SARATOOLS.com
POWER TO PRODUCE

TAKEOFF 03.20

effective until 30.09.2020 €

ATORN®

The ATORN TiAlNplus HPC solid carbide drill bit range covers a variety of materials. Thanks to the modern cutting material and innovative, newly-developed geometry, the tools offer enormous capacity. What's more, they come in a variety of different materials with maximum process reliability and efficiency. You can benefit from the enormous breadth and depth of this range.

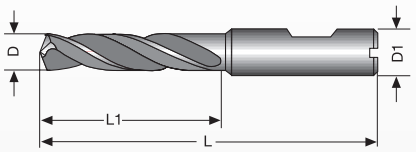
Features:

- **25 % longer service life compared with competitors**
- **Wide range of applications (steel, stainless steel, cast iron and aluminium)**
- **Newly developed TiAlNplus coating**

ATORN® Solid carbide high-performance drill bit *TiAlNplus HPC 3D*

VHM | DIN 6537 | Typ U | 140° | 30° | 3xD | DIN 6535 HB | TiAlN plus | Vc/fz

- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: ultra-superfine grain solid carbide TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life

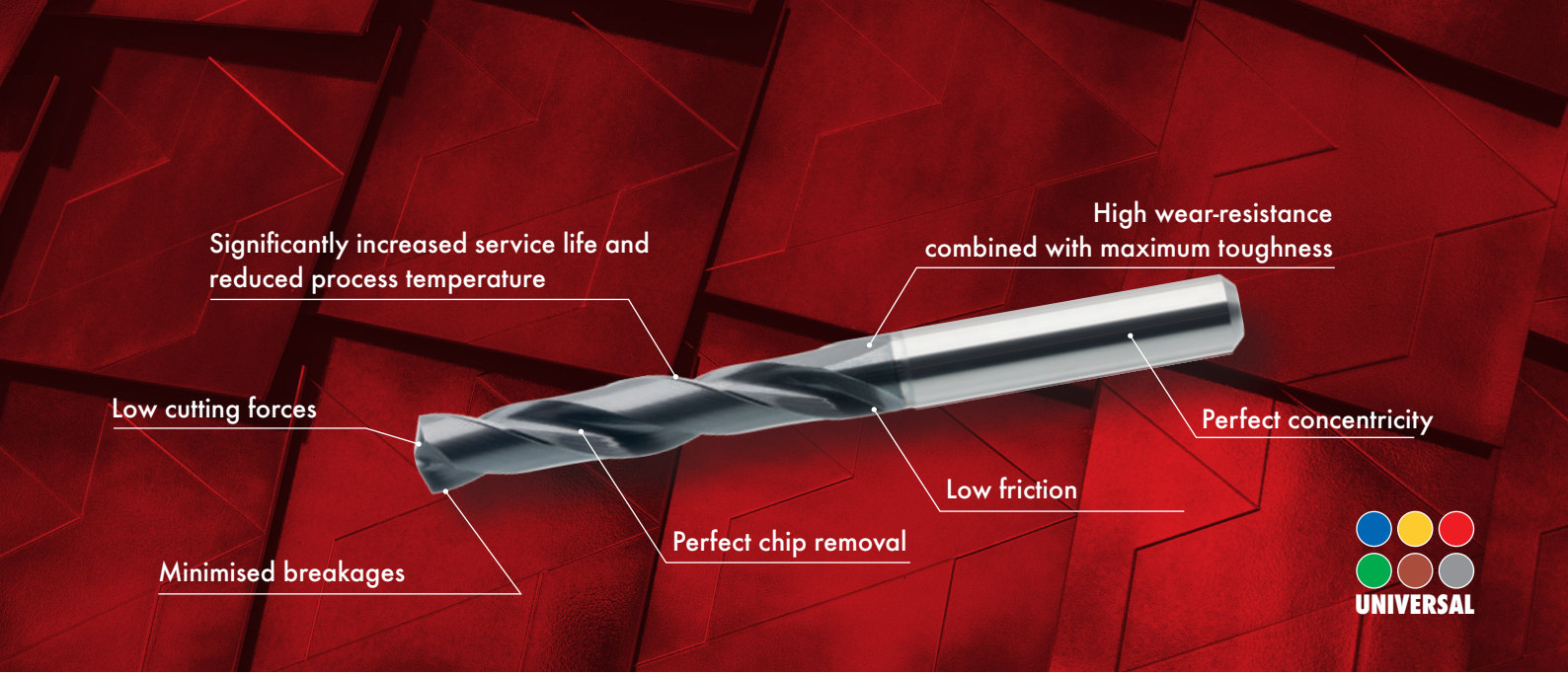


D1 h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	without IC Art.no.	€	with IC Art.no.	€
3	6	62	20	0.08	**111563** 0300	27.30	**111565** 0300	35.10
3.2	6	62	20	0.08	111563 0320	27.30	111565 0320	37.00
3.3	6	62	20	0.08	111563 0330	27.30	111565 0330	37.00
3.5	6	62	20	0.09	111563 0350	27.30	111565 0350	37.00
3.8	6	66	24	0.10	111563 0380	27.30	111565 0380	37.00
4	6	66	24	0.10	111563 0400	27.30	111565 0400	37.00
4.2	6	66	24	0.11	111563 0420	28.00	111565 0420	37.00
4.5	6	66	24	0.11	111563 0450	28.00	111565 0450	37.00
4.8	6	66	28	0.12	111563 0480	28.00	111565 0480	37.00
5	6	66	28	0.13	111563 0500	28.00	111565 0500	37.00
5.1	6	66	28	0.13	111563 0510	28.00	111565 0510	37.00
5.5	6	66	28	0.14	111563 0550	28.00	111565 0550	37.00
5.8	6	66	28	0.15	111563 0580	28.00	111565 0580	37.00
6	6	66	28	0.15	111563 0600	28.00	111565 0600	37.00
6.2	8	79	34	0.16	111563 0620	28.40	111565 0620	48.50
6.5	8	79	34	0.16	111563 0650	28.40	111565 0650	48.50
6.8	8	79	34	0.17	111563 0680	28.40	111565 0680	48.50
7	8	79	34	0.18	111563 0700	28.40	111565 0700	48.50
7.5	8	79	41	0.19	111563 0750	28.40	111565 0750	48.50
8	8	79	41	0.20	111563 0800	28.40	111565 0800	48.50
8.2	10	89	47	0.21	111563 0820	31.90	111565 0820	56.50
8.5	10	89	47	0.21	111563 0850	31.90	111565 0850	56.50
8.8	10	89	47	0.22	111563 0880	31.90	111565 0880	56.50
9	10	89	47	0.23	111563 0900	31.90	111565 0900	56.50
9.5	10	89	47	0.24	111563 0950	31.90	111565 0950	56.50
10	10	89	47	0.25	111563 1000	31.90	111565 1000	56.50
10.2	12	102	55	0.26	111563 1020	47.40	111565 1020	84.50
10.5	12	102	55	0.26	111563 1050	47.40	111565 1050	84.50
11	12	102	55	0.28	111563 1100	47.40	111565 1100	84.50
11.5	12	102	55	0.29	111563 1150	47.40	111565 1150	84.50
12	12	102	55	0.30	111563 1200	47.40	111565 1200	84.50
12.5	14	107	60	0.31	111563 1250	63.00	111565 1250	114.00
13	14	107	60	0.33	111563 1300	63.00	111565 1300	114.00
13.5	14	107	60	0.34	111563 1350	63.00	111565 1350	114.00
14	14	107	60	0.35	111563 1400	63.00	111565 1400	114.00
14.5	16	115	65	0.36	111563 1450	78.00	111565 1450	135.00
15	16	115	65	0.38	111563 1500	78.00	111565 1500	135.00
15.5	16	115	65	0.39	111563 1550	78.00	111565 1550	135.00
16	16	115	65	0.40	111563 1600	78.00	111565 1600	135.00
16.5	18	123	73	0.41	111563 1650	114.00	111565 1650	191.00
17	18	123	73	0.43	111563 1700	114.00	111565 1700	191.00
17.5	18	123	73	0.44	111563 1750	114.00	111565 1750	191.00
18	18	123	73	0.45	111563 1800	114.00	111565 1800	191.00
18.5	20	131	79	0.46	111563 1850	150.00	111565 1850	239.00
19	20	131	79	0.48	111563 1900	150.00	111565 1900	239.00
19.5	20	131	79	0.49	111563 1950	150.00	111565 1950	239.00
20	20	131	79	0.50	111563 2000	150.00	111565 2000	239.00

● very well suited
○ well suited

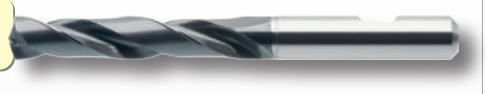
Material	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
111563....	● 110-145	● 85-110	● 55-85	● 40	● 45	○ 30	● 125-155	● 120	● 35-40	● 30	○ 25	○ 260	● 180	○ 125		● 40-55	○ 25-35	○ 25
111565....	● 120-170	● 85-120	● 65-105	● 45	● 55	○ 44	● 160	● 120	● 40-45	● 40	○ 35	○ 260-310	● 220	○ 125		● 55	○ 35	○ 30

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

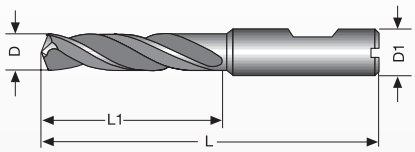


ATORN® Solid carbide high-performance drill bit TiAlNplus HPC 5D

VHM | DIN 6537 | Typ U | 140° | 30° | 5xD | DIN 6535 HB | TiAlN plus | Vc/fz



- Optimised shank diameter tolerance for use as a holding fixture in power chucks and hydraulic expansion chucks
- **Cutting material: ultra-superfine grain solid carbide TiAlNplus**
- Efficient drilling in different materials
- Newly developed geometry in conjunction with a customised multilayer coating for enhanced performance
- Special cutting edge finishing reduces micro-nicks and increases service life



D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	without IC Art.no.	€	with IC Art.no.	€
3	6	66	28	0.08	**111567** 0300	38.30	**111569** 0300	46.50
3.2	6	66	28	0.08	111567 0320	39.60	111569 0320	46.50
3.3	6	66	28	0.08	111567 0330	39.60	111569 0330	46.50
3.5	6	66	28	0.09	111567 0350	39.60	111569 0350	46.50
3.8	6	74	36	0.10	111567 0380	39.60	111569 0380	46.50
4	6	74	36	0.10	111567 0400	39.60	111569 0400	46.50
4.2	6	74	36	0.11	111567 0420	39.60	111569 0420	47.00
4.5	6	74	36	0.11	111567 0450	39.60	111569 0450	47.00
4.8	6	82	44	0.12	111567 0480	39.60	111569 0480	47.00
5	6	82	44	0.13	111567 0500	39.60	111569 0500	47.00
5.1	6	82	44	0.13	111567 0510	40.30	111569 0510	47.00
5.5	6	82	44	0.14	111567 0550	40.30	111569 0550	47.00
5.8	6	82	44	0.15	111567 0580	40.30	111569 0580	47.00
6	6	82	44	0.15	111567 0600	40.30	111569 0600	47.00
6.2	8	91	53	0.16	111567 0620	43.50	111569 0620	52.50
6.5	8	91	53	0.16	111567 0650	43.50	111569 0650	52.50
6.8	8	91	53	0.17	111567 0680	43.50	111569 0680	52.50
7	8	91	53	0.18	111567 0700	43.50	111569 0700	52.50
7.5	8	91	53	0.19	111567 0750	44.50	111569 0750	52.50
8	8	91	53	0.20	111567 0800	44.50	111569 0800	52.50
8.2	10	103	61	0.21	111567 0820	51.00	111569 0820	61.50
8.5	10	103	61	0.21	111567 0850	51.00	111569 0850	61.50
8.8	10	103	61	0.22	111567 0880	51.00	111569 0880	61.50
9	10	103	61	0.23	111567 0900	51.00	111569 0900	61.50

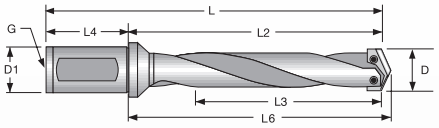
D h7 mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	without IC Art.no.	€	with IC Art.no.	€
9.5	10	103	61	0.24	111567 0950	52.00	111569 0950	61.50
10	10	103	61	0.25	111567 1000	52.00	111569 1000	61.50
10.2	12	118	71	0.26	111567 1020	72.50	111569 1020	87.00
10.5	12	118	71	0.26	111567 1050	72.50	111569 1050	87.00
11	12	118	71	0.28	111567 1100	72.50	111569 1100	87.00
11.5	12	118	71	0.29	111567 1150	72.50	111569 1150	87.00
12	12	118	71	0.30	111567 1200	72.50	111569 1200	87.00
12.5	14	124	77	0.31	111567 1250	94.50	111569 1250	117.00
13	14	124	77	0.33	111567 1300	94.50	111569 1300	117.00
13.5	14	124	77	0.34	111567 1350	96.50	111569 1350	117.00
14	14	124	77	0.35	111567 1400	96.50	111569 1400	117.00
14.5	16	133	83	0.36	111567 1450	115.00	111569 1450	137.50
15	16	133	83	0.38	111567 1500	115.00	111569 1500	137.50
15.5	16	133	83	0.39	111567 1550	115.00	111569 1550	137.50
16	16	133	83	0.40	111567 1600	115.00	111569 1600	137.50
16.5	18	143	93	0.41	111567 1650	204.00	111569 1650	219.00
17	18	143	93	0.43	111567 1700	204.00	111569 1700	219.00
17.5	18	143	93	0.44	111567 1750	204.00	111569 1750	219.00
18	18	143	93	0.45	111567 1800	204.00	111569 1800	219.00
18.5	20	153	101	0.46	111567 1850	204.00	111569 1850	230.00
19	20	153	101	0.48	111567 1900	204.00	111569 1900	230.00
19.5	20	153	101	0.49	111567 1950	204.00	111569 1950	240.00
20	20	153	101	0.50	111567 2000	204.00	111569 2000	240.00

● very well suited
○ well suited

Material	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
111567....	● 110-145	● 85-110	● 55-85	● 40	● 45	○ 30	● 125-155	● 120	● 35-40	● 30	○ 25	○ 260	● 180	○ 125		● 40-55	○ 25-35	○ 25
111569....	● 120-170	● 85-120	● 65-105	● 45	● 55	○ 44	● 160	● 120	● 40-45	● 40	○ 35	○ 260-310	● 220	○ 125		● 55	○ 35	○ 30

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

T-A® drilling system



- **Internal coolant supply**
- * Holders also have a 1/8 inch coolant supply connection on the side
- Version with MT shank in catalogue range

Series 1 holder with straight shank

18-24 mm

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread	Art.no.	€
Straight-fluted	Extra-short	18,00-24,00	47	75.8	79.4	131.8	25	56	1/8 inch *	**105007** 0010	248.50
Straight-fluted	Short	18,00-24,00	67	107.2	110.7	163.2	25	56	1/8 inch	105007 0030	217.30
Spiral-fluted	Medium-length	18,00-24,00	118	154.8	158.4	210.8	25	56	1/8 inch	105007 0050	251.50
Spiral-fluted	Standard	18,00-24,00	168	205.6	209.2	261.6	25	56	1/8 inch	105007 0070	277.60
Spiral-fluted	Extra-long	18,00-24,00	270	307.2	310.8	363.2	25	56	1/8 inch	105007 0090	311.80
Straight-fluted	XL	18,00-24,00	457	494.5	498.1	550.5	25	56	1/8 inch	105007 0110	325.70
Straight-fluted	3XL	18,00-24,00	565	602.5	606.1	658.5	25	56	1/8 inch	105007 0120	395.70

Holder Series 2 with straight shank

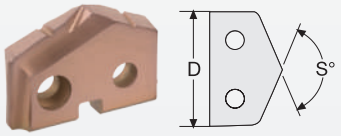
24.5-35 mm

Chip space design	Tool length	D mm	L3 mm	L2 mm	L6 mm	L mm	D1 mm	L4 mm	Thread	Art.no.	€
Straight-fluted	Extra-short	24,50-35,00	57	88.5	92.1	148.5	32	60	1/4 inch *	**105009** 0010	276.10
Straight-fluted	Short	24,50-35,00	86	128.6	132.2	188.6	32	60	1/4 inch	105009 0030	234.40
Spiral-fluted	Medium-length	24,50-35,00	137	179.4	183	239.4	32	60	1/4 inch	105009 0050	277.60
Spiral-fluted	Standard	24,50-35,00	187	230.2	233.8	290.2	32	60	1/4 inch	105009 0070	304.10
Spiral-fluted	Extra-long	24,50-35,00	289	331.8	335.4	391.8	32	60	1/4 inch	105009 0090	352.30
Straight-fluted	XL	24,50-35,00	511	554.1	557.7	614.1	32	60	1/4 inch	105009 0110	349.10

Cutting inserts Series 1

Other quality grades and diameters available on request, some from stock.

GEN2 T-A



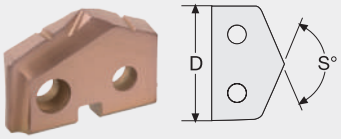
D mm	S °		HSS Super Cobalt AM200™ Art.no.	€
18.00	132	2	**105441** 1800	54.30
18.50	132	2	105441 1850	54.30
19.00	132	2	105441 1900	54.30
19.50	132	2	105441 1950	54.30
20.00	132	2	105441 2000	54.30
20.50	132	2	105441 2050	54.30
21.00	132	2	105441 2100	54.30

D mm	S °		HSS Super Cobalt AM200™ Art.no.	€
21.50	132	2	105441 2150	54.30
22.00	132	2	105441 2200	54.30
22.50	132	2	105441 2250	54.30
23.00	132	2	105441 2300	54.30
23.50	132	2	105441 2350	54.30
24.00	132	2	105441 2400	54.30

Cutting inserts Series 2

Other quality grades and diameters available on request, some from stock.

GEN2 T-A



D mm	S °		HSS Super Cobalt AM200™ Art.no.	€
24.50	132	2	**105541** 2450	62.20
25.00	132	2	105541 2500	62.20
25.50	132	2	105541 2550	62.20
26.00	132	2	105541 2600	62.20
26.50	132	2	105541 2650	62.20
27.00	132	2	105541 2700	62.20
27.50	132	2	105541 2750	62.20
28.00	132	2	105541 2800	62.20
28.50	132	2	105541 2850	62.20

D mm	S °		HSS Super Cobalt AM200™ Art.no.	€
29.00	132	2	105541 2900	62.20
29.50	132	2	105541 2950	62.20
30.00	132	2	105541 3000	62.20
30.50	132	2	105541 3050	62.20
31.00	132	2	105541 3100	62.20
32.00	132	2	105541 3200	62.20
33.00	132	2	105541 3300	62.20
34.00	132	2	105541 3400	62.20
35.00	132	2	105541 3500	62.20

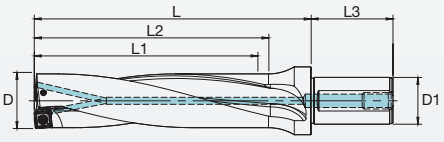
Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	○	○		○	○	○	○	○		○	●				

Indexable inserts solid drill bits *SCS 3D*

- Surface-hardened carrier tools
- **Available tool lengths of 3xD and 4xD**
- **Diameter 15-50 mm (catalogue range)**
- Optimised chip space geometry and cutting edge positions for stable drilling
- Wide range of applications
- Good chip control and reduced cutting forces
- **With internal coolant supply**
- **Suitable indexable cutting inserts SPKX**

SCS 3D - 3xD

- Bore tolerances: Ø 15-21 mm > - 0.1/+0.15 mm; Ø 22-36 mm > - 0.12/+0.2 mm



Designation	D mm	L1 mm	L2 mm	L mm	D1 mm	L3 mm	Suitable indexable inserts	Art.no.	€
SCS 15020-3D	15	45	48	68	20	50	SPKX 050204	**124403** 0150	169.00
SCS 16025-3D	16	48	51	76	25	56	SPKX 060204	124403 0160	169.00
SCS 17025-3D	17	51	54	79	25	56	SPKX 060204	124403 0170	169.00
SCS 18025-3D	18	54	57	82	25	56	SPKX 060204	124403 0180	169.00
SCS 19025-3D	19	57	60	85	25	56	SPKX 060204	124403 0190	169.00
SCS 20025-3D	20	60	63	88	25	56	SPKX 060204	124403 0200	169.00
SCS 21025-3D	21	63	66	91	25	56	SPKX 060204	124403 0210	169.00
SCS 22032-3D	22	66	69	99	32	60	SPKX 07T308	124403 0220	170.00
SCS 23032-3D	23	69	72	102	32	60	SPKX 07T308	124403 0230	170.00
SCS 24032-3D	24	72	75	105	32	60	SPKX 07T308	124403 0240	170.00
SCS 25032-3D	25	75	78	108	32	60	SPKX 07T308	124403 0250	170.00
SCS 26032-3D	26	78	81	111	32	60	SPKX 07T308	124403 0260	180.00
SCS 28032-3D	28	84	87	117	32	60	SPKX 090408	124403 0280	180.00
SCS 29032-3D	29	87	90	120	32	60	SPKX 090408	124403 0290	180.00
SCS 30032-3D	30	90	95	125	32	60	SPKX 090408	124403 0300	180.00
SCS 31032-3D	31	93	98	128	32	60	SPKX 090408	124403 0310	205.00
SCS 32032-3D	32	96	101	131	32	60	SPKX 090408	124403 0320	210.00
SCS 33032-3D	33	99	104	134	32	60	SPKX 090408	124403 0330	210.00
SCS 34040-3D	34	102	107	142	40	70	SPKX 110408	124403 0340	210.00
SCS 35040-3D	35	105	110	145	40	70	SPKX 110408	124403 0350	210.00

Indexable cutting inserts *SPKX*

- Carbide indexable cutting inserts, positive 11°
- **PH6920** PVD-coated (TiAlN)
  fine grain carbide for universal applications, good toughness and wear resistance
- **PH6930** PVD-coated (TiAlN)
  superfine grain carbide for applications under unstable machine conditions at average cutting speeds
- **PHC930** PVD-coated (TiAlN+TiN)
  fine grain carbide for universal applications at high cutting speeds

PHC930

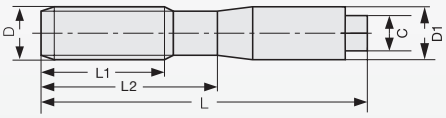
PH6920, PH6930

ISO designation		ISO P M K S PH6920 Art.no.	€		ISO P M K S PH6930 Art.no.	€		ISO P M K S PHC930 Art.no.	€
SPKX 050204	10	**124512** 0005	8.45	10	**124513** 0005	8.45	10	**124514** 0005	8.45
SPKX 060204	10	124512 0006	9.40	10	124513 0006	9.40	10	124514 0006	9.40
SPKX 07T308	10	124512 0007	9.40	10	124513 0007	9.40	10	124514 0007	9.40
SPKX 090408	10	124512 0009	9.85	10	124513 0009	9.85	10	124514 0009	9.85
SPKX 110408	10	124512 0011	10.80	10	124513 0011	10.80	10	124514 0011	10.80
SPKX 140512	10	124512 0014	11.25	10	124513 0014	11.27	10	124514 0014	11.25

ATORN® SARA® Machine tap

M | 60° | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | C 2-3 | 40° | 2,5xD | Vc/fz

- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **HSS-E cutting material**
- Strong chip removal to the rear for long-chipping materials
- Minimal thread relief grinding



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN® Art.no.	ATORN® €	SARA® Art.no.	SARA® €
M 2	0.4	45	8	-	2.8	2.1	1.60	**134200** 0020	12.15		
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134200 0025	12.15		
M 3	0.5	56	6	18	3.5	2.7	2.50	134200 0030	9.65	**134201** 0030	6.10
M 4	0.7	63	7	21	4.5	3.4	3.30	134200 0040	9.65	134201 0040	6.10
M 5	0.8	70	8	25	6	4.9	4.20	134200 0050	9.75	134201 0050	6.15
M 6	1	80	10	30	6	4.9	5.00	134200 0060	9.90	134201 0060	6.25
M 8	1.25	90	13	35	8	6.2	6.80	134200 0080	12.35	134201 0080	7.80
M 10	1.5	100	15	39	10	8	8.50	134200 0100	14.65	134201 0100	9.30
M 12	1.75	110	18	-	9	7	10.25	134200 0120	21.00	134201 0120	13.30
M 14	2	110	20	-	11	9	12.00	134200 0140	29.90		
M 16	2	110	20	-	12	9	14.00	134200 0160	31.50		
M 20	2.5	140	25	-	16	12	17.50	134200 0200	51.80		
M 24	3	160	30	-	18	14.5	21.00	134200 0240	74.80		
M 30	3.5	180	35	-	22	18	26.50	134200 0300	141.50		

Material — ● very well suited ○ well suited

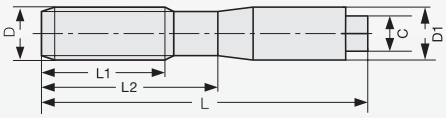
	Steel < 700 N/mm²	Steel < 1000 N/mm²	Steel < 1400 N/mm²	Stainless steel ferrit./martens.	Stainless steel austenitic	Stainless steel duplex	Cast iron GG/GTS	Cast iron GGG	Titanium alloys	Super alloys Fe/NiCo-based < 30 HRc	Super alloys Fe/NiCo-based ≥ 30 HRc	Aluminium < 8 % Si	Aluminium ≥ 8 % Si	Copper Cu-alloy.	Graphite GRP/CFP/thermo.	Hardened steel < 55 HRc	Hardened steel < 60 HRc	Hardened steel ≥ 60 HRc
134200.... 134201....	● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

ATORN® SARA® Machine tap

M | 60° | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | B 3,5-5 | 3xD | Vc/fz

- DIN 371 = up to M10, DIN 376 = from M12
- **HSS-E cutting material**
- The spiral point ensures strong chip removal to the front



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	ATORN® Art.no.	ATORN® €	SARA® Art.no.	SARA® €
M 2	0.4	45	8	-	2.8	2.1	1.60	**134105** 0020	11.95		
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134105 0025	9.85		
M 3	0.5	56	10	18	3.5	2.7	2.50	134105 0030	7.95	**134106** 0030	5.75
M 4	0.7	63	12	21	4.5	3.4	3.30	134105 0040	7.95	134106 0040	5.75
M 5	0.8	70	14	25	6	4.9	4.20	134105 0050	8.00	134106 0050	5.80
M 6	1.0	80	16	30	6	4.9	5.00	134105 0060	8.25	134106 0060	5.95
M 8	1.25	90	18	35	8	6.2	6.80	134105 0080	9.40	134106 0080	6.75
M 10	1.5	100	20	39	10	8	8.50	134105 0100	11.50	134106 0100	8.30
M 12	1.75	110	22	-	9	7	10.25	134105 0120	16.25	134106 0120	11.75
M 14	2.0	110	25	-	11	9	12.00	134105 0140	22.10		
M 16	2.0	110	28	-	12	9	14.00	134105 0160	25.00		
M 20	2.5	140	32	-	16	12	17.50	134105 0200	38.80		
M 24	3.0	160	36	-	18	14.5	21.00	134105 0240	57.20		
M 30	3.5	180	40	-	22	18	26.50	134105 0300	112.00		

Material — ● very well suited ○ well suited

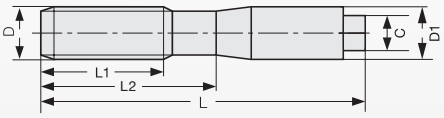
	Steel < 700 N/mm²	Steel < 1000 N/mm²	Steel < 1400 N/mm²	Stainless steel ferrit./martens.	Stainless steel austenitic	Stainless steel duplex	Cast iron GG/GTS	Cast iron GGG	Titanium alloys	Super alloys Fe/NiCo-based < 30 HRc	Super alloys Fe/NiCo-based ≥ 30 HRc	Aluminium < 8 % Si	Aluminium ≥ 8 % Si	Copper Cu-alloy.	Graphite GRP/CFP/thermo.	Hardened steel < 55 HRc	Hardened steel < 60 HRc	Hardened steel ≥ 60 HRc
134105.... 134106....	● 5-20	● 5-15		○ 5-10	○ 5-12			○ 8-20										

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

ATORN SARA Machine tap

M | 60° | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Vc/fz

- **ISO 6H metric thread**
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **HSS-E cutting material**



C 2-3 | 40° | 2,5xD — ATORN / SARA

B 3,5-5 | 3xD — ATORN / SARA

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	Blind hole Art.no.	€	Blind hole Art.no.	€	Through hole Art.no.	€	Through hole Art.no.	€
M 3	0.5	56	6	18	3.5	2.7	2.50	**134230** 0030	10.45	**134231** 0030	6.60	**134135** 0030	11.05	**134136** 0030	7.00
M 4	0.7	63	7	21	4.5	3.4	3.30	134230 0040	10.45	134231 0040	6.60	134135 0040	11.05	134136 0040	7.00
M 5	0.8	70	8	25	6	4.9	4.20	134230 0050	10.60	134231 0050	6.70	134135 0050	11.15	134136 0050	7.05
M 6	1.0	80	10	30	6	4.9	5.00	134230 0060	10.85	134231 0060	6.85	134135 0060	11.45	134136 0060	7.25
M 8	1.25	90	13	35	8	6.2	6.80	134230 0080	13.35	134231 0080	8.45	134135 0080	14.15	134136 0080	8.95
M 10	1.5	100	15	39	10	8	8.50	134230 0100	15.95	134231 0100	10.00	134135 0100	16.75	134136 0100	10.60
M 12	1.75	110	18	-	9	7	10.25	134230 0120	23.00	134231 0120	14.50	134135 0120	24.20	134136 0120	15.30
M 16	2.0	110	20	-	12	9	14.00	134230 0160	35.10			134135 0160	37.40		
M 20	2.5	140	25	-	16	12	17.50	134230 0200	60.10			134135 0200	63.00		

Material — ● very well suited ○ well suited

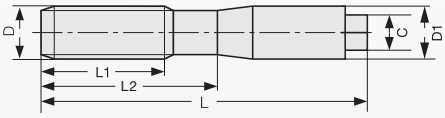
	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
134230....134231.... 134135....134136....	● 5-20	● 5-15	● 5-10	○ 5-10			● 8-20	● 8-20	○ 2-6	○ 2-6			○ 10-25					

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

ATORN SARA Machine tap

M | 60° | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Vap. | Vc/fz

- **ISO 6H metric thread**
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **Cutting material: HSS-E, vapour-treated**



C 2-3 | 40° | 2,5xD — ATORN / SARA

B 3,5-5 | 3xD — ATORN / SARA

D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	Blind hole Art.no.	€	Blind hole Art.no.	€	Through hole Art.no.	€	Through hole Art.no.	€
M 2	0.4	45	8	-	2.8	2.1	1.60	**134225** 0020	16.90			**134130** 0020	16.40		
M 2.5	0.45	50	9	-	2.8	2.1	2.05	134225 0025	14.00			134130 0025	13.50		
M 3	0.5	56	6	18	3.5	2.7	2.50	134225 0030	11.20	**134227** 0030	7.10	134130 0030	10.90	**134132** 0030	6.90
M 4	0.7	63	7	21	4.5	3.4	3.30	134225 0040	11.20	134227 0040	7.10	134130 0040	10.90	134132 0040	6.90
M 5	0.8	70	8	25	6	4.9	4.20	134225 0050	11.35	134227 0050	7.15	134130 0050	11.00	134132 0050	6.95
M 6	1.0	80	10	30	6	4.9	5.00	134225 0060	11.65	134227 0060	7.35	134130 0060	11.30	134132 0060	7.15
M 8	1.25	90	13	35	8	6.2	6.80	134225 0080	14.45	134227 0080	9.15	134130 0080	13.95	134132 0080	8.80
M 10	1.5	100	15	39	10	8	8.50	134225 0100	17.20	134227 0100	10.85	134130 0100	16.50	134132 0100	10.45
M 12	1.75	110	18	-	9	7	10.25	134225 0120	24.80	134227 0120	15.70	134130 0120	23.80	134132 0120	15.00
M 16	2.0	110	20	-	11	9	14.00	134225 0160	38.10			134130 0160	36.70		

Material — ● very well suited ○ well suited

	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
134225...., 134227.... 134130...., 134132....				● 5-10	● 5-12	● 5-8												

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

BECK MAPAL GROUP | SARA® Taper and deburring countersinks

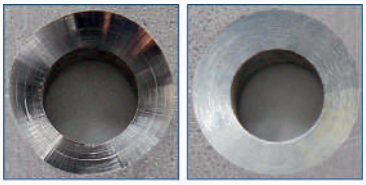
HSS | DIN 335C | 90° | Z 3 | Vc/fz

- Geometry with unequal pitch
- **High degree of smoothness**
- Radially relief-ground
- **Reduced axial and radial forces**
- **Low vibration tendency**
- Patented shank to stop rotation of the countersink in the drill chuck with optimum torque transfer (from Ø 8.3 mm)

with unequal pitch

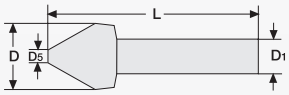
150172

Very unequal pitch



Optimised countersink

150271



Single

D mm	D5 mm	D1 mm	L mm	Feed f steel < 700 N/mm² mm/rev	BECK ZrN Art.no.	BECK ZrN €	SARA TiN Art.no.	SARA TiN €
6.3	1.5	5	45	0.08	**150172** 0063	**18.00**	**150271** 0063	**13.50**
8.3	2	6	50	0.10	150172 0083	**19.80**	150271 0083	**15.00**
10.4	2.5	6	50	0.10	150172 0104	**20.00**	150271 0104	**15.30**
12.4	2.8	8	56	0.12	150172 0124	**24.00**	150271 0124	**18.40**
16.5	3.2	10	60	0.14	150172 0165	**27.20**	150271 0165	**21.20**
20.5	3.5	10	63	0.18	150172 0205	**33.30**	150271 0205	**26.40**

150172 1000

150271 1000

Sets, 5-pcs.

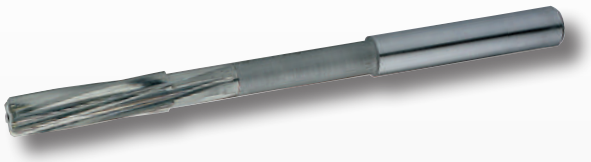
Contents	BECK ZrN Art.no.	BECK ZrN €	SARA TiN Art.no.	SARA TiN €
6.3 / 10.4 / 16.5 / 20.5 / 25 mm (1 of each)	**150172** 1000	**119.90**	**150271** 2000	**103.50**

Material	● very well suited ○ well suited	Steel < 700 N/mm²	Steel < 1000 N/mm²	Steel < 1400 N/mm²	Stainless steel ferrit./martens.	Stainless steel austenitic	Stainless steel duplex	Cast iron GG/GTS	Cast iron GGG	Titanium alloys	Super alloys Fe/NiCo-based < 30 HRc	Super alloys Fe/NiCo-based ≥ 30 HRc	Aluminium < 8 % Si	Aluminium ≥ 8 % Si	Copper Cu-alloy.	Graphite GRP/CFP/thermo.	Hardened steel < 55 HRc	Hardened steel < 60 HRc	Hardened steel ≥ 60 HRc
	150172....	● 36	● 30	○ 12	○ 10	○ 10		● 14	● 12	○ 10			○ 42		○ 42				
	150271....	● 20-28	● 10-15	○ 5-8	○ 5-8	○ 5-10	○ 5-10	○ 8-14	○ 8-12				○ 40-80	○ 20-50	○ 25-40				
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

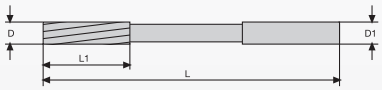
ATORN® NC machine reamers

34 % reduced

VHM | DIN 212 | H7 | 9° | Vc/fz



- **Sim. to DIN 212/8093**
- **For H7 fit**
- **NC shank for use in hydraulic expansion chucks and high-precision collet chucks**
- High true running accuracy
- Type D
- Straight shank, spiral-fluted, right-hand cutting
- **Up to Ø 13.0 mm solid carbide, from Ø 14 mm with steel shank**
- For reaming through-holes
- Also suitable for blind bores



D H7 mm	D1 h6 mm	L mm	L1 mm	Z	Feed f steel < 1000 N/mm² mm/rev	Art.no.	€	
1.0	1	34	6	3	0.15	**163005** 0010	~~48.00~~	31.40
1.5	2	40	8	3	0.15	163005 0015	~~46.70~~	30.50
2.0	2	49	11	4	0.15	163005 0020	~~46.70~~	30.50
2.5	3	57	14	4	0.15	163005 0025	~~46.70~~	30.50
3.0	3	61	15	6	0.15	163005 0030	~~46.70~~	30.50
3.5	4	70	18	6	0.15	163005 0035	~~46.70~~	30.50
4.0	4	75	19	6	0.15	163005 0040	~~46.70~~	30.50
4.5	5	80	21	6	0.15	163005 0045	~~69.50~~	45.50
5.0	5	86	23	6	0.15	163005 0050	~~67.50~~	44.20
5.5	6	93	26	6	0.18	163005 0055	~~68.50~~	44.80
6.0	6	93	26	6	0.18	163005 0060	~~67.50~~	44.20
7.0	8	109	31	6	0.18	163005 0070	~~83.50~~	54.60
8.0	8	117	33	6	0.18	163005 0080	~~82.50~~	54.00
9.0	10	125	36	6	0.20	163005 0090	~~107.00~~	70.00
10.0	10	133	38	6	0.20	163005 0100	~~112.00~~	73.30
11.0	10	142	41	6	0.20	163005 0110	~~119.00~~	77.90
12.0	10	151	44	6	0.25	163005 0120	~~126.00~~	82.50
13.0	10	151	44	8	0.25	163005 0130	~~154.00~~	100.00
14.0	14	160	47	8	0.25	163005 0140	~~158.00~~	103.00
15.0	14	162	50	8	0.25	163005 0150	~~183.00~~	119.50
16.0	14	170	52	8	0.25	163005 0160	~~187.00~~	122.00
18.0	14	182	56	8	0.30	163005 0180	~~235.00~~	153.50
20.0	16	195	60	8	0.30	163005 0200	~~290.00~~	189.00

Material — ● very well suited ○ well suited

Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
● 10-15	● 8-12	● 6-10	○ 10-15	○ 8-12		● 8-12	● 8-12					● 15-25	● 20-30				

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

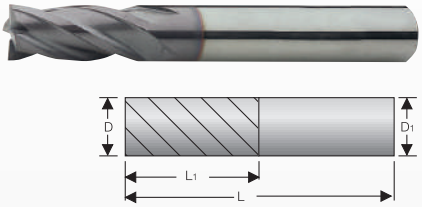
SARA® End milling cutter

VHM | 30° | h9 | h5 | DIN 6535 HA | DIN 6535 HB | Z 4 | TiAlN | HSC | Vc/fz

- **Short and long versions**
- **Cutting material, solid carbide ultra-fine grain TiAlN-coated**

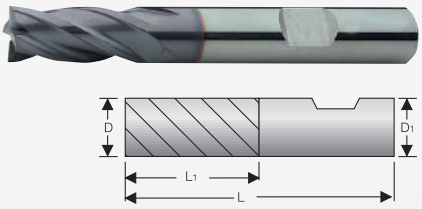
Up to 55 HRc

Short



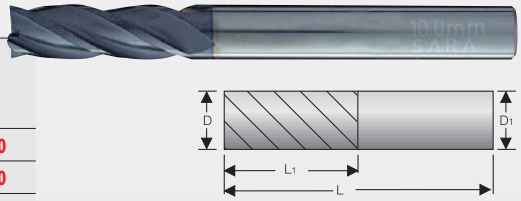
D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/Z	Feed fz steel < 1000 N/mm² mm/Z	DIN 6535-HA Art.no.	€	
2.0	6	40	4.0	0.010	0.055	**254005** 0020	~~25.80~~	19.30
3.0	8	45	6.0	0.010	0.055	254005 0030	~~36.30~~	27.20
4.0	11	45	6.0	0.020	0.044	254005 0040	~~36.30~~	27.20
5.0	13	50	6.0	0.020	0.044	254005 0050	~~36.30~~	27.20
6.0	13	50	6.0	0.020	0.041	254005 0060	~~36.30~~	27.20
7.0	16	60	8.0	0.030	0.041	254005 0070	~~45.70~~	34.20
8.0	19	60	8.0	0.030	0.041	254005 0080	~~45.70~~	34.20
10.0	22	70	10.0	0.045	0.042	254005 0100	~~67.50~~	50.50
12.0	26	75	12.0	0.050	0.042	254005 0120	~~91.50~~	68.50
16.0	32	100	16.0	0.060	0.042	254005 0160	~~157.00~~	117.50
20.0	38	105	20.0	0.080	0.045	254005 0200	~~230.00~~	172.50

Short with weldon shank



D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/Z	Feed fz steel < 1000 N/mm² mm/Z	DIN 6535-HB Art.no.	€	
3.0	8	45	6.0	0.010	0.055	**254006** 0030	~~36.30~~	27.20
4.0	11	45	6.0	0.010	0.044	254006 0040	~~36.30~~	27.20
5.0	13	50	6.0	0.020	0.044	254006 0050	~~36.30~~	27.20
6.0	13	50	6.0	0.020	0.041	254006 0060	~~36.30~~	27.20
7.0	16	60	8.0	0.020	0.041	254006 0070	~~45.70~~	34.20
8.0	19	60	8.0	0.030	0.041	254006 0080	~~45.70~~	34.20
9.0	19	70	10.0	0.030	0.041	254006 0090	~~67.50~~	50.50
10.0	22	70	10.0	0.040	0.042	254006 0100	~~67.50~~	50.50
11.0	22	75	12.0	0.045	0.042	254006 0110	~~91.50~~	68.50
12.0	26	75	12.0	0.050	0.042	254006 0120	~~91.50~~	68.50
16.0	32	100	16.0	0.060	0.042	254006 0160	~~157.00~~	117.50
20.0	38	105	20.0	0.080	0.045	254006 0200	~~220.00~~	165.00
25.0	45	120	25.0	0.100	0.058	254006 0250	~~400.00~~	299.00

Long



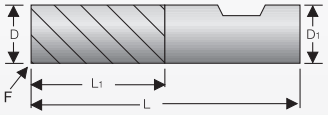
D mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm² mm/Z	Feed fz steel < 1000 N/mm² mm/Z	DIN 6535-HA Art.no.	€	
2.0	8	40	4.0	0.010	0.055	**254007** 0020	~~29.00~~	21.70
3.0	12	50	6.0	0.010	0.055	254007 0030	~~42.60~~	31.90
4.0	15	50	6.0	0.020	0.044	254007 0040	~~42.60~~	31.90
5.0	20	60	6.0	0.020	0.044	254007 0050	~~42.60~~	31.90
6.0	20	60	6.0	0.020	0.041	254007 0060	~~42.60~~	31.90
8.0	25	70	8.0	0.030	0.041	254007 0080	~~52.50~~	39.30
10.0	30	90	10.0	0.040	0.042	254007 0100	~~80.50~~	60.00
12.0	30	90	12.0	0.050	0.042	254007 0120	~~109.00~~	81.50
14.0	40	110	16.0	0.060	0.042	254007 0140	~~157.00~~	117.50
16.0	50	110	16.0	0.060	0.042	254007 0160	~~205.00~~	153.00
20.0	55	110	20.0	0.080	0.045	254007 0200	~~350.00~~	260.00
25.0	75	140	25.0	0.100	0.058	254007 0250	~~579.00~~	429.00

Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		● 60-80	● 50-70	● 40-70	○ 35-45	○ 40-50		● 80-100	● 75-95								● 25-30	○ 15-20	
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

End milling cutter

VHM | 35° -38° | h10 | h6 | DIN 6535 HB | Z 4 | AlTiN+ | HPC

- **4 cutting edges, short, 35°/38° right-hand cutting**
- Irregular helix angle and pitch for low-vibration milling
- **With protective chamfer F for improved service life**
- Eccentric relief grinding
- **Material: fine grain solid carbide**



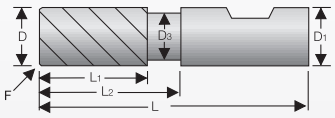
D mm	L1 mm	L mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/Z	Feed fz steel < 1000 N/mm² mm/Z	Art.no.	€
3.0	6	54	6	0.13	4	0.008	0.009	**254203** 0030	**11.00**
4.0	8	54	6	0.18	4	0.013	0.015	254203 0040	**11.00**
5.0	9	54	6	0.2	4	0.021	0.025	254203 0050	**11.00**
6.0	10	54	6	0.2	4	0.021	0.025	254203 0060	**11.00**
8.0	12	58	8	0.2	4	0.027	0.032	254203 0080	**14.90**
10.0	14	66	10	0.3	4	0.044	0.052	254203 0100	**20.40**
12.0	16	73	12	0.3	4	0.044	0.052	254203 0120	**26.50**
16.0	22	82	16	0.4	4	0.059	0.07	254203 0160	**45.30**
20.0	26	92	20	0.5	4	0.071	0.084	254203 0200	**67.70**

Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		190	150	110	70			200	150										
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

End milling cutter

VHM | 35° -38° | h10 | h6 | DIN 6535 HB | Z 4 | AlTiN+ | HPC

- **4 cutting edges, short, 35°/38° right-hand cutting**
- **Irregular helix angle and pitch for low-vibration milling**
- **With clearance**
- **With protective chamfer F for improved service life**
- Eccentric relief grinding
- **Material: fine grain solid carbide**



Standard with weldon shank

D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	F x 45° mm	Z	Feed fz steel < 1000 N/mm² mm/Z	Feed fz steel < 1000 N/mm² mm/Z	Art.no.	€
3.0	8	12	57	2.8	6	0.13	4	0.008	0.009	**254204** 0030	**12.85**
4.0	11	15	57	3.8	6	0.18	4	0.013	0.015	254204 0040	**12.85**
5.0	13	17	57	4.8	6	0.20	4	0.021	0.025	254204 0050	**12.85**
6.0	13	21	57	5.5	6	0.20	4	0.021	0.025	254204 0060	**12.85**
8.0	19	27	63	7.5	8	0.20	4	0.027	0.032	254204 0080	**17.30**
10.0	22	32	72	9.5	10	0.30	4	0.044	0.052	254204 0100	**23.50**
12.0	26	38	83	11.5	12	0.30	4	0.044	0.052	254204 0120	**32.10**
16.0	32	44	92	15.5	16	0.40	4	0.059	0.07	254204 0160	**54.30**
20.0	38	54	104	19.5	20	0.50	4	0.071	0.084	254204 0200	**86.00**

Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		190	150	110	70			200	150										
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

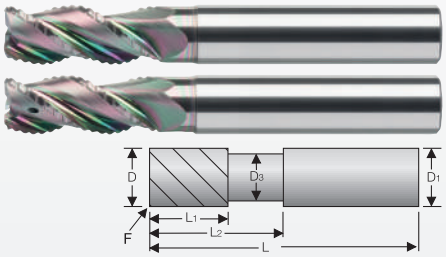
ATORN® Roughing cutter Ultra-N PRO

VHM | WR | 30° | e8 | h6 | DIN 6535 HA | DIN 6535 HB | Z 3 | Ta-C | Vc/fz

- **With clearance**
- **3 cutting edges, with edge chamfer**
- **Spiral angle 30°**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

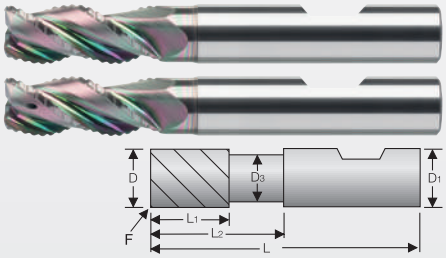
Shank version HA

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/Z	Feed fz aluminium < 8 % Si mm/Z	without internal cooling Art.no.	€	with internal cooling Art.no.	€
6.0	14	57	20	5.9	6.0	0.2	0.08	0.06	**249017** 0060	30.00	**249018** 0060	57.00
8.0	21	63	26	7.8	8.0	0.25	0.08	0.06	249017 0080	37.40	249018 0080	66.10
10.0	23	72	31	9.8	10.0	0.3	0.09	0.07	249017 0100	51.10	249018 0100	80.00
12.0	27	83	37	11.7	12.0	0.35	0.09	0.07	249017 0120	67.90	249018 0120	98.50



Shank version HB

D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/Z	Feed fz aluminium < 8 % Si mm/Z	without internal cooling Art.no.	€	with internal cooling Art.no.	€
16.0	36	92	43	15.7	16.0	0.4	0.11	0.09	**249017** 0160	98.50	**249018** 0160	135.50
20.0	41	104	52	19.5	20.0	0.4	0.14	0.12	249017 0200	144.50	249018 0200	190.00



Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 320	● 260					
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

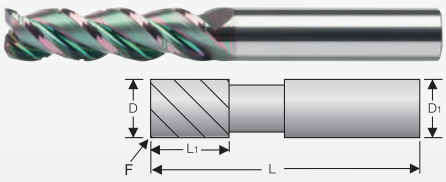
ATORN® Trochoidal milling cutter Ultra-N PRO

VHM | 30° | e8 | h6 | DIN 6535 HA | DIN 6535 HB | Z 3 | Ta-C | TVC | Vc/fz

- **3 cutting edges, with edge chamfer**
- **Spiral angle 30°**
- **3.5 x D**
- For non-ferrous materials
- **Cutting material: solid carbide with DLC-sp3 coating**
- With polish grinding in the chip chambers
- Large chip space for unhindered chip removal

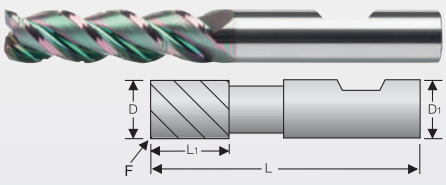
Shank version HA

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/Z	Art.no.	€	
6.0	21	62	6.0	0.2	0.036	**249019** 0060	~~66.00~~	46.20
8.0	28	68	8.0	0.2	0.048	249019 0080	~~72.00~~	50.40
10.0	35	80	10.0	0.2	0.06	249019 0100	~~96.00~~	67.20
12.0	42	93	12.0	0.2	0.084	249019 0120	~~144.00~~	100.00



Shank version HB

D mm	L1 mm	L mm	D1 mm	F x 45° mm	Feed fz aluminium < 8 % Si mm/Z	Art.no.	€	
16.0	56	108	16.0	0.2	0.108	**249019** 0160	~~204.00~~	142.50
20.0	70	126	20.0	0.2	0.144	249019 0200	~~288.00~~	200.00



Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
													● 270	● 180					
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

HPMT End milling cutter Trochoidal 2.5 x D / 3.5 x D

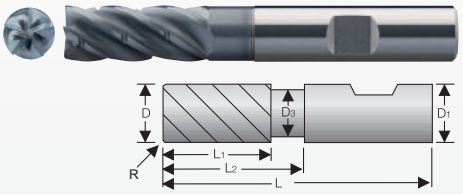
NEW

VHM | h8 | h6 | DIN 6535 HB | Z 5 | AlCrN | TVC | Vc/fz

- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- **With internal coolant supply**

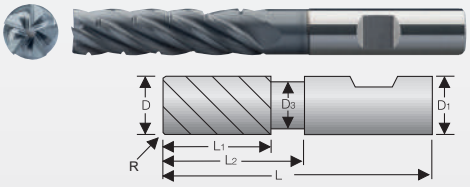
Trochoidal

2.5 x D



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Art.no.	€	
4	10	15	57	3.7	6	0.1	**254235** 0040	~~58.40~~	43.80
6	15	20	57	5.5	6	0.1	254235 0060	~~58.40~~	43.80
8	20	25	64	7.4	8	0.2	254235 0080	~~81.70~~	61.20
10	25	30	72	9.2	10	0.2	254235 0100	~~119.40~~	89.50
12	30	40	83	11	12	0.3	254235 0120	~~159.70~~	119.50
16	40	50	92	15	16	0.3	254235 0160	~~262.40~~	195.00
20	50	60	104	19	20	0.3	254235 0200	~~398.30~~	298.00

3.5 x D



D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	R mm	Art.no.	€	
6	26	32	75	5.5	6	0.1	**254236** 0060	~~105.30~~	78.90
8	32	38	75	7.4	8	0.2	254236 0080	~~141.80~~	106.00
10	42	52	100	9.2	10	0.2	254236 0100	~~180.40~~	135.00
12	48	60	100	11	12	0.3	254236 0120	~~223.50~~	167.50
16	60	68	125	15	16	0.3	254236 0160	~~371.20~~	278.00
20	70	78	125	19	20	0.3	254236 0200	~~522.00~~	389.00

Material

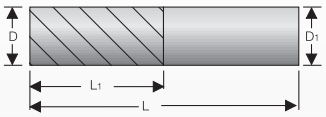
● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
254235 2.5xD....	● 275	● 240	● 220	● 60	● 90		● 220	● 150	● 75	○ 30	○ 60							
254236 3.5xD....	● 200	● 180	● 150	● 55	● 80		● 180	● 85	● 70	○ 30	○ 55							

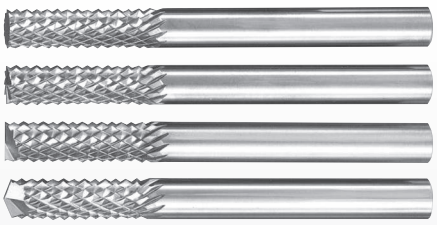
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

SARA® Contour cutters for GFRP and CFRP

VHM | Typ N | h5 | Vc/fz

- Various versions
- Type A - smooth front face
- Type B - rotary cutter front face
- Type C - end milling cutter front face
- Type D - drill point





D mm	L1 mm	L mm	D1 mm	Feed fz graphite mm/Z	Type A Art.no.	€	Type B Art.no.	€	Type C Art.no.	€	Type D Art.no.	€
1.6	5	38	3	1000-1500	**250050** 0001	6.45	**250051** 0001	7.65	**250052** 0001	7.65	**250053** 0001	8.10
2.4	9.5	38	3	1100-1800	250050 0002	6.85	250051 0002	7.65	250052 0002	8.30	250053 0002	8.75
3.0	12	38	3	1100-1800	250050 0003	6.55	250051 0003	7.30	250052 0003	7.90	250053 0003	8.40
4.0	16	50	4	900-1700	250050 0004	10.70	250051 0004	11.90	250052 0004	12.45	250053 0004	12.50
4.0	16	50	6	900-1700	250050 0005	11.70	250051 0005	13.05	250052 0005	13.95	250053 0005	14.45
6.0	19	50	6	900-1700	250050 0007	11.70	250051 0007	13.05	250052 0007	13.95	250053 0007	14.45
6.0	19	63	6	900-1700	250050 0008	11.70	250051 0008	13.05	250052 0008	13.95	250053 0008	14.45
6.0	25	75	6	900-1700	250050 0009	14.45	250051 0009	15.75	250052 0009	16.50	250053 0009	17.00
8.0	25	63	8	900-1700	250050 0006	24.30	250051 0006	25.80	250052 0006	26.90	250053 0006	27.60
10.0	25	75	10	500-1300	250050 0010	30.20	250051 0010	32.80	250052 0010	34.20	250053 0010	35.40
12.0	25	75	12	500-1300	250050 0011	41.60	250051 0011	45.70	250052 0011	48.00	250053 0011	50.20

Material

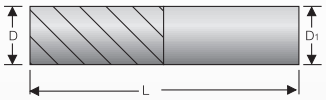
● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
															● 200-230			

Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

ATORN® Deburring tools

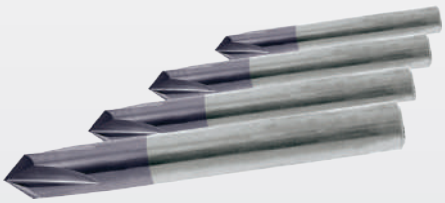
VHM | Typ N | 60° | 90° | 120° | DIN 6535 HA | Z 3 | Z 4 | Z 5 | Z 6 | TiAlN

- **Ideal for chamfering and deburring workpiece edges, and for contour milling**



D mm	L mm	D1 mm	Z	Art.no.	90° €	
1.0	38	3	3	**251551** 0010	~~26.10~~	20.10
2.0	38	3	3	251551 0020	~~26.10~~	20.10
3.0	38	3	3	251551 0030	~~26.10~~	20.10
4.0	51	4	4	251551 0040	~~27.70~~	21.30
6.0	64	6	4	251551 0060	~~34.20~~	26.30
8.0	64	8	5	251551 0080	~~42.60~~	32.80
10.0	70	10	6	251551 0100	~~50.50~~	38.80
12.0	78	12	6	251551 0120	~~74.00~~	56.90
16.0	89	16	6	251551 0160	~~126.00~~	97.00

90° deburring tool set



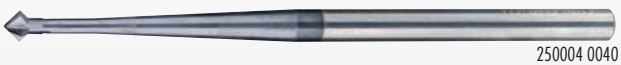
Contents	Art.no.	€	
Ø 6, 8, 10, 12 mm (1 of each)	**251551** 0001	~~195.00~~	129.00

Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	○	○	●	●	○	○	○							
		160-180	120-140	100-120	80-100	60-80	60-80	140-160	140-160	80-100	80-100	60-80							
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

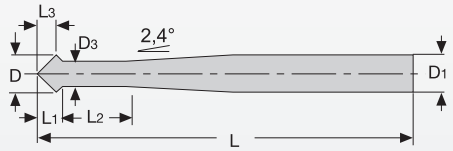
ATORN® Front and rear-side deburring tool

VHM | 90° | DIN 6535 HA | Z 4 | TiAlN

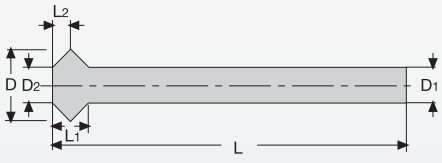
- **For linear and circular front and rear-side deburring or chamfering**



250004 0040
250004 0060



250004 0080
250004 0100
250004 0120



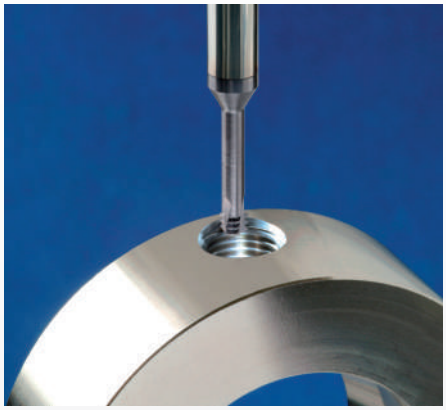
D mm	D1 h6 mm	D2 mm	L mm	L1 mm	L3 mm	L2 mm	D3 mm	Art.no.	€	
3.9	4	-	75	2.95	1.95	10	1.9	**250004** 0040	~~72.20~~	49.90
5.8	6	0.8	100	3.8	1.9	15	4	250004 0060	~~80.50~~	56.00
7.8	6	6.0	100	1.8	0.9	-	-	250004 0080	~~104.00~~	72.50
9.8	6	6.0	100	3.8	1.9	-	-	250004 0100	~~128.00~~	89.50
11.8	6	6.0	100	5.8	2.9	-	-	250004 0120	~~154.00~~	107.50

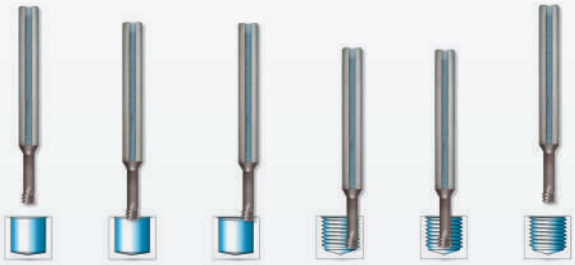
Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy.	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	○	○	●	●	○	○	○	○	○	○		●		
		60-120	60-90	50-80	70-100	60-90	60-90	40-80	40-80	20-40	20-40	20-30	100-200	60-140	60-100		50-60		
	Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

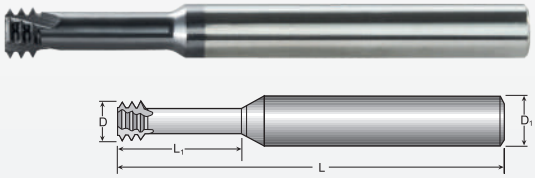
ATORN® SARA® Thread milling cutter for small bore holes

VHM | Z 3 | Z 4 | Z 5 | HSC | Vc/fz

- **Especially for small bores, with straight shank**
- Threading from M1 x 0.25 mm, **thread depth up to 2 x D1**
- **Version for thread depths up to 3 x D1 available on request**
- Suitable for HSC, extremely low cutting pressure, excellent surface finish quality
- Threading in blind holes possible up to the shoulder
- Long service life due to special multi-layer coating
- One tool for right-handed and left-handed threads
- **Cutting material: AMT7 solid carbide, multi-layer TiAlN coating for universal applications**
- **MTSH version for hard machining up to 62 HRc!**







Metric, full profile, ISO 60°, internal

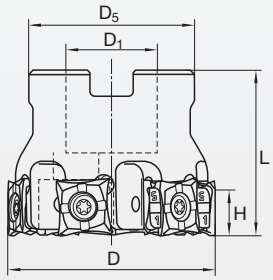
Designation	Pitch mm	Standard thread	D mm	D1 mm	L1 mm	L mm	Z	Feed fz steel < 1000 N/mm² mm/Z	ATORN® Art.no.	ATORN® €	SARA® Art.no.	SARA® €
MTS03007C2 0.25 ISO	0.25	M1	0.72	3	2.5	39	3	0.04	**258010** 0010	102.50		
MTS06016C4 0.4 ISO	0.4	M2	1.53	6	4.5	58	3	0.04	258010 0020	102.50	**258022** 0020	78.00
MTS06017C5 0.45 ISO	0.45	M2.2	1.65	6	5.0	58	3	0.04	258010 0022	102.50		
MTS0602C5 0.45 ISO	0.45	M2.5	1.95	6	5.5	58	3	0.04	258010 0025	102.50	258022 0025	78.00
MTS06024C6 0.5 ISO	0.5	M3	2.37	6	6.5	58	3	0.04	258010 0030	102.50	258022 0030	78.00
MTS06028C7 0.6 ISO	0.6	M3.5	2.75	6	7.5	58	3	0.05	258010 0035	102.50	258022 0035	78.00
MTS06031C9 0.7 ISO	0.7	M4	3.10	6	9.0	58	3	0.05	258010 0040	102.50	258022 0040	78.00
MTS06038C12 0.8 ISO	0.8	M5	3.80	6	12.5	58	3	0.05	258010 0050	102.50	258022 0050	78.00
MTS06047C14 1.0 ISO	1.0	M6	4.65	6	14.0	58	3	0.06	258010 0060	102.50	258022 0060	78.00
MTS0606C18 1.25 ISO	1.25	M8	6.00	6	18.0	58	3	0.07	258010 0080	102.50	258022 0080	78.00
MTS08078C23 1.5 ISO	1.5	M10	7.80	8	23.0	64	3	0.07	258010 0100	136.00	258022 0100	104.50
MTS01009C26 1.75 ISO	1.75	M12	9.00	10	26.0	73	3	0.07	258010 0120	157.00	258022 0120	120.00
MTS12118D35 2.0 ISO	2.0	M16	11.80	12	35.0	84	4	0.07	258010 0160	224.00		
MTS1615E43 2.5 ISO	2.5	M20	15.00	16	43.0	105	5	0.07	258010 0200	284.00		

ATORN® Tangential shoulder milling cutter 90°

Tangential

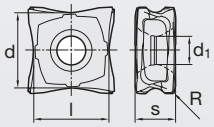
- Process reliability due to tangential installation position
- **8-blade indexable insert for high efficiency**
- Efficiency due to good cutting properties
- Cost savings thanks to reduced cycle times
- For roughing and semi-finishing operations / steel and cast iron machining
- **Infeed depth ap max. = 10 mm**
- up to Ø 125 mm with internal cooling

D mm	L mm	D5 mm	D1 mm	H mm	Z	Tightening torque max. N·m	Designation	Art.no.	€	
50	40	40	22	10	6	5.2	FMP90T X12.050AN-IF	**262566** 0051	~~405.00~~	269.00
63	40	50	22	10	8	5.2	FMP90T X12.063AN-IF	262566 0064	~~509.00~~	339.00
80	50	60	27	10	10	5.2	FMP90T X12.080AN-IF	262566 0081	~~619.00~~	409.00
100	50	65	32	10	12	5.2	FMP90T X12.100AN-IF	262566 0101	~~749.00~~	499.00
125	63	90	40	10	16	5.2	FMP90T X12.125AN-IF	262566 0126	~~909.00~~	599.00
160	63	130	40	10	20	5.2	FMP90T X12.160AN-F	262566 0161	~~1,199.00~~	789.00



XNMU

ISO designation	l mm	d mm	S mm	d1 mm	R mm	ISO K HC4420 Art.no.	€	ISO P K HC4430 Art.no.	€	ISO P HC4640 Art.no.	€
XNMU 120508ER	12	12	5.56	4.4	0.8	**283320** 0120	13.90	**283321** 0130	13.90	**283322** 0140	13.90

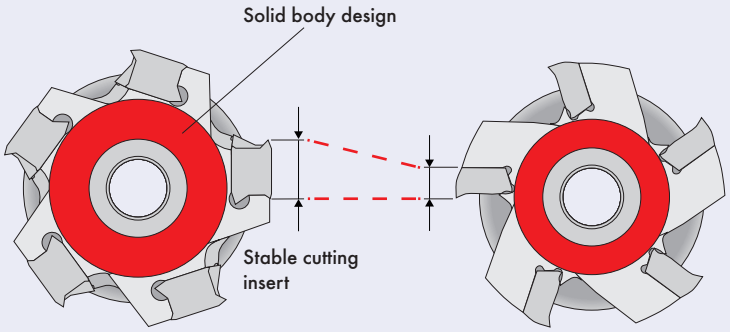


Tangential milling cutters

- **Process reliability due to tangential installation position**
  The tangential installation position of the indexable cutting inserts provides some special features. The favourable contact surface and clamping force conditions ensure maximum stability. The tools are therefore extremely reliable even at high cutting performance.

- **Efficiency due to good cutting properties**
  The stable indexable cutting inserts have a positive rake angle, resulting in excellent cutting performance and low power consumption of the machine. This significantly increases the service life of the cutting edge. This has a direct and positive effect on tool costs.

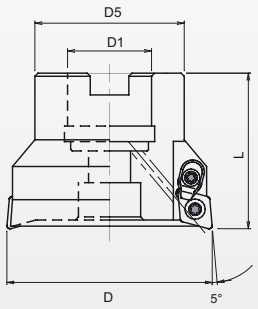
- **Cost savings thanks to reduced cycle times**
  The ratio of tool diameter to the number of teeth, combined with high achievable feed rates, facilitates enormous removal rates. This results in significantly shorter cycle times, which considerably reduces the total process costs and cost per part.



palbit Shoulder milling cutter 95° *LINEPRO 40595*

NEW

- **For milling inserts XP..10T3**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**

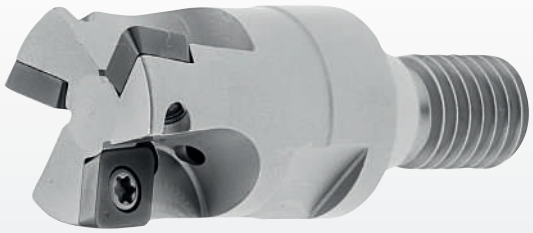


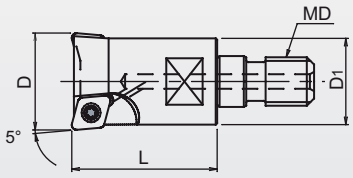
D mm	L mm	D5 mm	D1 mm	Z	Tightening torque max. N·m	Suitable indexable inserts	Art.no.	€	
52	50	40	22	5	3.0	XD..10T3..	**260295** 0052	~~269.00~~	234.00
66	50	48	27	6	3.0	XD..10T3..	260295 0066	~~320.50~~	279.00
80	50	60	27	7	3.0	XD..10T3..	260295 0080	~~400.00~~	349.00

palbit Screw-in milling cutter 95° *LINEPRO 40595*

NEW

- **For milling inserts XD..1003**
- Easy cutting action due to the positive installation position of the indexable insert
- Tools deliver smooth milling performance
- **Internal coolant supply**



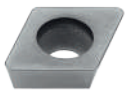


D mm	D1 mm	L mm	Z	MD	Tightening torque max. N·m	Suitable indexable inserts	Art.no.	€	
25	40	50	2	12	3.0	XD..10T3..	**260294** 0025	~~143.50~~	125.00
35	48	50	3	16	3.0	XD..10T3..	260294 0035	~~172.00~~	149.50
42	60	50	4	16	3.0	XD..10T3..	260294 0042	~~200.50~~	175.00

Milling inserts XDHW *LINEPRO 40095 / 40595 / 4109*

NEW

XDHW shoulder milling inserts

F finishing -	M medium -	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
			XDHW 10T310	●					○	**PH 6103**	10	**285367** 0431	7.80
				●		●				**PH 6125**	10	285367 0432	7.80
				●						**PH 6135**	10	285367 0433	7.80
				●		●				**PH 6910**	10	285367 0441	7.80

ISO	PH 6103	PH 6125	PH 6135	PH 6910	PHD 103
ISO P Steel	Vc = 180-300	Vc = 130-190	Vc = 120-180	Vc = 160-250	
ISO K Cast iron		Vc = 80-290		Vc = 90-300	
ISO N Al/non-ferrous					Vc = 300-1000
ISO H Hard	Vc = 120-260				
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.1-02		fz = 0.1-0.35	fz = 0.1-0.3	fz = 0.1-0.2
	ap = 0.05-1.0				

ISO indexable cutting inserts *CCMT*

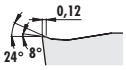
NEW

- **80° rhombic, positive 7°**

Chip breaker *MP*

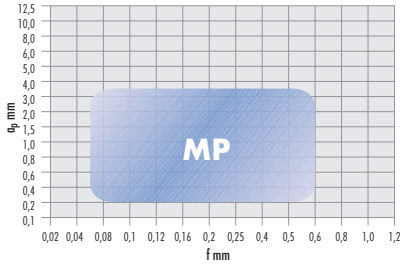
F finishing	M medium	R roughing
●	-	-

Finishing



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
CCMT 060208-MP	●		●				**PHG 125**	10	**333501** 0165	5.55
CCMT 09T304-MP	●		●				**PHG 115**	10	333501 0264	5.55
	●		●				**PHG 125**	10	333501 0265	5.55
CCMT 09T308-MP	●		●				**PHG 115**	10	333501 0364	5.55
	●		●				**PHG 125**	10	333501 0365	5.55
CCMT 120404-MP	●		●				**PHG 115**	10	333501 0464	6.90
	●		●				**PHG 125**	10	333501 0465	6.90
CCMT 120408-MP	●		●				**PHG 115**	10	333501 0564	6.90
	●		●				**PHG 125**	10	333501 0565	6.90

ISO	PHG 115	PHG 125
ISO P Steel	Vc = 110-270	Vc = 100-240
ISO K Cast iron	Vc = 110-270	Vc = 100-240
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.08-0.60 ap = 0.20-3.60	



ISO indexable cutting inserts *CNMG*

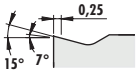
NEW

- **80° rhombic, negative 0°**

Chip breaker *PM*

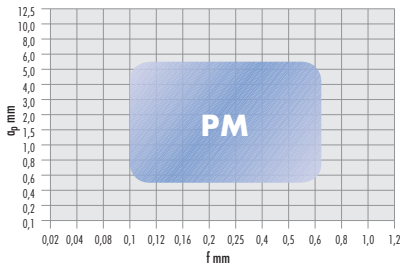
F finishing	M medium	R roughing
○	●	-

Medium machining



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
CNMG 120404-PM	●		●				**PHG 115**	10	**333607** 0164	6.10
	●		●				**PHG 125**	10	333607 0165	6.10
CNMG 120408-PM	●		●				**PHG 115**	10	333607 0264	6.10
	●		●				**PHG 125**	10	333607 0265	6.10
CNMG 120412-PM	●		●				**PHG 115**	10	333607 0364	6.10
	●		●				**PHG 125**	10	333607 0365	6.10
CNMG 120416-PM	●		●				**PHG 115**	10	333607 0464	6.10
	●		●				**PHG 125**	10	333607 0465	6.10

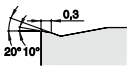
ISO	PHG 115	PHG 125
ISO P Steel	Vc = 110-270	Vc = 100-240
ISO K Cast iron	Vc = 110-270	Vc = 100-240
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.10-0.65 ap = 0.40-5.50	



Chip breaker *SF*

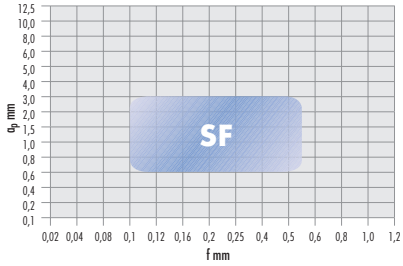
F finishing	M medium	R roughing
○	●	-

Finishing/medium machining



palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
CNMG 120404-SF		●					**PHS 215**	10	**333604** 0371	6.90
		●					**PHS 225**	10	333604 0472	6.90
CNMG 120408-SF		●					**PHS 215**	10	333604 0771	6.90
		●					**PHS 225**	10	333604 0872	6.90
CNMG 120412-SF		●					**PHS 215**	10	333604 1171	6.90
		●					**PHS 225**	10	333604 1272	6.90

ISO	PHS 215	PHS 225
ISO M Stainless steel	Vc = 80-290	Vc = 55-240
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.10-0.55 ap = 0.60-3.0	

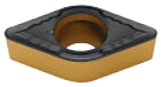
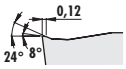


ISO indexable cutting inserts *DCMT*

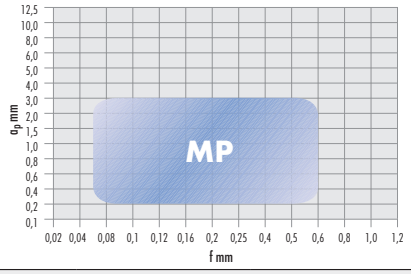
NEW

- **55° rhombic, positive 7°**

Chip breaker *MP*

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
●	-	-											
 Finishing 	DCMT 070208-MP		●		●					**PHG 115**	10	**333566** 0164	5.55
	DCMT 11T304-MP		●		●					**PHG 115**	10	333566 0264	5.55
			●		●					**PHG 125**	10	333566 0265	5.55
	DCMT 11T308-MP		●		●					**PHG 115**	10	333566 0364	5.55
			●		●					**PHG 125**	10	333566 0365	5.55
	DCMT 11T312-MP		●		●					**PHG 115**	10	333566 0464	5.55
			●		●					**PHG 125**	10	333566 0465	5.55

ISO	PHG 115	PHG 125
ISO P Steel	Vc = 110-270	Vc = 100-240
ISO K Cast iron	Vc = 110-270	Vc = 100-240
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.06-0.60 ap = 0.20-3.00	

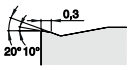


ISO indexable cutting inserts *DNMG*

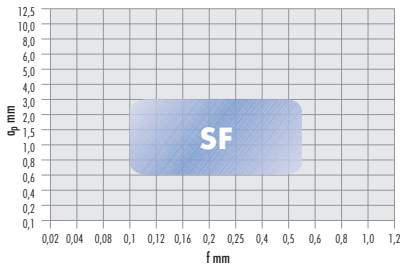
NEW

- **55° rhombic, negative 0°**

Chip breaker *SF*

F finishing	M medium	R roughing	ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
○	●	-											
 Finishing/medium machining 	DNMG 110404-SF		●							**PHS 215**	10	**333618** 0371	6.90
			●							**PHS 225**	10	333618 0472	6.90
	DNMG 110408-SF		●							**PHS 215**	10	333618 0771	6.90
			●							**PHS 225**	10	333618 0872	6.90
	DNMG 150404-SF		●							**PHS 215**	10	333618 1171	9.10
			●							**PHS 225**	10	333618 1272	9.10
	DNMG 150408-SF		●							**PHS 215**	10	333618 1571	9.10
			●							**PHS 225**	10	333618 1672	9.10
	DNMG 150412-SF		●							**PHS 215**	10	333618 1971	9.10
			●							**PHS 225**	10	333618 2072	9.10
	DNMG 150604-SF		●							**PHS 215**	10	333618 2371	10.30
			●							**PHS 225**	10	333618 2472	10.30
	DNMG 150608-SF		●							**PHS 215**	10	333618 2771	10.30
			●							**PHS 225**	10	333618 2872	10.30
	DNMG 150612-SF		●							**PHS 215**	10	333618 3171	10.30

ISO	PHS 215	PHS 225
ISO M Stainless steel	Vc = 80-290	Vc = 55-240
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.10-0.55 ap = 0.60-3.0	

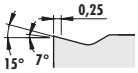


ISO indexable cutting inserts *WNMG*

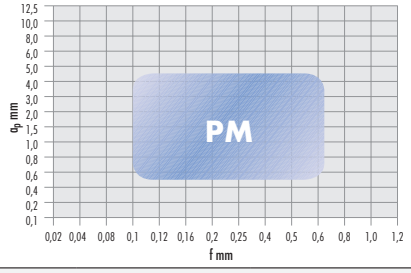
NEW

- **80° trigonometric, negative 0°**

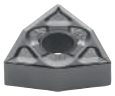
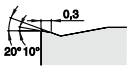
Chip breaker *PM*

F finishing ○	M medium ●	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
 Medium machining 	WNMG 080404-PM	●		●				PHG 115	10	**333672** 0164	7.00
		●		●				PHG 125	10	333672 0165	7.00
	WNMG 080408-PM	●		●				PHG 115	10	333672 0264	7.00
		●		●				PHG 125	10	333672 0265	7.00
	WNMG 080412-PM	●		●				PHG 115	10	333672 0364	7.00
		●		●				PHG 125	10	333672 0365	7.00
	WNMG 080416-PM	●		●				PHG 115	10	333672 0464	7.00
		●		●				PHG 125	10	333672 0465	7.00

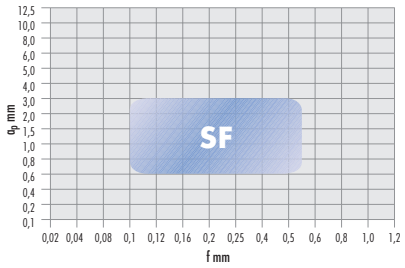
ISO	PHG 115	PHG 125
ISO P Steel	Vc = 110-270	Vc = 100-240
ISO K Cast iron	Vc = 110-270	Vc = 100-240
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.10-0.65 ap = 0.50-4.50	



Chip breaker *SF*

F finishing ○	M medium ●	R roughing -	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
 Finishing/medium machining 	WNMG 060404-SF		●						PHS 215	10	**333668** 0371	6.30
			●						PHS 225	10	333668 0472	6.30
	WNMG 060408-SF		●						PHS 215	10	333668 0771	6.30
			●						PHS 225	10	333668 0872	6.30
	WNMG 060412-SF		●						PHS 215	10	333668 1171	6.30
			●						PHS 225	10	333668 1272	6.30
	WNMG 080404-SF		●						PHS 215	10	333668 1571	7.60
			●						PHS 225	10	333668 1672	7.60
	WNMG 080408-SF		●						PHS 215	10	333668 1971	7.60
			●						PHS 225	10	333668 2072	7.60
	WNMG 080412-SF		●						PHS 215	10	333668 2371	7.60
			●						PHS 225	10	333668 2472	7.60

ISO	PHS 215	PHS 225
ISO M Stainless steel	Vc = 80-290	Vc = 55-240
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.1-0.55 ap = 0.6-3.0	



ISO indexable cutting inserts *KNUX TURN*

- **55° rhombic, negative**
- Secondary applications in ISO **K** and ISO **S**
- One-sided chip breaker design
- Minimum ap feed always 63 % of the corner radius "r"
- Maximum ap feed is 63 % of the cutting edge length
- Easy-action operating principle of chip breaker
- Cutting data recommendations apply to a corner radius **r = 0.4 mm**

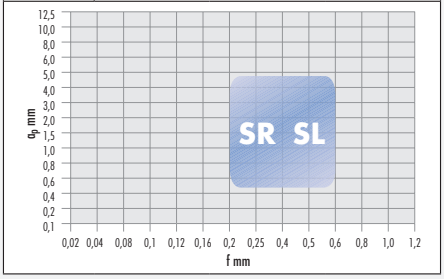
Chip breaker *SR* right-hand version

- **Note:**
  RH insert = **right-hand** external clamp mounting or **left-hand** boring bar
  LH insert = **left-hand** external clamp mounting or **right-hand** boring bar

F finishing	M medium	R roughing	SARA® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
○	●	-	KNUX 160405-SR	●	○	○				SC 25 PT	10	**366645** 0125	8.95
			KNUX 160410-SR	●	○	○				SC 25 PT	10	366645 0225	8.95
			KNUX 160405-SR	●	○					SC 20 UT	10	366645 0350	8.95
				●	○					SC 40 UT	10	366645 0455	8.95

Universal application

ISO	SC 20 UT	SC 25 PT	SC 40 UT
ISO P Steel	Vc = 90-200	Vc = 100-240	Vc = 90-180
ISO M Stainless steel	Vc = 90-180	Vc = 70-210	Vc = 50-160
ISO K Cast iron		Vc = 130-250	
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.2-0.6 ap = 0.5-4.8		



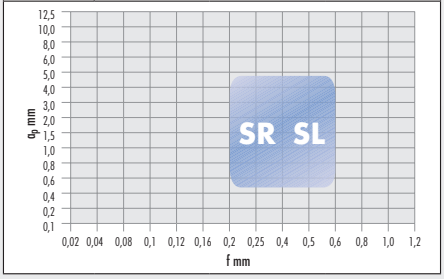
Chip breaker *SL* left-hand version

- **Note:**
  RH insert = **right-hand** external clamp mounting or **left-hand** boring bar
  LH insert = **left-hand** external clamp mounting or **right-hand** boring bar

F finishing	M medium	R roughing	SARA® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality		Art.no.	€
○	●	-	KNUX 160405-SL	●	○	○				SC 25 PT	10	**366644** 0125	8.95
			KNUX 160410-SL	●	○	○				SC 25 PT	10	366644 0225	8.95
			KNUX 160405-SL	●	○					SC 20 UT	10	366644 0350	8.95
				●	○					SC 40 UT	10	366644 0455	8.95

Universal application

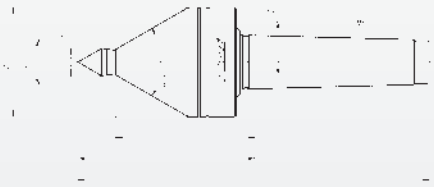
ISO	SC 20 UT	SC 25 PT	SC 40 UT
ISO P Steel	Vc = 90-200	Vc = 100-240	Vc = 90-180
ISO M Stainless steel	Vc = 90-180	Vc = 70-210	Vc = 50-160
ISO K Cast iron		Vc = 130-250	
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.2-0.6 ap = 0.5-4.8		



ATORN® Live centre, extended running point

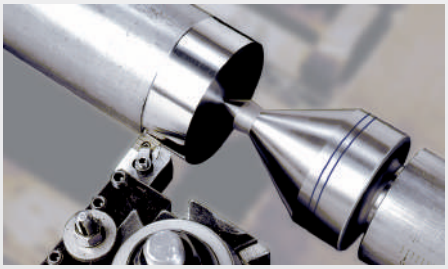
- **60° point angle**
- **Extended running point**
- Perfect all-purpose point for universal use on manual lathes
- Radial run-out: max. 0.005 mm
- Fully hardened and ground tool
- Bearing arrangement for high axial forces
- Shaft sealing ring prevents the ingress of dirt and coolant

Shank	A mm	B mm	C mm	D mm	E mm	F mm	Max. speed rpm	Workpiece weight max. kg	Art.no.	€
MK 2	54	13	17.78	68.5	86.5	150.5	4200	170	**401503** 0002	**239.00**
MK 3	54	13	23.83	68.5	86.5	167.5	4200	170	401503 0003	**259.00**
MK 3	64	16	23.83	78	100	181	3800	330	401503 0013	**279.00**
MK 4	64	16	31.27	78	100	202.5	3800	330	401503 0004	**299.00**
MK 4	86	19	31.27	93.5	121.5	224	3200	550	401503 0014	**369.00**
MK 5	86	19	44.40	93.5	121.5	251	3200	550	401503 0005	**409.00**



Easy to use for tubes with large diameters.

The extended running point guarantees the required clearance angle for turning parts with small diameters.



Ideal for bar stock with large diameters.

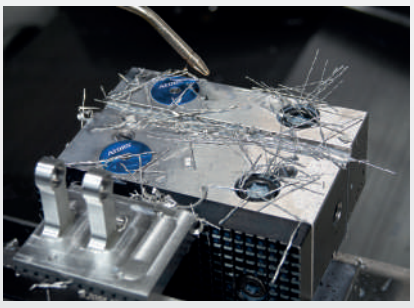
ATORN® Cover for holes and screw hole

NEW

- prevents chips from sticking and the accumulation of cooling lubricants in screw head and counterbore
- Increased work safety when working and cleaning with compressed air
- faster set-up due to less cleaning effort
- patented reusable system
- suitable for the clamping systems in the catalogue
- Special sizes on request

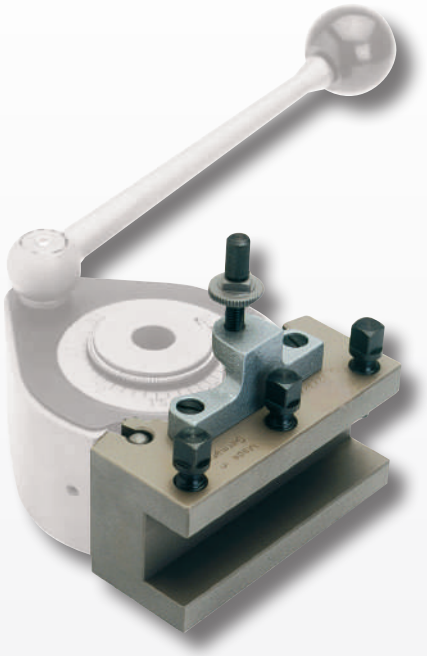
Aluminium cover

Description	Art.no.	€	
Cover M10	**438110** 0010	~~75.00~~	**67.50**
Cover M12	438110 0012	~~75.00~~	**67.50**
Cover M16	438110 0016	~~95.00~~	**85.50**
Cover M20	438110 0020	~~55.00~~	**49.50**



ATORN® Quick-change tool holder

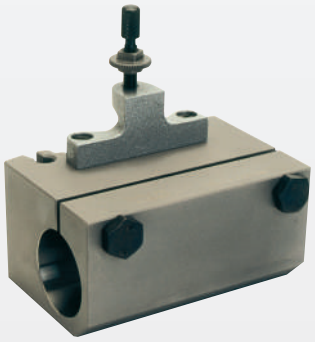
- Profile-ground, toothed central body attached to the lathe support along with the base body
- The base body can accommodate an unlimited number of interchangeable holders for turning or drilling tools, one after the other.
- 40 different steel holder angle settings possible
- Repetition precision ± 0.01 mm



Quick-change D lathe tool holder

- Flat tool support
- Supplied with lockable height-adjustment screw and clamping screws

Suitable for holder size	D mm	Total length mm	Suitable quadratic-head bolt	Art.no.	€	
AA	12	50	M5 x 0.8 x 18	**446505** 0012	~~83.50~~	62.50
A	16	75	M7 x 1 x 23	446505 1116	~~83.50~~	62.50
A	16	90	M7 x 1 x 23	446505 1117	~~83.50~~	62.50
A	20	75	M7 x 1 x 23	446505 1120	~~85.00~~	63.50
A	20	90	M7 x 1 x 23	446505 1121	~~85.00~~	63.50
B	25	120	M11 x 1 x 30	446505 2225	~~130.00~~	97.50
B	25	140	M11 x 1 x 30	446505 2226	~~130.00~~	97.50
B	32	120	M11 x 1 x 30	446505 2232	~~133.00~~	99.50
B	32	140	M11 x 1 x 30	446505 2233	~~133.00~~	99.50
C	32	150	M14 x 1.5 x 40	446505 3332	~~205.00~~	153.50
C	32	170	M14 x 1.5 x 40	446505 3333	~~205.00~~	153.50
C	40	150	M14 x 1.5 x 40	446505 3340	~~224.00~~	168.00
C	40	170	M14 x 1.5 x 40	446505 3341	~~224.00~~	168.00
C	45	170	M14 x 1.5 x 40	446505 3345	~~232.00~~	174.00
D1	40	180	M14 x 1.5 x 40	446505 4440	~~340.00~~	255.00
D1	50	180	M14 x 1.5 x 40	446505 4450	~~360.00~~	270.00
D1	63	180	M14 x 1.5 x 40	446505 4463	~~385.00~~	288.00



Quick-change BS boring bar holder

- With straight bore for Morse taper sleeves and for direct attachment of boring bars
- Supplied with lockable height-adjustment screw and clamping screws
- Tool holder blanks available on request

Suitable for holder size	For boring bar Ø mm	Total length mm	Art.no.	€	
AA	15	50	**446520** 0015	~~102.00~~	81.50
A	30	80	446520 1130	~~121.50~~	97.00
B	40	120	446520 2240	~~184.50~~	147.50
C	40	160	446520 3340	~~308.00~~	246.00
C	50	160	446520 3350	~~312.00~~	249.00
D1	63	180	446520 4463	~~629.00~~	499.00

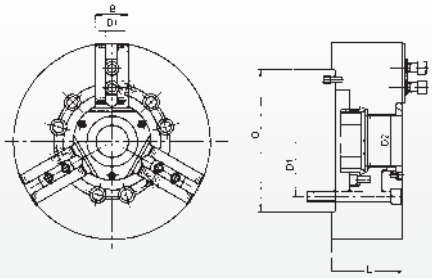
Morse taper sleeve, type H

- With jacking screw
- For mounting in BS quick-release boring bar holders, straight outer diameter
- For tools with a Morse taper shank

Suitable for holder size	Shank Ø mm	Shank design interior	Art.no.	€	
A	30	MK 1	**446525** 1101	~~42.70~~	34.10
A	30	MK 2	446525 1102	~~45.20~~	36.10
B	40	MK 3	446525 2203	~~55.00~~	44.00
B	40	MK 4	446525 2204	~~61.80~~	49.40
C	40	MK 3	446525 3303	~~55.00~~	44.00
C	40	MK 4	446525 3304	~~61.80~~	49.40
C	50	MK 3	446525 3313	~~70.00~~	56.00
C	50	MK 4	446525 3314	~~74.00~~	59.20
C	50	MK 5	446525 3315	~~100.00~~	80.00
D1	63	MK 5	446525 4405	~~144.00~~	115.00

kitagawa EUROPE Wedge hook power chuck

DIN 6353



- **3-jaw version**
- **Model B/BT-200**
- **with large clearance**
- Solid steel design
- Hardened and ground guides
- High true running accuracy
- Lubrication nipple in every base jaw
- Centre mount in accordance with DIN 6353
- Supplied without flange, **without top jaws**, with base jaw teeth 1.5 mm x 60°, T-slot nuts, chuck and jaw fastening screws, drawbar nuts without thread, special assembly wrench
- Further sizes and models available on request
- **Threaded drawbar nuts available on request**

Model	Chuck Ø mm	L mm	B mm	B1 H7 mm	D H6 mm	D1 mm	D2 mm	Jaw lift distance mm	Piston stroke mm	Max. clamp force kN	Max. actuating force kN	Max. speed rpm	Clamping range mm	Weight kg	U max.	Art.no.	€
B-204	110	59	23	10	85	70.6	26	5.4	10	28.5	14	8000	7 - 110	4	M32 x 1.5	**410101** 0204	2,097.00
B-206	169	81	26	12	140	104.8	45	5.5	12	57	22	6000	16 - 168	11.9	M55 x 2	410101 0206	1,689.00
B-208	210	91	35	14	170	133.4	52	7.4	16	86	34.8	5000	13 - 210	22.3	M60 x 2	410101 0208	1,773.00
B-210	254	100	40	16	220	171.4	75	8.8	19	111	43	4200	31 - 254	34.5	M85 x 2	410101 0210	2,071.00

kitagawa EUROPE Reversible top jaws, 1.5 mm x 60°

- **For chuck types: BT200 / B200 / BB200**
- **Hardened**
- Material 16 MnCr 5
- Price per 3-piece set
- **No reversible jaws are available for BT204, BT205 and BT212**
- **For other sizes, please visit www.spannbackenfinder.de**

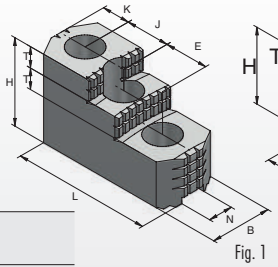


Fig. 1

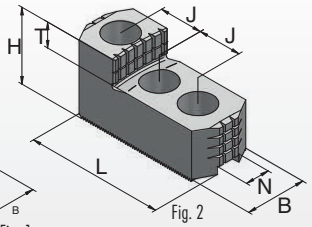


Fig. 2

For chuck Ø mm	B mm	H mm	L mm	T mm	N mm	J mm	Screw	Weight kg	Illustration	Art.no.	€	
169	31	36	67	12	12	20	M10	1	2	**420240** 0006	~~245.00~~	219.00
210	35	51	87	12	14	25	M12	2.5	1	420240 0008	~~365.00~~	325.00
254	40	54	101	13	16	30	M12	3.5	1	420240 0010	~~405.00~~	359.00

kitagawa EUROPE Top jaws, 1.5 mm x 60°

- **For chuck types: BT200 / B200 / BB200**
- Material C15
- Price per 3-piece set
- **For aluminium jaws and other sizes, please visit www.spannbackenfinder.de**

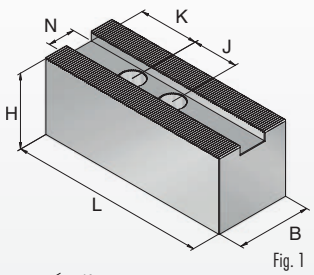


Fig. 1

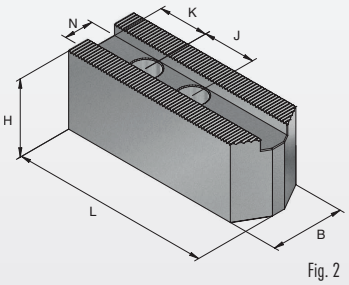


Fig. 2

For chuck Ø mm	B mm	H mm	L mm	N mm	K+J mm	Screw	Weight kg	Illustration	Art.no.	€	
110/135	22	24	52	10	12+14	M8	0.5	2	**420210** 0205	~~48.50~~	43.50
110/135	24	50	52	10	12+14	M8	1.1	2	420210 2055	~~45.40~~	40.50
169	30	31	72	12	15+20	M10	1.2	1	420210 0006	~~40.50~~	36.00
169	30	31	82	12	15+20	M10	1.2	2	420210 0601	~~53.50~~	48.00
169	30	50	72	12	15+20	M10	2	2	420210 0650	~~57.50~~	51.50
210	35	37	95	14	24+25	M12	2.2	2	420210 0008	~~47.50~~	42.50
210	35	37	95	14	24+25	M12	2.2	1	420210 0108	~~47.90~~	43.00
210	35	37	102	14	20+25	M12	2.9	2	420210 0801	~~56.00~~	50.00
210	35	79	95	14	24+25	M12	5	2	420210 0810	~~60.50~~	54.00
254	40	42	110	16	30+30	M12	3.5	2	420210 0010	~~50.50~~	45.00
254	40	42	125	16	30+30	M12	4.1	2	420210 1001	~~60.00~~	54.00
254	40	60	90	16	21+30	M12	4.2	1	420210 1010	~~64.50~~	58.00
254	40	60	110	16	30+30	M12	5.2	2	420210 1060	~~64.50~~	58.00
254	40	79	110	16	30+30	M12	8.1	1	420210 1080	~~76.50~~	68.50
304	50	50	129	21	40+30	M16	6	1	420210 0212	~~66.00~~	59.00
304	50	50	145	21	30+30	M16	6.7	2	420210 2121	~~90.00~~	81.00
304	50	79	129	21	40+30	M16	9.7	1	420210 2128	~~124.00~~	111.50

Magnetic vice jaws

NEW

- **Suitable for all vice models**
- With integrated permanent magnets
- Material: Aluminium
- Further jaw widths from 80 to 200 mm as well as felt types available on request

Aluminium protective jaw with rubber coating

- 1 pair

Jaw width mm	Art.no.	€	
100	**452102** 0100	~~24.10~~	19.20
125	452102 0125	~~27.20~~	21.70
150	452102 0150	~~30.40~~	24.30

Aluminium protective jaw with fibre coating

- 1 pair

Jaw width mm	Art.no.	€	
100	**452100** 0100	~~24.10~~	19.20
125	452100 0125	~~27.20~~	21.70
150	452100 0150	~~30.40~~	24.30

Aluminium protective jaw, smooth surface

- 1 pair

Jaw width mm	Art.no.	€	
100	**452103** 0100	~~17.70~~	14.10
125	452103 0125	~~21.30~~	17.00
150	452103 0150	~~24.80~~	19.80

Aluminium protective jaw, horizontal and vertical V-block 12 mm

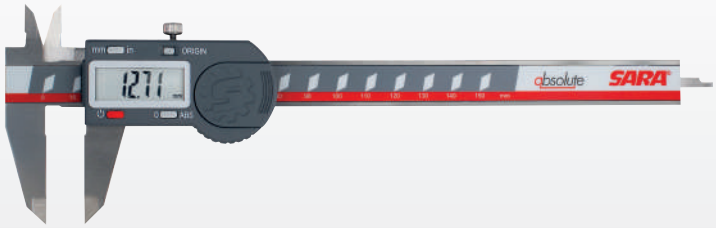
- 1 pair

Jaw width mm	Art.no.	€	
100	**452105** 0100	~~25.60~~	20.40
125	452105 0125	~~29.00~~	23.20
150	452105 0150	~~32.30~~	25.80

SARA® Absolute digital vernier calliper

DIN 862 | INOX | 0,01 mm | inch / mm

- With absolute scale, no zeroing required
- Locking screw on top
- External, internal, depth and step measurements
- High-contrast, easily readable LCD display
- Thread table on the back
- Functions: ON/OFF, ZERO, mm/inch
- Supplied with CR2032 battery, No. 548079 6032

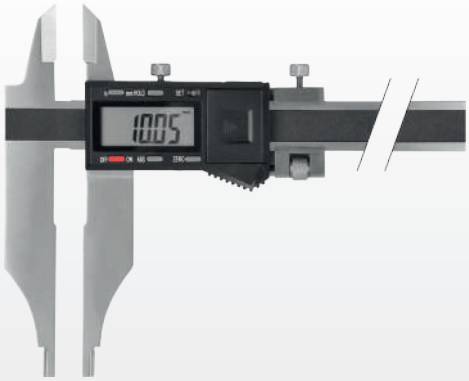


Measurement range mm/inch	Jaw length mm	Error limit mm	Art.no.	€		Calibration Art.no.	Calibration €
150/6 inch	40	0.03	**500702** 1150	~~72.50~~	49.95	070101 0001	**7.50**

SARA® Digital workshop vernier calliper

INOX | 0,01 mm | inch / mm

- With blade tips
- With fine adjustment
- Offset jaw ends for internal measurements
- Bevelled blade tips
- Supplied with CR2032 battery, No. 548079 6032



Measurement range mm/inch	Jaw length mm	Inside measurement from mm	Error limit mm	Art.no.	€		Calibration Art.no.	Calibration €
300	90	10	0.03	**500628** 0300	~~210.00~~	155.00	070101 0002	**14.00**
500	150	20	0.05	500628 0500	~~420.00~~	315.00	070101 0003	**19.00**
1000	150	20	0.06	500528 1000	~~739.00~~	549.00	070101 0004	**42.50**

SARA® Dial indicator

DIN 878 | 0,01 mm

- Matt chrome-plated metal housing
- Rotating external ring for zero setting
- Two adjustable inner tolerance marks
- Probe tip thread: M 2.5
- Clamping shank Ø: 8 mm
- Optional ring clamping, self-locking or with clamping screw
- Supplied in moulded packaging

510101 1005

510101 1002

Measurement range mm	Pitch mm	External ring Ø mm	Ring clamping	Art.no.	€		Calibration Art.no.	Calibration €
10	0.01	58	No	**510101** 1002	~~21.30~~	16.95	070140 0001	**11.50**
10	0.01	58	Yes	510101 1005	~~21.30~~	16.95	070140 0001	**11.50**

SARA® Three-point internal measuring device sets

DIN 863/4 | 0,5 mm

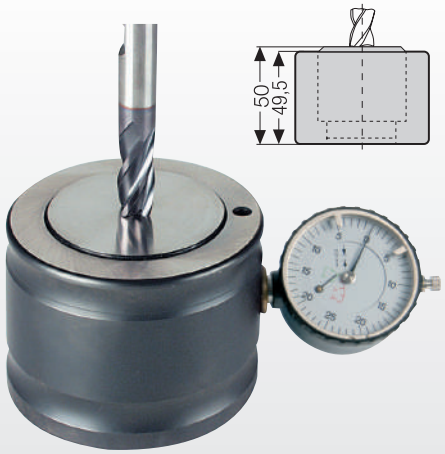
- For measuring through holes and blind holes
- Large measurement depths thanks to extension
- Reading and operating parts matt chrome-plated
- Measuring spindle fully hardened and ground
- Ratchet coupling for repeatable measuring force
- Self-centring measuring head with three laterally extending measuring probes
- Carbide-tipped from a measurement range of 12 mm
- Clearance a for 6-12 mm = 1.4 mm, 12-100 mm = 0.5 mm
- Scale division up to size 0012 = 0.001 mm, from size 0016 = 0.005 mm
- Calibration including ring gauges, reduced testing
- Supplied in a sturdy transport case including ring gauge and extension

507704 0050

Measurement range mm	Single units mm	Ring gauges mm	Extensions mm	Art.no.	€		Calibration Art.no.	Calibration €
6-12	6-8, 8-10, 10-12	6, 8, 10	100	**507704** 0012	~~695.00~~	519.00	070525 0307	**102.00**
12-20	12-16, 16-20	16	150	507704 0020	~~429.00~~	319.00	070525 0303	**52.00**
20-50	20-25, 25-30, 30-40, 40-50	25, 40	2 x 150	507704 0050	~~995.00~~	739.00	070525 0304	**104.00**
50-100	50-63, 62-75, 75-88, 87-100	62, 87	150	507704 0100	~~1,449.00~~	1,079.00	070525 0305	**134.00**

Zero setter, height 50 mm

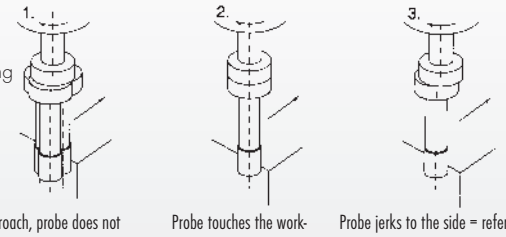
- For setting the reference point in the machine
- The adjustment device is placed on the workpiece and the tool (e.g. milling cutter) is moved onto the spring-mounted contact surface until both pointers on the dial indicator are at the zero setting. The lower edge of the tool now points precisely to 50 mm ± 0.01 mm. The reference dimension 50 mm is entered into the machine control system.
  Attention: Process may only be performed while the tool is stationary.
- Base body and probe tip are case hardened (60 HRc), fine ground
- Two guide diameters for optimum handling of the contact surface
- 558020 0005: six magnets in the base, surface ground
- Supplied in wooden case including dial indicator, operating manual and measurement log



Casing Ø mm	Sensor surface Ø mm	Spring deflection mm	Reading mm	Magnetic foot	Art.no.	€	
68	47	50,5 - 49,5	0.01	No	**558020** 0001	~~209.00~~	189.00
68	47	50,5 - 49,5	0.01	Yes	558020 0005	~~269.00~~	239.00

Edge probe for rotary applications

- For determining tool reference faces and edges
- **Recommended speed: approx. 600 rpm**
- All parts hardened and burnished
- Ground clamping and contact diameters
- Surfaces between holding fixture and probe head lapped
- Probe head is connected to the clamping shank via an extension spring
- Alignment accuracy of 0.01 mm
- Supplied in a case



Approach, probe does not rotate smoothly

Probe touches the workpiece and runs quietly

Probe jerks to the side = reference point

558040 0002

558040 0001

Clamping Ø mm	Contact Ø mm	Total length mm	Art.no.	€	
10	10 and 4	90	**558040** 0001	~~45.50~~	35.90
10	10	84	558040 0002	~~45.50~~	35.90
6	6	50	558040 0003	~~45.50~~	35.90

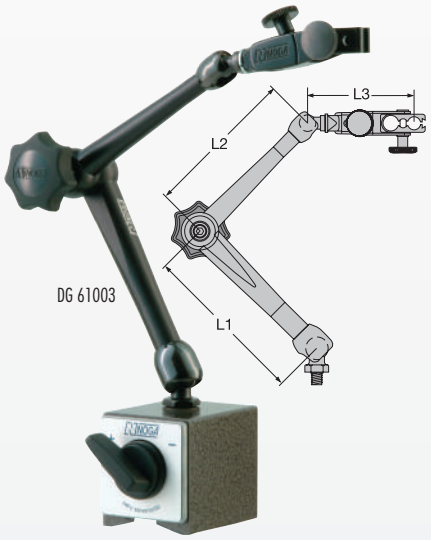
NOGA Magnetic measuring stands

- For quickly and precisely positioning dial indicators
- **With mechanical central clamping mechanism**
- Improved fine adjustment on the magnetic foot
- Strong, switchable magnetic foot
- Universal holding fixture for common dial indicators
- Robust arm system with central clamping mechanism


Fine adjustment holding fixture


Arm mechanism


Fine adjustment magnetic foot

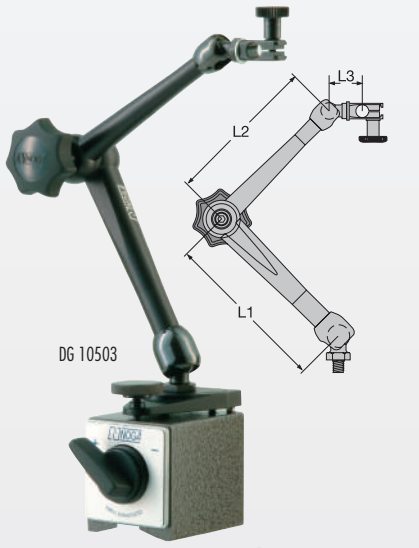


DG 61003

Complete stand with fine adjustment on the measuring instrument holding fixture

- Measuring instrument holding fixture: ∅ 8 mm, 6 mm, 3/8 inch and dovetail

Model	L1 mm	L2 mm	L3 mm	Magnetic foot L x W x H mm	Retention force N	Magnetic foot thread	Art.no.	€	
DG 61003	110	101	71	60 x 50 x 55	800	M 8	**550501** 2001	~~178.00~~	137.00
MG 61003	133	113	71	60 x 50 x 55	800	M 8	550501 3001	~~200.00~~	154.00
MA 61003	287	223	71	120 x 50 x 55	1300	M10 x 1.25	550501 4001	~~395.00~~	299.00

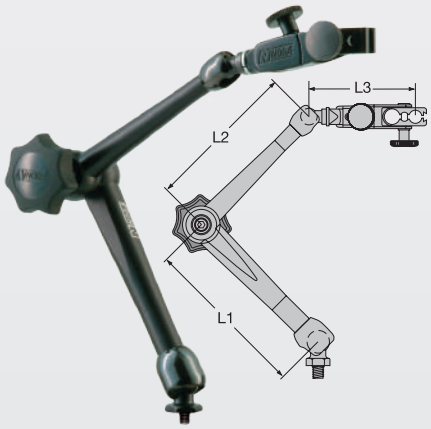


DG 10503

Complete stand with fine adjustment on magnetic foot

- ∅ 8 mm and dovetail holding fixture for measuring instruments

Model	L1 mm	L2 mm	L3 mm	Magnetic foot L x W x H mm	Retention force N	Magnetic foot thread	Art.no.	€	
NF 10403	56	51	21.5	40 x 30 x 35	320	M 5	**550501** 1101	~~104.50~~	79.90
DG 10503	110	101	21.5	60 x 50 x 55	800	M 8	550501 2101	~~135.50~~	104.00
MG 10503	133	113	21.5	60 x 50 x 55	800	M 8	550501 3101	~~157.50~~	121.00



Articulated stand without base, fine adjustment to the measuring instrument holding fixture

- Measuring instrument holding fixture: ∅ 8 mm, 6 mm, 3/8 inch and dovetail

Model	L1 mm	L2 mm	L3 mm	Magnetic foot thread	Art.no.	€	
NF 60103	56	51	71	M 5	**550501** 1010	~~117.00~~	89.90
DG 60103	110	101	71	M 8	550501 2010	~~149.00~~	114.50
MG 60103	133	113	71	M 8	550501 3110	~~186.00~~	142.50

SARA® Modular emulsion mist separator *Ultra-Cleaner*

NEW

We'll never let you get caught in the mist.

Self-regulating separator

- **Mechanical, with patented X-Cyclone® agglomerator system**
- **Thanks to European ErP directives, energy savings of several thousand euros are possible compared to conventional air purifiers.**
- **Functions without disposable filters – no subsequent costs!**
- Effective separation of oils, emulsions, other fluids and solid particles
- Complete unit as a recirculating device with an integrated ventilator
- Robust and torsion-free housing made of powder-coated stainless steel (RAL 7035 - light grey), smooth inner surface and with service opening
- Bottom section designed as an oil and water-tight collection tray
- Collecting tray fitted with drain cock for emptying, optional siphon available
- Thanks to the diverse installation and assembly possibilities of the Ultra-Cleaner system, most extraction problems arising in connection with various machining processes and the use of different coolant lubricants and oils can be solved with a single appliance.
- Developed, designed and manufactured in conformity with the relevant EU directives
- Ultra-Cleaners are tested for flame resistance in accordance with DIN EN 16282
- Separation efficiencies tested and confirmed by the Fraunhofer Institute for Toxicology and Aerosol Research
- Permissible ambient temperature for all models 0 °C to 50 °C
- **Included:** Ultra-Cleaner with frequency converter and motor cover, agglomerator and X-Cyclone® filter insert
- **Pricing:** ex works, including packaging

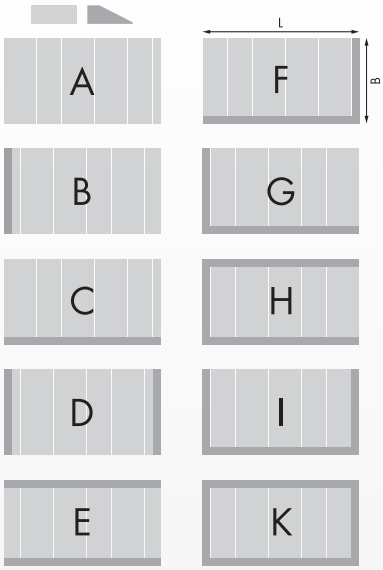
Single units

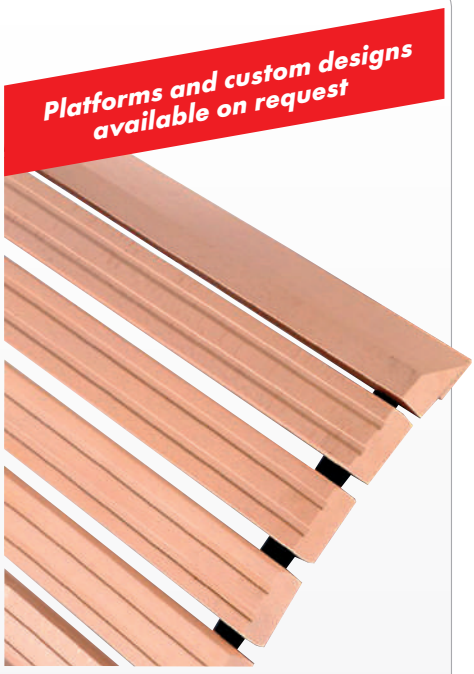
- **Filter system automatically regulates the motor output according to the degree of contamination of the separator. This guarantees that the volume flow, inflow velocity and separation efficiency remain the same until complete contamination (red status indicator).**
- digital wear indicator

Model	Volume flow min. m³/h	Volume flow max. m³/h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Noise level dB	Motor output kW	I(A)	Tension V	right-hand Art.no.	€	left-hand Art.no.	€
UCS-Mini	0	500	360 x 355 x 565	150	20	50	0.157	1.1	230	**909100** 0001	1,919.00	**909105** 0001	1,919.00
UC1SD	200	1000	865 x 360 x 640	200	44	67	0.75	1.6	400	909100 0010	3,079.00	909105 0010	3,079.00
UC2SD	400	2000	900 x 440 x 720	200	62	69	1.5	3.2	400	909100 0020	4,299.00	909105 0020	4,299.00
UC3SD	600	3000	945 x 520 x 800	300	93	69	2.2	4.3	400	909100 0030	6,159.00	909105 0030	6,159.00

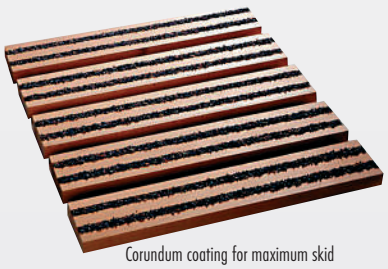
SARA® Walk grating

- **The safe machine base**
- Made of dried beech
- Can be rolled up, practical in terms of cleaning
- Elastic, relieves strain on the vertebrae
- Robust, can also withstand hard use on machines
- Maintenance-free, no wear at connecting elements
- Supported on oil-resistant, fibre-reinforced rubber belt
- Profiled batten surface, height 3.5 cm
- Available grille widths 60-150 cm
- Grille length as required, prices per running metre
- 970111.... Standard version without access ramp
  970112.... Additional charge for version with access ramp along one width (for version with access ramps along both widths, please order 2x)
  970113.... Additional charge for version with access ramp along length
  970114.... Additional charge for impregnation
- Corundum coating for maximum skid resistance also available on request
- Price per running metre
- **For orders with access ramp on one side, please specify which side (see example)**
- **Delivery:** free kerbside delivery within Germany, excluding platforms and custom designs



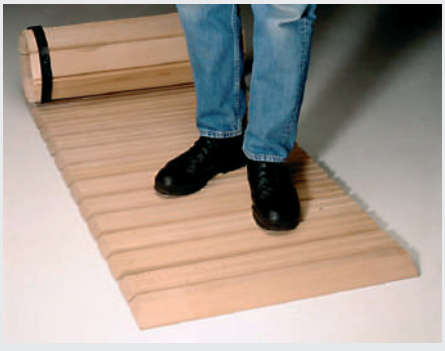


Width mm	Number Cover rows	Walk grating Art.no.	€	Ramp edge along width Art.no.	€	Ramp edge along length Art.no.	€	Impregnation Art.no.	€
600	2	**970111** 0602	79.00	**970112** 0602	14.50	**970113** 0602	16.50	**970114** 0602	15.50
700	2	970111 0702	99.00	970112 0702	14.50	970113 0702	16.50	970114 0702	18.50
800	2	970111 0802	115.00	970112 0802	14.50	970113 0802	16.50	970114 0802	21.00
800	3	970111 0803	145.00	970112 0803	14.50	970113 0803	16.50	970114 0803	21.00
900	3	970111 0903	159.00	970112 0903	14.50	970113 0903	16.50	970114 0903	23.50
1000	3	970111 1003	169.00	970112 1003	14.50	970113 1003	16.50	970114 1003	26.50
1100	3	970111 1103	189.00	970112 1103	14.50	970113 1103	16.50	970114 1103	29.00
1200	3	970111 1203	199.00	970112 1203	14.50	970113 1203	16.50	970114 1203	31.50
1300	3	970111 1303	215.00	970112 1303	14.50	970113 1303	16.50	970114 1303	34.00
1400	3	970111 1403	229.00	970112 1403	14.50	970113 1403	16.50	970114 1403	37.00
1500	3	970111 1503	249.00	970112 1503	14.50	970113 1503	16.50	970114 1503	39.50



Corundum coating for maximum skid resistance also available on request

Platforms and custom designs available on request



Universal mat

- **High absorption capacity ensures a clean and safe workplace**
- Simply place the mat over the spill
- Rapid absorption and high strength, even with fully saturated mats
- Saves on disposal costs due to the reduced volume
- Perforation enables mats to be laid as needed
- For absorbing oil, coolants, solvents and water
- Ideal for wiping off machinery, laying out tool boxes and covering work areas
- The exceptionally hard-wearing 4-in-1® mats (MAT284 and MAT235) can be used as an underlay, roll, wipe and absorbent sock
- **Prices per pack**

Mats

Type	Dimensions	Thickness	Contents	Absorption capacity	Art.no.	€
MAT 231	38 x 51 cm	Double thickness	50 in box	42 l	**910101** 0001	**62.50**
MAT 203	38 x 51 cm	Double thickness	100 in box	84 l	910101 0020	**120.00**
MAT 204	38 x 51 cm	Single thickness	200 in box	84 l	910101 0021	**120.00**
MAT 2101	41 x 51 cm	Quadruple thickness	50 in dispenser box	84 l	910101 0042	**112.50**
MAT 240	38 x 51 cm	Double thickness	100 in dispenser box	84 l	910101 0025	**126.50**


MAT 231

Roll material, perforated every 25.5 cm

Type	Dimensions	Thickness	Contents	Absorption capacity	Art.no.	€
MAT 137	76 cm x 46 m	Single thickness	1 roll	76 l	**910101** 0032	**99.00**
MAT 220	38 cm x 46 m	Double thickness	2 rolls	76 l	910110 0030	**199.00**
MAT 202-01	61 cm x 46 m	Double thickness	1 roll	123 l	910110 0035	**159.00**
MAT 230	76 cm x 46 m	Double thickness	1 roll	152 l	910110 0010	**199.00**
MAT 2102	81 cm x 23 m	Quadruple thickness	1 roll	152 l	910110 0033	**188.00**


MAT 230 MAT 202-01

4-in-1® roll material, perforated every 25.5 cm, extremely hard-wearing

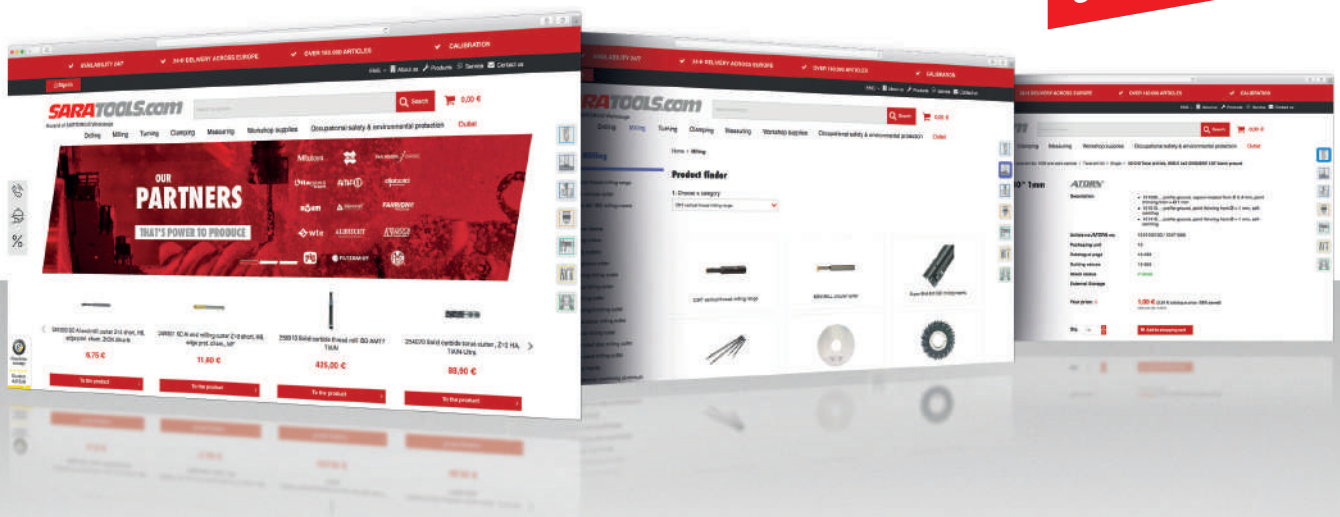
Type	Dimensions	Contents	Absorption capacity	Art.no.	€
MAT 284	41 cm x 24 m	1 roll in dispenser box	35 l	**910110** 0060	**89.50**
MAT 235	41 cm x 46 m	1 roll	66 l	910110 0061	**159.00**


MAT 284

SARATOOLS.com

POWER TO PRODUCE

over 180,000 articles



At SARATOOLS.com we offer a high-quality package of services:

- 24-hour delivery throughout Europe
- Top products at unbeatable prices
- Personal contact partners

SARATOOLS.com and our tool catalogue are available for you in eight languages:

019921 2003 3/20 GB 1300 ton

SARTORIUS Werkzeuge

POWER TO PRODUCE

SARTORIUS Werkzeuge GmbH & Co. KG
www.sartorius-werkzeuge.de