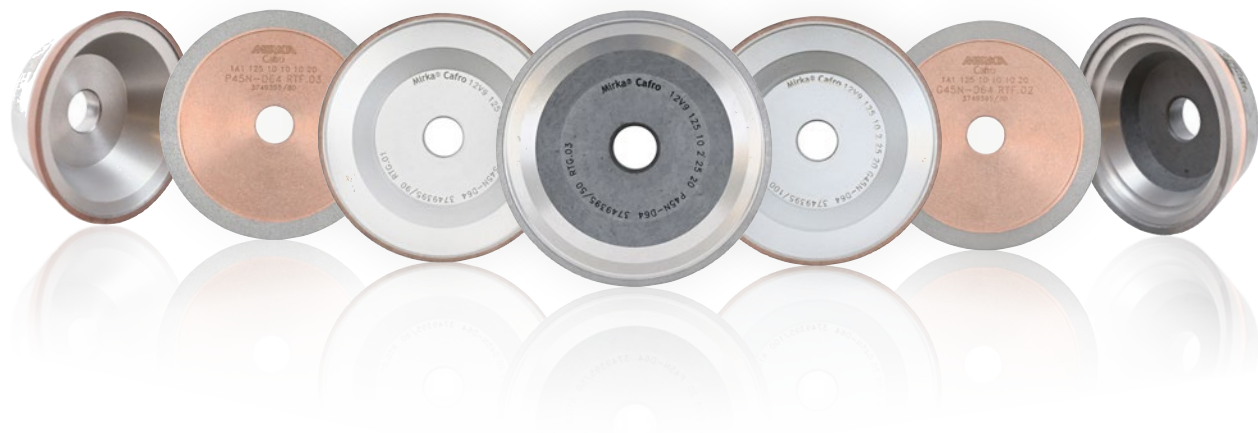
 Topping14

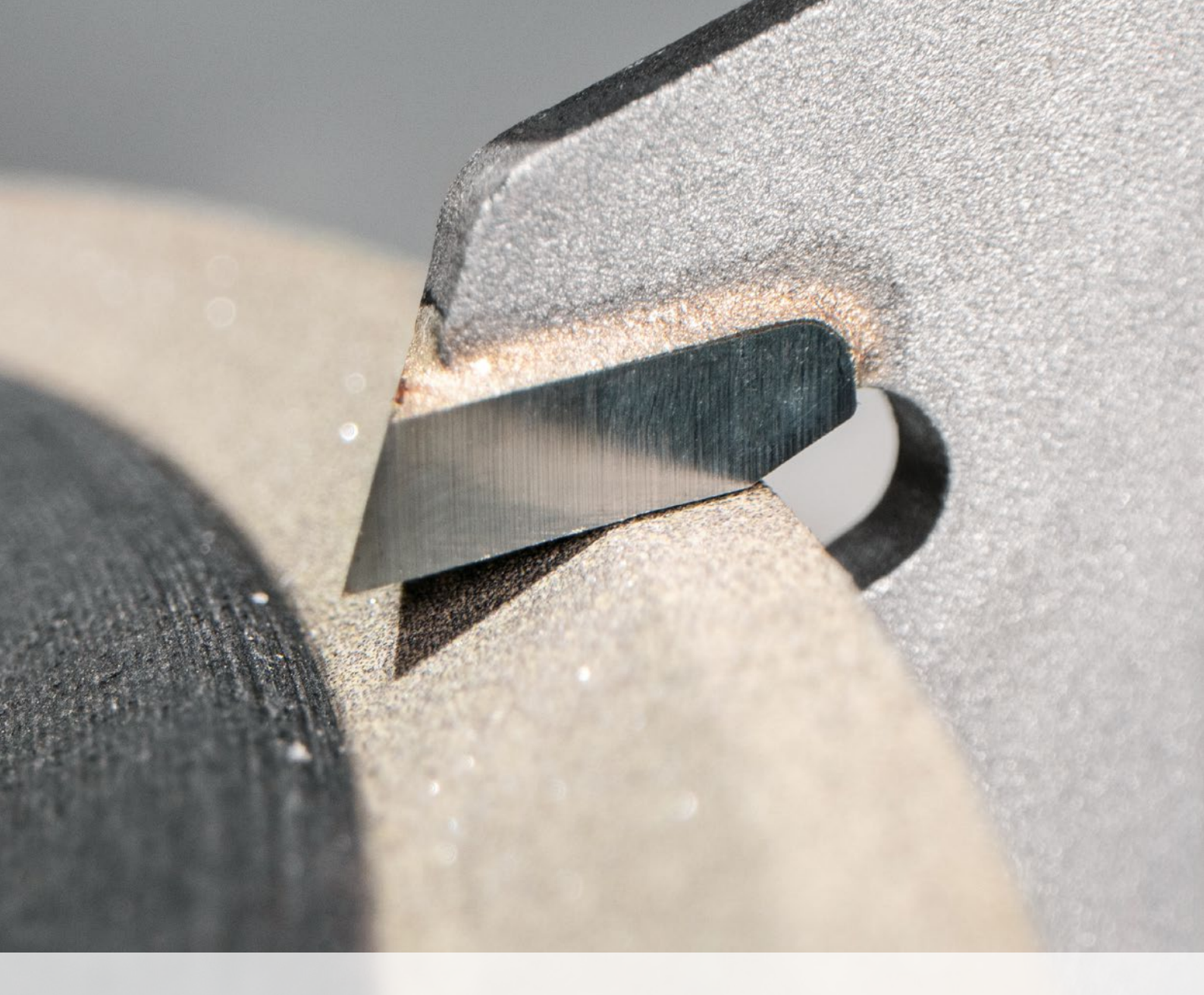
 Side Grinding 15

Band saws

 Profile Grinding15

 Side Grinding15





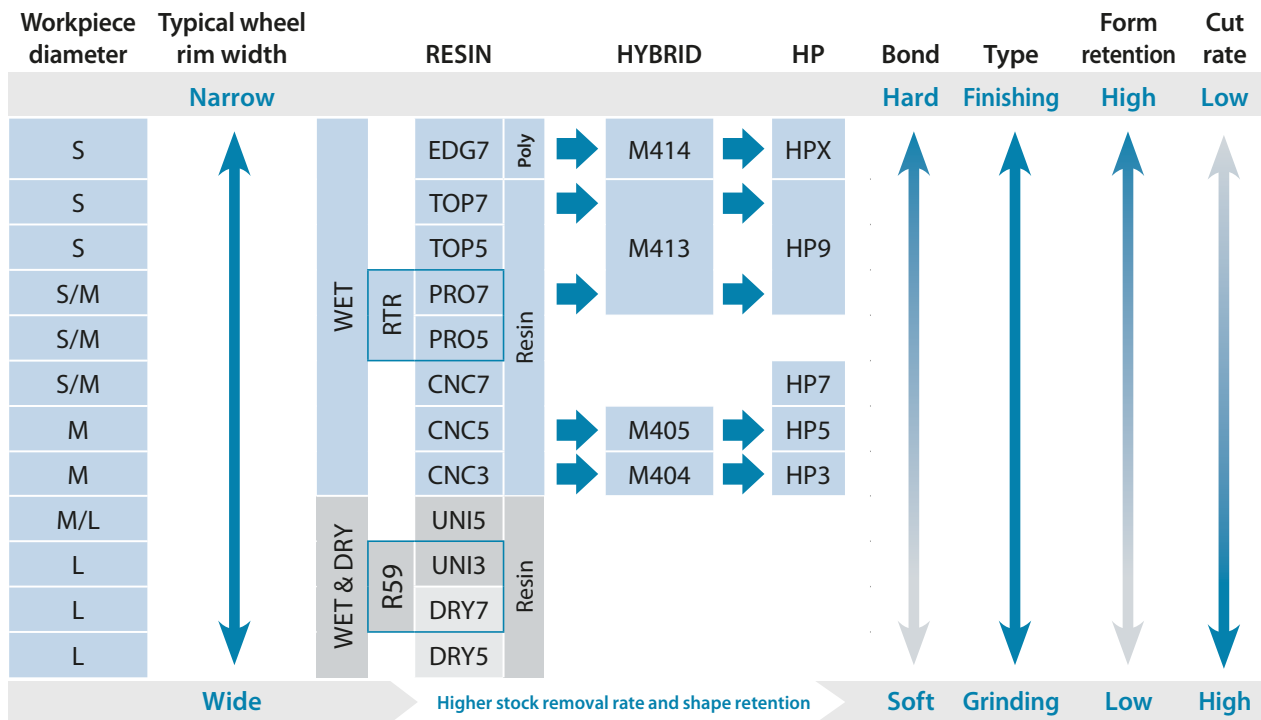
TOOL MANUFACTURING

– It takes tools to make tools



Our world-class Mirka® Cafro superabrasives help you get the job done efficiently and easily. Our dedication to the finish, means we are constantly working to improve our products in order to offer the ideal solution for your tool manufacturing needs.

MIRKA BOND SYSTEM FOR SUPERABRASIVES



Wheel rim width:

Small contact: Below 10 mm

Medium contact: 10-20 mm

Large contact: Above 20 mm

FEPA Shapes

FEPA Shapes

Standard shape		Some of the most common derived shapes					
6A2		6C2		6V5		6Y2	
9A3		9A9					
4A2		4V2		1A2		1V2	
13A2		13V2		13BH2		4V5	
11A2		11C2		11V2		11V5	
11V9		15V9		11V9P			
4BT9		4B9		4B2		4ET2	
12V4		11V4					
14A1		14D1V		14A1Q		3A1	
1A1		1D1V		1Q1		1M1	
≥75mm Ø							
14F1Q		1F1R		14F1		1P1	
14FF1		1FF1		1GG1		1DD1	
1A1W		1U1W		1DD1W			
1A1		1A8		6A9P			
<75mm Ø							

Standard shape		Some of the most common derived shapes	
6A9		6V9	
11VV2		3AA1	
10A2		14AA1	
12A2		10BH2	
12V9		10V2	
13V9		12V9P	
1A1R		10V9	
14EE1		SHARK	
1V1		4V9	
1VF1		1A1X	
L		3A1R	
PL		14A1R	
1U1W		1E1	
		14E1	
		1V1P	
		3V1	
		1VF1P	
		3VF1	
		LG10	
		PMR	
		1PL	
		1EE1W	
		1R1W	

Designation according to the standard ISO 6106-2005 and FEPA 2005

ROUND TOOL MANUFACTURING

Production of endmills, drills and other tools

Round tools shape our modern world, and Mirka® Cafro's superabrasive wheels shape the round tools. Each feature of a tool needs the correct wheel to shape it; precisely, efficiently, and consistently.

A high-quality tool is made from high speed steel (HSS) or tungsten carbide and is produced by the precision grinding and shaping of round stock using specialized tool grinding machines. The working properties of the tool are set by the specific angles and characteristics of the cutting edges created during grinding.

This grinding process can take place with or without coolant, but the greatest efficiency is achieved

by using high-pressure coolant on a high-end machine.

Whether for cut-off, fluting, gashing, clearance, or other operations Mirka® Cafro grinding wheels provide the cutting power, wheel life, precision, and thermal control you need to manufacture precision tungsten carbide round tooling; endmills, drills, reamers, routers, taps, and more.



Wide range of Mirka® Cafro wheels

- Resin, metal, and hybrid-bonded wheels are available.
- Mirka R&D department is working to develop new bonds and qualities to meet the need for greater wheel performance. Our HP hybrid-bonded wheels are a prime example.
- Stocked and standard wheel options allow you to quickly identify and order the right wheel for your machine and specific operation.
- Grind precisely and efficiently while leaving an optimal surface finish.

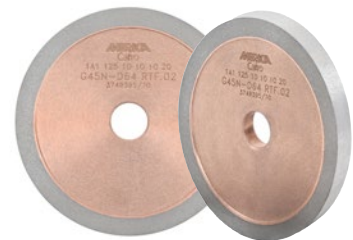
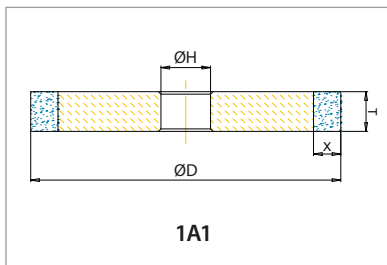


Flute grinding

Flute grinding is an operation that pushes the limit of what a superabrasive wheel is capable of. The wheel is in full contact with a rotating tool blank, cutting the characteristic flutes of an end mill or drill.

Fluting demands an aggressively cutting wheel, able to handle the intense heat and forces generated by the deep grinding zone, all while maintaining its profile and leaving an acceptable finish. It takes a quality wheel; Mirka® Cafro fluting wheels are up to the challenge.

St Code	Shape	Ø D	W	X	T	Ø H	Grain	Grit	BOND	Mirka Code
H.36	3A1	100	6	10	10	20	Diamond	64	M405	E5759001L8D28405.16
H.09	1A1	100	8	10	8	20	Diamond	64	M405	E59720021J328405.16
D.33	1A1	100	10	6	10	20	Diamond	107	DRY5	0465406244S25DR5.16
H.37	1A1	100	10	10	10	20	Diamond	64	M404	E59730021J328404.16
H.PA	1A1	100	10	10	10	20	Diamond	64	HP3	E59730021J328H3P.16
H.38	1A1	100	12	10	12	20	Diamond	64	M404	E50950021J328404.16
H.PB	1A1	100	12	10	12	20	Diamond	64	HP3	E50950021J328H3P.16
D.32	1A1	125	10	6	10	20	Diamond	107	DRY5	0511707244S25DR5.16
H.40	1A1	125	10	10	10	20	Diamond	64	M404	E60720021J328404.16
H.PH	1A1	125	10	10	10	20	Diamond	64	HP3	E60720021J328H3P.16

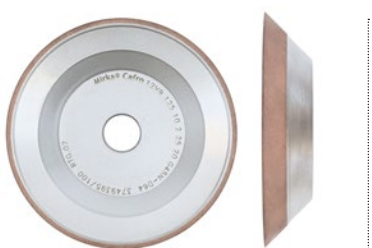
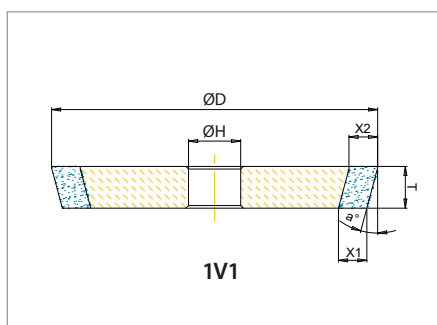
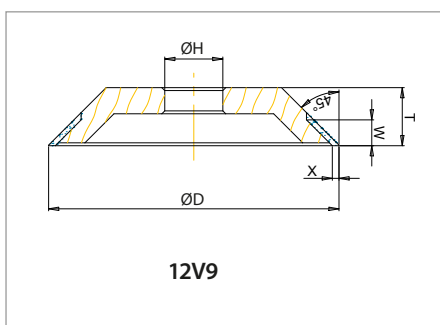




Gashing

Gashing is a challenging operation, requiring the superabrasive wheel to maintain its precise profile while still removing a large amount of material. It takes the right combination of bond, grit, and abrasive quality to ensure that the tool you produce is balanced, strong, and perfectly suited for its task. Mirka® Cafro range of gashing wheels are here to make it possible.

St Code	Shape	Ø D	W	X	T	Ø H	Grain	Grit	BOND	Mirka Code
H.04	12V9	100	10	2	20	20	Diamond	64	M413	E40890021Z128413.16
C.08	12V9P	125	10	2	25	20	Diamond	64	TOP7	0800603211628TP7.16
C.12	1V1	125	10	10	10	20	Diamond	76	PRO7	0758000221624PR7.16
C.40	1V1	125	10	10,6	10	20	Diamond	76	TOP7	0758000221624TP7.16
H.05	12V9	125	10	2	20	20	Diamond	64	M413	E41640021Z128413.16
H.06	1V1	125	10	10	10	20	Diamond	64	M413	E57140021J328413.16



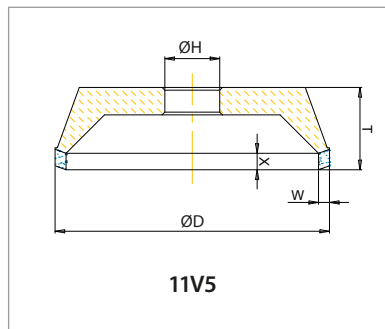
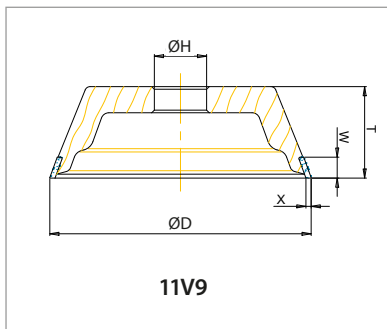


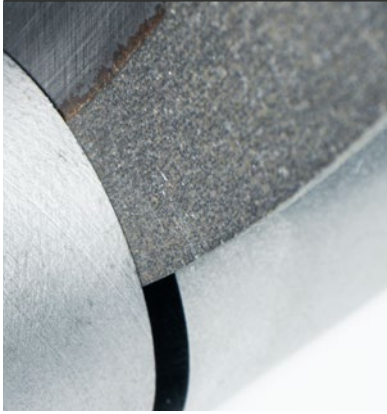
Clearance grinding

Clearance grinding is a critical operation in any round tool manufacturing process, it ensures that the tool feeds easily and cuts smoothly.

A superabrasive wheel used for clearance grinding must hold its shape while leaving an optimal surface finish and precisely removing material to achieve the proper cutter geometry. With Mirka® Cafro grinding wheels, clearance angle grinding can be performed efficiently and effectively.

St Code	Shape	Ø D	W	X	T	Ø H	Grain	Grit	BOND	Mirka Code
H.03	11V9G	75	8	2	35	20	Diamond	64	M414	E40880021Z128414.16
A.01	11V9G	75	10	2	35	20	Diamond	64	EDG7	E913600211628ED7.16
C.15	11V9G	75	10	2	35	20	Diamond	64	TOP7	0845403211628TP7.16
H.22	11V5	100	4	6	30	20	Diamond	64	M414	E73750021Z128414.16
A.04	11V9G	100	10	3	35	20	Diamond	64	EDG7	E877500211628ED7.16
C.17	11V9G	100	10	3	35	20	Diamond	64	TOP7	0339811211628TP7.16
D.06	11V9	100	10	3	35	20	Diamond	126	DRY5	0175550251618DR5.16
D.07	11V9	100	10	3	35	20	Diamond	126	UNI3	0175550251618UN3.16
D.43	11V9	100	10	3	35	20	Diamond	126	DRY5	0175550254S25DR5.16
H.01	11V9G	100	10	3	35	20	Diamond	46	M414	E39820019Z125414.16
H.02	11V9G	100	10	3	35	20	Diamond	64	M414	E39820021Z128414.16

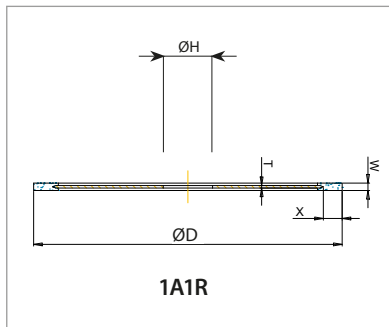




Cut-off

The cut-off operation is a key step in the production of round tools. It requires speed, rigidity, and thermal stability to accomplish efficiently and precisely. Mirka® Cafro cut-off wheels make quick work of this demanding operation and help you deliver a quality tool.

St Code	Shape	Ø D	W	X	T	Ø H	Grain	Grit	BOND	Mirka Code
T.01	1A1R	100	1,0	5	0,8	20	Diamond	151	DRY7	0407810261624DR7.16
T.02	1A1R	125	1,1	5	0,9	20	Diamond	151	DRY7	0432900261624DR7.16
T.11	1A1R	125	1,1	5	0,9	20	Diamond	151	PRO5	0432900261624PR5.16
T.26	1A1R	150	1,2	7	1,0	20	Diamond	151	CNC3	0622005261628CN3.16
T.21	1A1R	150	1,2	7	1,0	20	Diamond	151	DRY7	0622005264S24DR7.16
T.22	1A1R	150	1,2	7	1,0	20	Diamond	151	PRO5	0622005264S24PR5.16
T.04	1A1R	200	1,2	7	1,0	20	Diamond	126	DRY7	0147006251624DR7.16
T.05	1A1R	200	1,2	7	1,0	22	Diamond	126	DRY7	0147006251624DR7.18
T.13	1A1R	200	1,2	7	1,0	20	Diamond	126	PRO5	0147006251624PR5.16
T.14	1A1R	200	1,2	7	1,0	22	Diamond	126	PRO5	0147006251624PR5.18
T.15	1A1R	200	1,2	7	1,0	32	Diamond	126	PRO5	0147006251624PR5.25
T.16	1A1R	200	1,2	7	1,0	30 w/ Holes	Diamond	126	PRO5	0968202251624PR5.55



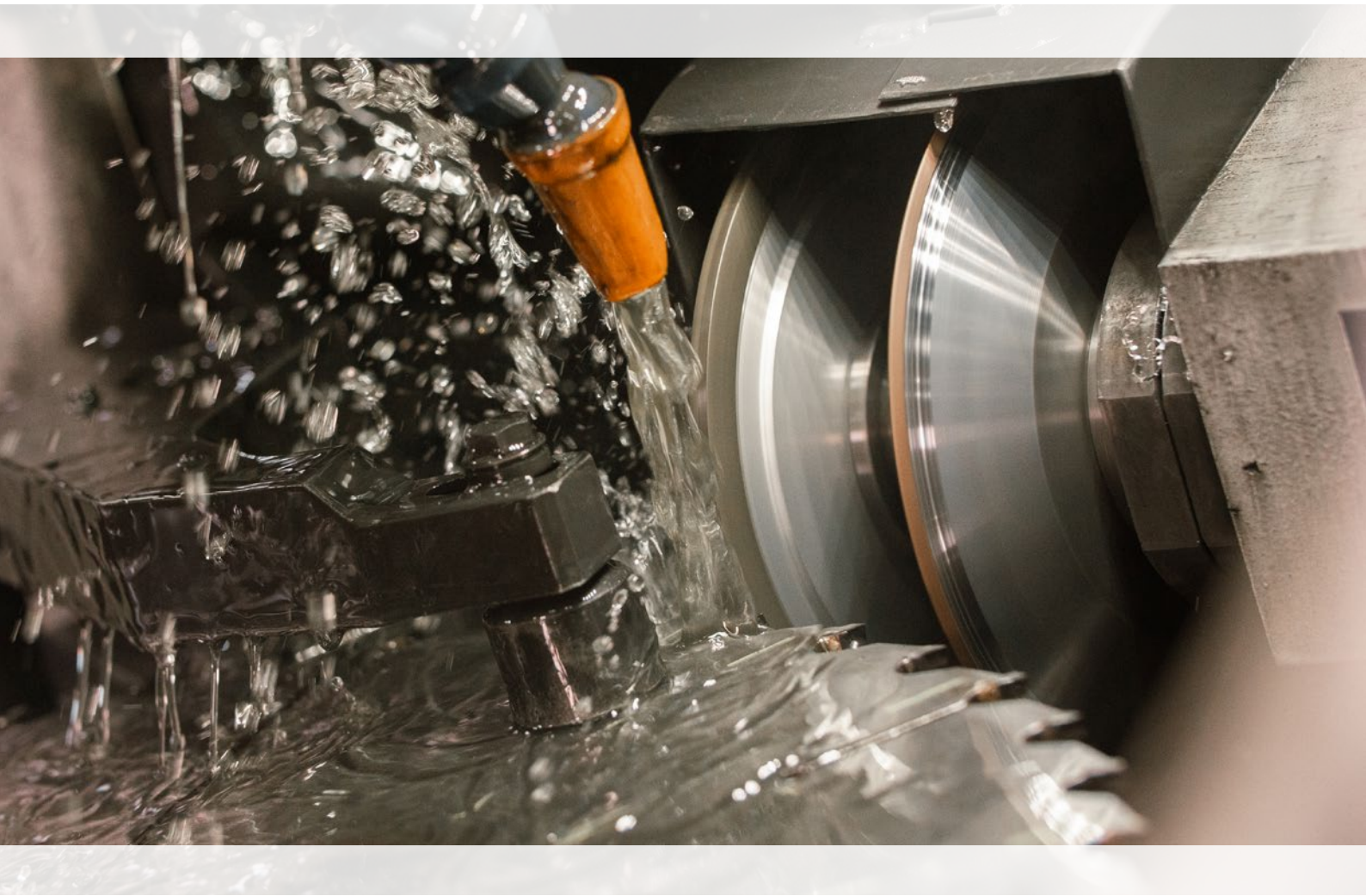
SAW GRINDING AND RESHARPENING

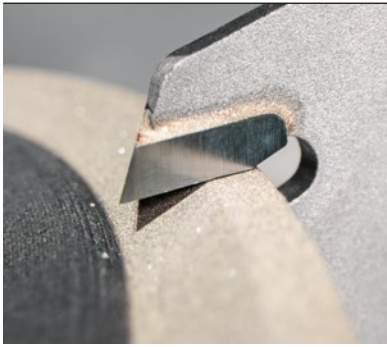
Production and sharpening of circular and band saw blades

Saws are an integral part of many industries, when a blade dulls or is otherwise damaged it is generally more economical to sharpen the sawblade or replace the damaged teeth than to purchase a new blade.

Saw sharpening was once the realm of the skilled artisan, but today it's a precise science. Hard saw teeth must be exactly ground into the desired shapes, repeatedly and unerringly by saw grinding machines and technicians. It's a tough job, and Mirka® Cafro superabrasive wheels are up to it.

Whether for the topping and facing of circular saw blades, the profiling of band saw blades, or for side grinding operations, Mirka® Cafro wheels are the right choice for steel, stellite, and tungsten carbide grinding saw grinding and sharpening.

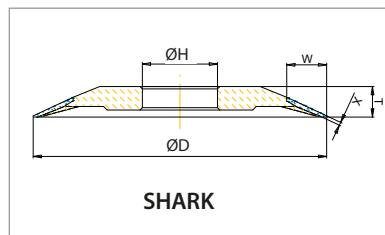
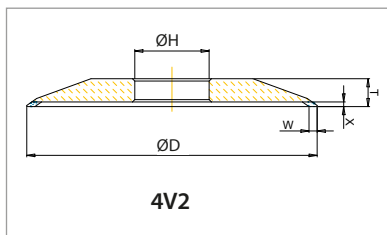




Facing

The facing of circular saw teeth requires a superabrasive wheel capable of grinding precisely between saw teeth while maintaining stability and holding its profile. It takes a specialized wheel for specialized machines, and Mirka® Cafro range of stocked wheels and standard shapes are up to the task.

St Code	Shape	Ø D	W	X	T	Ø H	Grain	Grit	BOND	Mirka Code
V.35	4V2	100	3,5	2	10	25 w/ Keyhole	Diamond	64	RTR	0419900211624191.22
V.36	4V2	125	3,5	2	12	32	Diamond	64	RTR	0532000211624191.25
V.24	4V2	125	3,5	2	12	32	Diamond	64	CNC3	0532000214525CN3.25
V.27	SHARK5	125	17	1,3	13	32	Diamond	64	PRO5	E734700214528PR5.25
V.28	SHARK4	125	17	1,5	12,3	32	Diamond	64	PRO5	E734400214528PR5.25
V.26	4V2	200	3,5	2	12	32	Diamond	54	CNC3	0822000204527CN3.25
V.29	SHARK4	200	17	1,5	12,3	32	Diamond	64	CNC7	E736600214527CN7.25



Topping

The top grinding of circular saw blades requires a free-cutting superabrasive wheel capable of efficiently and repeatedly grinding and forming the cutting angle of tungsten carbide saw teeth. Mirka® Cafro line of stocked and standard-sized wheels are capable of matching the needs of your specific machine to create an optimal saw tooth topping operation.

St Code	Shape	Ø D	W	X	T	Ø H	Grain	Grit	BOND	Mirka Code
V.37	11VV9	100	5	6	20	25 w/ Keyhole	Diamond	46/126	R59	0432500561660998.22
V.18	11AA2	125	5	8	20	32	Diamond	46/126	DRY7	E474100561662586.25
V.19	11AA2	125	5	8	20	32	Diamond	46/126	UNI3	E47410056Z462565.25
V.20	11AA2	125	5	6	18	32	Diamond	46/126	DRY7	E274401561662586.25



Side grinding

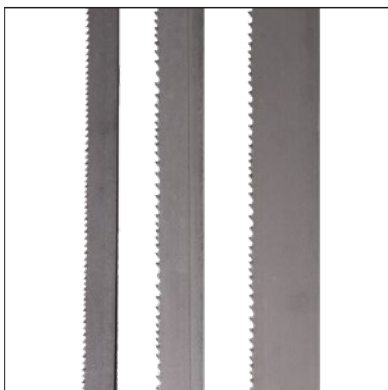
Side grinding is a critical operation for creating a smooth cutting circular saw after the facing and topping operations. The superabrasive wheel must be free cutting and leave a precise surface. Mirka® Cafro portfolio includes a variety of shapes and bonds that are ideal for your specific side grinding machine.

Band saws



Profile grinding

Profile grinding is a key operation in the sharpening of bandsaw blades, as it restores and reshapes the specific profile of the tooth and gullet to a chosen form. A superabrasive wheel used for this operation needs to be precisely shaped to produce the chosen profile and be able to maintain the profile without breaking down. Mirka offers a range of standard wheels that can be profiled as needed to produce your specific tooth geometry.



Side grinding

Side grinding is a critical operation for creating a smooth-cutting band saw after the profiling operation. The superabrasive wheel must be free cutting and leave a precise surface. Mirka's portfolio includes a variety of shapes and bonds that are ideal for your specific side grinding machine.



Mirka Ltd
Finland

Brazil Mirka Brasil Ltda.

Belgium Mirka Belgium Logistics NV

Canada Mirka Canada Inc.

China Mirka Trading Shanghai Co., Ltd

Finland & Baltics Mirka Ltd

France Mirka France Sarl

Germany Mirka GmbH

India Mirka India Pvt Ltd

Italy Mirka Italia s.r.l., CAFRO S.p.A, UrmaRolls s.r.l.

Mexico Mirka Mexicana S.A. de C.V.

Russia Mirka Rus LLC

Singapore Mirka Asia Pacific Pte Ltd

Spain KWH Mirka Ibérica S.A.U.

Sweden Mirka Scandinavia AB

Turkey Mirka Turkey Zımpara Ltd Şirketi

United Kingdom Mirka (UK) Ltd

United Arab Emirates Mirka Middle East FZCO

USA Mirka USA Inc.

For more information, please visit
mirka.com/en/know-how/industries/tool-manufacturing

