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TAKEOFF 02.20

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€



ATORN
Twist drill bits



P. **3**

ATORN
RockTec 52 & 65 end milling cutters



P. **14**

SARA
Emulsion mist separator



P. **29**

SARA® Centring drill



- For centring holes without protected centre DIN 332 A
- Spiral-fluted
- Bare surface
- Ø 0.8 mm, single cutting edge

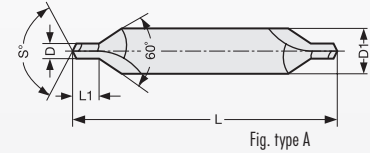
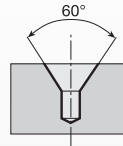


Fig. type A



D k12 mm	D1 h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm ² mm/rev	Art.no.	€
0.8	3.15	25	1.0-1.3	0.05	5 100141 0080	2.70 1.67
1	3.15	31	1.3-1.7	0.05	5 100141 0100	2.70 1.67
1.25	3.15	31	1.6-2.0	0.05	5 100141 0125	2.70 1.67
1.6	4	35	2.0-2.6	0.05	5 100141 0160	2.70 1.67
2	5	40	2.5-3.1	0.05	5 100141 0200	3.32 2.06
2.5	6.3	45	3.1-3.8	0.05	5 100141 0250	3.79 2.35
3.15	8	50	3.9-4.6	0.07	5 100141 0315	4.69 2.91
4	10	55	5.0-5.9	0.07	1 100141 0400	5.80 3.60
5	12.5	63	6.3-7.2	0.07	1 100141 0500	9.20 5.70
6.3	16	71	8.0-8.9	0.14	1 100141 0630	15.80 9.80
8	20	80	10.1-11.1	0.14	1 100141 0800	27.60 17.10
10	25	100	12.8-13.8	0.21	1 100141 1000	48.80 30.20

Set

Contents	Art.no.	€
3 units 1.6 x 4 mm 2 units 4 x 10 mm	100111 0001	63.50 38.90

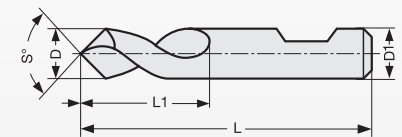
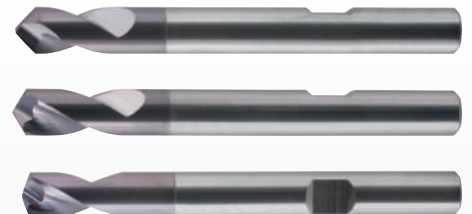
Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
100141.... 100111....		25-45	15-25	10-15	6-10	6-10		15-25	10-15	6-10					40-50				

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

SARA® HPC NC spot drill



- S° = point angle 90°, 120° and 142°
- Cylindrical shank with clamping surface in accordance with DIN 6535-HB
- Cutting material: ultra-fine grain solid carbide, TiAlN-coated**
- Spot drilling and countersinking on NC and CNC machines
- 142° point angle version for spot drilling for the next twist drill's operation



D mm	D1 h6 mm	L mm	L1 mm	Feed f steel < 1000 N/mm ² mm/rev	Art.no.	90° €	Art.no.	120° €	Art.no.	142° €
3	3	38	8	0.07	100540 0300	26.20 17.80	100550 0300	26.20 17.80	100560 0300	26.20 17.80
4	4	50	10	0.07	100540 0400	26.20 17.80	100550 0400	26.20 17.80	100560 0400	26.20 17.80
5	5	50	13	0.07	100540 0500	26.20 17.80	100550 0500	26.20 17.80	100560 0500	26.20 17.80
6	6	57	13	0.13	100540 0600	35.70 24.20	100550 0600	35.70 24.20	100560 0600	35.70 24.20
8	8	63	19	0.13	100540 0800	44.60 30.30	100550 0800	44.60 30.30	100560 0800	44.60 30.30
10	10	66	20	0.20	100540 1000	61.50 41.80	100550 1000	61.50 41.80	100560 1000	61.50 41.80
12	12	73	22	0.20	100540 1200	74.50 50.60	100550 1200	74.50 50.60	100560 1200	74.50 50.60
16	16	82	24	0.27	100540 1600	133.00 90.40	100550 1600	133.00 90.40	100560 1600	133.00 90.40
20	20	92	30	0.27	100540 2000	220.00 149.50	100550 2000	220.00 149.50	100560 2000	220.00 149.50

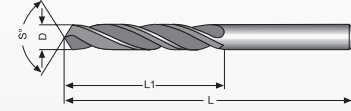
Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm ²	< 1000 N/mm ²	< 1400 N/mm ²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
		60-100	55-75	30-50	25-50	25-50	20-35	80-90	70-90	35-40	30-40	30-40	150-200	100-180	110-140		25-30		

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

ATORN® Twist drill



- **TiN head coating**
- blank chip flute
- Intermediate dimensions in the catalogue



D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm ² mm/rev		Art.no.	€
1.0	34	12	0.03	10	101008 0100	2.40 1.68
1.5	40	18	0.04	10	101008 0150	1.95 1.37
2.0	49	24	0.04	10	101008 0200	1.57 1.10
2.5	57	30	0.09	10	101008 0250	1.83 1.28
3.0	61	33	0.09	10	101008 0300	1.63 1.14
3.2	65	36	0.09	10	101008 0320	2.08 1.46
3.3	65	36	0.09	10	101008 0330	2.08 1.46
3.5	70	39	0.09	10	101008 0350	1.83 1.28
4.0	75	43	0.09	10	101008 0400	1.83 1.28
4.2	75	43	0.09	10	101008 0420	2.33 1.63
4.5	80	47	0.09	10	101008 0450	2.46 1.72
5.0	86	52	0.09	10	101008 0500	2.40 1.68
5.1	86	52	0.13	10	101008 0510	3.60 2.52
5.5	93	57	0.13	10	101008 0550	3.15 2.21
6.0	93	57	0.13	1	101008 0600	3.15 2.21
6.5	101	63	0.13	1	101008 0650	3.78 2.65
6.8	109	69	0.13	1	101008 0680	6.10 4.27
7.0	109	69	0.13	1	101008 0700	4.58 3.21
7.5	109	69	0.13	1	101008 0750	5.15 3.61

D h8 mm	L mm	L1 mm	Feed f steel < 1000 N/mm ² mm/rev		Art.no.	€
8.0	117	75	0.13	1	101008 0800	4.85 3.40
8.5	117	75	0.18	1	101008 0850	6.20 4.34
9.0	125	81	0.18	1	101008 0900	6.85 4.80
9.5	125	81	0.18	1	101008 0950	7.80 5.45
10.0	133	87	0.18	1	101008 1000	8.70 6.05
10.2	133	87	0.18	1	101008 1020	10.35 7.25
10.5	133	87	0.18	1	101008 1050	10.60 7.40
11.0	142	94	0.18	1	101008 1100	12.25 8.55
11.5	142	94	0.18	1	101008 1150	18.50 12.95
12.0	151	101	0.18	1	101008 1200	15.30 10.70
12.5	151	101	0.22	1	101008 1250	18.10 12.65
13.0	151	101	0.22	1	101008 1300	23.10 16.15
13.5	160	108	0.22	1	101008 1350	29.80 20.80
14.0	160	108	0.22	1	101008 1400	28.40 19.80
14.5	169	114	0.22	1	101008 1450	29.90 20.90
15.0	169	114	0.22	1	101008 1500	34.40 24.00
15.5	178	120	0.22	1	101008 1550	36.00 25.20
16.0	178	120	0.22	1	101008 1600	39.00 27.30

Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper Co-alloy	Graphite GRP/CFP/thermo.	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			< 55 HRc	< 60 HRc	≥ 60 HRc
		● 25-28	● 20-22	○ 12-15	○ 10-12	○ 12-14				● 6-9	○ 6-8		○ 50-60	○ 40-50	○ 30-40				

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

ATORN® Twist drill bit set



- **TiN head coating**
- blank chip flute

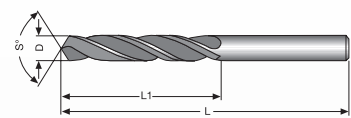
D mm	Number of drills	Art.no.	€
Ø 1.0 to 5.9 mm in 0.1 mm increments	50	101048 0001	149.00 96.90
Ø 6.0 to 10.0 mm in 0.1 mm increments	41	101048 0002	320.00 208.00
Ø 1.0 to 10.0 mm in 0.5 mm increments	19	101048 0003	94.00 61.00
Ø 1.0 to 13.0 mm in 0.5 mm increments	25	101048 0004	209.00 135.50
Ø 1.0 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	101048 0005	135.00 87.90



ATORN® Solid carbide twist drill



For universal applications



- Robust twist drill for automatic units/revolving lathes
- Facet-ground, point thinning from Ø 2.0 mm, TiAlN-coated
- Other intermediate dimensions and versions available in the catalogue

DIN 6539

D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	Art.no.	€	TiAlN Art.no.	€
1.00	26	6	0.03	111005 0010	3.20	111009 0010	5.05
1.10	28	7	0.03	111005 0011	3.20	111009 0011	5.05
1.50	32	9	0.05	111005 0015	3.20	111009 0015	5.05
1.60	34	10	0.06	111005 0016	3.20	111009 0016	5.05
1.80	36	11	0.06	111005 0018	3.20	111009 0018	5.05
2.00	38	12	0.06	111005 0020	3.60	111009 0020	6.10
2.10	38	12	0.07	111005 0021	3.60	111009 0021	6.10
2.20	40	13	0.07	111005 0022	3.60	111009 0022	6.10
2.30	40	13	0.07	111005 0023	3.60	111009 0023	6.10
2.50	43	14	0.07	111005 0025	3.60	111009 0025	6.10
2.80	46	16	0.08	111005 0028	4.90	111009 0028	6.85
2.90	46	16	0.08	111005 0029	4.90	111009 0029	6.85
3.00	46	16	0.09	111005 0030	4.90	111009 0030	6.85
3.20	49	18	0.09	111005 0032	5.15	111009 0032	8.50
3.30	49	18	0.09	111005 0033	5.15	111009 0033	8.50
3.50	52	20	0.09	111005 0035	5.45	111009 0035	9.30
3.80	55	22	0.09	111005 0038	6.30	111009 0038	10.60
4.00	55	22	0.09	111005 0040	6.30	111009 0040	10.60
4.20	55	22	0.09	111005 0042	6.70	111009 0042	10.90
4.50	58	24	0.09	111005 0045	7.05	111009 0045	10.90
4.80	62	26	0.09	111005 0048	7.65	111009 0048	12.20
5.00	62	26	0.09	111005 0050	7.65	111009 0050	12.20



D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	Art.no.	€	TiAlN Art.no.	€
5.10	62	26	0.09	111005 0051	7.65	111009 0051	12.20
5.50	66	28	0.10	111005 0055	9.95	111009 0055	15.15
5.80	66	28	0.10	111005 0058	10.50	111009 0058	16.30
6.00	66	28	0.10	111005 0060	10.50	111009 0060	16.30
6.20	70	31	0.10	111005 0062	12.70	111009 0062	20.10
6.50	70	31	0.11	111005 0065	12.70	111009 0065	20.10
6.80	74	34	0.11	111005 0068	14.85	111009 0068	23.00
7.00	74	34	0.11	111005 0070	14.85	111009 0070	23.00
7.50	74	34	0.12	111005 0075	18.00	111009 0075	26.20
8.00	79	37	0.12	111005 0080	20.40	111009 0080	28.80
8.20	79	37	0.12	111005 0082	25.20	111009 0082	33.80
8.50	79	37	0.13	111005 0085	25.20	111009 0085	33.80
8.80	84	40	0.13	111005 0088	26.50	111009 0088	36.00
9.00	84	40	0.13	111005 0090	26.50	111009 0090	36.00
9.50	84	40	0.14	111005 0095	29.20	111009 0095	38.30
9.80	89	43	0.14	111005 0098	30.20	111009 0098	45.10
10.00	89	43	0.15	111005 0100	30.20	111009 0100	45.10
10.20	89	43	0.15	111005 0102	38.00	111009 0102	51.30
10.50	89	43	0.15	111005 0105	38.00	111009 0105	51.30
11.00	95	47	0.16	111005 0110	38.00	111009 0110	51.30
11.50	95	47	0.16	111005 0115	44.50	111009 0115	63.30
12.00	102	51	0.17	111005 0120	44.50	111009 0120	63.30

Sim. to DIN 338

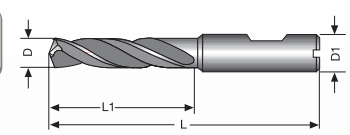
D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	Art.no.	€	TiAlN Art.no.	€
1.0	34	12	0.02	111010 0100	3.55	111012 0100	5.80
1.1	36	14	0.02	111010 0110	3.55	111012 0110	5.80
1.5	40	18	0.02	111010 0150	3.55	111012 0150	5.80
1.6	43	20	0.02	111010 0160	4.10	111012 0160	6.85
1.8	46	22	0.02	111010 0180	4.45	111012 0180	7.80
2.0	49	24	0.02	111010 0200	4.45	111012 0200	7.80
2.1	49	24	0.03	111010 0210	5.75	111012 0210	8.55
2.2	53	27	0.03	111010 0220	5.75	111012 0220	8.55
2.3	53	27	0.03	111010 0230	5.75	111012 0230	8.55
2.5	57	30	0.07	111010 0250	5.75	111012 0250	8.55
2.8	61	33	0.07	111010 0280	7.80	111012 0280	9.80
2.9	61	33	0.07	111010 0290	7.80	111012 0290	9.80
3.0	61	33	0.07	111010 0300	8.20	111012 0300	12.20
3.2	65	36	0.07	111010 0320	8.20	111012 0320	12.20
3.3	65	36	0.07	111010 0330	8.20	111012 0330	12.20
3.5	70	39	0.07	111010 0350	8.65	111012 0350	13.30
3.8	75	43	0.07	111010 0380	9.35	111012 0380	14.75
4.0	75	43	0.07	111010 0400	9.35	111012 0400	14.75
4.2	75	43	0.07	111010 0420	9.35	111012 0420	14.75
4.5	80	47	0.07	111010 0450	12.25	111012 0450	16.50
4.8	86	52	0.07	111010 0480	13.25	111012 0480	17.35
5.0	86	52	0.07	111010 0500	13.25	111012 0500	17.35
5.1	86	52	0.10	111010 0510	14.95	111012 0510	22.10

D h7 mm	L mm	L1 mm	Feed f steel < 1000 N/mm² mm/rev	Art.no.	€	TiAlN Art.no.	€
5.5	93	57	0.10	111010 0550	17.75	111012 0550	24.10
5.8	93	57	0.10	111010 0580	17.75	111012 0580	24.10
6.0	93	57	0.10	111010 0600	17.75	111012 0600	24.10
6.2	101	63	0.10	111010 0620	21.30	111012 0620	28.80
6.5	101	63	0.10	111010 0650	21.30	111012 0650	28.80
6.8	109	69	0.10	111010 0680	24.90	111012 0680	33.80
7.0	109	69	0.10	111010 0700	24.90	111012 0700	33.80
7.5	109	69	0.10	111010 0750	26.00	111012 0750	36.40
7.8	117	75	0.10	111010 0780	29.10	111012 0780	38.60
8.0	117	75	0.10	111010 0800	29.10	111012 0800	38.60
8.2	117	75	0.14	111010 0820	34.10	111012 0820	46.80
8.5	117	75	0.14	111010 0850	34.10	111012 0850	46.80
8.8	125	81	0.14	111010 0880	36.70	111012 0880	54.20
9.0	125	81	0.14	111010 0900	36.70	111012 0900	54.20
9.5	125	81	0.14	111010 0950	43.20	111012 0950	60.40
9.8	133	87	0.14	111010 0980	43.20	111012 0980	60.40
10.0	133	87	0.14	111010 1000	43.20	111012 1000	60.40
10.2	133	87	0.14	111010 1020	52.30	111012 1020	67.50
10.5	133	87	0.14	111010 1050	52.30	111012 1050	67.50
11.0	142	94	0.14	111010 1100	64.30	111012 1100	90.00
11.5	142	94	0.14	111010 1150	75.40	111012 1150	96.00
12.0	151	101	0.14	111010 1200	75.40	111012 1200	105.50
13.0	151	101	0.18	111010 1300	91.00	111012 1300	122.50

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/therma.	< 55 HRC	< 60 HRC	≥ 60 HRC
	111005....	●	●	●	○	○		●	●	○			●	●	●		○		
		80	50-70	50	25	25		80-90	70-80	15-20			150-200	120-150	70-120		20		
	111009....	●	●	●	●	●		●	●	●	○		260	156	140-210		26		
		91-104	78-91	78	32	32		104-117	91-104	20-26	20								
111010....	●	●	●	○			●	●	○			200	150	70-120		20			
	80	50-70	50	25			70-90	80	15-20										
111012....	●	●	●	●	○		●	●	●	○	○		260	155	100		25		
	90-100	80-90	65	30	30		80-115	90	20-25	20									

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

SARA® Solid carbide high-performance drill bit **TiNplus HPC**



- Newly developed geometry with reinforced core and special point thinning
- **Solid carbide ultra-fine grain cutting material TiNplus** (TiAlN+TiN)
- Modern multi-layer hard coating for maximum service life and optimum chip transport
- High centring accuracy
- **For universal applications**



3 x D without coolant bore

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
3	6	62	20	111503 0030	17.40
3.2	6	62	20	111503 0032	17.40
3.3	6	62	20	111503 0033	17.40
3.5	6	62	20	111503 0035	17.40
3.8	6	66	24	111503 0038	17.40
4	6	66	24	111503 0040	17.40
4.2	6	66	24	111503 0042	17.40
4.5	6	66	24	111503 0045	17.40
4.8	6	66	28	111503 0048	17.40
5	6	66	28	111503 0050	17.40
5.1	6	66	28	111503 0051	17.40
5.5	6	66	28	111503 0055	17.40
5.8	6	66	28	111503 0058	17.40
6	6	66	28	111503 0060	17.40
6.2	8	79	34	111503 0062	17.95
6.5	8	79	34	111503 0065	17.95

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
6.8	8	79	34	111503 0068	17.95
7	8	79	34	111503 0070	17.95
7.5	8	79	41	111503 0075	17.95
8	8	79	41	111503 0080	17.95
8.2	10	89	47	111503 0082	21.10
8.5	10	89	47	111503 0085	21.10
8.8	10	89	47	111503 0088	21.10
9	10	89	47	111503 0090	21.10
9.5	10	89	47	111503 0095	21.10
10	10	89	47	111503 0100	21.10
10.2	12	102	55	111503 0102	29.40
10.5	12	102	55	111503 0105	29.40
11	12	102	55	111503 0110	29.40
11.5	12	102	55	111503 0115	29.40
12	12	102	55	111503 0120	29.40
12.5	14	107	60	111503 0125	41.40

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
13	14	107	60	111503 0130	41.40
13.5	14	107	60	111503 0135	41.40
14	14	107	60	111503 0140	41.40
14.5	16	115	65	111503 0145	53.50
15	16	115	65	111503 0150	53.50
15.5	16	115	65	111503 0155	53.50
16	16	115	65	111503 0160	53.50
16.5	18	123	73	111503 0165	85.30
17	18	123	73	111503 0170	85.30
17.5	18	123	73	111503 0175	85.30
18	18	123	73	111503 0180	85.30
18.5	20	131	79	111503 0185	102.50
19	20	131	79	111503 0190	102.50
19.5	20	131	79	111503 0195	102.50
20	20	131	79	111503 0200	102.50

3 x D with coolant bore

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
3	6	62	20	111507 0030	23.60
3.2	6	62	20	111507 0032	23.60
3.3	6	62	20	111507 0033	23.60
3.5	6	62	20	111507 0035	23.60
3.8	6	66	24	111507 0038	23.60
4	6	66	24	111507 0040	23.60
4.2	6	66	24	111507 0042	23.60
4.5	6	66	24	111507 0045	23.60
4.8	6	66	28	111507 0048	23.60
5	6	66	28	111507 0050	23.60
5.1	6	66	28	111507 0051	23.60
5.5	6	66	28	111507 0055	23.60
5.8	6	66	28	111507 0058	23.60
6	6	66	28	111507 0060	23.60
6.2	8	79	34	111507 0062	30.40
6.5	8	79	34	111507 0065	30.40

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
6.8	8	79	34	111507 0068	30.40
7	8	79	34	111507 0070	30.40
7.5	8	79	41	111507 0075	30.40
8	8	79	41	111507 0080	30.40
8.2	10	89	47	111507 0082	36.00
8.5	10	89	47	111507 0085	36.00
8.8	10	89	47	111507 0088	36.00
9	10	89	47	111507 0090	36.00
9.5	10	89	47	111507 0095	36.00
10	10	89	47	111507 0100	36.00
10.2	12	102	55	111507 0102	53.00
10.5	12	102	55	111507 0105	53.00
11	12	102	55	111507 0110	53.00
11.5	12	102	55	111507 0115	53.00
12	12	102	55	111507 0120	53.00
12.5	14	107	60	111507 0125	70.00

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
13	14	107	60	111507 0130	70.00
13.5	14	107	60	111507 0135	70.00
14	14	107	60	111507 0140	70.00
14.5	16	115	65	111507 0145	86.70
15	16	115	65	111507 0150	86.70
15.5	16	115	65	111507 0155	86.70
16	16	115	65	111507 0160	86.70
16.5	18	123	73	111507 0165	119.00
17	18	123	73	111507 0170	119.00
17.5	18	123	73	111507 0175	119.00
18	18	123	73	111507 0180	119.00
18.5	20	131	79	111507 0185	147.50
19	20	131	79	111507 0190	147.50
19.5	20	131	79	111507 0195	147.50
20	20	131	79	111507 0200	147.50

5 x D with coolant bore

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
3	6	66	28	111512 0030	30.10
3.2	6	66	28	111512 0032	30.10
3.3	6	66	28	111512 0033	30.10
3.5	6	66	28	111512 0035	30.10
3.8	6	74	36	111512 0038	30.10
4	6	74	36	111512 0040	30.10
4.2	6	74	36	111512 0042	30.10
4.5	6	74	36	111512 0045	30.10
4.8	6	82	44	111512 0048	30.10
5	6	82	44	111512 0050	30.10
5.1	6	82	44	111512 0051	30.10
5.5	6	82	44	111512 0055	30.10
5.8	6	82	44	111512 0058	30.10
6	6	82	44	111512 0060	30.10
6.2	8	91	53	111512 0062	34.60
6.5	8	91	53	111512 0065	34.60

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
6.8	8	91	53	111512 0068	34.60
7	8	91	53	111512 0070	34.60
7.5	8	91	53	111512 0075	34.60
8	8	91	53	111512 0080	34.60
8.2	10	103	61	111512 0082	39.00
8.5	10	103	61	111512 0085	39.00
8.8	10	103	61	111512 0088	39.00
9	10	103	61	111512 0090	39.00
9.5	10	103	61	111512 0095	39.00
10	10	103	61	111512 0100	39.00
10.2	12	118	71	111512 0102	54.80
10.5	12	118	71	111512 0105	54.80
11	12	118	71	111512 0110	54.80
11.5	12	118	71	111512 0115	54.80
12	12	118	71	111512 0120	54.80
12.5	14	124	77	111512 0125	74.80

D m7 mm	D1 h6 mm	L mm	L1 mm	Art.no.	€
13	14	124	77	111512 0130	74.80
13.5	14	124	77	111512 0135	74.80
14	14	124	77	111512 0140	74.80
14.5	16	133	83	111512 0145	96.20
15	16	133	83	111512 0150	96.20
15.5	16	133	83	111512 0155	96.20
16	16	133	83	111512 0160	96.20
16.5	18	143	93	111512 0165	150.00
17	18	143	93	111512 0170	150.00
17.5	18	143	93	111512 0175	150.00
18	18	143	93	111512 0180	150.00
18.5	20	153	101	111512 0185	163.50
19	20	153	101	111512 0190	163.50
19.5	20	153	101	111512 0195	163.50
20	20	153	101	111512 0200	163.50

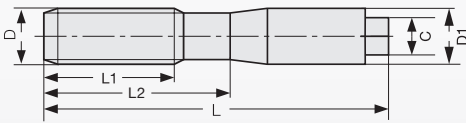
Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRC	≥ 30 HRC	< 8 % Si	≥ 8 % Si	Cu-alloy	GRP/CFP/thermo.	< 55 HRC	< 60 HRC	≥ 60 HRC
Without coolant bore	●	110-130	95-100	50-75	40-50	40	27	110-140	110	32-36	27	22	230	160	110		35-50	22-32	
With coolant bore	●	110-150	75-110	60-95	40	50	40	145	110	36-40	36	32	230-280	200	110		50	32	

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

ATORN® Universal machine taps



- for universal applications
- available from just M1



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole mm	Vapour-treated Art.no.	€	TiN Art.no.	€	Vapour-treated Art.no.	€	TiN 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	11.15	134700 0050	7.25	134705 0050	11.15
M 6	1.0	80	16	30	6	4.9	5.00	134710 0060	7.25	134715 0060	11.15	134700 0060	7.25	134705 0060	11.15
M 8	1.25	90	18	35	8	6.2	6.80	134710 0080	9.20	134715 0080	13.65	134700 0080	9.20	134705 0080	13.65
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	21.95	134700 0120	15.70	134705 0120	21.95
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 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
134700....	●	5-15	5-15		4-6	4-6			5-8				10-15		10-15				
134710....	●	5-15	5-15		4-6	4-6			5-8				10-15		10-15				
134705....	●	10-20	5-20		5-8	5-8			10-15				10-20		10-20				
134715....	●	10-20	5-20		5-8	5-8			10-15				10-20		10-20				

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

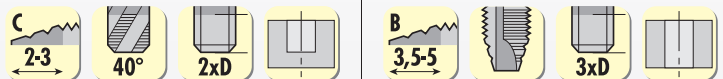
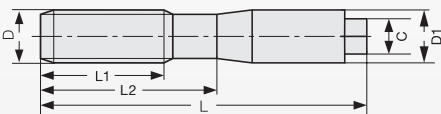
ATORN® Universal machine tap ULTRA-HL



- HSS-E and HSS-E-PM cutting material, Hardlube coating
- 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 Art.no.	€	HSS-E-PM Art.no.	€	HSS-E Art.no.	€	HSS-E-PM 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	13.45	134740 0050	16.95	134755 0050	13.45	134745 0050	16.95
M 6	1.0	80	16	30	4.9	6	5.00	134750 0060	13.55	134740 0060	17.20	134755 0060	13.55	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 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
134750....	●	10-20	5-20		5-8	5-8			10-15				10-20		10-20				
134755....	●	10-20	5-20		5-8	5-8			10-15				10-20		10-20				
134740....	●	15-35	10-25		5-15	5-15			10-20				10-30		10-25				
134745....	●	15-35	10-25		5-15	5-15			10-20				10-30		10-25				

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



Machine tap S-TAP

M



HSS-E

DIN 371

DIN 376

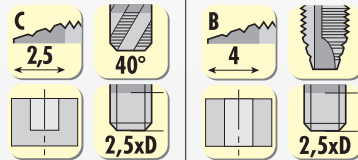
ISO 2 6H

Vap.

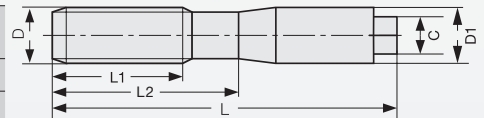


- ISO 6H metric thread
- DIN 371 construction dimensions = up to M10, DIN 376 = from M12
- Cutting material: HSS-E, vapour-treated

Accelerated chip removal due to unequally twisted flute



D mm	Pitch mm	L mm	L1 mm	L2 mm	D1 mm	C mm	Tapping hole Ø mm	Blind hole Art.no.	€	Pass-through hole Art.no.	€
M 3	0.5	56	11	18	3.5	2.7	2.5	133865 0030	15.60	133875 0030	14.70
M 4	0.7	63	13	21	4.5	3.4	3.3	133865 0040	15.90	133875 0040	14.90
M 5	0.8	70	16	25	6	4.9	4.2	133865 0050	16.50	133875 0050	15.50
M 6	1	80	19	30	6	4.9	5	133865 0060	16.60	133875 0060	15.60
M 8	1.25	90	22	35	8	6.2	6.8	133865 0080	19.00	133875 0080	17.80
M 10	1.5	100	24	39	10	8	8.5	133865 0100	24.10	133875 0100	22.30
M 12	1.75	110	18	-	9	7	10.2	133865 0120	29.50	133875 0120	27.50
M 14	2	110	20	-	11	9	12	133865 0140	36.50	133875 0140	34.20
M 16	2	110	20	-	12	9	14	133865 0160	42.80	133875 0160	39.80
M 18	2.5	125	25	-	14	11	15.5	133865 0180	57.90	133875 0180	53.60
M 20	2.5	140	25	-	16	12	17.5	133865 0200	68.30	133875 0200	63.50
M 22	2.5	140	25	-	18	14.5	19.5	133865 0220	74.30	133875 0220	69.60
M 24	3	160	30	-	18	14.5	21	133865 0240	91.50	133875 0240	85.30



Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper Co-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
		● 15-24	● 10-15	○ 8-13	● 8-16	● 8-16	○ 5-8		○ 10-15						● 12-17				

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

RIGHT ACROSS **EUROPE.**

WE MANAGE THAT FOR YOU

WITHIN 24 HOURS:

24-HOUR DELIVERY

THROUGHOUT EUROPE

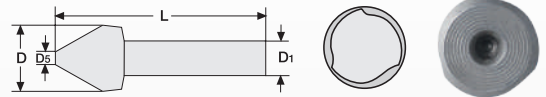
THAT'S POWER TO PRODUCE

SARATOOLS.com
POWER TO PRODUCE

SARA® taper and deburring countersinks ADVANCED



- 3 cutting edges
- **Cutting material: HSS and HSS TiN**
- New cutting edge geometry prevents uneven wear of the cutting edges
- High degree of wear resistance and hot hardness for maximum service life
- High true running accuracy with considerably reduced force application
- **Patented shank to stop rotation of the countersink in the drill chuck with optimum torque transfer** (from Ø 8.3 mm)



Patented shank and irregular pitch

Single

D mm	D5 mm	D1 mm	L mm	Feed f steel < 1000 N/mm² mm/rev	Art.no.	€	Art.no.	TiN €
6.3	1.5	5	45	0.08	150270 0063	16.00 11.60	150271 0063	18.70 13.55
8.3	2	6	50	0.10	150270 0083	17.70 12.80	150271 0083	20.80 15.00
10.4	2.5	6	50	0.10	150270 0104	18.00 13.05	150271 0104	21.20 15.30
12.4	2.8	8	56	0.12	150270 0124	21.60 15.60	150271 0124	25.40 18.40
16.5	3.2	10	60	0.14	150270 0165	25.00 18.10	150271 0165	29.30 21.20
20.5	3.5	10	63	0.18	150270 0205	31.10 22.50	150271 0205	36.50 26.40
25	3.8	10	67	0.22	150270 0250	37.40 27.10	150271 0250	44.00 31.90
31	4.2	12	71	0.22	150270 0310	45.90 33.20	150271 0310	54.00 39.10

Sets

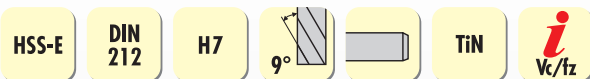
Contents	Art.no.	€	Art.no.	TiN €
6.3 / 8.3 / 10.4 / 12.4 / 16.5 / 20.5 mm (1 of each)	150270 1000	127.00 92.00	150271 1000	146.00 105.00
6.3 / 10.4 / 16.5 / 20.5 / 25 mm (1 of each)	150270 2000	125.00 90.50	150271 2000	148.00 107.00



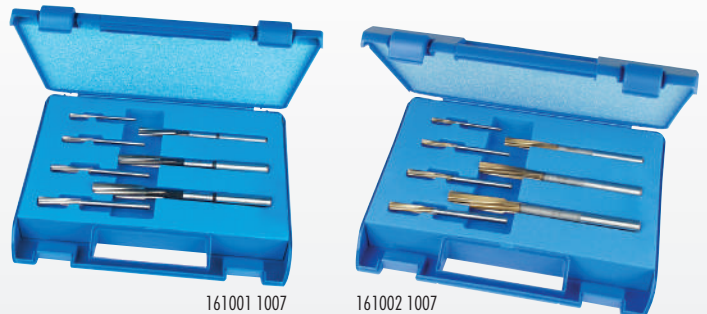
Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based		Aluminium		Copper	Graphite	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit./martens.	austenitic	duplex	GG/GTS	GGG		< 30 HRc	≥ 30 HRc	< 8 % Si	≥ 8 % Si	Cu alloy	GRP/CFP/thermo.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

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

ATORN® NC machine reamers



- **For H7 fit**
- Right-hand cutting
- **Cutting material: HSS-E, HSS-E TiN-coated**
- Cylindrical shank without square end
- Form D: spiral-fluted with offset shank
- **To ensure maximum true running accuracy for use in hydraulic expansion chucks** and high-precision chucks, these reamers are delivered with **straight shank diameter**
- For reaming through-holes
- Also suitable for blind bores



161001 1007

161002 1007

Description	Art.no.	€	Art.no.	TiN €
Set with 1 reamer in each size, Ø 3 / 4 / 5 / 6 / 8 / 10 / 12 mm	161001 1007	209.00 129.00	161002 1007	279.00 179.00

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	Co-alloy	GRP/CFP/thermo.	< 55 HRc	< 60 HRc	≥ 60 HRc
161001....		● 8-10	● 6-8	○ 4-6				● 8-10	● 8-10				○ 15-20	○ 15-20	○ 8-12				
161002....		● 12-15	● 9-12	○ 6-9				● 12-15	● 12-15				○ 22-30	○ 22-30	○ 12-18				

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

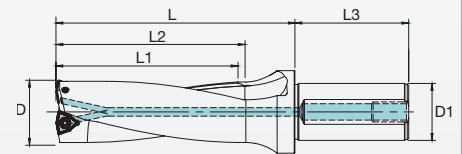
palbit Indexable inserts – solid drill bits TDS 3D



- Surface-hardened carrier tools
- **Drilling depths up to 3xD**
- **Diameter 13-58 mm**
- Soft cutting for lower power requirement
- Optimised chip space geometry and cutting edge positions for stable drilling
- Wide range of applications in structural steel and stainless steels
- Good chip control and reduced cutting forces
- **With internal coolant supply**
- Bore tolerances:
 $\varnothing 13-21.5 \text{ mm} > -0.1/+0.15 \text{ mm}$; $\varnothing 22-50 \text{ mm} > -0.12/+0.2 \text{ mm}$; $\varnothing 50-58 \text{ mm} > -0.15/+0.25 \text{ mm}$
- **Suitable indexable cutting inserts WCKX**



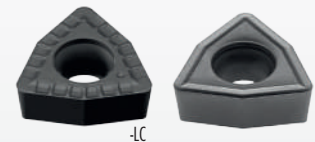
Designation	D mm	L1 mm	L2 mm	L mm	D1 mm	L3 mm	Suitable indexable inserts	Art.no.	€
TDS 15020-3D	15	45	48	68	20	50	WCKX 02T104	124303 0150	149.00
TDS 16025-3D	16	48	51	76	25	56	WCKX 030204	124303 0160	135.00
TDS 17025-3D	17	51	54	79	25	56	WCKX 030204	124303 0170	135.00
TDS 18025-3D	18	54	57	82	25	56	WCKX 030204	124303 0180	135.00
TDS 19025-3D	19	57	60	85	25	56	WCKX 030204	124303 0190	135.00
TDS 20025-3D	20	60	63	88	25	56	WCKX 030204	124303 0200	135.00
TDS 21025-3D	21	63	66	91	25	56	WCKX 040204	124303 0210	139.00
TDS 22025-3D	22	66	69	94	25	56	WCKX 040204	124303 0220	139.00
TDS 23025-3D	23	69	72	97	25	56	WCKX 040204	124303 0230	139.00
TDS 24025-3D	24	72	75	100	25	56	WCKX 040204	124303 0240	139.00
TDS 25025-3D	25	75	78	103	25	56	WCKX 040204	124303 0250	139.00
TDS 26032-3D	26	78	81	111	32	60	WCKX 050308	124303 0260	159.00
TDS 28032-3D	28	84	87	117	32	60	WCKX 050308	124303 0280	159.00
TDS 29032-3D	29	87	90	120	32	60	WCKX 050308	124303 0290	159.00
TDS 30032-3D	30	90	93	123	32	60	WCKX 050308	124303 0300	159.00
TDS 31032-3D	31	93	96	126	32	60	WCKX 06T308	124303 0310	169.00
TDS 32032-3D	32	96	99	129	32	60	WCKX 06T308	124303 0320	169.00
TDS 33032-3D	33	99	102	132	32	60	WCKX 06T308	124303 0330	169.00
TDS 34032-3D	34	102	105	135	32	60	WCKX 06T308	124303 0340	169.00
TDS 35032-3D	35	105	108	138	32	60	WCKX 06T308	124303 0350	169.00



palbit Indexable cutting inserts WCKX

- Carbide indexable cutting inserts, positive 7°
- **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.
- **Recommendation:** Chip breaker LC specially designed for machining low-carbon steels

**Indexable cutting inserts
compatible with
VORTEX DRILL System**

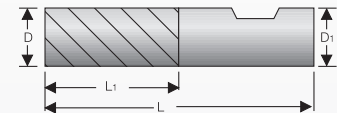


ISO designation	ISO P M K S		ISO P M K S		ISO P		ISO P	
	 PH6920	Art.no. €	 PH6930	Art.no. €	 -LC PH6920	Art.no. €	 -LC PH6930	Art.no. €
WCKX 02T104	10	124522 0002 6.80	10	124523 0002 6.80				
WCKX 030204	10	124522 0003 6.80	10	124523 0003 6.80				
WCKX 040204	10	124522 0004 6.80	10	124523 0004 6.80				
WCKX 050308	10	124522 0005 7.75	10	124523 0005 7.75	10	124532 0005 7.75	10	124533 0005 7.75
WCKX 06T308	10	124522 0006 7.75	10	124523 0006 7.75	10	124532 0006 7.75	10	124533 0006 7.75
WCKX 080408	10	124522 0008 8.90	10	124523 0008 8.90				

Mini end milling cutter



- Cylindrical shank with driving plane, up to Ø 1.8 mm smooth
- **Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated**
- **Note:** This milling cutter is not cost-effective to re-sharpen. It is more economical to use the milling cutters up to the wear limit and thus use brand-new tools all the time.



ULTRA											
D mm	L1 mm	L mm	D1 mm			Art.no.	€		Art.no.	TiAlN €	
				Feed fz steel < 1000 N/mm ² mm/Z	Feed fz steel < 1000 N/mm ² mm/Z						
0.5	2.0	38.0	3.0	0.012	0.015	251006 0005	11.80	8.25	251009 0005	17.80	12.40
0.6	2.0	38.0	3.0	0.012	0.015	251006 0006	11.80	8.25	251009 0006	17.80	12.40
0.8	2.0	38.0	3.0	0.012	0.015	251006 0008	11.80	8.25	251009 0008	17.80	12.40
1.0	2.0	38.0	3.0	0.012	0.015	251006 0010	11.80	8.25	251009 0010	17.80	12.40
1.2	2.0	38.0	3.0	0.012	0.015	251006 0012	11.80	8.25	251009 0012	17.80	12.40
1.5	2.0	38.0	3.0	0.012	0.015	251006 0015	11.80	8.25	251009 0015	17.80	12.40
1.8	2.0	38.0	3.0	0.012	0.015	251006 0018	11.80	8.25	251009 0018	17.80	12.40
2.0	4.0	35.0	6.0	0.012	0.015	251006 0020	11.75	8.20	251009 0020	17.80	12.40
2.5	4.0	35.0	6.0	0.023	0.03	251006 0025	12.45	8.70	251009 0025	17.80	12.40
3.0	5.0	36.0	6.0	0.031	0.038	251006 0030	11.75	8.20	251009 0030	17.80	12.40
3.5	5.0	36.0	6.0	0.040	0.045	251006 0035	12.45	8.70	251009 0035	19.30	13.50
4.0	7.0	38.0	6.0	0.048	0.052	251006 0040	11.75	8.20	251009 0040	17.80	12.40
4.5	7.0	38.0	6.0	0.050	0.056	251006 0045	12.45	8.70	251009 0045	19.30	13.50
5.0	8.0	39.0	6.0	0.051	0.057	251006 0050	11.75	8.20	251009 0050	17.80	12.40
5.5	8.0	39.0	6.0	0.053	0.06	251006 0055	12.45	8.70	251009 0055	19.30	13.50
5.75	8.0	39.0	6.0	0.053	0.06	251006 0057	12.45	8.70	251009 0057	19.30	13.50
6.0	8.0	39.0	6.0	0.054	0.06	251006 0060	11.75	8.20	251009 0060	17.80	12.40
6.75	11.0	43.0	8.0	0.056	0.062	251006 0067	16.50	11.50	251009 0067	23.70	16.50
7.0	11.0	43.0	8.0	0.057	0.062	251006 0070	15.70	10.95	251009 0070	22.00	15.40
7.75	11.0	43.0	8.0	0.059	0.066	251006 0077	16.60	11.60	251009 0077	23.80	16.60
8.0	11.0	43.0	8.0	0.060	0.066	251006 0080	18.30	12.80	251009 0080	23.50	16.40
8.7	13.0	50.0	10.0	0.061	0.067	251006 0087	25.70	17.95	251009 0087	35.60	24.90
9.0	13.0	50.0	10.0	0.062	0.067	251006 0090	23.50	16.40	251009 0090	32.40	22.60
9.7	13.0	50.0	10.0	0.063	0.068	251006 0097	25.70	17.95	251009 0097	35.60	24.90
10.0	13.0	50.0	10.0	0.063	0.068	251006 0100	26.40	18.40	251009 0100	33.90	23.70
12.0	15.0	55.0	12.0	0.063	0.068	251006 0120	33.40	23.30	251009 0120	43.80	30.60

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/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
251006....	●	80-100	70-90	50-60	●	●	○	●	●	●	●	○	●	●	●				
251009....	●	90-110	80-100	45-55	●	●	○	●	●	●	●	○	●	●	●				

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

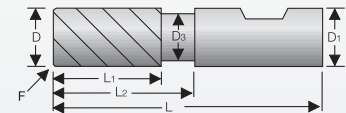
SARA® Roughing cutter



- With clearance
- First-rate chip removal due to extremely smooth surface
- Cutting material: ultra-fine grain solid carbide, TiAlN-Ultra-coated



D mm	L1 mm	L2 mm	L mm	D1 mm	D3 mm	F x 45° mm	Feed fz steel < 1400 N/mm² mm/Z	Feed fz steel < 1400 N/mm² mm/Z	Art.no.	€
5.0	13	19	57	6.0	4.8	0.5	0.024	0.030	254090 0050	62.50
6.0	13	19	57	6.0	5.8	0.5	0.024	0.030	254090 0060	62.50
8.0	19	25	63	8.0	7.7	0.5	0.024	0.030	254090 0080	71.40
10.0	22	30	72	10.0	9.8	0.5	0.032	0.040	254090 0100	78.40
12.0	26	36	83	12.0	11.8	0.5	0.032	0.040	254090 0120	93.80
14.0	26	36	83	14.0	13.8	0.5	0.040	0.050	254090 0140	130.00
16.0	32	42	92	16.0	15.7	0.5	0.040	0.050	254090 0160	147.00
18.0	32	42	92	18.0	17.7	0.5	0.048	0.060	254090 0180	196.00
20.0	38	52	104	20.0	19.7	0.5	0.048	0.060	254090 0200	220.00



Material	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based	Aluminium	Copper	Graphite	Hardened steel				
	● very well suited ○ 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
		90-160	80-110	60-80				130-160	130-150									
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!																		

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

HPMT End milling cutter

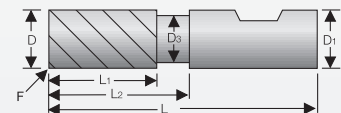


- With clearance
- Unequal pitch to minimise vibrations
- CNC repetition precision to within 10 µm
- For milling stainless steel, machining exotic materials, and general applications
- Especially suitable for slot milling and for lateral machining

**EXCLUSIVE item:
The all-rounder!**



D mm	L1 mm	L2 mm	D1 mm	L mm	D3 mm	Feed fz steel < 1000 N/mm² mm/Z	Feed fz steel < 1000 N/mm² mm/Z	Art.no.	€
3	9	15	6	57	2.80	0.016	0.020	254121 0030	17.70
4	12	20	6	57	3.70	0.021	0.026	254121 0040	17.70
5	13	20	6	57	4.60	0.026	0.032	254121 0050	17.70
6	13	20	6	57	5.50	0.031	0.038	254121 0060	17.70
8	20	30	8	64	7.40	0.037	0.046	254121 0080	25.00
10	22	32	10	72	9.20	0.044	0.054	254121 0100	37.10
12	26	37	12	83	11.00	0.050	0.062	254121 0120	47.90
16	32	46	16	92	15.00	0.063	0.078	254121 0160	83.00
20	38	58	20	104	19.00	0.075	0.094	254121 0200	135.00



Material	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based			Aluminium		Copper	Graphite	Hardened steel			
	● very well suited ○ 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	
		150-200	100-120	70-90	40-70	40-70	50-60			60-70	15-25	15-20	280-350	200-250	150-200					
Cutting speed V _c m/min. Please adjust these guidelines according to clamping operation and machine set-up!																				

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

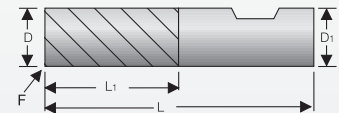
End milling cutter



- 3 cutting edges, long, 45° right-hand cutting
- 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	8	57	6	0.1	3	0.012	0.016	254202 0030	8.75
4	11	57	6	0.1	3	0.019	0.026	254202 0040	8.75
5	13	57	6	0.1	3	0.019	0.026	254202 0050	8.75
6	13	57	6	0.1	3	0.024	0.032	254202 0060	8.75
8	19	63	8	0.1	3	0.033	0.044	254202 0080	10.90
10	22	72	10	0.1	3	0.044	0.60	254202 0100	16.00
12	26	83	12	0.1	3	0.044	0.060	254202 0120	22.70
16	32	92	16	0.1	3	0.059	0.080	254202 0160	46.30
20	38	104	20	0.1	3	0.074	0.100	254202 0200	71.50



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
		107	80	68	80	60		80	67				270	190	150				

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

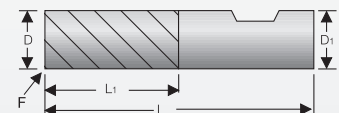
Roughing cutter



- 3-4 cutting edges, long, 30° right-hand cutting
- Eccentric relief ground
- 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.	€
4	8	57	6	0.3	3	0.013	0.015	254205 0040	21.70
5	13	57	6	0.3	3	0.021	0.025	254205 0050	21.70
6	13	57	6	0.3	4	0.021	0.025	254205 0060	21.70
8	16	63	8	0.3	4	0.027	0.032	254205 0080	24.20
10	22	72	10	0.5	4	0.044	0.052	254205 0100	37.70
12	26	83	12	0.5	4	0.044	0.052	254205 0120	47.60
16	32	92	16	0.5	4	0.059	0.07	254205 0160	71.50
20	38	104	20	0.5	4	0.071	0.084	254205 0200	112.00



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
		150	110	90	85			150	100										

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

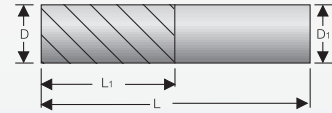
ATORN® Single-blade milling cutter Ultra-N PRO



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



D mm	L1 mm	L mm	D1 mm	Feed fz aluminium < 8 % Si mm/Z	Art.no.	€
1.0	4	50	3.0	0.004	249005 0010	20.90
1.5	6	50	3.0	0.004	249005 0015	21.20
2.0	8	50	3.0	0.008	249005 0020	22.30
3.0	12	50	3.0	0.008	249005 0030	23.50
4.0	15	60	4.0	0.015	249005 0040	26.20
5.0	17	60	5.0	0.015	249005 0050	30.50
6.0	20	65	6.0	0.025	249005 0060	32.10
8.0	22	65	8.0	0.03	249005 0080	44.80
10.0	25	75	10.0	0.04	249005 0100	66.50
12.0	30	80	12.0	0.05	249005 0120	92.40



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
													440	400					

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

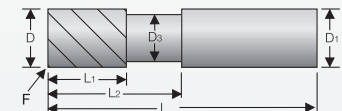
ATORN® Drill groove milling cutter 45° Ultra-N PRO



- With clearance
- 2 cutting edges, with edge chamfer
- **Spiral angle 45°**
- 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

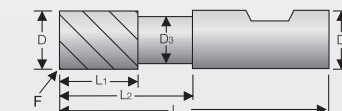
Shank version HA

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	Art.no.	€
3.0	8	57	18	2.9	6.0	0.1	0.010	0.008	249007 0030	28.30
4.0	11	57	18	3.9	6.0	0.1	0.025	0.015	249007 0040	28.30
5.0	11	57	20	4.9	6.0	0.1	0.032	0.020	249007 0050	28.30
6.0	13	57	20	5.8	6.0	0.1	0.040	0.025	249007 0060	28.40
8.0	19	63	26	7.8	8.0	0.1	0.050	0.030	249007 0080	32.10
10.0	22	72	29	9.7	10.0	0.2	0.065	0.040	249007 0100	44.40
12.0	26	83	36	11.7	12.0	0.2	0.090	0.050	249007 0120	68.50



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	Art.no.	€
16.0	32	92	42	15.7	16.0	0.2	0.12	0.065	249007 0160	108.50
20.0	38	104	52	19.5	20.0	0.2	0.15	0.080	249007 0200	156.00



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
													440	400					

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

ATORN® RockTec 52 end milling cutter



- With clearance
- For machining materials up to 52 HRc
- Cutting edge tolerance: at Ø 3.0-20.0 mm = 0/-0.020 mm
- Solid carbide ultra-fine grain cutting material
- Rake angle 3°



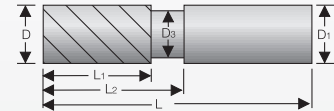
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz steel < 1400 N/mm² mm/Z	Art.no.	€
3.0	9	15	50	2.8	6.0	0.02	257003 0030	20.40
4.0	12	20	50	3.7	6.0	0.02	257003 0040	20.40
5.0	15	20	50	4.6	6.0	0.03	257003 0050	20.40
6.0	16	20	50	5.5	6.0	0.03	257003 0060	20.40
8.0	20	30	64	7.4	8.0	0.04	257003 0080	32.30
10.0	22	32	70	9.2	10.0	0.05	257003 0100	43.50
12.0	25	37	75	11.0	12.0	0.06	257003 0120	49.80
16.0	32	46	90	15.0	16.0	0.08	257003 0160	87.00
20.0	38	58	100	19.0	20.0	0.1	257003 0200	119.00

Set, version HA

Contents	Art.no.	€
Set, solid carbide 40°, Ø 6/8/10/12 mm, 4 cutting edges, RockTec 52	257003 0001	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	ferritic/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
		140-160	130-150	120-140	100-120	100-120	80-100	100-120	100-120	80-100	80-100	70-90				60-80		

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



ATORN® RockTec 65 end milling cutter



- With clearance
- For machining materials up to 65 HRc
- Cutting edge tolerance: at Ø 3.0-20.0 mm = 0/-0.020 mm
- Solid carbide ultra-fine grain cutting material
- Rake angle -6°



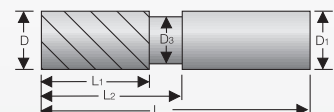
D mm	L1 mm	L2 mm	L mm	D3 mm	D1 mm	Feed fz hardened steel ≥ 60 HRc mm/Z	Art.no.	€
3.0	9	15	50	2.8	6.0	0.015	257004 0030	22.20
4.0	12	20	50	3.7	6.0	0.02	257004 0040	22.20
5.0	15	20	50	4.6	6.0	0.025	257004 0050	22.20
6.0	16	20	50	5.5	6.0	0.038	257004 0060	22.20
8.0	20	30	64	7.4	8.0	0.05	257004 0080	35.50
10.0	22	32	70	9.2	10.0	0.052	257004 0100	48.70
12.0	25	37	75	11.0	12.0	0.06	257004 0120	59.20
16.0	32	46	90	15.0	16.0	0.07	257004 0160	104.00
20.0	38	58	100	19.0	20.0	0.08	257004 0200	126.00

Set, version HA

Contents	Art.no.	€
Set, solid carbide 40°, Ø 6/8/10/12 mm, 4 cutting edges, RockTec 65	257004 0001	145.00

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	ferritic/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
				160-200						250-300	250-300	250-300				120-140	140-140	80-120

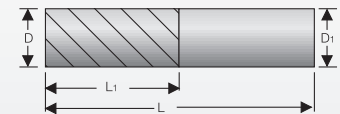
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!



SARA® Engraving milling cutter



- 1 cutting edge, centre cutting
- For engraving plastics and non-ferrous metals
- Lettering width 0.1 mm



D mm	D1 mm	L mm	L1 mm	Feed fz aluminium < 8 % Si mm/Z	Art.no.	€
3.0	3.0	40	15	0.01	251545 0030	35.50 28.40
4.0	4.0	40	15	0.02	251545 0040	37.80 30.20
6.0	6.0	40	15	0.03	251545 0060	41.00 32.80

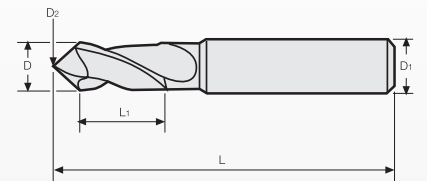
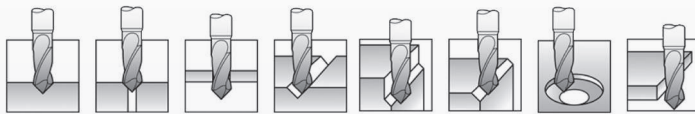
Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based < 30 HRC ≥ 30 HRC	Aluminium		Copper Cu-alloy	Graphite GRP/CFP/thermo.	Hardened steel		
		< 700 N/mm²	< 1000 N/mm²	< 1400 N/mm²	ferrit/martens.	austenitic	duplex	GG/GTS	GGG			< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
		40-60	25-45	15-35	20-40	20-40		35-55				120-140	85-105	160-180				

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

SARA® MULTI-V multifunction tool



- Reinforced cylindrical shank
- **Cutting material: K15F solid carbide, TiAlN-coated**
- Milling, drilling and countersinking with one tool
- Especially suited for use on CNC machining centres
- Up to eight machining operations without tool change



D mm	L mm	L1 mm	D1 mm	D2 mm	Feed fz steel < 1000 N/mm² mm/Z	Feed fz steel < 1000 N/mm² mm/Z	Art.no.	60° €	Art.no.	90° €	Art.no.	120° €
0.5	39	1.0	3.0	0.05	0.002	0.004			251556 0050	32.60		
0.6	39	1.2	3.0	0.06	0.002	0.004			251556 0060	32.60		
0.7	39	1.4	3.0	0.07	0.002	0.004			251556 0070	32.60		
0.8	39	1.6	3.0	0.08	0.002	0.004			251556 0080	32.60		
0.9	39	1.8	3.0	0.09	0.002	0.004			251556 0090	32.60		
1.0	39	2.0	3.0	0.10	0.003	0.006	251548 0100	39.90	251556 0100	32.60	251542 0100	32.60
1.2	39	2.4	3.0	0.12	0.003	0.006			251556 0120	32.60		
1.4	39	2.8	3.0	0.14	0.003	0.006			251556 0140	32.60		
1.5	39	3.0	3.0	0.15	0.003	0.006	251548 0150	39.90	251556 0150	32.60	251542 0150	32.60
1.8	39	3.6	3.0	0.18	0.003	0.006			251556 0180	32.60		
2.0	39	4.0	3.0	0.20	0.004	0.008	251548 0200	39.90	251556 0200	32.60	251542 0200	32.60
2.5	39	5.0	3.0	0.25	0.004	0.008	251548 0250	39.90	251556 0250	32.60	251542 0250	32.60
3.0	50	6.0	4.0	0.30	0.004	0.008	251548 0300	50.10	251556 0300	40.20	251542 0300	41.00
4.0	50	8.0	5.0	0.40	0.004	0.008	251548 0400	52.40	251556 0400	41.80	251542 0400	42.50
5.0	50	10.0	6.0	0.50	0.006	0.013	251548 0500	55.10	251556 0500	44.00	251542 0500	44.80
6.0	60	12.0	8.0	0.60	0.006	0.013	251548 0600	67.50	251556 0600	53.90		
8.0	70	16.0	10.0	0.80	0.012	0.025	251548 0800	93.00	251556 0800	74.50	251542 0800	76.00
10.0	70	18.0	12.0	1.00	0.012	0.025	251548 1000	120.00	251556 1000	96.50	251542 1000	98.00
12.0	70	20.0	12.0	1.20	0.017	0.040	251548 1200	118.50	251556 1200	95.00	251542 1200	96.50
16.0	80	26.0	16.0	1.60	0.020	0.050	251548 1600	169.00	251556 1600	136.50	251542 1600	139.00
20.0	100	32.0	20.0	2.00	0.027	0.062	251548 2000	289.00	251556 2000	235.00	251542 2000	239.00

Material	● very well suited ○ well suited	Steel			Stainless steel			Cast iron		Titanium alloys	Super alloys Fe/NiCo-based < 30 HRC ≥ 30 HRC	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			< 8 % Si	≥ 8 % Si			< 55 HRC	< 60 HRC	≥ 60 HRC
		40-75	35-40	30-35	30-35	30-35		35-40	30-35	25-30	10-20	100-150	50-120	60-80				

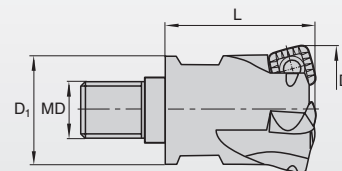
Cutting speed Vc m/min. Please adjust these guidelines according to clamping operation and machine set-up!

palbit High feed-rate screw-in milling cutter **HIFEED 06690**



- for milling inserts SO.. 13M
- 4-edged, extremely robust indexable insert
- Wide range of applications

D mm	D1 mm	L mm	Z	MD	Tightening torque max. N·m	Suitable indexable inserts	Art.no.	€
32	29	35	3	16	3.0	SO..13M5..	260220 0032	200.50 175.00
35	29	35	3	16	3.0	SO..13M5..	260220 0035	200.50 175.00
42	29	35	4	16	3.0	SO..13M5..	260220 0042	228.50 199.00

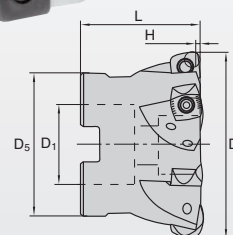


palbit High feed-rate shoulder milling cutter **HIFEED 06690**



- for milling inserts SO.. 13M
- 4-edged, extremely robust indexable insert
- Wide range of applications

D mm	L mm	D5 mm	D1 mm	Z	Tightening torque max. N·m	Suitable indexable inserts	Art.no.	€
50	45	40	22	4	3.0	SO..13M5	260221 0050	275.00 239.00
52	45	40	22	4	3.0	SO..13M5	260221 0052	275.00 239.00
63	50	48	27	5	3.0	SO..13M5	260221 0063	291.25 255.00
66	50	48	27	5	3.0	SO..13M5	260221 0066	291.25 255.00
80	50	60	27	6	3.0	SO..13M5	260221 0080	360.25 315.00
100	50	70	32	8	3.0	SO..13M5	260221 0100	444.75 389.00



palbit Milling inserts SO..13M5.... **HIFEED 06690**

SOET 13M520

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
-	-	-	ISO designation									
			SOET 13M520-MS	●	●			●		PH 7930	10 285245 0151	12.75
					●			●		PHM 740	10 285245 0169	13.60
				●	●			●		PH 7740	10 285245 0148	12.75

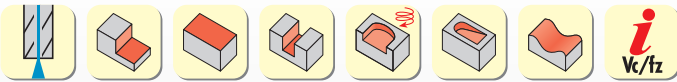
ISO	PH 7740	PH 7930	PHM 740
ISO P Steel	Vc = 80-180	Vc = 100-220	
ISO M Stainless steel	Vc = 70-180	Vc = 70-220	Vc = 70-180
ISO S Superalloy	Vc = 25-60	Vc = 35-65	Vc = 25-60
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.4-2.0 ap = 0.05-1.5		fz = 0.4-1.8

SOEW 13M510

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
-	-	-	ISO designation									
			SOEW 13M510 S	●						PH 7740	10 285244 0148	12.75
				●		●				PH 7910	10 285244 0149	12.75
				●		●				PH 7920	10 285244 0150	12.75

ISO	PH 7740	PH 7910	PH 7920
ISO P Steel	Vc = 80-180	Vc = 140-280	Vc = 130-230
ISO K Cast iron		Vc = 120-350	Vc = 100-310
Vc = [m/min] fz = [mm/Z] ap = [mm]	fz = 0.5-2.2 ap = 0.05-1.5		

palbit End milling cutter 90° **ALUPRO 76090**



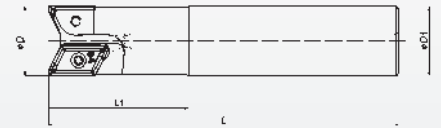
- For milling inserts XDGX 15M..
- Tools deliver smooth milling performance
- Internal coolant supply

up to $r = 3.2$

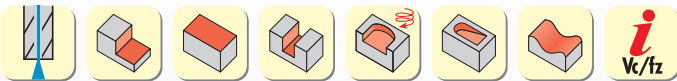
D mm	D1 mm	L mm	L1 mm	Z	Suitable indexable inserts	Tightening torque max. N-m	Art.no.	€	
20	20	150	60	1	XDGX 15M5	3.0	260252 0020	261.75	229.00
25	25	180	90	2	XDGX 15M5	3.0	260252 0025	287.75	249.00
32	32	200	120	2	XDGX 15M5	3.0	260252 0032	313.75	275.00
40	40	250	65	3	XDGX 15M5	3.0	260252 0040	418.25	365.00

greater than $r = 4.0$

D mm	D1 mm	L mm	L1 mm	Z	Tightening torque max. N-m	Suitable indexable inserts	Art.no.	€	
20	20	150	60	1	3.0	XDGX 15M5	260253 0020	261.75	229.00
25	25	180	90	2	3.0	XDGX 15M5	260253 0025	287.75	249.00
32	32	200	120	2	3.0	XDGX 15M5	260253 0032	313.75	275.00
40	40	250	65	3	3.0	XDGX 15M5	260253 0040	418.25	365.00



palbit Shoulder milling cutter 90° **ALUPRO 76090**



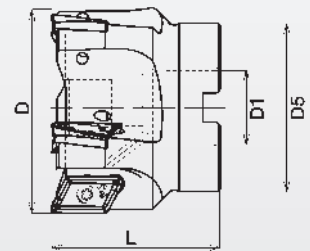
- For milling inserts XDGX 15M..
- Tools deliver smooth milling performance
- Internal coolant supply

up to $r = 3.2$

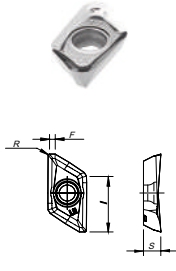
D mm	L mm	D1 mm	D5 mm	Z	Tightening torque max. N-m	Suitable indexable inserts	Art.no.	€	
40	50	16	32	3	3.0	XDGX 15M5	260250 0040	366.25	319.00
50	50	22	42	4	3.0	XDGX 15M5	260250 0050	418.25	365.00
63	50	22	48	5	3.0	XDGX 15M5	260250 0063	470.75	409.00
80	50	27	60	5	3.0	XDGX 15M5	260250 0080	496.75	435.00
100	63	32	73	6	3.0	XDGX 15M5	260250 0100	575.50	499.00

greater than $r = 4.0$

D mm	L mm	D1 mm	D5 mm	Z	Tightening torque max. N-m	Suitable indexable inserts	Art.no.	€	
40	50	16	32	3	3.0	XDGX 15M5	260251 0040	366.25	319.00
50	50	22	42	4	3.0	XDGX 15M5	260251 0050	418.25	365.00
63	50	22	48	5	3.0	XDGX 15M5	260251 0063	470.75	409.00
80	50	27	60	5	3.0	XDGX 15M5	260251 0080	496.75	435.00
100	63	32	73	6	3.0	XDGX 15M5	260251 0100	575.50	499.00



palbit Milling inserts XDGX 15M5.. **ALUPRO 76090**

F finishing	M medium	R roughing	palbit 	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
-	-	-	ISO designation									
			XDGX 15M504 PDFR-LN				●			PH 0910	10 285301 0120	17.50
			XDGX 15M508 PDFR-LN				●			PH 0910	10 285301 0220	17.50
			XDGX 15M512 PDFR-LN				●			PH 0910	10 285301 0320	17.50
			XDGX 15M516 PDFR-LN				●			PH 0910	10 285301 0420	17.50
			XDGX 15M520 PDFR-LN				●			PH 0910	10 285301 0520	17.50
			XDGX 15M530 PDFR-LN				●			PH 0910	10 285301 0620	17.50
			XDGX 15M532 PDFR-LN				●			PH 0910	10 285301 0720	17.50
			XDGX 15M540 PDFR-LN				●			PH 0910	10 285301 0820	17.50
			XDGX 15M550 PDFR-LN				●			PH 0910	10 285301 0920	17.50

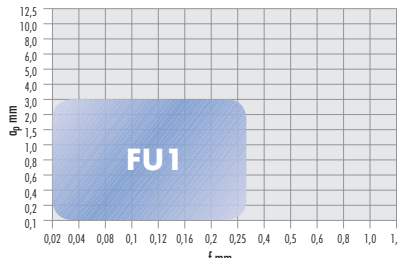
ISO	PH 0910
ISO N Al/non-ferrous	Vc = 350-1400
Vc = [m/min]	fz = 0.15-0.4
fz = [mm/Z]	ap = 0.05-14.0
ap = [mm]	

ATORN® ISO indexable cutting inserts CCGT

• 80° 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.	€
●	-	-										
 Finishing				●	●			●		APS 20 T	10 311530 1312	6.45
				●	●			●		APS 10 T	10 311530 1411	6.45
				●	●			●		APS 20 T	10 311530 1412	6.45
				●	●			●		APS 10 T	10 311530 1511	6.45
				●	●			●		APS 20 T	10 311530 1512	6.45
				●	●			●		APS 20 T	10 311530 1612	7.55
				●	●			●		APS 10 T	10 311530 1711	7.55
				●	●			●		APS 20 T	10 311530 1712	7.55
				●	●			●		APS 10 T	10 311530 1811	7.55
				●	●			●		APS 20 T	10 311530 1812	7.55
				●	●			●		APS 10 T	10 311530 1911	7.55
				●	●			●		APS 20 T	10 311530 1912	7.55

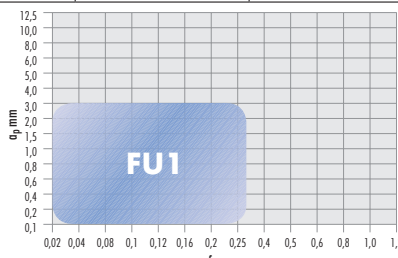
ISO	APS 10 T	APS 20 T
ISO P Steel	Vc = 80-160	Vc = 50-130
ISO M Stainless steel	Vc = 130-220	Vc = 100-210
ISO S Superalloy	Vc = 40-70	Vc = 40-60
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.05-0.30 ap = 0.20-3.0	f = 0.02-0.30 ap = 0.10-3.0
		

ATORN® ISO indexable cutting inserts DCGT

• 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.	€
●	-	-										
 Finishing				●	●			●		APS 20 T	10 311530 2012	6.25
				●	●			●		APS 10 T	10 311530 2111	6.25
				●	●			●		APS 20 T	10 311530 2112	6.25
				●	●			●		APS 10 T	10 311530 2211	6.25
				●	●			●		APS 20 T	10 311530 2212	6.25
				●	●			●		APS 20 T	10 311530 2312	7.45
				●	●			●		APS 10 T	10 311530 2411	7.45
				●	●			●		APS 20 T	10 311530 2412	7.45
				●	●			●		APS 10 T	10 311530 2511	7.45
				●	●			●		APS 20 T	10 311530 2512	7.45
				●	●			●		APS 10 T	10 311530 2611	7.45
				●	●			●		APS 20 T	10 311530 2612	7.45

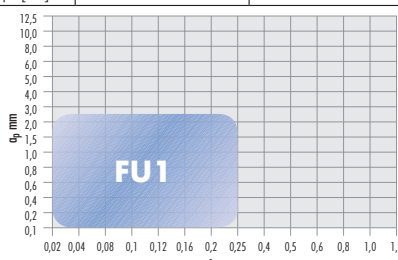
ISO	APS 10 T	APS 20 T
ISO P Steel	Vc = 80-160	Vc = 80-130
ISO M Stainless steel	Vc = 130-220	Vc = 100-210
ISO S Superalloy	Vc = 40-70	Vc = 40-60
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.05-0.30 ap = 0.20-3.0	f = 0.02-0.30 ap = 0.10-3.0
		

ATORN® ISO indexable cutting inserts VCGT

• 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.	€
●	-	-										
 Finishing				●	●			●		APS 20 T	10 311530 2712	8.35
				●	●			●		APS 10 T	10 311530 2811	8.35
				●	●			●		APS 20 T	10 311530 2812	8.35
				●	●			●		APS 10 T	10 311530 2911	8.35
				●	●			●		APS 20 T	10 311530 2912	8.35
				●	●			●		APS 10 T	10 311530 3011	9.75
				●	●			●		APS 20 T	10 311530 3012	9.75
				●	●			●		APS 10 T	10 311530 3111	9.75
				●	●			●		APS 20 T	10 311530 3112	9.75

ISO	APS 10 T	APS 20 T
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
		

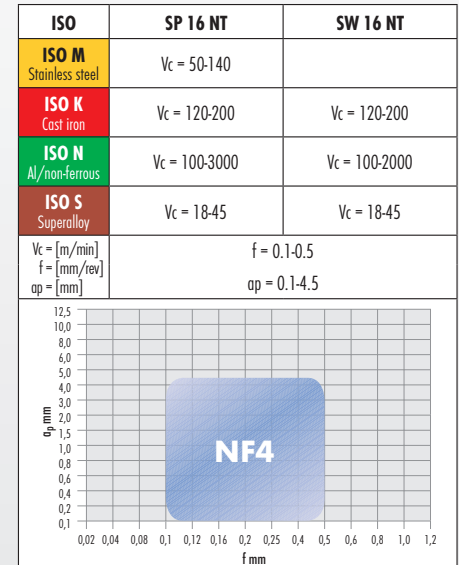
SARA® ISO indexable cutting inserts CCGT ground TURN

- 80° rhombic, positive 7°, ground peripherally
- One-sided chip breaker design
- Appropriate for aluminium, plastic and non-ferrous metals
- **SW16NT** uncoated
- **SP16NT** coated, also suitable for finishing **stainless steel (austenitic, quenched)**
- **for stainless steel** max. ap = 0.4 mm at Vc max 140 m/min
- **SP16NT** for **titanium Rm 440 Vc 60-120 m/min**
- Minimum ap feed always 63 % of the corner radius "r"
- Maximum ap feed is 63 % of the cutting edge length
- Cutting data recommendations apply for a corner radius **r = 0.4 mm**; if the radius changes, the cutting data must be adapted

Especially for
machining aluminium

Chip breaker NF4

F finishing	M medium	R roughing	SARA® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
○	○	○				○	●	○		SW 16 NT	10 366601 0116	6.60
			CCGT 060201-NF4			○	●	○		SW 16 NT	10 366601 0216	6.60
			CCGT 060202-NF4		●	○	●	○		SP 16 NT	10 366601 0417	8.20
			CCGT 060204-NF4			○	●	○		SW 16 NT	10 366601 0316	6.60
					●	○	●	○		SP 16 NT	10 366601 0517	8.20
			CCGT 09T302-NF4			○	●	○		SW 16 NT	10 366601 0616	7.00
					●	○	●	○		SP 16 NT	10 366601 0717	8.50
			CCGT 09T304-NF4			○	●	○		SW 16 NT	10 366601 0816	7.00
					●	○	●	○		SP 16 NT	10 366601 0917	8.50
			CCGT 09T308-NF4			○	●	○		SW 16 NT	10 366601 1016	7.00
					●	○	●	○		SP 16 NT	10 366601 1117	8.50
			CCGT 120404-NF4			○	●	○		SW 16 NT	10 366601 1216	8.20
					●	○	●	○		SP 16 NT	10 366601 1317	9.80
			CCGT 120408-NF4			○	●	○		SW 16 NT	10 366601 1416	8.20
					●	○	●	○		SP 16 NT	10 366601 1517	9.80



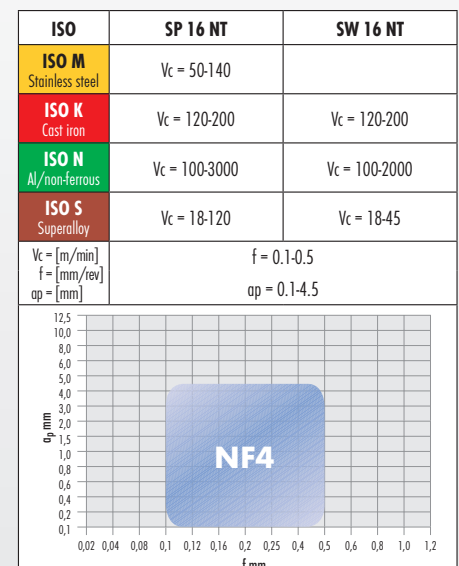
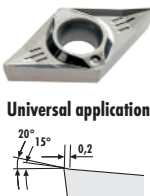
SARA® ISO indexable cutting inserts DCGT ground TURN

- 55° rhombic, positive 7°, ground peripherally
- One-sided chip breaker design
- Appropriate for aluminium, plastic and non-ferrous metals
- **SW16NT** uncoated
- **SP16NT** coated, also suitable for finishing **stainless steel (austenitic, quenched)**
- **for stainless steel** max. ap = 0.4 mm at Vc max 140 m/min
- **SP16NT** for **titanium Rm* 440 Vc 60-120 m/min**
- 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**

Especially for
machining aluminium

Chip breaker NF4

F finishing	M medium	R roughing	SARA® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
○	○	○				○	●	○		SW 16 NT	10 366623 0116	6.60
			DCGT 070201-NF4			○	●	○		SW 16 NT	10 366623 0216	6.60
			DCGT 070202-NF4		●	○	●	○		SP 16 NT	10 366623 0317	7.90
			DCGT 070204-NF4			○	●	○		SW 16 NT	10 366623 0416	6.60
					●	○	●	○		SP 16 NT	10 366623 0517	7.90
			DCGT 070208-NF4			○	●	○		SW 16 NT	10 366623 0616	6.60
						○	●	○		SW 16 NT	10 366623 0716	7.90
			DCGT 11T302-NF4		●	○	●	○		SP 16 NT	10 366623 0817	8.90
						○	●	○		SW 16 NT	10 366623 0916	7.90
			DCGT 11T304-NF4			○	●	○		SP 16 NT	10 366623 1017	8.90
					●	○	●	○		SP 16 NT	10 366623 1116	7.90
			DCGT 11T308-NF4			○	●	○		SW 16 NT	10 366623 1217	8.90
					●	○	●	○		SP 16 NT		



SARA® ISO indexable cutting inserts VCGT ground TURN

- **55° rhombic, positive 7°**
- One-sided chip breaker design
- Appropriate for aluminium, plastic and non-ferrous metals
- **SW16NT** uncoated
- **SP16NT** coated, also suitable for finishing **stainless steel (austenitic, quenched)**
- for **stainless steel** max. ap = 0.4mm at Vc max 140 m/min
- **SP16NT** for **titanium** Rm* 440 Vc 60-120 m/min
- Minimum ap feed always 63 % of the corner radius "r"
- Maximum ap feed is 35% of the cutting edge length
- Cutting data recommendations apply to a corner radius **r = 0.4 mm**

**Especially for
machining aluminium**

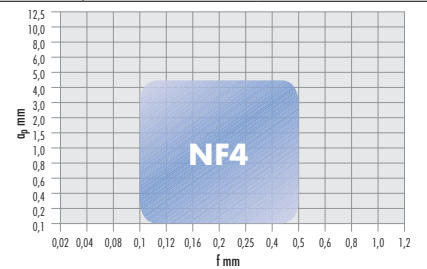
Chip breaker NF4

F finishing	M medium	R roughing	SARA® ISO designation	ISO P	ISO M	ISO K	ISO N	ISO S	ISO H	Quality	Art.no.	€
○	○	○				○	●	○		SW 16 NT	10 366680 0116	9.00
					○	○	●	○		SP 16 NT	10 366680 0317	10.60
					○	○	●	○		SP 16 NT	10 366680 0417	10.60
						○	●	○		SW 16 NT	10 366680 0216	9.00
						○	●	○		SW 16 NT	10 366680 0616	9.30
						○	●	○		SW 16 NT	10 366680 0516	9.30
						○	●	○		SW 16 NT	10 366680 0717	11.00
					○	○	●	○		SP 16 NT	10 366680 0917	12.40
						○	●	○		SW 16 NT	10 366680 1017	11.00
					○	○	●	○		SP 16 NT	10 366680 1217	12.40
					○	○	●	○		SP 16 NT	10 366680 1317	12.40
					○	○	●	○		SP 16 NT	10 366680 1417	14.90



Universal application

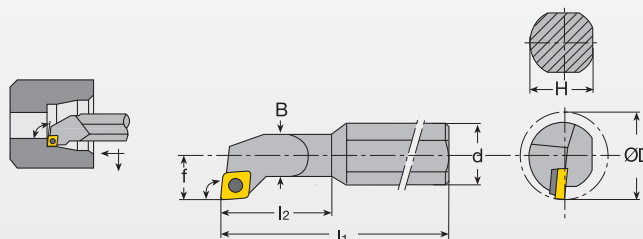
ISO	SP 16 NT	SW 16 NT
ISO M Stainless steel	Vc = 50-140	
ISO K Cast iron	Vc = 120-200	Vc = 120-200
ISO N Al/non-ferrous	Vc = 100-3000	Vc = 100-2000
ISO S Superalloy	Vc = 18-120	Vc = 18-45
Vc = [m/min] f = [mm/rev] ap = [mm]	f = 0.1-0.5 ap = 0.1-4.5	



ATORN® Boring bars, positive SCLC



- **SCLC R/L 95°**
- Setting angle 95°, for rhombic indexable inserts positive 7°, 80° point angle
- **With internal cooling**
- **Application:** Longitudinal turning, **very well suited to machining tight bores**



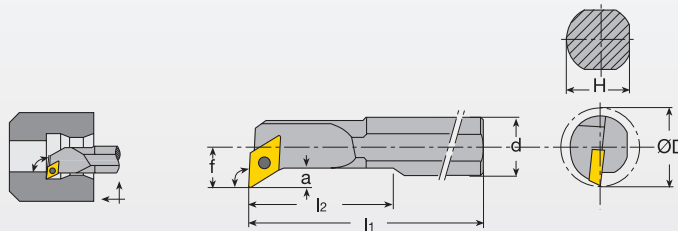
Set

Contents	right-hand Art.no. €	left-hand Art.no. €
A0608H SCLC/R/L 06; A0810J SCLC/R/L 06; A1012K SCLC/R/L 06; A1216M SCLC/R/L 06 (1 of each)	321003 1004 225.00 149.00	321004 1004 225.00 149.00

ATORN® Boring bars, positive SDUC



- **SDUC R/L 93°**
- Setting angle 93°, for rhombic indexable inserts positive 7°, 55° point angle
- **With internal cooling**
- **Application:** Longitudinal turning, **very well suited to machining tight bores**



Set

Contents	right-hand			left-hand		
	Art.no.	€		Art.no.	€	
A0810H SDUCR/L 07; A1012K SDUCR/L 07; A1216M SDUCR/L 07 (1 of each)	321013 1003	215.00	149.00	321014 1003	215.00	149.00

Dümmel® WERKZEUGFABRIK Mini-bore cutting tool sets



Mini-borecutting tool set 1

- **Internal turning, recess turning and chamfering**
- Complete set including holder
- Internal machining from 3 mm bore hole Ø
- Version: **right-hand cutting**
- Cutting inserts: **CN45F-TiN-coated**
- Supplied in a case

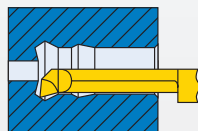


Fig. A

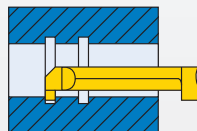


Fig. E

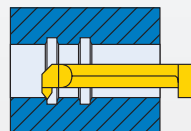


Fig. F

Designation	Bore hole Ø mm	Bore depth mm	Punching depth mm	Punching width mm	Illustration	Art.no.	€
676.0016-D							
645.0016-D							
111,645							
R 050.6-22	6	22	-	-	A	304601 0001	315.00
R 050.5-20	5	20	-	-	A		
R 060.5-20	5	20	-	-	F		
R 050.4-16	4	16	-	-	A		
R 050.3-16	3	16	-	-	A		
R 006.0200-22	6	22	1.8	2.0	E		
R 006.0150-22	6	22	1.8	1.5	E		
R 005.0200-20	5	20	1.0	2.0	E		
R 005.0150-20	5	20	1.0	1.5	E		
R 004.0100-16	4	16	0.8	1.0	E		

ATORN® Clamp mountings and boring bars

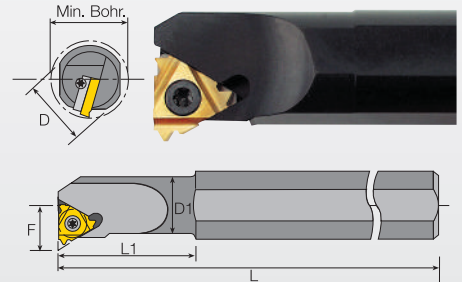
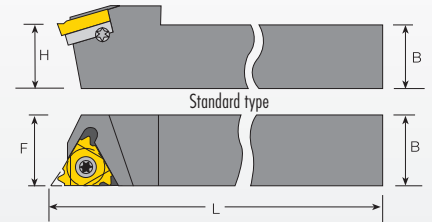
- Note:** All clamp mountings and boring bars are manufactured with a pitch angle of 1.5°. Other pitch angles are specified in the pitch angle table in the technical part of the catalogue.

Right-hand clamp mounting for outer thread

Designation	B mm	L mm	F mm	Cutting edge length mm	H mm	Art.no.	€
SER 12 12 F16	12	80	16	16**	12	340101 0011	68.00
SER 16 16 H16	16	100	16	16**	16	340101 0012	68.00
SER 20 20 K16	20	125	20	16**	20	340101 0013	68.00
SER 25 25 M16	25	150	25	16**	25	340101 0014	72.00

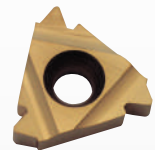
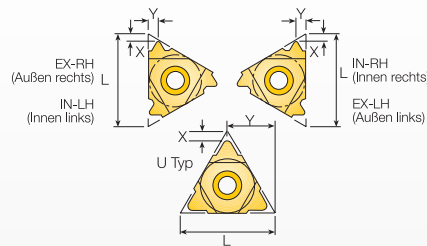
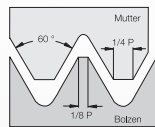
Right boring bar for female thread

Designation	Cutting edge length mm	D mm	D1 mm	Min. hole Ø mm	L mm	L1 mm	F mm	Art.no.	€
SIR 0013 M16	16*	16	13	16.0	150	32	10.2	340301 0011	70.00
SIR 0016 P16	16*	20	16	19.0	170	40	11.7	340301 0012	70.00
SIR 0020 P16	16**	20	20	24.0	170	-	13.7	340301 0013	79.00
SIR 0025 R16	16**	25	25	29.0	200	-	16.2	340301 0014	88.50
SIR 0032 S16	16**	32	32	36.0	250	-	19.7	340301 0015	111.00
SIR 0040 T16	16**	40	40	44.0	300	-	23.7	340301 0016	148.00



ATORN® Threading inserts

- Metric, ISO full profile**
- For right-hand holder**



Full profile, ISO external right-hand, ground

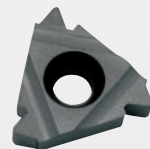
Designation	L mm	Pitch mm	X mm	Y mm	HC 5615 Art.no.	€
16 ER 1.0 ISO	16	1.0	0.7	0.7	10 342801 2135	11.80
16 ER 1.25 ISO	16	1.25	0.8	0.9	10 342801 2235	11.80
16 ER 1.5 ISO	16	1.5	0.8	1.0	10 342801 2335	11.80
16 ER 1.75 ISO	16	1.75	0.9	1.2	10 342801 2435	11.80
16 ER 2.0 ISO	16	2.0	1.0	1.3	10 342801 2535	11.80
16 ER 2.5 ISO	16	2.5	1.1	1.5	10 342801 2635	13.00
16 ER 3.0 ISO	16	3.0	1.2	1.6	10 342801 2735	13.00

Full profile, ISO internal right-hand, ground

Designation	L mm	Pitch mm	X mm	Y mm	HC 5615 Art.no.	€
16 IR 1.0 ISO	16	1.0	0.6	0.7	10 343001 1835	11.80
16 IR 1.25 ISO	16	1.25	0.8	0.9	10 343001 1935	11.80
16 IR 1.5 ISO	16	1.5	0.8	1.0	10 343001 2035	11.80
16 IR 1.75 ISO	16	1.75	0.9	1.2	10 343001 2135	11.80
16 IR 2.0 ISO	16	2.0	1.0	1.3	10 343001 2235	11.80
16 IR 2.5 ISO	16	2.5	1.1	1.5	10 343001 2335	13.00
16 IR 3.0 ISO	16	3.0	1.1	1.5	10 343001 2435	13.00

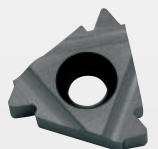
ER set, 10-pcs, external right-hand ground

Contents per set	HC 5630 Art.no.	€
2 x 16 ER 1.0 ISO 2 pieces 16 ER 1.25 ISO 2 pieces 16 ER 1.5 ISO 2 pieces 16 ER 1.75 ISO 2 pieces 16 ER 2.0 ISO	342801 5016	89.90



IR set, 10 pcs., internal right-hand ground

Contents	HC 5630 Art.no.	€
2 pieces 16 IR 1.0 ISO 2 pieces 16 IR 1.25 ISO 2 pieces 16 IR 1.5 ISO 2 pieces 16 IR 1.75 ISO 2 pieces 16 IR 2.0 ISO	343001 5016	89.90



ER set, 10-pcs., external right-hand, ground with chip breaker type B

Contents	HC 5630 Art.no.	€
2 pieces 16 ER B 1.0 ISO 2 pieces 16 ER B 1.25 ISO 2 pieces 16 ER B 1.5 ISO 2 pieces 16 ER B 1.75 ISO 2 pieces 16 ER B 2.0 ISO	342802 5016	89.90



IR set, 10 pcs., internal right-hand ground with chip breaker type B

Contents	HC 5630 Art.no.	€
2 pieces 16 IR B 1.0 ISO 2 pieces 16 IR B 1.25 ISO 2 pieces 16 IR B 1.5 ISO 2 pieces 16 IR B 1.75 ISO 2 pieces 16 IR B 2.0 ISO	343002 5016	89.90



SARA® Square transverse holding fixture

- Surface hardness 58-60 HRC
- Core strength HV 950 N/mm²
- Hardness depth 0.8 mm ± 0.2 mm
- Fully burnished and precision-ground

Type B1, right, short

Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	Art.no.	€
VDI 20	20	55	30	16	7	25	30	30	16	446005 0020	54.00 46.00
VDI 30	30	70	35	20	10	28	38	40	22	446005 0030	62.00 51.00
VDI 40	40	85	42.5	25	12.5	32.5	48	44	22	446005 0040	69.00 56.50
VDI 50	50	100	50	32	16	35	60	55	30	446005 0050	91.00 75.00

Type B2, left, short

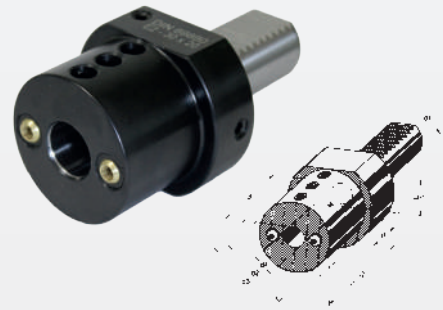
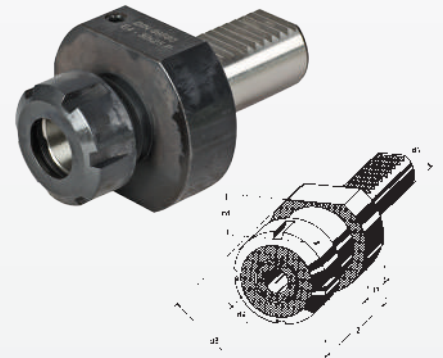
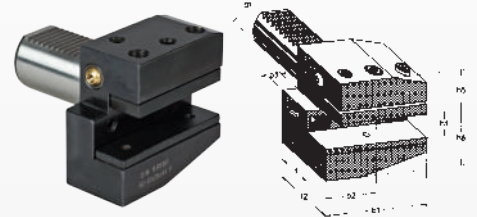
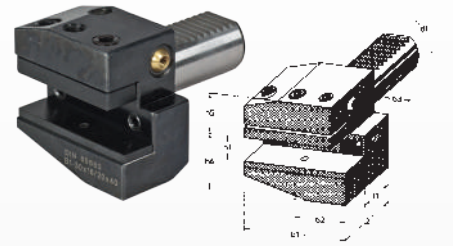
Shank	d1 mm	b1 mm	b2 mm	h1 mm	b3 mm	h5 mm	h6 mm	l1 mm	l2 mm	Art.no.	€
VDI 20	20	55	30	16	7	25	30	30	16	446007 0020	56.00 46.00
VDI 30	30	70	35	20	10	28	38	40	22	446007 0030	62.00 51.00
VDI 40	40	85	42.5	25	12.5	32.5	48	44	22	446007 0040	69.00 56.50
VDI 50	50	100	50	32	16	35	60	55	30	446007 0050	91.00 75.00

Type E4, cylindrical holding fixture with collet

Shank	Designation	Clamping range mm	d1 mm	h1 mm	l2 mm	l1 mm	d3 mm	Art.no.	€
VDI 20	ER16 426E	1 - 10	20	23	40	16	50	446036 2016	83.00 68.00
VDI 20	ER25 430E	2 - 16	20	23	50	16	50	446036 2025	83.00 68.00
VDI 20	ER32 470E	2 - 20	20	23	50	16	50	446036 2032	83.00 68.00
VDI 30	ER25 430E	2 - 16	30	28	57	22	68	446036 3025	85.50 70.50
VDI 30	ER32 470E	2 - 20	30	28	62	22	68	446036 3032	85.50 70.50
VDI 30	ER40 472E	3 - 26	30	28	75	22	68	446036 3040	85.50 70.50
VDI 40	ER25 430E	2 - 16	40	32.5	75	22	83	446036 4025	85.50 70.50
VDI 40	ER32 470E	2 - 20	40	32.5	62	22	83	446036 4032	85.50 70.50
VDI 40	ER40 472E	3 - 26	40	32.5	75	22	83	446036 4040	85.50 70.50
VDI 50	ER40 472E	3 - 26	50	35	75	30	98	446036 5040	124.00 102.00

Type E2, for straight shank turning tools with an internal and external coolant supply

Shank	d1 mm	d4 mm	d3 mm	h1 mm	l1 mm	l2 mm	d2 mm	l3 mm	Art.no.	€
VDI 20	20	8	50	23	18	50	40	32	446033 2008	65.00 53.50
VDI 20	20	10	50	23	18	50	40	32	446033 2010	65.00 53.50
VDI 20	20	12	50	23	18	50	40	32	446033 2012	65.00 53.50
VDI 20	20	16	50	23	18	50	40	32	446033 2016	65.00 53.50
VDI 20	20	20	50	23	18	50	50	32	446033 2020	65.00 53.50
VDI 20	20	25	50	23	18	60	50	42	446033 2025	65.00 53.50
VDI 30	30	8	68	28	22	60	55	38	446033 3008	65.00 53.50
VDI 30	30	10	68	28	22	60	55	38	446033 3010	65.00 53.50
VDI 30	30	12	68	28	22	60	55	38	446033 3012	65.00 53.50
VDI 30	30	16	68	28	22	60	55	38	446033 3016	65.00 53.50
VDI 30	30	20	68	28	22	60	55	38	446033 3020	65.00 53.50
VDI 30	30	25	68	28	22	60	55	38	446033 3025	65.00 53.50
VDI 30	30	32	68	28	22	75	68	53	446033 3032	65.00 53.50
VDI 30	30	40	68	28	22	90	68	68	446033 3040	65.00 53.50
VDI 40	40	8	83	32.5	22	75	55	53	446033 4008	66.00 54.00
VDI 40	40	10	83	32.5	22	75	55	53	446033 4010	66.00 54.00
VDI 40	40	12	83	32.5	22	75	55	53	446033 4012	66.00 54.00
VDI 40	40	16	83	32.5	22	75	55	53	446033 4016	66.00 54.00
VDI 40	40	20	83	32.5	22	75	55	53	446033 4020	66.00 54.00
VDI 40	40	25	83	32.5	22	75	55	53	446033 4025	66.00 54.00
VDI 40	40	32	83	32.5	22	75	83	53	446033 4032	66.00 54.00
VDI 40	40	40	83	32.5	22	90	83	68	446033 4040	66.00 54.00
VDI 50	50	12	98	35	30	90	68	60	446033 5012	91.00 75.00
VDI 50	50	16	98	35	30	90	68	60	446033 5016	91.00 75.00
VDI 50	50	20	98	35	30	90	68	60	446033 5020	91.00 75.00
VDI 50	50	25	98	35	30	90	68	60	446033 5025	91.00 75.00
VDI 50	50	32	98	35	30	90	68	60	446033 5032	91.00 75.00
VDI 50	50	40	98	35	30	90	98	60	446033 5040	91.00 75.00
VDI 50	50	50	98	35	30	100	98	70	446033 5050	91.00 75.00



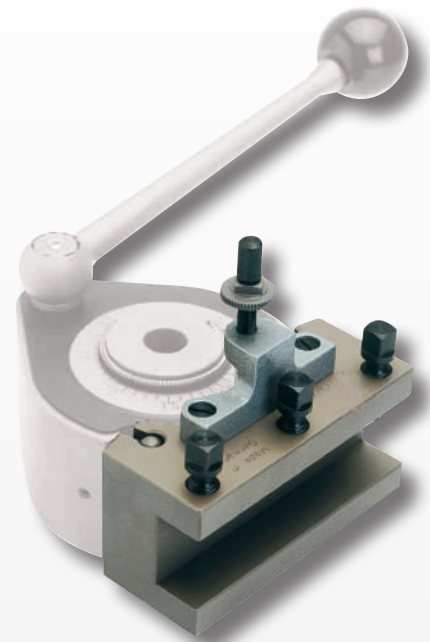
ATORN® Quick-change tool holder

- 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

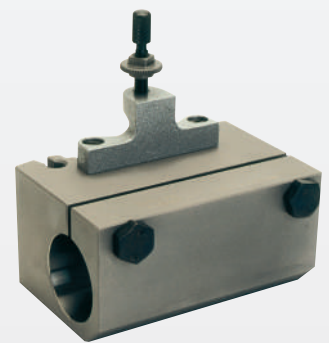
Suitable for holder size	D mm	Total length mm	Suitable quadratic-head bolt	Art.no.	€	
AA	12	50	M5 x 0.8 x 18	446505 0012	83.50	62.50
A	16	75	M7 x 1 x 23	446505 1116	83.50	62.50
A	16	90	M7 x 1 x 23	446505 1117	83.50	62.50
A	20	75	M7 x 1 x 23	446505 1120	85.00	63.50
A	20	90	M7 x 1 x 23	446505 1121	85.00	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

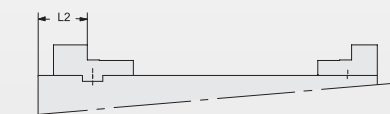
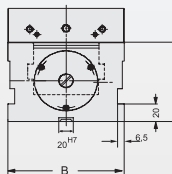
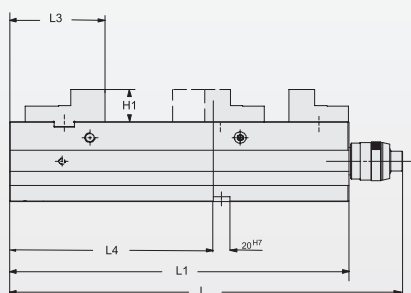
- With jacking screw
- For mounting in BS quick-release boring bar holders, straight outer diameter
- For tools with a Morse taper shank

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



ATORN® MM-G NC high-pressure machine vice

- **mechanical/mechanical**
- Base body made of spheroidal graphite iron
- clamping on base
- Pull-down jaws and other accessories available on request
- Stepped jaws, reversible, hardened and ground
- Long clamping slide assembly including a transverse slot drive spindle with pre-set clamping force
- Mounting thread M12 for workpiece stop
- Clamping surfaces for clamping claws
- Stable chip guard, prevents chips from entering inside the body
- **Incl. clamping fitting bore (pitch 200 mm) for ATORN zero-point clamping system**



Compact spanner

- incl. stepped jaws and regulator

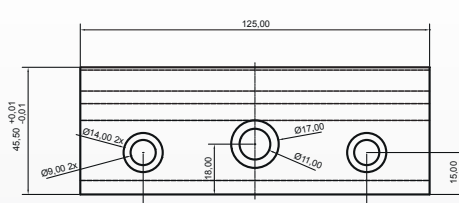
Jaw width mm	Clamp force kN	L mm	L1 mm	L2 mm	L3 mm	L4 mm	H mm	H1 mm	Clamping range mm	Weight kg	Art.no.	€
125	40	463	400	56.5	112.5	240	100	40	0 - 312	41	458800 0125	1,769.00 1,499.00

SARA® Adjustable vice jaws

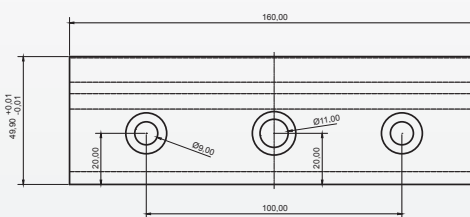
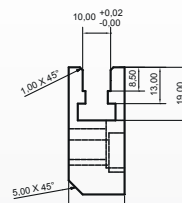
- Universal jaws for different component forms
- For machining unfinished and finished parts
- For clamping round and flat materials
- Simple adjustment of the top jaws

Supplied with:

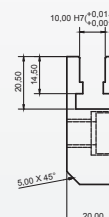
- 2 x base jaw
- 4 x combination jaw, flat
- 4 x combination jaw, round
- (without attachment screws)



462500 0125

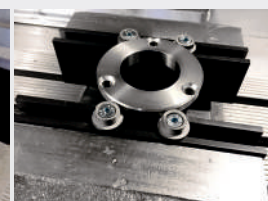
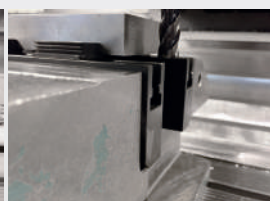


462500 0160



Clamping jaws suitable for various ATORN, Allmatic, Kesel and Röhml models

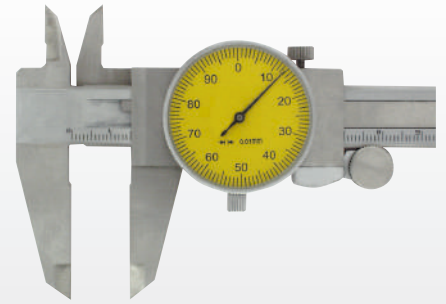
Jaw width mm	Art.no.	€
125	462500 0125	460.00 399.00
160	462500 0160	480.00 399.00



SARA® Dial calliper



- Scale satin chrome plated
- Locking screw on top
- Fine adjustment via thumb roller
- One pointer rotation represents 1 mm
- Dial clamp, simple zeroing
- Rack protected against dirt



Measurement range mm	Jaw length mm	Reading mm	Art.no.	€	Calibration Art.no.	€
150	40	0.01	500110 0151	63.50 45.90	070101 0001	7.50

SARA® Digital special-purpose vernier calliper



- Locking screw on top
- Measuring jaws for different special applications
- **Functions:** ON/OFF, ZERO, mm/inch
- Supplied with CR2032 battery, No. 548079 6032



with adjustable measuring jaw

Measurement range mm	A mm	B mm	C mm	Art.no.	€	Calibration Art.no.	€
150	110	40	10	500701 2000	157.00 115.00	070101 0001	7.50



Wall thickness vernier calliper

Measurement range mm	A mm	C mm	Art.no.	€	Calibration Art.no.	€
150	40	30	500701 2020	115.00 85.00	070101 0001	7.50



ATORN® LED magnifier lamp

- Even, largely anti-glare lighting provided by 90 LEDs (colour temperature 6,500 K)
- Extremely long-life LEDs, no risk of breakage
- High-quality glass lenses with 1.75x or 2.25x magnification
- Metal arm with plastic covering, no risk of pinching
- Particularly slim magnifier casing with replaceable magnifier cover
- Extremely low power consumption (only around 9 W!)
- Table clamp



Enlargement	Lens Ø mm	Projection mm	Art.no.	€
1.75x	125	1060	560160 0175	179.00 143.00
2.25x	125	1060	560160 0225	182.50 145.00

SARA® Steel gauge block sets

DIN
EN ISO
3650

Werks-
norm



- Made of carefully selected, high-quality, alloyed special steel, aged, hardened and hand-lapped
- Edges slightly blunted
- Each gauge block is engraved with an individual identification number
- Supplied in a wooden case with individually labelled compartments
- The works inspection certificate provided lists all the gauge blocks with the nominal dimensions and the deviation from the nominal dimensions. It documents traceability to national standards and the test conditions.
- Calibration: Test B = 5-point measurement, Test C = 1-point measurement

Satzinhalt 32-teilig			Satzinhalt 47-teilig			Satzinhalt 87-teilig			Satzinhalt 103-teilig		
Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm	Anzahl	Maß mm	Stufung mm
1	1,005	-	1	1,005	-	9	1,001-1,009	0,001	1	1,005	-
9	1,01-1,09	0,01	21	1,00-1,20	0,01	49	1,01-1,49	0,01	49	1,01-1,49	0,01
9	1,1-1,9	0,1	8	1,3-2,0	0,1	19	0,5-9,5	0,5	49	0,5-24,5	0,5
9	1-9	1,0	8	3-10	1	10	10-100	10	4	25-100	25
3	10-30	10	9	20-100	10						
1	50	-									



535001 1087

Tolerance class	Contents	Test B				Test C	
		Art.no.	€	Art.no.	€	Art.no.	€
0	32	535001 0032	450.00 339.00	073045 0001	170.00	073050 0001	135.50
1	32	535001 1032	295.00 219.00	073045 0001	170.00	073050 0001	135.50
2	32	535001 2032	185.50 139.00	073045 0001	170.00	073050 0001	135.50
0	47	535001 0047	679.00 509.00	073045 0002	243.00	073050 0002	195.00
1	47	535001 1047	425.00 319.00	073045 0002	243.00	073050 0002	195.00
2	47	535001 2047	263.00 199.00	073045 0002	243.00	073050 0002	195.00
0	87	535001 0087	1,029.00 769.00	073045 0003	432.00	073050 0003	349.00
1	87	535001 1087	665.00 499.00	073045 0003	432.00	073050 0003	349.00
2	87	535001 2087	398.00 299.00	073045 0003	432.00	073050 0003	349.00
0	103	535001 0103	1,359.00 1,019.00	073045 0004	485.00	073050 0004	389.00
1	103	535001 1103	799.00 599.00	073045 0004	485.00	073050 0004	389.00
2	103	535001 2103	469.00 349.00	073045 0004	485.00	073050 0004	389.00

ATORN® Straightedge

DIN
874



INOX



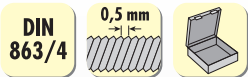
- Wedge-shaped cross-section
- Hardened and burnished special steel, or hardened and matt chrome-plated stainless steel with an anti-glare finish
- Hairline measuring edge finely lapped
- With plastic insulated handle



547501 0100

Length mm	Hardened		Stainless steel, hardened		Calibration	
	Art.no.	€	Art.no.	€	Art.no.	€
75	547501 0075	12.75 9.50	547505 0075	17.90 13.40	076005 0001	11.00
100	547501 0100	14.50 10.80	547505 0100	19.60 14.70	076005 0001	11.00
125	547501 0125	17.10 12.80	547505 0125	23.10 17.30	076005 0001	11.00
150	547501 0150	19.40 14.50	547505 0150	29.20 21.90	076005 0001	11.00
200	547501 0200	24.40 18.30	547505 0200	32.60 24.40	076005 0001	11.00
300	547501 0300	45.80 34.30	547505 0300	64.00 48.00	076005 0001	11.00
400	547501 0400	79.00 59.20	547505 0400	110.00 82.50	076005 0002	17.90
500	547501 0500	115.00 86.00	547505 0500	151.00 113.00	076005 0002	17.90

ATORN® Internal precision instrument with three-point contact

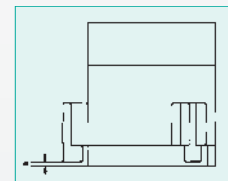


- For measuring through-holes, blind holes (from $\varnothing$ 12 mm, dimension $a = 0$ mm) and short centring shoulders
- Self-centring version
- Carbide-tipped measuring faces from $\varnothing$ 12 mm
- Measuring heads from $\varnothing$ 40 mm with lightweight anodised aluminium construction
- Measuring spindle hardened and ground
- Matt chrome-plated reading parts with an anti-glare finish
- Quick drive with integrated coupling

Blind hole version!



Measurement range mm	Error limit μ m	a mm	Reading mm	Measurement depth without extension mm	Art.no.	€	Calibration Art.no.	€
6-8	4	1.5	0.001	58	507801 0008	289.00	070525 0001	18.00
8-10	4	1.8	0.001	58	507801 0010	289.00	070525 0001	18.00
10-12	4	1.8	0.001	58	507801 0012	295.00	070525 0001	18.00
12-16	4	0	0.001	64	507801 0016	295.00	070525 0001	18.00
16-20	4	0	0.001	64	507801 0020	305.00	070525 0001	18.00
20-25	4	0	0.005	68	507801 0025	315.00	070525 0001	18.00
25-30	4	0	0.005	68	507801 0030	319.00	070525 0001	18.00
30-40	4	0	0.005	76	507801 0040	355.00	070525 0001	18.00
40-50	4	0	0.005	76	507801 0050	355.00	070525 0001	18.00
50-60	5	0	0.005	79	507801 0060	405.00	070525 0002	24.00
60-70	5	0	0.005	79	507801 0070	419.00	070525 0002	24.00
70-85	5	0	0.005	97	507801 0085	445.00	070525 0002	24.00
85-100	5	0	0.005	97	507801 0100	455.00	070525 0002	24.00
100-125	6	0	0.005	132	507801 0125	629.00	070525 0003	28.00
125-150	6	0	0.005	132	507801 0150	749.00	070525 0003	28.00
150-175	7	0	0.005	132	507801 0175	799.00	070525 0004	32.00
175-200	7	0	0.005	132	507801 0200	839.00	070525 0004	32.00



From $\varnothing$ 12-16 mm
measurements to borehole bottom
possible

Sets

Measurement range mm	Reading mm	Single units mm	Ring gauges mm	Art.no.	€	Calibration Art.no.	€
6-12	0.001	6-8 / 8-10 / 10-12	8 / 10	507802 0012	819.00	070525 0301	86.00
12-20	0.001	12-16 / 16-20	16	507802 0020	639.00	070525 0303	52.00
20-50	0.005	20-25 / 25-30 / 30-40 / 40-50	25 / 40	507802 0050	1,439.00	070525 0301	86.00
50-100	0.005	50-60 / 60-70 / 70-85 / 85-100	60 / 85	507802 0100	1,699.00	070525 0305	134.00



SARA® 3D probe SAVEplus

- Slim and attractive design
- For determining the spindle centre when aligning workpieces on X, Y, and Z axes
- Adjustable scale
- Probe insert with predetermined break point at the far top
- Probes can be replaced by the user
- Supplied with standard probe insert



Predetermined break point

Shank $\varnothing$ mm	Length mm	Art.no.	€	Calibration Art.no.	€
12	128	558002 0010	219.50 189.00	077330 0001	97.50



SARA® Emulsion mist separator **Ultra-Eco compact**

- CFD-optimised high-performance separation system with a separation rate of up to 99.9999 %.
- Thanks to European ErP directives, energy savings of several thousand euros are possible compared to conventional air purifiers.
- for processing machines up to approx. 2m³ workspace volume
- Effective separation of liquid-based aerosols
- Compact design, direct mounting on the machine
- Robust and torsion-free housing made of stainless steel
- Integrated long-term HEPA filter
- Designed, constructed and manufactured in Germany
- **Supplied with:** Ultra-Eco compact emulsion mist separator, HEPA filter
- **Pricing:** ex works, including packaging

Compact and energy-efficient



Model	Volume flow min. m ³ /h	Volume flow max. m ³ /h	Dimensions L x W x H mm	Connection Ø mm	Weight kg	Noise level dB	Motor output kW	I(A)	Tension V	Art.no.	€
UEC-1000	200	1000	345 x 345 x 595	200	27	67	0.168	1.4	230	909090 0010	2,049.00

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



Single units

Model	Volume flow max. m ³ /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

SARA® Filter fleece

- For the protection of electrical and electronic equipment for industrial manufacturing plants and electric motors against oil mist and dust
- The inspection for replacing the filter fleece is visual. If the filter is covered in impurities, it must be replaced.
- Magnetic holder



Filter fleece for switch cabinets

- Each roll contains 110 sheets
- Sheet length 200 mm
- Appropriate for machine tools, cooling systems, control cabinets, robots, CNC machines

	Width mm	Art.no.	€
	200	991001 2012	35.50
	300	991001 3012	62.50
	400	991001 4006	72.00
	500	991001 5006	82.00
	600	991001 6006	91.50

**Up to 30 % savings
in maintenance costs!**



Filter fleece for compressors

- Each roll contains 60 sheets
- Sheet length 200 mm
- Appropriate for compressors, heat exchangers, air-conditioning units
- Other lengths up to 1500 mm available on request

	Width mm	Art.no.	€
	200	991003 2012	37.00
	300	991003 3012	65.50
	400	991003 4006	76.00
	500	991003 5006	86.50
	600	991003 6006	96.00

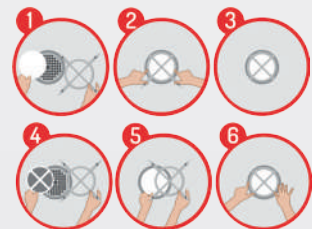


Filter fleece for electric motors

- Appropriate for electric motors
- Supplied with: 12 filter fleeces, 10 clamping rings, 1 plastic fastening system with magnet



Ø mm	Art.no.	€
100	991005 1036	40.00
120	991005 1236	42.50
150	991005 1518	48.50
175	991005 1718	53.00
200	991005 2008	57.00
230	991005 2308	65.50
260	991005 2605	72.00
300	991005 3005	78.50



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
- **Prices per pack**



Roll material

Type	Dimensions	Contents	Absorption capacity	Art.no.	€
GRP36201	91 cm x 15 m	1 roll	15 l	910105 3621	149.00
GRP36200	91 cm x 30 m	1 roll	50 l	910105 3620	275.00

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
- **Prices per pack**



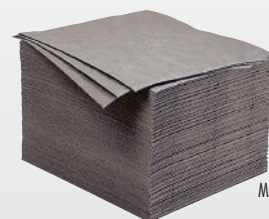
MAT 411

Roll material

Type	Dimensions	Contents	Absorption capacity	Art.no.	€
MAT 411	76 cm x 61 m	1 roll	161 l	910110 0045	199.00

Mats

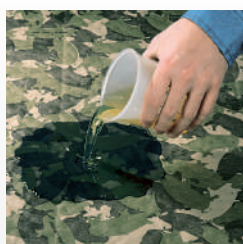
Type	Dimensions	Contents	Absorption capacity	Art.no.	€
MAT 412	38 x 51 cm	125 units in box	82 l	910101 0030	121.00



MAT 412

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
- **Prices per pack**



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



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



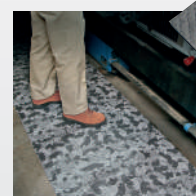
910101 0081



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	154.00
MAT 269	81 cm x 46 m	1 roll	180 l	Green	910110 0269	275.00
MAT 116	81 cm x 46 m	1 roll	179.5 l	Grey	910101 0022	275.00

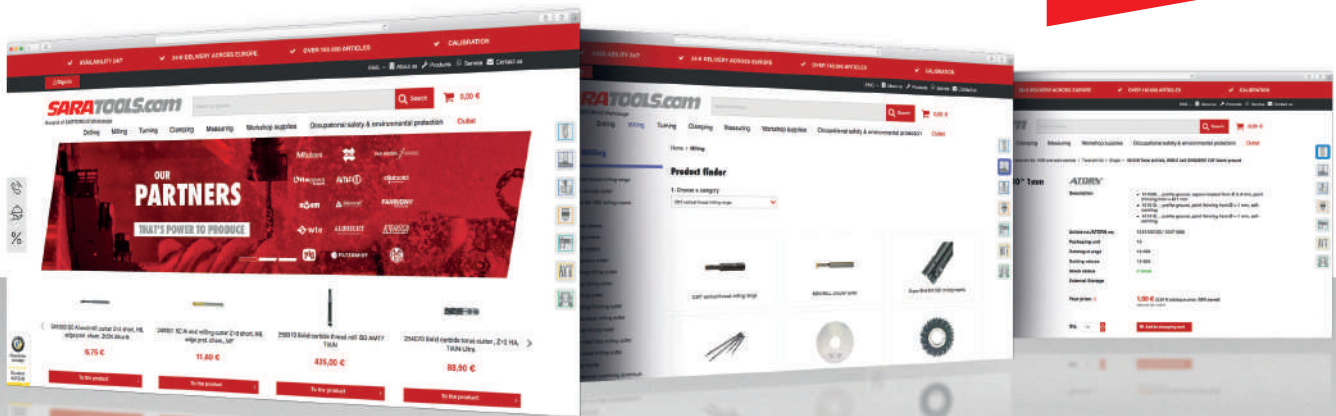


910101 0022



MAT 116

over 180,000 articles



Our multilingual online shop will have a brand new look **as of 1 January 2020**. At SARATOOLS.com we offer a high-quality package of services:

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



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