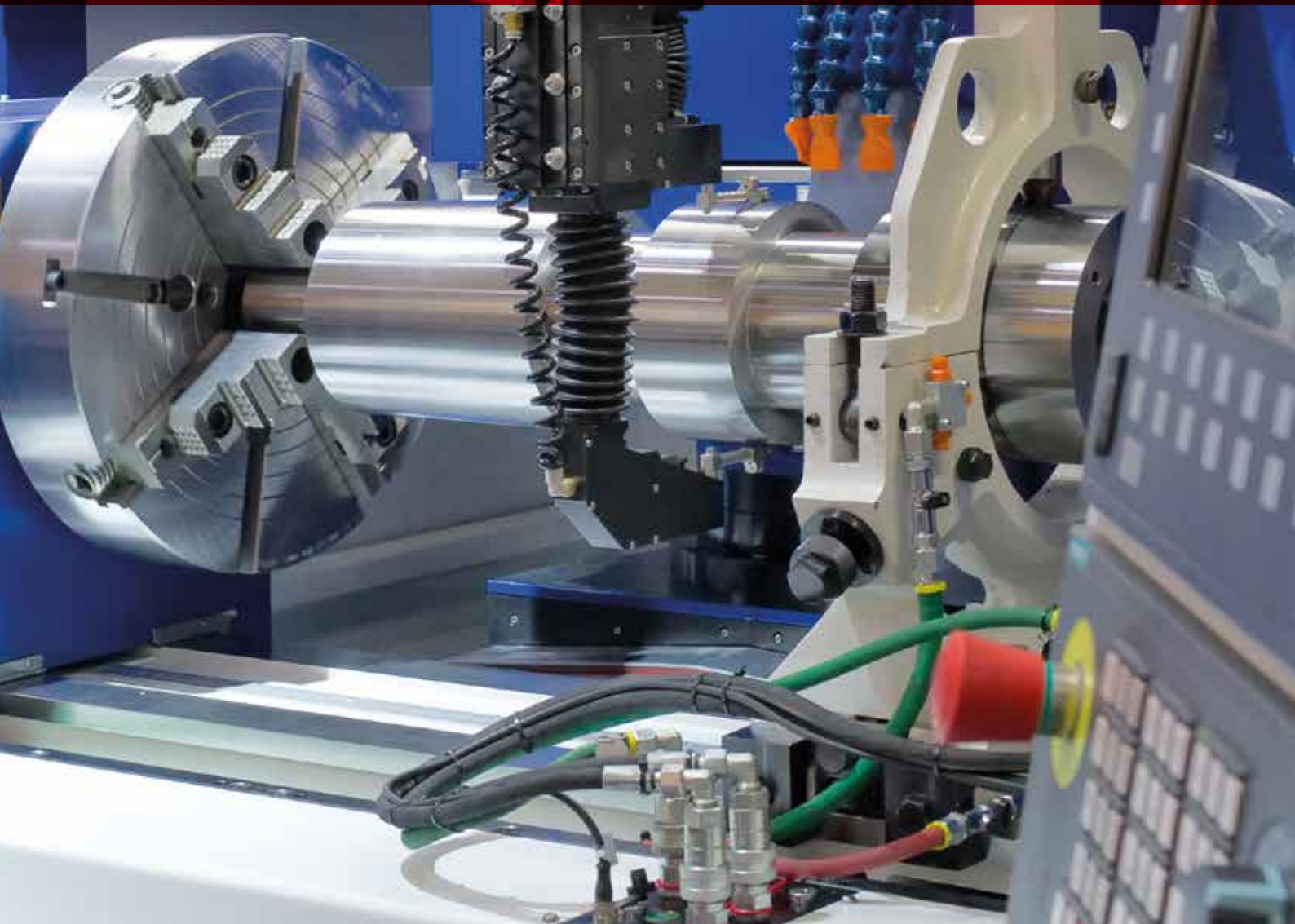


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€

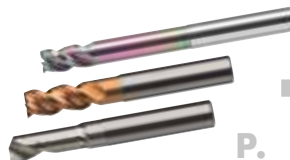


ATORN
Machine taps



P. 6

ATORN
End milling cutters



P. 12

ATORN
ISO indexable cutting inserts



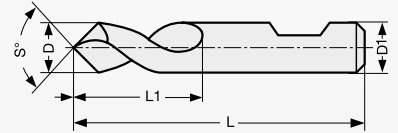
P. 20

ATORN® NC spotting drill bits

NEW



- S° = point angle 90°, 120° and 142°
- Straight shank with clamping surface in accordance with DIN6535-HB (from \varnothing 6 mm)
- **Cutting material: SC, uncoated**
- Spot drilling and countersinking on NC and CNC machines
- 142° point angle version for spot drilling for the next operation of the solid carbide twist drill



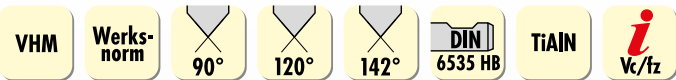
D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm ² mm/rev	90°		120°		142°	
					Art.no.	€	Art.no.	€	Art.no.	€
2	2	32	6	0.07	100570 0200	13.95	100571 0200	13.95	100572 0200	13.95
3	3	46	12	0.07	100570 0300	13.95	100571 0300	13.95	100572 0300	13.95
4	4	55	12	0.07	100570 0400	15.10	100571 0400	15.10	100572 0400	15.10
5	5	62	14	0.07	100570 0500	15.60	100571 0500	15.60	100572 0500	15.60
6	6	66	20	0.13	100570 0600	16.30	100571 0600	16.30	100572 0600	16.30
8	8	79	25	0.13	100570 0800	22.80	100571 0800	22.80	100572 0800	22.80
10	10	89	25	0.20	100570 1000	32.40	100571 1000	32.40	100572 1000	32.40
12	12	102	30	0.20	100570 1200	42.00	100571 1200	42.00	100572 1200	42.00
16	16	115	35	0.27	100570 1600	77.50	100571 1600	77.50	100572 1600	77.50
20	20	131	40	0.27	100570 2000	138.00	100571 2000	138.00	100572 2000	138.00

Material	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper Cu-alloy	Graphite GRP/CFP/thermo.	Hardened steel		
	● very well suited ○ well suited	< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 60-100	● 55-75	○ 30-50	● 25-50	○ 25-50		○ 80-90	○ 70-90	○ 35-40		● 150-200	● 100-180	● 110-140				

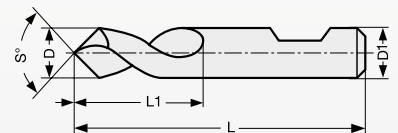
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

ATORN® NC spotting drill bits

NEW



- S° = point angle 90°, 120° and 142°
- Straight shank with clamping surface in accordance with DIN6535-HB (from \varnothing 6 mm)
- **Cutting material: SC, TiAlN-coated**
- Spot drilling and countersinking on NC and CNC machines
- 142° point angle version for spot drilling for the next operation of the solid carbide twist drill



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm ² mm/rev	90°		120°		142°	
					Art.no.	€	Art.no.	€	Art.no.	€
2	2	32	6	0.07	100580 0200	17.95	100581 0200	17.95	100582 0200	17.95
3	3	46	12	0.07	100580 0300	17.95	100581 0300	17.95	100582 0300	17.95
4	4	55	12	0.07	100580 0400	23.10	100581 0400	23.10	100582 0400	23.10
5	5	62	14	0.07	100580 0500	24.00	100581 0500	24.00	100582 0500	24.00
6	6	66	20	0.13	100580 0600	24.50	100581 0600	24.50	100582 0600	24.50
8	8	79	25	0.13	100580 0800	30.90	100581 0800	30.90	100582 0800	30.90
10	10	89	25	0.20	100580 1000	40.90	100581 1000	40.90	100582 1000	40.90
12	12	102	30	0.20	100580 1200	52.50	100581 1200	52.50	100582 1200	52.50
16	16	115	35	0.27	100580 1600	90.00	100581 1600	90.40	100582 1600	90.40
20	20	131	40	0.27	100580 2000	160.00	100581 2000	160.00	100582 2000	160.00

Material	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper Cu-alloy	Graphite GRP/CFP/thermo.	Hardened steel		
	● very well suited ○ well suited	< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG	< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 60-100	● 55-75	○ 30-50	● 25-50	○ 25-50		○ 80-90	○ 70-90	○ 35-40		● 150-200	● 100-180	● 110-140				

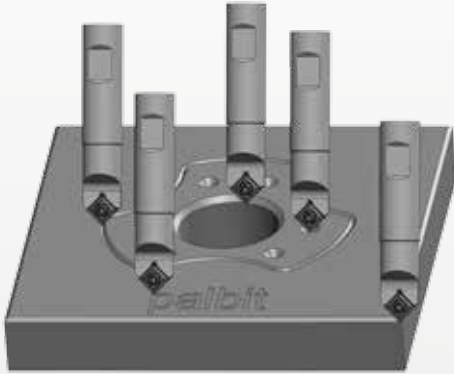
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

palbit Indexable inserts NC spotting drill bit sets **CHT**



- Surface-hardened carrier tools
- **for NC spot drilling and chamfering**
- **Suitable indexable cutting inserts SOMT**

NC spotting drill bit incl. 10 indexable cutting inserts



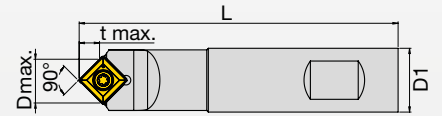
Centring, chamfering, engraving



100800 1310



100800 1315



Designation	Contents	Art.no.	€
PK SOMT 11T308 CHTS16H	Indexable inserts centre drill bits L = 100 mm incl. 10 x SOMT 11T308	100801 1310	134.75
PK SOMT 11T308 CHTS16M	Indexable inserts centre drill bits L = 150 mm incl. 10 x SOMT 11T308	100801 1315	165.75

ATORN® Twist drill sets



- 101035.... profile-ground, vapour-treated from Ø 2.4 mm, point thinning from Ø ≥ 1 mm
- 101048.... TiN head coating, bare chip flute, point thinning from Ø ≥ 1 mm



101035 0004

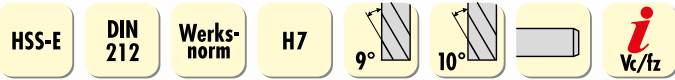
101048 0004

D mm	Number of drills	ATORN® Vapour-treated, 27°		ATORN® TiN, 35°	
		Art.no.	€	Art.no.	€
Ø 1.0 to 5.9 mm in 0.1 mm increments	50	101035 0001	79.50	101048 0001	99.50
Ø 6.0 to 10.0 mm in 0.1 mm increments	41	101035 0002	166.50	101048 0002	209.00
Ø 1.0 to 10.0 mm in 0.5 mm increments	19	101035 0003	49.50	101048 0003	59.50
Ø 1.0 to 13.0 mm in 0.5 mm increments	25	101035 0004	103.50	101048 0004	134.00
Ø 1.0 to 10.5 mm in 0.5 mm increments with the following additional dimensions for threaded bores: Ø 3.3 - 4.2 - 6.8 - 10.2 mm	24	101035 0005	67.00	101048 0005	84.00

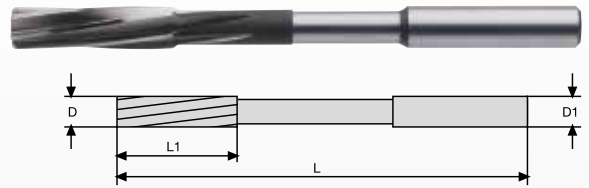
Material	● very well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8% Si	≥ 8% Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
101035....		●	●					●	○				○	○	○					
101048....		●	●	○	○	○				●	○		○	○	○					

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

ATORN® Machine reamers



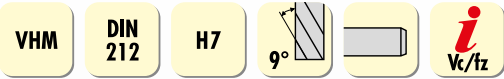
- Type B with offset shank up to Ø 2.8 mm
- Type D with offset shank from Ø 2.9 mm
- **For H7 fit**
- Right-hand cutting, straight shank
- Manufacturing tolerances in accordance with DIN 1420
- Ground chip-space version
- **HSS-E cutting material**
- For reaming through-holes



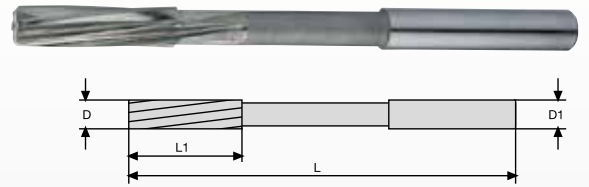
D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm ² mm/rev	Art.no.	€
1.5	8	40	1.5	3	0.10	161001 0015	19.50
2.0	11	49	2.0	4	0.10	161001 0020	17.90
2.5	14	57	2.5	4	0.10	161001 0025	17.90
3.0	15	61	3.0	6	0.10	161001 0030	16.70
3.5	18	70	3.5	6	0.10	161001 0035	19.50
4.0	19	75	4.0	6	0.10	161001 0040	18.00
4.5	21	80	4.5	6	0.10	161001 0045	19.30
5.0	23	86	5.0	6	0.10	161001 0050	18.60
5.5	26	93	5.6	6	0.13	161001 0055	24.80
6.0	26	93	5.6	6	0.13	161001 0060	19.50
6.5	28	101	6.3	6	0.13	161001 0065	24.40
7.0	31	109	7.1	6	0.13	161001 0070	24.40
7.5	31	109	7.1	6	0.13	161001 0075	27.20
8.0	33	117	8.0	6	0.13	161001 0080	24.80

D H7 mm	L1 mm	L mm	D1 mm	Z	Feed f steel < 1000 N/mm ² mm/rev	Art.no.	€
8.5	33	117	8.0	6	0.13	161001 0085	31.40
9.0	36	125	9.0	6	0.15	161001 0090	28.90
9.5	36	125	9.0	6	0.15	161001 0095	31.90
10.0	38	133	10.0	6	0.15	161001 0100	28.80
11.0	41	142	10.0	6	0.15	161001 0110	40.40
12.0	44	151	10.0	6	0.20	161001 0120	41.40
13.0	44	151	10.0	8	0.20	161001 0130	48.60
14.0	47	160	12.5	8	0.20	161001 0140	49.60
15.0	50	162	12.5	8	0.20	161001 0150	50.50
16.0	52	170	12.5	8	0.20	161001 0160	52.30
17.0	54	175	14.0	8	0.25	161001 0170	62.50
18.0	56	182	14.0	8	0.25	161001 0180	63.90
19.0	58	189	16.0	8	0.25	161001 0190	75.40
20.0	60	195	16.0	8	0.25	161001 0200	72.00

ATORN® NC machine reamers



- **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/mm ² mm/rev	Art.no.	€
1.0	1	34	6	3	0.15	163005 0010	31.40
1.5	2	40	8	3	0.15	163005 0015	30.50
2.0	2	49	11	4	0.15	163005 0020	30.50
2.5	3	57	14	4	0.15	163005 0025	30.50
3.0	3	61	15	6	0.15	163005 0030	30.50
3.5	4	70	18	6	0.15	163005 0035	30.50
4.0	4	75	19	6	0.15	163005 0040	30.50
4.5	5	80	21	6	0.15	163005 0045	45.50
5.0	5	86	23	6	0.15	163005 0050	44.20
5.5	6	93	26	6	0.18	163005 0055	44.80
6.0	6	93	26	6	0.18	163005 0060	44.20
7.0	8	109	31	6	0.18	163005 0070	54.60

D H7 mm	D1 h6 mm	L mm	L1 mm	Z	Feed f steel < 1000 N/mm ² mm/rev	Art.no.	€
8.0	8	117	33	6	0.18	163005 0080	54.00
9.0	10	125	36	6	0.20	163005 0090	70.00
10.0	10	133	38	6	0.20	163005 0100	73.30
11.0	10	142	41	6	0.20	163005 0110	77.90
12.0	10	151	44	6	0.25	163005 0120	82.50
13.0	10	151	44	8	0.25	163005 0130	100.00
14.0	14	160	47	8	0.25	163005 0140	103.00
15.0	14	162	50	8	0.25	163005 0150	119.50
16.0	14	170	52	8	0.25	163005 0160	122.00
18.0	14	182	56	8	0.30	163005 0180	153.50
20.0	16	195	60	8	0.30	163005 0200	189.00

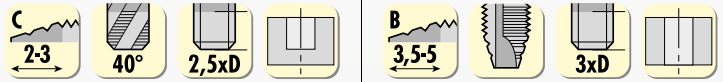
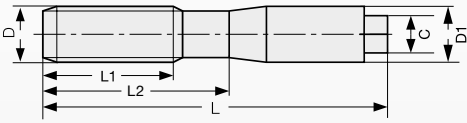
Material	● very well suited	○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper Cu-alloy	Graphite	Hardened steel			
			< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si		GRP/CFP/therma	< 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!

ATORN® Universal machine taps



- for universal applications
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	Vapour-treated		TiN		Vapour-treated		TiN	
								Art.no.	€	Art.no.	€	Art.no.	€	Art.no.	€
M 3	0.5	56	10	18	3.5	2.7	2.50	134710 0030	7.00	134715 0030	10.90	134700 0030	7.00	134705 0030	10.90
M 4	0.7	63	12	21	4.5	3.4	3.30	134710 0040	7.00	134715 0040	10.90	134700 0040	7.00	134705 0040	10.90
M 5	0.8	70	14	25	6	4.9	4.20	134710 0050	7.25	134715 0050	11.10	134700 0050	7.25	134705 0050	11.10
M 6	1.0	80	16	30	6	4.9	5.00	134710 0060	7.25	134715 0060	11.30	134700 0060	7.25	134705 0060	11.30
M 8	1.25	90	18	35	8	6.2	6.80	134710 0080	9.20	134715 0080	13.60	134700 0080	9.20	134705 0080	13.60
M 10	1.5	100	20	39	10	8	8.50	134710 0100	10.85	134715 0100	15.90	134700 0100	10.85	134705 0100	15.90
M 12	1.75	110	22	-	9	7	10.25	134710 0120	15.70	134715 0120	21.90	134700 0120	15.70	134705 0120	21.90
M 16	2.0	110	28	-	12	9	14.00	134710 0160	23.00	134715 0160	32.80	134700 0160	22.60	134705 0160	32.80
M 20	2.5	140	32	-	16	12	17.50	134710 0200	37.70	134715 0200	53.30	134700 0200	37.00	134705 0200	53.30

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	
134700.... 134710....	● ○	● ●	● ●		○ ○	○ ○			○ ○				○ ○	○ ○					
134705.... 134715....	● ○	● ●	● ●		● ●	● ●			○ ○				○ ○	○ ○					

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

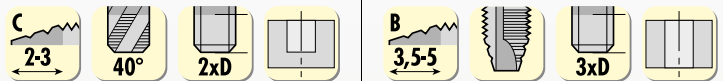
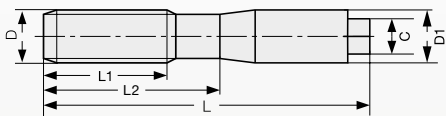
ATORN® Universal machine tap ULTRA-HL



- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- **BALINIT® HARDLUBE**: The high level of hardness and temperature resistance of the TiAlN layer effectively protects cutting edges from wear, while the excellent sliding and lubricating properties of the WC/C ensure smooth chip flow. The result: Greater production reliability thanks to reliable, reproducible performance.



**BALINIT®
HARDLUBE**



D mm	Pitch mm	L mm	L1 mm	L2 mm	C mm	D1 mm	Tapping hole Ø mm	HSS-E		HSS-E-PM		HSS-E		HSS-E-PM	
								Art.no.	€	Art.no.	€	Art.no.	€	Art.no.	€
M 3	0.5	56	10	18	2.7	3.5	2.50	134750 0030	12.80	134740 0030	16.30	134755 0030	12.80	134745 0030	16.30
M 4	0.7	63	12	21	3.4	4.5	3.30	134750 0040	12.80	134740 0040	16.30	134755 0040	12.80	134745 0040	16.30
M 5	0.8	70	14	25	4.9	6	4.20	134750 0050	13.40	134740 0050	16.90	134755 0050	13.40	134745 0050	16.90
M 6	1.0	80	16	30	4.9	6	5.00	134750 0060	13.50	134740 0060	17.20	134755 0060	13.50	134745 0060	17.20
M 8	1.25	90	18	35	6.2	8	6.80	134750 0080	16.50	134740 0080	20.40	134755 0080	16.50	134745 0080	20.40
M 10	1.5	100	20	39	8	10	8.50	134750 0100	19.30	134740 0100	22.80	134755 0100	19.30	134745 0100	22.80
M 12	1.75	110	22	-	7	9	10.25	134750 0120	24.60	134740 0120	29.50	134755 0120	24.60	134745 0120	29.50
M 16	2.0	110	28	-	9	12	14.00	134750 0160	36.40	134740 0160	41.90	134755 0160	36.40	134745 0160	41.90
M 20	2.5	140	32	-	12	16	17.50	134750 0200	55.90	134740 0200	64.00	134755 0200	55.90	134745 0200	64.00

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	
134750.... 134755....	● ○	● ●	● ●		● ●	● ●			○ ○				● ●	○ ○					
134740.... 134745....	● ○	● ●	● ●		● ●	● ●			○ ○				● ●	○ ○					

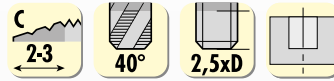
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

ATORN® Universal machine tap sets

NEW

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

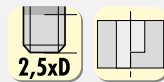
- ISO 6H metric thread
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- for universal applications
- Cutting material: HSS-E, vapour-treated



Contents	Art.no.	€
7-pcs. set: M3, M4, M5, M6, M8, M10, M12	134710 1000	138.00 79.00



Contents	Art.no.	€
7-pcs. set: M3, M4, M5, M6, M8, M10, M12	134700 1000	138.00 79.00



Contents	Art.no.	€
14-pcs. set: M3-M12 through-hole and blind-hole thread (1 of each)	134712 1014	210.00 135.00



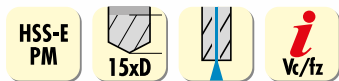
Material	● very well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel			
	○ well suited	< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc	
		● 5-15	● 5-15		○ 4-6	○ 4-6			○ 5-8				○ 10-15		○ 10-15					

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

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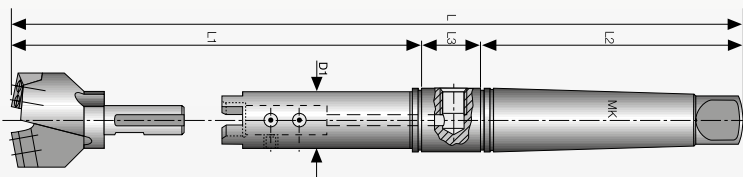
SARA® Solid drilling tool SARADRILL



- **Machining of bore holes from Ø 49 to 270 mm on machines with low drive power**
- Low-vibration, equipment-friendly machining with up to 50% less drive power
- Drilling in a single work step without centring and pre-drilling
- No front face planing required
- Cost-efficient boring system, since differences in diameter of up to 30 mm can be machined with one boring head by changing the cutting edges
- Variable drilling depths of up to 15 x D thanks to holding fixture system with pluggable extensions
- Internal coolant supply directly to the cutting edge, no high-pressure pump required
- For rotating tools, the coolant is supplied via a coolant ring
- Short chips due to chip-separating grooves in the roughing blade, no chip removal, even with extremely deep bores
- Also for use on vertically operating machines
- Low tool costs, as wear is limited to the cutting edges and centre bit
- Unproblematic regrinding of the centre bit and the cutting edges (in pairs) using the grinding fixture or the tool grinding machine

- **Cutting material:**
cutting edges **HSS-E-PM**, ASP30 centre bit **HSS**
- Use on all machine tools as a rotating or stationary tool, especially for machining large bore diameters on machines with low drive power

- **Caution:** Not suitable for boring out existing holes!



Boring head

Designation	Working area mm	Art.no.	€
A1-55	49 - 55	104501 0055	639.00
A2-65	55 - 65	104501 0065	639.00
B-80	65 - 80	104501 0080	779.00
C-100	80 - 100	104501 0100	909.00
D-120	100 - 120	104501 0120	1,069.00

Boring bar with Morse taper shank

For boring head	L1 mm	L2 mm	L3 mm	D1 mm	Shank	Art.no.	€
A1/A2	200	158	30	29	MK 4	104505 0055	360.00
B-80	200	158	30	35	MK 4	104505 0080	380.00
C-100	200	158	30	38	MK 4	104505 0100	425.00
D-120	200	192	30	45	MK 5	104505 0120	739.00

Extension

150 mm and 300 mm

For boring head	D1 mm	150 mm		300 mm	
		Art.no.	€	Art.no.	€
A1/A2	29	104510 0055	295.00	104515 0055	345.00
B-80	35	104510 0080	320.00	104515 0080	400.00
C-100	38	104510 0100	345.00	104515 0100	420.00
D-120	45	104510 0120	395.00	104515 0120	445.00

Centre bit

For boring head	D mm	Working area mm	Art.no.	€
A1-55 to D-120	12	49 - 120	104530 0012	57.50

Cutting edge SARADRILL

- For **SARA-DRILL** solid drilling tools
- Cutting edges are supplied in pairs, i.e. 1 roughing blade and 1 finishing blade.
- **Note for machining blind holes:** for machining intermediate sizes, the finishing blade can be adjusted in the range of 3 to 10 mm, depending on the size of the boring head. (Not permissible for machining through-holes!)
- **Caution: The cutting edges may only be replaced in pairs, as otherwise there is a risk of breakage!**
- Prices per pair (1 roughing blade and 1 finishing blade)

D mm	For boring head	Art.no.	€
50	A1-55	104550 0050	165.00
52	A1-55	104550 0052	165.00
55	A1-55, A2-65	104550 0055	165.00
58	A2-65	104550 0058	165.00
60	A2-65	104550 0060	165.00
62	A2-65	104550 0062	170.00
65	A2-65, B-80	104550 0065	170.00
70	B-80	104550 0070	205.00
72	B-80	104550 0072	205.00
75	B-80	104550 0075	215.00
78	B-80	104550 0078	215.00
80	B-80, C-100	104550 0080	230.00
85	C-100	104550 0085	230.00
88	C-100	104550 0088	230.00
90	C-100	104550 0090	230.00
95	C-100	104550 0095	245.00
100	C-100, D-120	104550 0100	245.00
105	D-120	104550 0105	260.00
110	D-120	104550 0110	260.00
115	D-120	104550 0115	305.00
120	D-120	104550 0120	305.00

Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper Cu-alloy	Graphite GRP/CFP/thermo.	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			< 55 HRc	< 60 HRc	≥ 60 HRc
104550....	●	●	●	○	○		●	●				●	●	○		○			

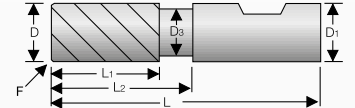
SARA® Longitudinal slot cutter



- With clearance
- Straight shank up to Ø 2.5 mm smooth, from Ø 2.8 mm with driving planes in accordance with DIN 6535-HB
- First-rate chip removal due to extremely smooth surface
- For P9 grooves
- Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated



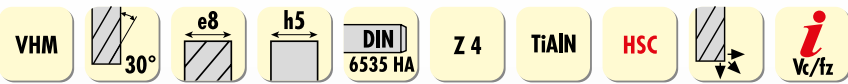
D	L1	L2	L	D1	D3	F x 45°	Feed fz	Feed fz	Art.no.	€	€
mm	mm	mm	mm	mm	mm	mm	steel < 1400 N/mm ² mm/Z	steel < 1400 N/mm ² mm/Z			
1.0	3	-	50	3.0	-	-	0.006	0.007	254050 0010	29.80	22.90
1.1	3	-	50	3.0	-	-	0.006	0.007	254050 0011	29.50	22.70
1.2	4	-	50	3.0	-	-	0.006	0.007	254050 0012	29.50	22.70
1.4	4	-	50	3.0	-	-	0.006	0.007	254050 0014	29.50	22.70
1.5	4	-	50	3.0	-	-	0.006	0.007	254050 0015	29.50	22.70
1.6	4	-	50	3.0	-	-	0.006	0.007	254050 0016	29.50	22.70
1.8	5	-	50	3.0	-	-	0.006	0.007	254050 0018	29.50	22.70
2.0	5	-	50	3.0	-	0.05	0.006	0.007	254050 0020	29.50	22.70
2.5	6	-	50	3.0	-	0.05	0.012	0.015	254050 0025	29.50	22.70
2.8	8	15	57	6.0	2.6	0.05	0.012	0.015	254050 0028	25.20	19.40
3.0	8	15	57	6.0	2.8	0.05	0.012	0.015	254050 0030	25.20	19.40
3.8	11	15	57	6.0	3.6	0.1	0.012	0.015	254050 0038	25.20	19.40
4.0	11	15	57	6.0	3.8	0.1	0.012	0.015	254050 0040	25.20	19.40
4.8	13	21	57	6.0	4.6	0.1	0.024	0.030	254050 0048	26.80	20.60
5.0	13	21	57	6.0	4.8	0.1	0.024	0.030	254050 0050	26.80	20.60
5.8	13	21	57	6.0	5.6	0.1	0.024	0.030	254050 0058	26.80	20.60
6.0	13	21	57	6.0	5.8	0.1	0.024	0.030	254050 0060	26.80	20.60
6.8	16	27	63	8.0	6.6	0.1	0.024	0.030	254050 0068	31.20	24.00
7.0	16	27	63	8.0	6.8	0.1	0.024	0.030	254050 0070	30.90	23.70
7.8	19	27	63	8.0	7.5	0.1	0.024	0.030	254050 0078	30.60	23.50
8.0	19	27	63	8.0	7.7	0.1	0.024	0.030	254050 0080	30.30	23.30
8.7	19	32	72	10.0	8.5	0.1	0.032	0.040	254050 0087	44.30	34.10
9.0	19	32	72	10.0	8.8	0.1	0.032	0.040	254050 0090	44.30	34.10
9.7	22	32	72	10.0	9.5	0.1	0.032	0.040	254050 0097	44.30	34.10
10.0	22	32	72	10.0	9.8	0.1	0.032	0.040	254050 0100	44.30	34.10
10.7	26	38	83	12.0	10.5	0.1	0.032	0.040	254050 0107	64.00	49.20
11.0	26	38	83	12.0	10.8	0.1	0.032	0.040	254050 0110	64.00	49.20
11.7	26	38	83	12.0	11.5	0.1	0.032	0.040	254050 0117	64.00	49.20
12.0	26	38	83	12.0	11.8	0.1	0.032	0.040	254050 0120	64.00	49.20
13.7	26	38	83	14.0	13.5	0.1	0.040	0.050	254050 0137	78.50	60.40
14.0	26	38	83	14.0	13.8	0.1	0.040	0.050	254050 0140	78.50	60.40
15.7	32	44	92	16.0	15.4	0.1	0.040	0.050	254050 0157	102.00	78.50
16.0	32	44	92	16.0	15.7	0.1	0.040	0.050	254050 0160	102.00	78.50
17.7	32	44	92	18.0	17.4	0.1	0.048	0.060	254050 0177	139.00	107.00
18.0	32	44	92	18.0	17.7	0.1	0.048	0.060	254050 0180	123.00	94.50
19.7	38	54	104	20.0	19.4	0.1	0.048	0.060	254050 0197	176.00	135.00
20.0	38	54	104	20.0	19.7	0.1	0.048	0.060	254050 0200	156.00	120.00



Material	● very well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/Ni/Co-based	Aluminium		Copper	Graphite	Hardened steel		
	○ well suited	< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
		●	●	●	●	●	●	●	●	●	●	●	●	●				
		100-120	80-100	60-80	50-65	50-60	40-50	100-130	80-120	40-60	40-50	30-40	300-400	200-300	100-140			

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

SARA® Torus milling cutters

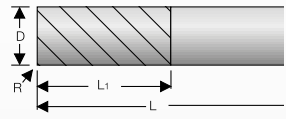


up to 60 HRc



- Long version
- Cutting material, solid carbide ultra-fine grain TiAlN-coated

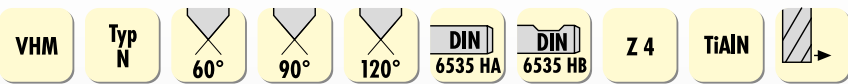
D mm	R mm	L1 mm	L mm	D1 mm	Feed fz steel < 1000 N/mm ² mm/Z	Art.no.	€
3.0	0.3	12	50	6.0	0.041	254019 0001	38.50 29.50
4.0	0.3	15	50	6.0	0.041	254019 0002	38.50 29.50
4.0	0.5	15	50	6.0	0.041	254019 0003	38.50 29.50
5.0	0.3	20	60	6.0	0.041	254019 0004	38.50 29.50
5.0	0.5	20	60	6.0	0.041	254019 0005	38.50 29.50
6.0	0.3	20	60	6.0	0.041	254019 0006	38.50 29.50
6.0	0.5	20	60	6.0	0.041	254019 0060	38.50 29.50
6.0	1.0	20	60	6.0	0.041	254019 1060	38.50 29.50
8.0	0.3	25	70	8.0	0.041	254019 0010	46.50 35.80
8.0	0.5	25	70	8.0	0.041	254019 0080	46.50 35.80
8.0	1.0	25	70	8.0	0.041	254019 1080	46.50 35.80
8.0	1.5	25	70	8.0	0.041	254019 1580	46.50 35.80
8.0	2.0	25	70	8.0	0.041	254019 2080	46.50 35.80
10.0	0.3	30	90	10.0	0.042	254019 0015	67.00 51.50
10.0	0.5	30	90	10.0	0.042	254019 0100	67.00 51.50
10.0	1.0	30	90	10.0	0.042	254019 1100	67.00 51.50
10.0	1.5	30	90	10.0	0.042	254019 1105	67.00 51.50
10.0	2.0	30	90	10.0	0.042	254019 2100	67.00 51.50
12.0	0.5	30	90	12.0	0.042	254019 0120	98.00 75.40
12.0	1.0	30	90	12.0	0.042	254019 1120	98.00 75.40
12.0	1.5	30	90	12.0	0.042	254019 1125	98.00 75.40
12.0	2.0	30	90	12.0	0.042	254019 2120	98.00 75.40
16.0	0.5	50	110	16.0	0.043	254019 0024	173.00 133.00
16.0	1.0	50	110	16.0	0.043	254019 1160	173.00 133.00
16.0	1.5	50	110	16.0	0.043	254019 1165	173.00 133.00
16.0	2.0	50	110	16.0	0.043	254019 2160	173.00 133.00
20.0	0.5	50	110	20.0	0.044	254019 0028	300.00 229.00
20.0	1.0	50	110	20.0	0.044	254019 1200	300.00 229.00
20.0	1.5	50	110	20.0	0.044	254019 1205	300.00 229.00
20.0	2.0	50	110	20.0	0.044	254019 2200	300.00 229.00



Material	● very well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
	○ well suited	< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	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
		●	●	●	○	○		●	●								●	●	
		70-85	60-70	50-70	40-50	40-50		55-85	50-60								20-30	15-20	

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

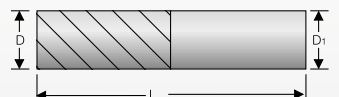
SARA® Deburring tools



- 4 cutting edges
- Ideal for chamfering and deburring workpiece edges, and for contour milling
- Cutting material: superfine grain solid carbide, TiAlN-coated



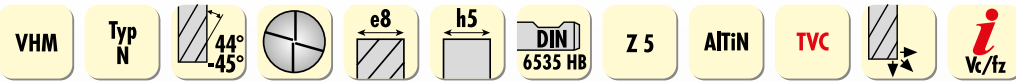
D mm	L mm	D1 mm	60° HA		90° HA		90° HB		120° HA	
			Art.no.	€	Art.no.	€	Art.no.	€	Art.no.	€
4	51	4	251538 0040	19.40	251540 0040	19.40	251543 0040	19.40	255165 0040	19.40
6	64	6	251538 0060	23.80	251540 0060	23.80	251543 0060	24.50	255165 0060	23.80
8	64	8	251538 0080	29.60	251540 0080	29.60	251543 0080	30.40	255165 0080	29.60
10	70	10	251538 0100	35.00	251540 0100	35.00	251543 0100	35.90	255165 0100	35.00
12	78	12	251538 0120	52.00	251540 0120	52.00	251543 0120	53.30	255165 0120	52.00



Material	● very well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel			
	○ well suited	< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	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® Trochoidal end milling cutter (steel)

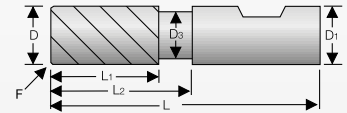


- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- Rounded chip space for improved chip removal
- **ae max. 20 %**
- **3 x D**

Trochoidal



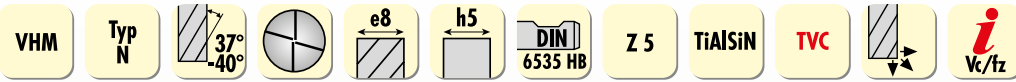
D	L1	L2	L	D3	D1	F	Z	Feed fz	Art.no.	€
mm	mm	mm	mm	mm	mm	mm		steel < 1000 N/mm ² mm/Z		
6.0	19.0	21.0	62	5.8	6	0.12	5	0.050	254155 0060	53.00 38.60
8.0	26.0	28.0	68	7.8	8	0.16	5	0.065	254155 0080	70.50 51.40
10.0	32.0	32.0	80	9.8	10	0.20	5	0.080	254155 0100	89.00 64.90
12.0	38.0	42.0	93	11.8	12	0.24	5	0.095	254155 0120	116.00 84.50
16.0	50.0	56.0	108	15.8	16	0.32	5	0.13	254155 0160	200.00 146.00
20.0	62.0	70.0	126	19.8	20	0.40	5	0.16	254155 0200	315.00 229.00



Material	● very well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel			
	○ well suited	< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	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	
		●	●	●																
		250	180	140																

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

ATORN® Trochoidal end milling cutter (stainless steel)

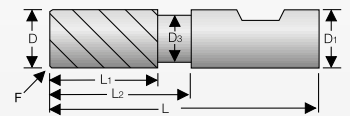


- With clearance
- **Milling cutter designed for TVC use**
- Reinforced core
- With chip breaker
- **Cutting material: superfine grain solid carbide**
- Irregular tooth pitch for a strong head centre
- **ae max. 15 %**
- **3 x D**

Trochoidal



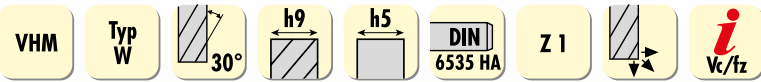
D	L1	L2	L	D3	D1	F	Z	Feed fz	Art.no.	€
mm	mm	mm	mm	mm	mm	mm		stainless steel ferrit./ martens. mm/Z		
6.0	19.0	21.0	62	5.8	6	0.12	5	0.050	254157 0060	66.00 48.10
8.0	26.0	28.0	68	7.8	8	0.16	5	0.065	254157 0080	86.00 62.70
10.0	32.0	35.0	80	9.8	10	0.20	5	0.080	254157 0100	111.00 81.00
12.0	38.0	42.0	93	11.8	12	0.24	5	0.095	254157 0120	135.00 98.50
16.0	50.0	56.0	108	15.8	16	0.32	5	0.13	254157 0160	235.00 171.50
20.0	62.0	70.0	126	19.8	20	0.40	5	0.16	254157 0200	360.00 262.00



Material	● very well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel			
	○ well suited	< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	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	
					●	●	●													
					140	100	75													

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

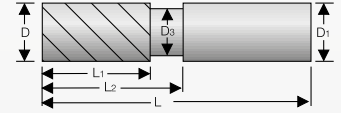
ATORN® Single-blade end milling cutter Ultra-N



- With clearance
- 1 cutting edge, sharp
- With defined cutting-edge rounding
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished design**
- Large chip space for unhindered chip removal



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/Z		Art.no.	€	Mirror finish		polished	
						aluminium < 8 % Si mm/Z	aluminium < 8 % Si mm/Z			Art.no.	€	Art.no.	€
1.5	6	50	22.0	1.45	3	0.0175	0.025	249100 0015	19.60	249700 0015	20.60		
2.0	8	50	22.0	1.8	3	0.02555	0.0365	249100 0020	19.90	249700 0020	22.00		
3.0	12	50	22.0	2.8	3	0.04025	0.0575	249100 0030	20.10	249700 0030	22.50		
4.0	15	57	29.0	3.8	4	0.0455	0.065	249100 0040	21.10	249700 0040	25.10		
5.0	17	60	32.0	4.8	5	0.056	0.08	249100 0050	27.40	249700 0050	30.10		
6.0	20	64	28.0	5.8	6	0.06825	0.0975	249100 0060	28.10	249700 0060	31.40		
8.0	24	64	28.0	7.8	8	0.08225	0.1175	249100 0080	38.10	249700 0080	45.20		
10.0	25	73	33.0	9.7	10	0.091	0.13	249100 0100	59.50	249700 0100	68.90		
12.0	32	84	39.0	11.7	12	0.105	0.15	249100 0120	80.50	249700 0120	87.00		
16.0	38	93	45.0	15.7	16	0.1155	0.165	249100 0160	115.00	249700 0160	127.00		



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	
249100....													●	●	●	●			
249700....													●	●	●	●			

Aluminium: 350-500, 150-250, 150-350, 200-350
Copper: 150-350
Graphite: 200-350

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

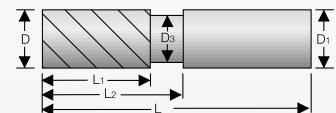
ATORN® Ultra-N end milling cutter



- With clearance
- 3 cutting edges, sharp
- With defined cutting-edge rounding
- For non-ferrous materials
- Cutting material: superfine grain solid carbide, uncoated with **mirror finish / polished design**
- Cutting material: superfine grain solid carbide, **ZrCN Ultra-N**-coated
- Short version



D mm	L1 mm	L mm	L2 mm	D3 mm	D1 mm	Feed fz aluminium < 8 % Si mm/Z		Art.no.	€
						aluminium < 8 % Si mm/Z	aluminium < 8 % Si mm/Z		
3.0	12	57	16	2.8	6	0.018	0.025	249304 0030	23.50
4.0	12	57	18	3.8	6	0.021	0.030	249304 0040	23.50
5.0	15	57	18	4.7	6	0.026	0.038	249304 0050	23.50
6.0	16	57	21	5.6	6	0.032	0.045	249304 0060	27.40
8.0	22	64	28	7.6	8	0.042	0.060	249304 0080	33.10
10.0	25	73	33	9.6	10	0.053	0.075	249304 0100	39.90
12.0	28	84	39	11.4	12	0.060	0.085	249304 0120	57.00
16.0	35	93	45	15.4	16	0.068	0.098	249304 0160	82.50
20.0	40	104	54	19.4	20	0.079	0.113	249304 0200	130.00



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	
													●	●	●				

Aluminium: 350-500, 150-250, 150-350

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

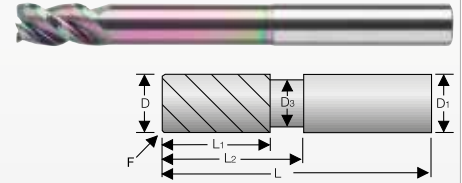
ATORN® End milling cutter Ultra-N PRO



- With clearance
- 3 cutting edges, with edge chamfer
- Irregular spiral angle 43° / 47°
- 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

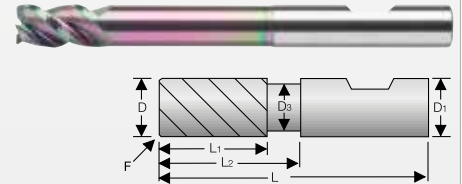
Shank version HA

D	L1	L	L2	D3	D1	F x 45°	Feed fz aluminium < 8 % Si mm/Z	Feed fz aluminium < 8 % Si mm/Z	Art.no.	€
4.0	6.5	80	24	3.9	6.0	0.1	0.02	0.015	249008 0040	44.70 31.70
5.0	8.0	80	30	4.9	6.0	0.1	0.02	0.025	249008 0050	44.70 31.70
6.0	10.0	80	42	5.8	6.0	0.2	0.03	0.025	249008 0060	44.70 31.70
8.0	13.0	100	62	7.8	8.0	0.2	0.04	0.03	249008 0080	61.90 43.90
10.0	16.0	100	58	9.7	10.0	0.2	0.05	0.04	249008 0100	83.10 59.00
12.0	19.0	120	73	11.7	12.0	0.2	0.07	0.05	249008 0120	122.50 86.90



Shank version HB

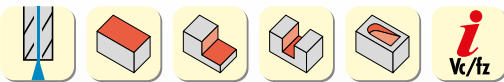
D	L1	L	L2	D3	D1	F x 45°	Feed fz aluminium < 8 % Si mm/Z	Feed fz aluminium < 8 % Si mm/Z	Art.no.	€
16.0	25	150	92	15.7	16.0	0.2	0.09	0.065	249008 0160	229.00 162.50
20.0	32	150	100	19.5	20.0	0.2	0.12	0.085	249008 0200	326.00 230.00



Material	● very well suited	○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/Ni/Co-based	Aluminium		Copper Cu/alloy	Graphite GRP/CFP/thermo.	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	< 55 HRc	< 60 HRc	≥ 60 HRc
														270	180			

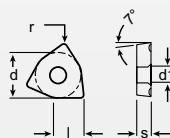
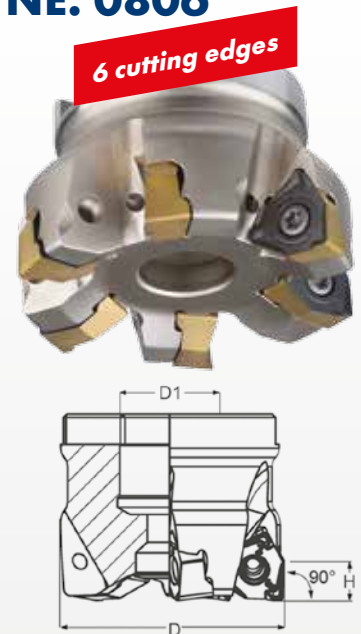
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

ATORN® Shoulder milling cutter 90°, for WNE. 0806



- for milling inserts, type WNE. 0806
- Wear-resistant, nickel-plated design
- Positive indexable insert basic form
- Very low power consumption thanks to special chip shape geometry
- Six cutting edges per indexable insert
- Double-sided indexable insert
- Large insert thickness
- Internal coolant supply
- Supplied with clamping screw and wrench

D	L	D1	Z	H	Tightening torque max.	Art.no.	€
50	40	22	5	7	3.0	262565 0050	210.00
63	40	22	6	7	3.0	262565 0063	235.00
80	50	27	7	7	3.0	262565 0080	270.00
100	50	32	8	7	3.0	262565 0100	330.00
125	63	40	10	7	3.0	262565 0125	419.00
160	63	40	11	7	3.0	262565 0160	495.00



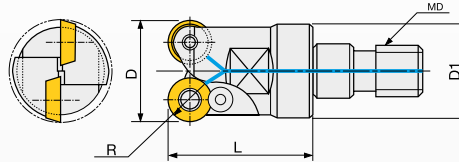
Milling inserts

ISO designation	ISO P K	ISO P M	ISO P M K	ISO N
WNE X 08060	Coated HC4620 Art.no. €	Coated HC4630 Art.no. €	Coated HC4430 Art.no. €	Uncoated HW4415 Art.no. €
WNEU 080608-M	10 295827 0001 12.95	10 295828 0001 11.95	10 295829 0001 11.95	1 295833 0001 13.95

palbit Copy milling cutter TOROMILL

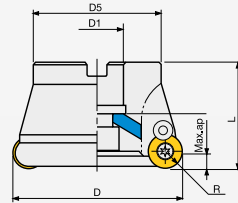


- For copy milling, radius cutting and contour milling in die and mould production
- Suitable for diagonal or axial plunge milling thanks to the clearance of the round indexable insert
- Internal coolant supply
- 7° positive setting angle for moderate and heavy machining, long-chipping materials with lower power consumption



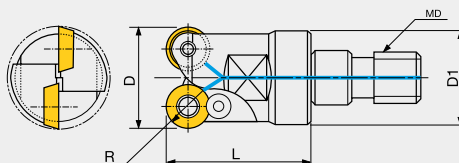
Screw-in milling cutter

D mm	R mm	MD	Z	Suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm	Art.no.	€
15	3.5	M8	3	RD..0702..	20	3.5	1.2	13	260284 0001	143.50 125.00
16	3.5	M8	2	RD..0702..	20	3.5	1.2	13	260284 0002	143.50 125.00
16	3.5	M8	3	RD..0702..	20	3.5	1.2	13	260284 0003	143.50 125.00
20	3.5	M10	4	RD..0702..	25	3.5	1.2	18	260284 0004	177.50 155.00
20	5.0	M10	2	RD..1003..	25	5	3.0	18	260284 0005	126.00 109.00
25	5.0	M12	3	RD..1003..	30	5	3.0	21	260284 0006	131.75 115.00
35	5.0	M16	5	RD..1003..	43	5	3.0	29	260284 0008	211.75 185.00
42	5.0	M16	5	RD..1003..	40	5	3.0	29	260284 0009	215.75 189.00
24	6.0	M16	2	RD..12T3..	32	6	3.0	21	260284 0010	131.75 115.00
35	6.0	M16	3	RD..12T3..	42	6	3.0	29	260284 0011	149.00 129.00
42	6.0	M16	4	RD..12T3..	42	6	3.0	29	260284 0012	206.25 179.00



Shell-type milling cutter

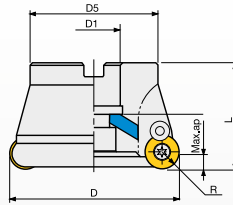
D mm	R mm	D5 mm	γ °	Z	Suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm	Art.no.	€
42	5	36	0	6	RD..1003..	44	5	3.0	16	260287 0001	263.25 229.00
52	5	40	0	7	RD..1003..	50	5	3.0	22	260287 0002	303.00 259.00
50	6	48	7	5	RD..12T3..	50	6	3.0	22	260288 0001	234.75 205.00
52	6	40	0	5	RD..12T3..	50	6	3.0	22	260287 0003	234.75 205.00
52	6	48	7	5	RD..12T3..	50	6	3.0	22	260288 0002	234.75 205.00
66	6	40	0	6	RD..12T3..	50	6	3.0	27	260287 0004	275.00 239.00
66	6	60	7	6	RD..12T3..	50	6	3.0	27	260288 0003	275.00 239.00
80	6	40	0	7	RD..12T3..	50	6	3.0	27	260287 0005	342.75 299.00
80	6	60	7	7	RD..12T3..	52.5	6	3.0	27	260288 0004	342.75 299.00



Screw-in milling cutter

D mm	R mm	MD	Z	Suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm	Art.no.	€
32	8	M16	2	RD..1604..	40	8	5.0	29	260289 0032	172.00 149.00





Shell-type milling cutter

D mm	R mm	D5 mm	γ °	Z	Z	Suitable indexable inserts	L mm	ap max. mm	Tightening torque max. N-m	D1 mm	Art.no.	€
52	8	40	0	4	4	RD..1604...	50	8	5.0	22	260290 0001	228.50 199.00
52	8	48	7	4	4	RD..1604...	50	8	5.0	22	260291 0001	228.50 199.00
66	8	40	0	5	5	RD..1604...	50	8	5.0	27	260290 0002	269.00 235.00
66	8	60	7	5	5	RD..1604...	52	8	5.0	27	260291 0002	269.00 235.00
80	8	48	0	6	6	RD..1604...	50	8	5.0	27	260290 0003	337.75 295.00
80	8	60	7	6	6	RD..1604...	52	8	5.0	27	260291 0003	337.75 295.00
125	8	90	7	8	8	RD..1604...	52	8	5.0	40	260291 0004	571.25 499.00
160	8	120	7	9	9	RD..1604...	52	8	5.0	40	260291 0005	811.00 709.00
80	10	60	7	5	5	RD..2006...	50	10	10.0	27	260291 0006	415.75 365.00
100	10	70	7	6	6	RD..2006...	52	10	10.0	32	260291 0007	445.75 389.00
125	10	90	7	7	7	RD..2006...	52	10	10.0	40	260291 0008	542.75 475.00
160	10	120	7	8	8	RD..2006...	52	10	10.0	40	260291 0009	788.50 689.00



palbit RD.. milling inserts TOROMILL

RDHT

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
-	-	-	RDHT 1003 MOT	●						PH 6125	10 285351 0132	7.40
			RDHT 12T3 MOT	●						PH 6135	10 285356 0132	7.80
			RDHT 1604 MOT	●						PH 6125	10 285361 0132	8.45
			RDHT 12T3 MOS-MP	●		●				PH 6740	10 285355 0139	7.80
			RDHT 1604 MOS-MP	●	●	●		●	●	PH 6920	10 285355 0142	7.80
			RDHT 1604 MOS-MP	●		●				PH 6740	10 285360 0139	8.45
			RDHT 1604 MOS-MP	●	●			●	●	PH 6920	10 285360 0142	8.45



ISO	PH 6125	PH 6135	PH 6740	PH 6920
ISO P Steel	Vc = 130-190	Vc = 120-180	Vc = 100-160	Vc = 130-230
ISO M Stainless steel				Vc = 100-200
ISO K Cast iron			Vc = 80-250	Vc = 80-280
ISO S Superalloy				Vc = 20-30
ISO H Hard				Vc = 50-100
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15-0.45 ap = max. 8.0		fz = 0.20 - 0.45 ap = max. 8.0	

RDMW

F finishing	M medium	R roughing	palbit ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
-	-	-	RDMW 1003 MOT	●						PH 6125	10 285353 0132	6.75
			RDMW 1003 MOT	●						PH 6135	10 285353 0133	6.75
			RDMW 1003 MOT	●		●				PH 6920	10 285353 0142	6.75
			RDMW 12T3 MOT	●						PH 6125	10 285358 0132	7.40
			RDMW 12T3 MOT	●						PH 6135	10 285358 0133	7.40
			RDMW 12T3 MOT	●		●				PH 6920	10 285358 0142	7.40
			RDMW 1604 MOT	●						PH 6125	10 285363 0132	7.80
			RDMW 1604 MOT	●						PH 6135	10 285363 0133	7.80
			RDMW 1604 MOT	●		●				PH 6920	10 285363 0142	7.80
			RDMW 2006 MOT	●						PH 6125	10 285365 0132	12.75
			RDMW 2006 MOT	●						PH 6135	10 285365 0133	12.75



ISO	PH 6125	PH 6135	PH 6920
ISO P Steel	Vc = 130-190	Vc = 120-180	Vc = 130-230
ISO K Cast iron			Vc = 80-280
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15-0.45 ap = max. 8.0		

RDHW

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€	
-	-	-	ISO designation										
	RDHW 0702 MOT			●		●		●	○	PH 6103	10 285349 0131	7.40	
				●		●				PH 6910	10 285349 0141	7.40	
				●	●	●		●	●	PH 6920	10 285349 0142	7.40	
	RDHW 1003 MOT				●		●		●	○	PH 6103	10 285350 0131	7.40
					●						PH 6135	10 285350 0133	7.40
					●		●				PH 6910	10 285350 0141	7.40
					●	●	●		●	●	PH 6920	10 285350 0142	7.40
	RDHW 12T3 MOT				●		●		●	○	PH 6103	10 285354 0131	7.80
					●						PH 6135	10 285354 0133	7.80
					●		●				PH 6910	10 285354 0141	7.80
					●	●	●		●	●	PH 6920	10 285354 0142	7.80
	RDHW 1604 MOT				●		●		●	○	PH 6103	10 285359 0131	8.45
				●						PH 6135	10 285359 0133	8.45	
				●		●				PH 6910	10 285359 0141	8.45	
				●	●	●		●	●	PH 6920	10 285359 0142	8.45	

ISO	PH 6103	PH 6135	PH 6910	PH 6920
ISO P Steel	Vc = 180-300	Vc = 130-190	Vc = 160-250	Vc = 130-230
ISO M Stainless steel				Vc = 100-200
ISO K Cast iron	Vc = 200-300		Vc = 90-300	Vc = 80-280
ISO S Superalloy	Vc = 30-40			Vc = 20-30
ISO H Hard	Vc = 120-240			Vc = 50-100
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15-0.45 ap = max. 8.0			

RDMT

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€	
-	-	-	ISO designation										
	RDMT 1003 MOT			●						PH 6125	10 285352 0132	6.75	
				●						PH 6135	10 285352 0133	6.75	
	RDMT 12T3 MOT				●						PH 6125	10 285357 0132	7.40
					●						PH 6135	10 285357 0133	7.40
	RDMT 1604 MOT				●						PH 6125	10 285362 0132	7.80
					●						PH 6135	10 285362 0133	7.80
	RDMT 2006 MOT				●						PH 6125	10 285364 0132	12.75
					●						PH 6135	10 285364 0133	12.75

ISO	PH 6125	PH 6135
ISO P Steel	Vc = 130-190	Vc = 120-180
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.15-0.45 ap = max. 8.0	

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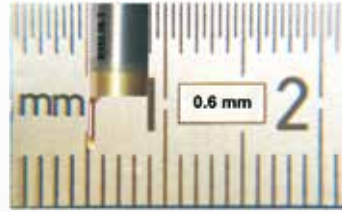
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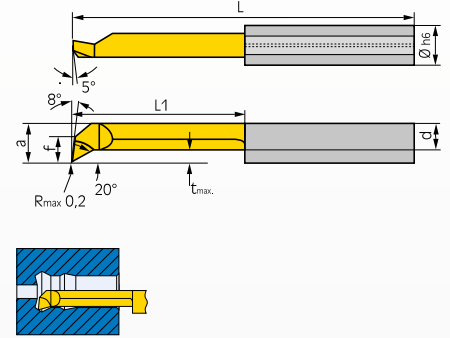
Dümmel® Cutting inserts *mini-bore*



- **Internal turning**
- **Internal turning and copying**
- Straight shank and lateral clamping surface
- right-hand versions (left-hand versions available on request)
- **Material: X2CA superfine grain carbide TiAlN+C, can be used up to HRC 66**
- **Material: AL41F superfine grain carbide TiAlN**
- **best service life results only when coolant emulsions are used**



From Ø 0.6 mm L1 to 7xD
X2CA for hard materials

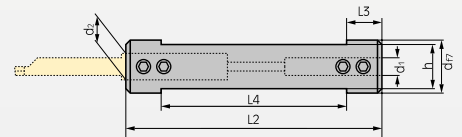


Model	r mm	s mm	f mm	d mm	a mm	L mm	L1 mm	t max. mm	D min. mm	D h6 mm	for holder	ISO P M K		ISO H	
												AL41F right-hand Art.no.	€	X2CA right-hand Art.no.	€
R/L 050.3-10	0.1	3.5	0.6	2.3	2.6	24	10	0.2	2.8	4.0	645...	304120 0001	20.50	304550 0004	28.60
R/L 050.3-16	0.1	3.5	0.6	2.3	2.6	30	16	0.2	2.8	4.0	645...	304120 0403	21.70	304550 0005	29.70
R/L 050.4-10	0.1	3.5	1.5	3.0	3.5	24	10	0.3	4.0	4.0	645...	304120 0010	20.50	304550 0007	28.60
R/L 050.4-16	0.1	3.5	1.5	3.0	3.5	30	16	0.3	4.0	4.0	645...	304120 0404	21.70	304550 0008	29.70
R/L 050.4-20	0.1	3.5	1.5	3.0	3.5	34	20	0.3	4.0	4.0	645...	304120 0012	24.70	304550 0009	32.80
R/L 050.5-10	0.15	4.4	1.9	3.8	4.4	25	10	0.5	5.0	5.0	645...	304120 0020	19.10	304550 0012	27.70
R/L 050.5-15	0.15	4.4	1.9	3.8	4.4	30	15	0.5	5.0	5.0	645...	304120 0021	20.50	304550 0013	29.00
R/L 050.5-20	0.15	4.4	1.9	3.8	4.4	35	20	0.5	5.0	5.0	645...	304120 0505	23.50	304550 0014	32.00
R/L 050.5-25	0.15	4.4	1.9	3.8	4.4	40	25	0.5	5.0	5.0	645...	304120 0023	26.70	304550 0015	35.20
R/L 050.6-15	0.15	5.3	2.3	4.5	5.3	30	15	0.5	6.0	6.0	676...	304120 0030	20.50	304550 0018	29.40
R/L 050.6-22	0.15	5.3	2.3	4.5	5.3	37	22	0.5	6.0	6.0	676...	304120 0606	23.50	304550 0019	32.50
R/L 050.6-25	0.15	5.3	2.3	4.5	5.3	40	25	0.5	6.0	6.0	676...	304120 0032	26.70	304550 0020	35.70
R/L 050.6-30	0.15	5.3	2.3	4.5	5.3	45	30	0.5	6.0	6.0	676...	304120 0033	30.10	304550 0021	39.00
R/L 050.7-20	0.15	6.3	2.8	5.5	6.3	35	20	0.6	6.8	7.0	676...	304120 0040	23.70	304550 0024	32.90
R/L 050.7-25	0.15	6.3	2.8	5.5	6.3	40	25	0.6	6.8	7.0	676... 687...	304120 0041	27.10	304550 0025	36.20
R/L 050.7-30	0.15	6.3	2.8	5.5	6.3	45	30	0.6	6.8	7.0	676... 687...	304120 0042	30.60	304550 0026	39.70

Dümmel® Clamp mounting *mini-bore*



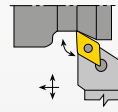
- **With internal coolant supply**
- for holding the cutting inserts in right and left version
- Two different holder Ø measurements (d1 and d2)
- Central coolant supply through the clamp mounting
- Axial setting of the cutting inserts in the clamp mounting can be precisely reproduced by means of a built-in depth step
- Radial position of the cutting edge is guaranteed by tension applied to the side clamping surface of the cutting inserts by the clamping screws
- Size O316 and O320 for 304450.... and 304455.... and high-pressure applications with central cooling hole



Designation	Suitable cutting inserts	d f7 mm	L2 mm	L3 mm	L4 mm	h mm	Art.no.	€
645.0012-D	4 / 5	12.0	75	10	55	10.3	304001 0012	79.90
645.0016-D	4 / 5	16.0	75	10	55	14.0	304001 0016	83.90
645.0020-D	4 / 5	20.0	90	10	70	18.0	304001 0020	89.90
676.0016-D	6 / 7	16.0	75	10	55	14.0	304001 0216	83.90
676.0020-D	6 / 7	20.0	90	10	70	18.0	304001 0220	89.90
687.0016-D	7 / 8	16.0	75	10	55	14.0	304001 0316	92.90
687.0020-D	7 / 8	20.0	90	10	70	18.0	304001 0320	98.90

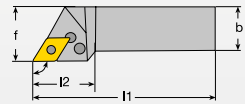
SARA® Basic-Line ISO clamp mounting, negative DDJN-PDJN

- DDJN R/L 93°
- PDJN R/L 93°
- Setting angle 93°, for negative 0° rhombic indexable inserts, 55° point angle
- **Application:** Copy turning, longitudinal turning



Jaw clamps from above

ISO designation	h=h1 mm	b1 mm	l1 mm	l2 mm	f mm	for indexable inserts DN...1506	right-hand		left-hand	
							Art.no.	€	Art.no.	€
DDJN R/L 2020 K15	20	20	125	40	25	DN...1506	320702 0001	39.90	320720 0001	39.90

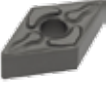


ISO designation	h=h1 mm	b1 mm	l1 mm	l2 mm	f mm	for indexable inserts DN...1506	right-hand	
							Art.no.	€
PDJN R/L 2525 M15	25	25	150	35	25	DN...1506	320602 0002	45.00

SARA® Basic Line DNMG ISO indexable cutting inserts

- 55° rhombic, negative 0°
- Bilateral chip breaker design
- Minimum ap feed always 63 % of the corner radius "r"
- Maximum ap feed is 63 % of the cutting edge length
- Cutting data recommendations apply to a corner radius **r = 0.4 mm**
- **While stocks last**

Chip breaker Mb

F finishing	M medium	R roughing	SARA	ISO P	ISO M	ISO K	ISO N	ISO S	Quality	Art.no.	€
-	●	○	ISO designation		●	○		○	SC 352 T-b	10 367004 0352	3.75
 <p>Roughing/medium machining</p>			DNMG 150608-Mb								

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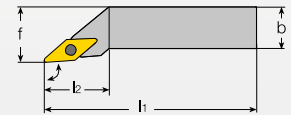
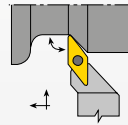
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SARA® Basic Line clamp mounting, positive SVJC

- SVJC R/L 93°
- Setting angle 93°, for positive 7° rhombic indexable inserts, 35° point angle
- **Application:** Longitudinal turning and copy turning

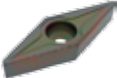


ISO designation	h=h1 mm	b1 mm	l1 mm	l2 mm	f mm	for indexable inserts	right-hand		left-hand	
							Art.no.	€	Art.no.	€
SVJC R/L 2020 K16	20	20	125	41	25	VC...1604	315003 0001	29.90	315030 0001	29.90
SVJC R/L 2525 M16	25	25	150	41	32	VC...1604	315003 0002	29.90	315030 0002	29.90

SARA® Basic Line VCMT ISO indexable cutting inserts

- 35° rhombic, positive 7°
- One-sided chip breaker design
- Minimum ap feed always 63 % of the corner radius "r"
- Maximum ap feed is 30 % of the cutting edge length
- Cutting data recommendations apply to a corner radius **r = 0.4 mm**
- **While stocks last**

Chip breaker Mb

F finishing	M medium	R roughing	SARA	ISO P	ISO M	ISO K	ISO N	ISO S	Quality	Art.no.	€
○	●	-	ISO designation								
			VCMT 160408-Mb	●	○				SC 251 T-b	10 367011 0251	3.69
Finishing/medium machining											

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ATORN® ISO indexable cutting inserts CC.. ISO P

• 80° rhombic, positive 7°

Chip breaker **FU1** positive


F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
 <p>Finishing 18°</p>			CCGT 060201-FU1	●	●			●		HC 7820	10 311530 1312	7.50
			CCGT 060202-FU1	●	●			●		HC 7810	10 311530 1411	7.50
				●	●			●		HC 7820	10 311530 1412	7.50
			CCGT 060204-FU1	●	●			●		HC 7810	10 311530 1511	7.50
				●	●			●		HC 7820	10 311530 1512	7.50
			CCGT 09T301-FU1	●	●			●		HC 7820	10 311530 1612	8.70
			CCGT 09T302-FU1	●	●			●		HC 7810	10 311530 1711	8.70
				●	●			●		HC 7820	10 311530 1712	8.70
			CCGT 09T304-FU1	●	●			●		HC 7810	10 311530 1811	8.70
			●	●			●		HC 7820	10 311530 1812	8.70	
		CCGT 09T308-FU1	●	●			●		HC 7810	10 311530 1911	8.70	
			●	●			●		HC 7820	10 311530 1912	8.70	

ISO	HC 7810	HC 7820
ISO P Steel	Vc = 80-160	Vc = 50-130
ISO M Stainless steel	Vc = 130-220	Vc = 100-210
ISO S Superalloy	Vc = 40-70	Vc = 40-60
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.05-0.30 ap = 0.20-3.0	f = 0.02-0.30 ap = 0.10-3.0

ATORN® ISO indexable cutting inserts DC.. ISO P

• 55° rhombic, positive 7°

Chip breaker **FU1**


F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
 <p>Finishing 18°</p>			DCGT 070201-FU1	●	●			●		HC 7820	10 311530 2012	7.20
			DCGT 070202-FU1	●	●			●		HC 7810	10 311530 2111	7.20
				●	●			●		HC 7820	10 311530 2112	7.20
			DCGT 070204-FU1	●	●			●		HC 7810	10 311530 2211	7.20
				●	●			●		HC 7820	10 311530 2212	7.20
			DCGT 11T301-FU1	●	●			●		HC 7820	10 311530 2312	8.50
			DCGT 11T302-FU1	●	●			●		HC 7810	10 311530 2411	8.50
				●	●			●		HC 7820	10 311530 2412	8.50
			DCGT 11T304-FU1	●	●			●		HC 7810	10 311530 2511	8.50
			●	●			●		HC 7820	10 311530 2512	8.50	
		DCGT 11T308-FU1	●	●			●		HC 7810	10 311530 2611	8.50	
			●	●			●		HC 7820	10 311530 2612	8.50	

ISO	HC 7810	HC 7820
ISO P Steel	Vc = 80-160	Vc = 80-130
ISO M Stainless steel	Vc = 130-220	Vc = 100-210
ISO S Superalloy	Vc = 40-70	Vc = 40-60
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.05-0.30 ap = 0.20-3.0	f = 0.02-0.30 ap = 0.10-3.0

ATORN® ISO indexable cutting inserts VC.. ISO P

• 35° rhombic, positive 7°

Chip breaker **FU1**

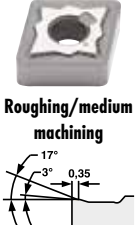
F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
 <p>Finishing 18°</p>			VCGT 110301-FU1	●	●			●		HC 7820	10 311530 2712	9.60
			VCGT 110302-FU1	●	●			●		HC 7810	10 311530 2811	9.60
				●	●			●		HC 7820	10 311530 2812	9.60
			VCGT 110304-FU1	●	●			●		HC 7810	10 311530 2911	9.60
				●	●			●		HC 7820	10 311530 2912	9.60
			VCGT 160402-FU1	●	●			●		HC 7810	10 311530 3011	11.20
				●	●			●		HC 7820	10 311530 3012	11.20
			VCGT 160404-FU1	●	●			●		HC 7810	10 311530 3111	11.20
				●	●			●		HC 7820	10 311530 3112	11.20

ISO	HC 7810	HC 7820
ISO P Steel	Vc = 80-160	Vc = 60-130
ISO M Stainless steel	Vc = 130-220	Vc = 110-210
ISO S Superalloy	Vc = 40-70	Vc = 40-60
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.05-0.25 ap = 0.20-2.5	f = 0.02-0.25 ap = 0.10-2.50

ATORN® ISO indexable cutting inserts CN.. ISO P

- 80° rhombic, negative 0°

Chip breaker RP5 negative


F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€	
-	○	●											
 <p>Roughing/medium machining</p>			CNMG 120408-RP5	●		●				HC 7810	10 311520 1511	6.45	
					●		●				HC 7820	10 311520 1512	6.45
					●		●				HC 7830	10 311520 1513	6.45
			CNMG 120412-RP5	●		●					HC 7810	10 311520 1611	6.45
					●		●				HC 7820	10 311520 1612	6.45
					●		●				HC 7830	10 311520 1613	6.45

ISO	HC 7810	HC 7820	HC 7830
ISO P Steel	Vc = 160-320	Vc = 130-270	Vc = 110-230
ISO K Cast iron	Vc = 160-520	Vc = 130-440	Vc = 110-390
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.20 - 0.60 ap = 0.80 - 6.0		

ATORN® ISO indexable cutting inserts DN.. ISO P

- 55° rhombic, negative 0°

Chip breaker RP5 negative


F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€	
-	○	●											
 <p>Roughing/medium machining</p>			DNMG 150608-RP5	●		●				HC 7810	10 311520 1711	8.70	
					●		●				HC 7820	10 311520 1712	8.70
					●		●				HC 7830	10 311520 1713	8.70
			DNMG 150612-RP5	●		●					HC 7820	10 311520 1812	8.70

ISO	HC 7810	HC 7820	HC 7830
ISO P Steel	Vc = 200-340	Vc = 140-290	Vc = 140-230
ISO K Cast iron	Vc = 250-580	Vc = 140-490	Vc = 180-430
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.15-0.35	f = 0.15-0.55 ap = 0.80-5.0	f = 0.15-0.35

ATORN® ISO indexable cutting inserts WN.. ISO P

- 80° trigonometric, negative 0°

Chip breaker RP5 negative

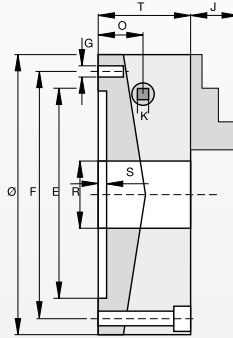
F finishing	M medium	R roughing	ATORN® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€	
-	○	●											
 <p>Roughing/medium machining</p>			WNMG 080408-RP5	●		●				HC 7810	10 311520 1911	6.75	
					●		●				HC 7820	10 311520 1912	6.75
					●		●				HC 7830	10 311520 1913	6.75
			WNMG 080412-RP5	●		●					HC 7820	10 311520 2012	6.75

ISO	HC 7810	HC 7820	HC 7830
ISO P Steel	Vc = 190-320	Vc = 160-270	Vc = 140-230
ISO K Cast iron	Vc = 230-520	Vc = 190-440	Vc = 140-390
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.20 - 0.40	f = 0.20 - 0.60 ap = 0.80 - 6.0	f = 0.20 - 0.40

Universal lathe chuck

DIN 6350A

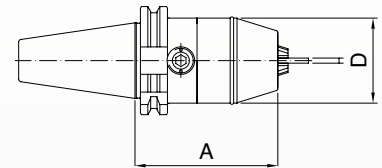
- Made from cast iron
 - CUSHMAN system, centric clamping
 - With straight centre mount in accordance with DIN 6350
 - Made of fine-pored special casting
 - For external and internal clamping of workpieces
- **Supplied with:**
 chuck key and attachment screws
 one set of boring jaws (outward stepped)
 one set of turning jaws (inward stepped)
- Additional chuck sizes as well as chucks with integrated short taper are available on request



Nominal Ø mm	F mm	E mm	R mm	T mm	J mm	G mm	O mm	S mm	K mm	Rotational speed max. rpm	True running accuracy mm	Three-jaw version Art.no.	€
100	83	70 H7	20	52	17	3 x M8	18	3	8	6300	0.04	405001 0100	225.00
125	108	95 H7	32	58	19	3 x M8	22	4	8	5500	0.04	405001 0125	239.00
160	140	125 H7	42	62	23	3 x M10	22	4	9	4500	0.04	405001 0160	279.00
200	176	160 H7	55	76	29	3 x M10	27.5	4	11	4000	0.06	405001 0200	349.00
250	224	200 H7	76	82	33	3 x M12	29.5	5	12	3500	0.06	405001 0250	519.00

SARA® NC short drill chuck with spur gear system

- Clamping via spur gear system
- Clockwise and anti-clockwise rotation possible
- True-running accuracy 0.05 mm
- Reliable bevel-pinion gear
- Slim design
- max. permitted rotational speed with unbalanced tool 7,000 rpm



DIN ISO 7388-1 Type A / DIN 69871

Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retention force N	Wr. width mm	True running accuracy mm	Art.no.	€
SK 40	0,5 - 13	50	84	20	40	6	0.05	440243 4013	149.90
SK 40	2,5 - 16	57	84	20	40	6	0.05	440243 4016	149.90



DIN ISO 7388-2 Type A / (JIS B6339)

Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retention force N	Wr. width mm	True running accuracy mm	Art.no.	€
SK 40	0,5 - 13	50	94	20	40	6	0.05	440241 4013	149.90
SK 40	2,5 - 16	57	94	20	40	6	0.05	440241 4016	149.90



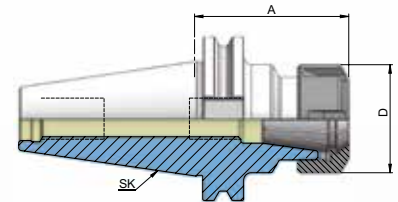
DIN 2080, Type A

Shank	Clamping range mm	D mm	A mm	Tightening torque max. N-m	Retention force N	Wr. width mm	True running accuracy mm	Art.no.	€
SK 40	0,5 - 13	50	78	20	40	6	0.05	440242 4013	149.90
SK 40	2,5 - 16	57	78	20	40	6	0.05	440242 4016	149.90



SARA® ER collet chuck

- For DIN 6499 ER collets
- Pre-balanced to G 2.5 / 25,000 rpm
- Alloyed case-hardened steel with a core tensile strength of min. 950 N/mm², case-hardened to HRC 60 ± 2 (HV 700 ± 50), case depth 0.8 mm ± 0.2 mm, burnished
- Taper angle tolerance quality < AT3 in accordance with DIN 7187 and DIN 2080, max. true running accuracy < 0.005 mm
- Supplied with clamping nut
- Additional shank designs and AD/AF version available on request
- ER16 / 426E* tool holding fixtures supplied with hexagonal nut



DIN 69893 type A (HSK-A)

- Internal coolant supply
- When machining with internal coolant supply, a coolant transfer pipe art.no. 431011... should be used

Shank	Clamping range mm	for collets	A mm	D mm	Art.no.	€
HSK-A 50	1 - 10	ER16 / 426E *	100	32	431009 5010	85.50 68.00
HSK-A 50	2 - 16	ER25 / 430E	100	42	431009 5016	85.50 68.00
HSK-A 50	2 - 20	ER32 / 470E	100	50	431009 5020	90.50 72.00
HSK-A 63	1 - 10	ER16 / 426E *	100	32	431009 6310	85.50 68.00
HSK-A 63	1 - 10	ER16 / 426E *	160	32	431009 6410	111.00 88.50
HSK-A 63	2 - 16	ER25 / 430E	100	42	431009 6316	82.00 65.50
HSK-A 63	2 - 16	ER25 / 430E	160	42	431009 6416	108.00 86.00
HSK-A 63	2 - 20	ER32 / 470E	100	50	431009 6320	85.50 68.00
HSK-A 63	2 - 20	ER32 / 470E	160	50	431009 6420	111.00 88.50
HSK-A 63	3 - 26	ER40 / 472E	120	63	431009 6326	90.50 72.00
HSKA 100	2 - 16	ER25 / 430E	100	42	431009 1016	114.00 91.00
HSKA 100	2 - 20	ER32 / 470E	100	50	431009 1020	114.00 91.00
HSKA 100	3 - 26	ER40 / 472E	120	63	431009 1026	119.00 95.00



DIN ISO 7388-1 / DIN 69871 AD

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	Art.no.	€
SK 40	1 - 10	ER16 / 426E *	63	32	431003 4010	46.00 36.50
SK 40	2 - 16	ER25 / 430E	60	42	431003 4016	46.00 36.50
SK 40	2 - 20	ER32 / 470E	70	50	431003 4020	49.00 39.00
SK 40	3 - 26	ER40 / 472E	80	63	431003 4026	52.00 41.50
SK 50	1 - 10	ER16 / 426E	100	32	431003 5010	87.50 70.00
SK 50	2 - 16	ER25 / 430E	60	42	431003 5016	72.00 57.50
SK 50	2 - 20	ER32 / 470E	70	50	431003 5020	75.00 60.00
SK 50	3 - 26	ER40 / 472E	80	63	431003 5026	75.00 60.00



DIN ISO 7388-2 / MAS BT JIS B 6339

- Internal coolant supply

Shank	Clamping range mm	for collets	A mm	D mm	Art.no.	€
SK 40	1 - 10	ER16 / 426E *	63	32	431007 4010	46.00 36.80
SK 40	2 - 16	ER25 / 430E	60	42	431007 4016	46.00 36.80
SK 40	2 - 20	ER32 / 470E	70	50	431007 4020	49.00 39.00
SK 40	3 - 26	ER40 / 472E	80	63	431007 4026	52.00 41.50
SK 50	2 - 16	ER25 / 230E	70	42	431007 5016	79.00 63.00
SK 50	2 - 20	ER32 / 470E	70	50	431007 5020	75.00 60.00
SK 50	3 - 26	ER40 / 472E	80	63	431007 5026	75.00 60.00



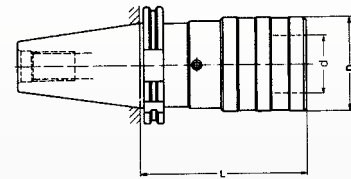
DIN 2080

Shank	Clamping range mm	for collets	A mm	D mm	Art.no.	€
SK 40	1 - 10	ER16 / 426E *	50	32	431001 4010	46.00 36.50
SK 40	2 - 16	ER25 / 430E	50	42	431001 4016	46.00 36.50
SK 40	2 - 20	ER32 / 470E	50	50	431001 4020	48.00 38.00
SK 40	3 - 26	ER40 / 472E	80	63	431001 4026	51.00 40.50
SK 50	2 - 20	ER32 / 470E	63	50	431001 5020	74.00 59.00
SK 50	3 - 26	ER40 / 472E	63	63	431001 5026	74.00 59.00



SARA® Thread cutting quick-change chucks

- Automatic locking of the inserts
- **Flexible length compensation under compression and tension**
- For quick-release inserts with adjustable safety coupling
- Minimal residual torque prevents tap breakage
- For thread cutting on mechanical and digitally controlled radial drills as well as drilling and milling machines
- Further sizes are available on request



DIN ISO 7388-1 / DIN 69871 A

Shank	d mm	D mm	A mm	L mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	Art.no.	€
SK 40	19	38	60	60	9	9	M3-M12	442003 4012	129.00
SK 40	31	55	100	98	15	15	M8-M20	442003 4024	169.00



DIN ISO 7388-2 / MAS BT JIS B 6339

Shank	d mm	D mm	A mm	Length compensation, pressure mm	Length compensation, tension mm	Thread	Art.no.	€
SK 40	19	38	68	9	9	M3-M12	442007 4012	139.00
SK 40	31	55	93	15	15	M8-M20	442007 4024	179.00



SARA® Quick-release inserts

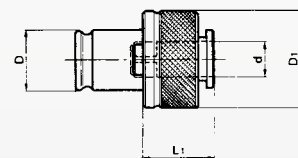
- Further sizes available on request

With safety coupling

d mm	Square mm	D mm	L mm	D1 mm	Thread	DIN	Art.no.	€
2.8	2.1	19	25	32	M 2	371	442505 1928	35.30
3.5	2.7	19	25	32	M 3	371	442505 1935	35.30
4	3.0	19	25	32	M3.5	371	442505 1940	35.30
4.5	3.4	19	25	32	M 4	371	442505 1945	35.30
6	4.9	19	25	32	M5 / M6	371	442505 1960	35.30
8	6.2	19	25	32	M 8	371	442505 1980	35.30
10	8	19	25	32	M 10	371	442505 1910	35.30
7	5.5	19	25	32	M 10	376	442505 1970	35.30
9	7	19	25	32	M 12	376	442505 1990	35.30
11	9	19	25	32	M 14	376	442505 1911	35.30
6	4.9	31	34	50	M5 / M6	371	442505 3106	51.90
8	6.2	31	34	50	M 8	371	442505 3108	51.90
10	8	31	34	50	M 10	371	442505 3110	51.90
7	5.5	31	34	50	M 10	376	442505 3107	51.90
9	7	31	34	50	M 12	376	442505 3109	51.90
11	9	31	34	50	M 14	376	442505 3111	51.90
12	9	31	34	50	M 16	376	442505 3112	51.90
14	11	31	34	50	M 18	376	442505 3114	51.90
16	12	31	34	50	M 20	376	442505 3116	51.90
18	14.5	31	34	50	M 22	376	442505 3118	51.90



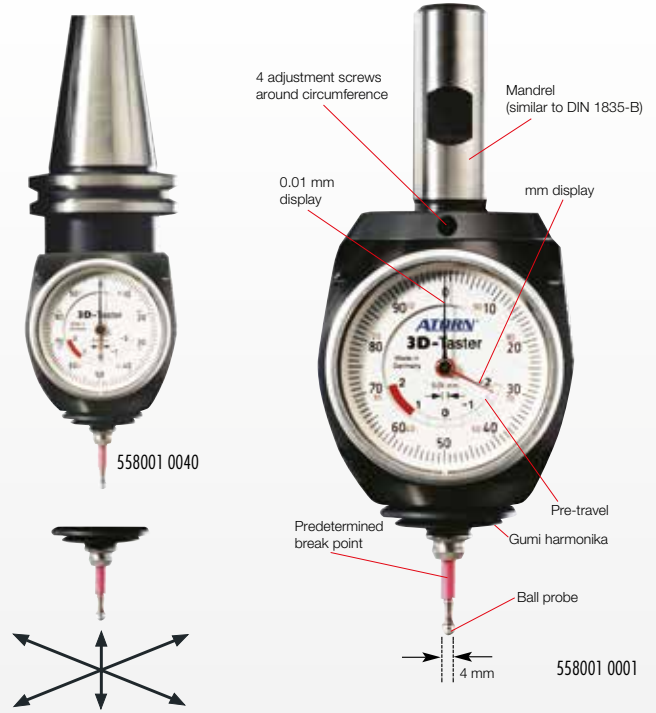
With safety coupling



ATORN® Universal 3D probe



- For determining the spindle centre when aligning workpieces on X, Y, and Z axes
- Easily readable dial indicator
- True running accuracy can be calibrated via 4 adjustment screws in the casing
- Robust metal casing
- No plus/minus sign problems, as actual value readings are independent of the direction
- Automatic probe radius compensation
- Ceramic predetermined break point prevents damage to the mechanism if maximum probe travel is exceeded
- You can replace probes yourself
- For use on all machine tools including eroding machines, as there is insulation between the probe tip and the holding fixture
- Dial indicator diameter: 57 mm
- Casing width: 65 mm
- Clamping shank: 20 mm Ø x 50 mm, similar to DIN 1835B or DIN 69871A, SK 40
- probe ball diameter: 4 mm
- Measurement accuracy: 0.01 mm
- Supplied in moulded packaging, including operating manual



Designation	Art.no.	€	Calibration	
			Art.no.	€
Universal 3D probe, shank Ø 20 mm	558001 0001	249.00	077330 0001	97.50
Universal 3D probe, shank DIN 69871A, SK 40	558001 0040	319.00	077330 0001	97.50

Accessories

Designation	Art.no.	€
Spare contact point 4 mm Ø x 33 mm long	558005 0001	27.95
Long contact point, Ø 8 mm x length 75 mm	558005 0005	38.95



SAUTER HMM rebound hardness tester

- For testing the hardness of large, solid workpieces
- Minimum wall thickness 8 mm, minimum workpiece weight 3 kg
- Workpiece surface Ra < 10 µm
- Integrated data storage for up to 9 measurement groups
- Basis of LEEB hardness test and calculation
- Conversion of measured hardness values into tensile strength
- Switchable backlighting, battery operation
- Dimensions L x W x H: 150 x 80 x 30 mm
- Direct display of HRC, HRB, HV, HB, HS and HL parameters

Technical data:

Hardness scale ranges

- HRC 19.8 - 68.5
- HRB 13.5 - 101.7
- HV 80 - 976
- HB 30 - 655



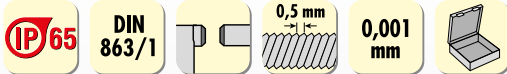
Wireless infra-red printer included



Designation	Measurement range HL	Error limit %	Art.no.	€	Calibration	
					Art.no.	€
HMM	170 - 960	1.5	576103 0001	999.00	077340 0001	97.50
HMM without printer	170-960	1.5	576103 0010	799.00	077340 0001	97.50

SARA® Digital outside micrometer IP65

NEW



- Sturdy, with ratchet
- Painted steel frame with hand protection
- Spindle fixed by means of a locking lever
- Spindle Ø 6.5 mm
- Calibration including setting gauge
- Supplied with CR2032 battery (no. 548079 6032) and adjustment key, versions over 25 mm include setting gauge



Measurement range mm	Art.no.	€	Calibration	
			Art.no.	€
0-25	503491 0025	79.00	070501 0001	15.70
25-50	503491 0050	89.00	070501 0102	26.00

SARA® Holder for outside micrometers

- Cast-iron version
- With large base surface for attaching outside micrometers up to 100 mm measurement range
- Ideal reading position can be adjusted by means of a swivel-mounted clamping jaw



Description	Art.no.	€
For outside micrometers up to 300 mm	504002 0001	27.90

SARA® Limit plug gauges



- Go/no-go bore testing
- Tolerances and deviations in accordance with DIN EN ISO 1938-1 and DIN 7164
- Go ends for limit plug gauges are supplied with additional wear allowances in accordance with DIN EN ISO 1938-1.
- Test pieces ground and lapped
- Up to Ø 70 mm = go/no-go ends on a single handle; 2-part version above Ø 70 mm
- Material: 540101..... to 540115.....: Go/no-go made from wear-resistant gauge steel, hardened and aged
540120.....: Go end hard chrome-plated, no-go end gauge steel
- Intermediate dimensions, other tolerance classes, numerical tolerances, carbide limit plug gauges or flat limit hole gauges are available on request!
- Tolerance class H7



540101 0020

Nominal Ø mm	Steel H7		Calibration	
	Art.no.	€	Art.no.	€
2	540101 0002	17.30	075501 0010	11.00
3	540101 0003	15.50	075501 0010	11.00
4	540101 0004	15.70	075501 0010	11.00
5	540101 0005	13.80	075501 0010	11.00
6	540101 0006	13.90	075501 0010	11.00
7	540101 0007	13.90	075501 0010	11.00
8	540101 0008	13.90	075501 0010	11.00
9	540101 0009	13.90	075501 0010	11.00
10	540101 0010	13.90	075501 0010	11.00
11	540101 0011	15.60	075501 0010	11.00
12	540101 0012	15.60	075501 0010	11.00
13	540101 0013	15.60	075501 0010	11.00
14	540101 0014	15.60	075501 0010	11.00
15	540101 0015	17.40	075501 0010	11.00

Nominal Ø mm	Steel H7		Calibration	
	Art.no.	€	Art.no.	€
16	540101 0016	17.40	075501 0010	11.00
17	540101 0017	17.40	075501 0010	11.00
18	540101 0018	17.40	075501 0010	11.00
19	540101 0019	20.00	075501 0010	11.00
20	540101 0020	20.00	075501 0010	11.00
21	540101 0021	20.00	075501 0011	13.70
22	540101 0022	20.00	075501 0011	13.70
23	540101 0023	20.00	075501 0011	13.70
24	540101 0024	20.00	075501 0011	13.70
25	540101 0025	21.70	075501 0011	13.70
26	540101 0026	21.70	075501 0011	13.70
27	540101 0027	22.00	075501 0011	13.70
28	540101 0028	22.30	075501 0011	13.70
30	540101 0030	23.20	075501 0011	13.70

Nominal Ø mm	Steel H7		Calibration	
	Art.no.	€	Art.no.	€
32	540101 0032	31.20	075501 0011	13.70
34	540101 0034	33.10	075501 0011	13.70
35	540101 0035	33.40	075501 0011	13.70
36	540101 0036	34.00	075501 0011	13.70
37	540101 0037	34.40	075501 0011	13.70
38	540101 0038	35.20	075501 0011	13.70
40	540101 0040	37.20	075501 0011	13.70
42	540101 0042	40.40	075501 0011	13.70
44	540101 0044	42.40	075501 0011	13.70
45	540101 0045	42.80	075501 0011	13.70
46	540101 0046	42.00	075501 0011	13.70
47	540101 0047	42.40	075501 0011	13.70
48	540101 0048	43.20	075501 0011	13.70
50	540101 0050	44.80	075501 0011	13.70

SARA® Feeler gauge strips in rolls

- For testing and adjusting valve play and electrode spacing, for measuring bearing play or for use as assembly supports
- Spring-hardened steel strip
- Length 5 m, width 12.7 mm
- Slotted dispenser box
- From 0.08 mm tape thickness, printed with nominal dimension every 120 mm
- Normal steel

Thickness mm	Art.no.	€
0.01	548525 0001	41.80
0.02	548525 0002	28.80
0.03	548525 0003	8.85
0.04	548525 0004	8.00
0.05	548525 0005	7.60
0.06	548525 0006	7.65
0.07	548525 0007	7.65
0.08	548525 0008	7.65
0.09	548525 0009	7.65
0.10	548525 0010	7.20
0.12	548525 0012	7.20
0.15	548525 0015	7.20
0.18	548525 0018	7.20
0.20	548525 0020	7.20
0.25	548525 0025	7.20

Thickness mm	Art.no.	€
0.30	548525 0030	8.20
0.35	548525 0035	8.20
0.40	548525 0040	8.20
0.45	548525 0045	10.00
0.50	548525 0050	10.00
0.55	548525 0055	11.15
0.60	548525 0060	11.15
0.65	548525 0065	11.15
0.70	548525 0070	11.15
0.75	548525 0075	11.15
0.80	548525 0080	11.70
0.85	548525 0085	11.70
0.90	548525 0090	11.70
0.95	548525 0095	11.70
1.00	548525 0100	11.70



548525 0030

Set

- 15 feeler gauge strips
- In wall bracket with feeler gauge strip holder for dispensing of feeler strip sections



Description	Art.no.	€
Feeler gauge strip set, 0.01 to 0.25 mm 0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.10 / 0.12 / 0.15 / 0.18 / 0.20 / 0.25 mm	548525 1000	159.00
Feeler gauge strip set, 0.30 to 1.00 mm 0.30 / 0.35 / 0.40 / 0.45 / 0.50 / 0.55 / 0.60 / 0.65 / 0.70 / 0.75 / 0.80 / 0.85 / 0.90 / 0.95 / 1.00 mm	548525 2000	179.00

SARA® Digital inclinometer

- Robust metal casing
- With 2 magnets on the bottom and side surfaces
- Rotating display
- Supplied with 6LR61 battery (no. 548079 4022)



Measurement range	Numerical intervals/sensitivity	Dimensions L x W x H mm	Art.no.	€
360° (4 x 90°)	0.05°	57 x 57 x 31	556550 0001	45.00

SARA® Emulsion mist separator **Ultra-Jet**

- **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.**
- **No rotational speed regulation**
- **No disposable filters**
- Depending on size, suitable for processing machines of approx. 1-3 m³ Suitable for internal chamber volume and light-duty chip-removal processes
- Compact design, direct mounting on the machine
- Up to four filter stages, can be retrofitted with a HEPA filter
- Dynamic-static combined filter system
- Dynamically balanced high-performance fan integrated into the filter unit
- Service opening with quick-release clamps
- ULTRA-JET is tested for flame resistance in accordance with DIN EN 16282
- Stainless steel housing powder-coated in RAL 7035 (light grey), high-performance X-Cyclone® separator profiles made of aluminium
- **Supplied with:** Ø 160/150 mm reducer with chip pre-filter insert, 3 m oil return hose
- **Pricing:** ex works, including packaging



Model	Volume flow max. m³/h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Motor output kW	I(A)	Tension V	Noise level dB	Art.no.	€
Ultra-Jet 1	1000	410 x 410 x 480	150	20	0.25	0.74	400	69	909016 0010	1,999.00
Ultra-Jet 2	1400	410 x 410 x 480	150	22	0.5	1.3	400	73	909016 0020	2,499.00

Elma Ultrasonic cleaning equipment with heating system **Elmasonic EASY**

NEW

- Contemporary design, with robust cleaning trays made of wear-resistant stainless steel
- Noise-reducing plastic cover with additional function as a drip tray (model S 900/H with stainless steel cover, no drip collector function)
- Nine different sizes with tray volume 0.8 to 28 litres
- Patented **integrated sweep function** with 100 % output at a frequency of 37 kHz
- **Switchable pulse function** to remove tough, mineral-based contaminants and polishing pastes. The ultrasonic effect is boosted up to 20 % and the impurities can be removed quickly and easily.
- Warning when the individually adjustable temperature limit is reached to prevent albuminous contaminants hardening or sensitive parts becoming damaged.
- **Supplied with:** cover and without basket
- **Pricing:** ex works, including packaging



Basic unit with cover and without basket

Type	Dimensions W x D x H mm	Weight kg	Heat output kW	Basket load kg	Basket interior dimensions mm	Basket meshes mm	Total power consumption W	Discharge diameter mm	Handles	Tray content l	Art.no.	€
EASY 10/H	206 x 133 x 182	2.0	0/0.06	1	177 x 73 x 30	7x1	30	-	-	0.8	986011 1080	299.00
EASY 20/H	176 x 189 x 218	2.1	0/0.12	1	112 x 103 x 49	7x1	35	-	2	1.75	986011 0175	349.00
EASY 30/H	301 x 189 x 218	3.3	0/0.02	1	198 x 106 x 49	7x1	80	-	2	2.75	986011 0275	379.00
EASY 40/H	301 x 189 x 268	4.0	0/0.2	3	190 x 105 x 74	7x1	140	-	2	4.25	986011 1425	559.00
EASY 60/H	362 x 201 x 269	5.1	0/0.4	5	255 x 115 x 74	9x1	150	3/8	2	5.75	986011 1575	659.00
EASY 100/H	363 x 289 x 272	5.9	0/0.4	6	255 x 200 x 73	9x1	150	3/8	2	9.5	986011 1950	789.00
EASY 120/H	363 x 289 x 272	7.5	0/0.8	6	250 x 190 x 113	9x1	200	3/8	2	12.75	986011 1275	999.00
EASY 180/H	393 x 352 x 322	8.5	0/0.8	8	280 x 250 x 113	9x1	200	3/8	2	18	986011 1800	1,099.00
EASY 300/H	566 x 352 x 322	11.0	0/1.2	10	455 x 250 x 112	9x1	300	3/8	2	28	986011 2800	1,389.00

SARA® Belt skimmer

Oil skimmer systems: Contaminations in coolant emulsions from leaked oil floating on the surface – such as hydraulic oil, peripheral lubrication or contact surface oil – cause problems with the production process. Oil leakages reduce oxygen absorption, thus encouraging bacterial growth. They also cause deposits to develop on machines and workpieces, increase the formation of oil mist and reduce cooling performance. The consequences are: skin diseases, unpleasant odours, higher disposal costs, corrosion, bacterial contamination, poor cooling performance and problematic chipping behaviour. The following oil skimmer systems provide assistance in this regard.

- Special oil-carrying belt
- Tramp oil removal from the emulsion surface
- Installed above the emulsion container, requires little space
- Immersion depth: 225 mm

F-series

- **High-quality aluminium casing**
- **Supplied with:** Base unit with 800 mm skimmer band, oil return hose, no timer

Model	Output l/h	Belt dimensions L x W mm	Connection	Dimensions L x W x H mm	Weight kg	Art.no.	€
F-40	4	800 x 40	230 / 50	155 x 85 x 148	1.8	904020 0040	399.00



SARA® Emulsion treatment station

- **Stationary/mobile treatment station for removing foreign oils from the cooling lubricant**
- **Emulsion treatment without staff intervention and no machine downtime (bypass procedure)**
- **Filters out up to 97 % of all foreign oils**
- Separation of emulsion and foreign oils by purely physical means
- Reduced costs due to longer service life of coolant lubricant
- Robust, fully-welded stainless steel housing with oil-resistant outside coating
- Examples of use include machine tools, parts washers
- **Supplied with:** EPS, suction and return hose,
- **Pricing:** ex works, including packaging



Model	Transport quantity l/h	Dimensions L x W x H mm	Weight kg	Art.no.	€
EPS 350	80 - 350	270 x 152 x 440	15	903001 0001	1,949.00 1,699.00

SARA® Overflow protection sirens

- **To monitor the maximum or minimum fill level**
- Acoustic fill level control on your machine tool
- No excess hall cleaning due to container overflowing
- Easy attachment thanks to magnetic plate
- **Supplied with:** Siren with magnetic foot and 1x 9 volt mono-block battery



Description	Art.no.	€
Overflow protection sirens	906011 0001	99.00

Grippy mat

- Suction mat with strong grip thanks to anti-slip underside
- Prevents slipping and tripping
- Grips the floor without adhesive tape
- Floor coverings can be removed without leaving residue
- Fluids cannot trickle out onto the floor
- Durable surface, suitable for pedestrian and forklift traffic
- **Price per pack**



Roll material

Type	Dimensions	Contents	Absorption capacity	Art.no.	€
MAT 1625	41 cm x 7.6 m	1 roll	7.5 l	910105 1625	39.90
MAT 3250	81 cm x 15 m	1 roll	30.3 l	910105 3250	145.00
MAT 32100	81 cm x 30 m	1 roll	60.6 l	910105 3210	274.00

Mats

Type	Dimensions	Contents	Absorption capacity	Art.no.	€
MAT 3200	41 cm x 61 cm	10 pcs. in bag	7.5 l	910105 3200	39.90



Grippy mat with safety edge

- **Black/yellow signal pattern on the edges of the roll mat warns of hazards and guarantees increased safety**
- Suction mat with strong grip thanks to adhesive backing
- Prevents slipping and tripping
- Grips the floor without adhesive tape
- Floor coverings can be removed without leaving residue
- Fluids cannot trickle out onto the floor
- Durable surface, suitable for pedestrian and forklift traffic
- **Easy to clean:** You can sweep, wipe, vacuum or go over the mat with your wet vacuum or floor cleaner (cleaning makes the signal edge visible again)
- **Easy adjustment:** You can trim the mat to indicate the safest route, even around corners
- **Price per pack**



Type	Dimensions	Contents	Absorption capacity	Art.no.	€
GRPSB36200	91 cm x 30 m	1 roll	30 l	910105 6200	408.00
GRPSB36201	91 cm x 15.3 m	1 roll	15 l	910105 6201	221.00

NEW

91 % more environmentally friendly than leased floor mats



pig Grippy Traffic MAT® mat

- Very durable suction mat
- The material is heat-fused and needle-punched, creating a high level of durability
- The underside provides the mat with a strong grip, which reduces the risk of slipping and tripping
- **Price per pack**



Roll material

Type	Dimensions	Contents	Absorption capacity	Art.no.	€
GRP36201	91 cm x 15 m	1 roll	15 l	910105 3621	151.00
GRP36200	91 cm x 30 m	1 roll	50 l	910105 3620	278.00

pig Economy mat

- **The cost-effective mat with a high absorption capacity**
- For small spills, leaking and dripping points
- For light-duty applications in walkway areas
- Ideal as an underlay for tools and workpieces
- **Price per pack**



MAT 411

Roll material

Type	Dimensions	Contents	Absorption capacity	Art.no.	€
MAT 411	76 cm x 61 m	1 roll	161 l	910110 0045	202.00

Mats

Type	Dimensions	Contents	Absorption capacity	Art.no.	€
MAT 412	38 x 51 cm	125 units in box	82 l	910101 0030	122.50



MAT 412

pig HAM-O mat

- **Liquid disappears in seconds**
- Unique pattern hides leaks and drops
- Absorbs oil, water and coolant (not recommended for solvents, which could dissolve the embossed pattern)
- Extremely hard-wearing
- Practical perforation
- **Price per pack**



225 ml oil is poured onto the HAM-O...



... and completely absorbed in a matter of seconds.



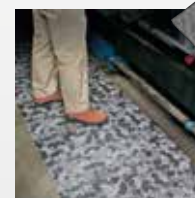
910101 0081



MAT 267

Roll material, perforated every 25.5 cm

Type	Dimensions	Contents	Absorption capacity	Colour	Art.no.	€
MAT 267	41 cm x 46 m	1 roll in dispenser box	89 l	Green	910101 0081	155.50
MAT 269	81 cm x 46 m	1 roll	180 l	Green	910110 0269	278.00
MAT 116	81 cm x 46 m	1 roll	179.5 l	Grey	910101 0022	278.00



910101 0022



MAT 116

over 180,000 articles



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