VERSION 03/2018 EU/VALID UNTIL 30 JUNE 2019

DRILLING

ATORN
UNI DRILL RANGE
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HARD DRILL
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UNI/VA
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HAHN+KOLB
GROUP

LET'S WORK TOGETHER.

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ATORN® UNI DRILL: RELIABLE APPLICATION FOR ALL MATERIALS

THE NEW ATORN UNIVERSAL DRILL RANGE OFFERS THE HIGHEST LEVEL OF PROCESS SAFETY WITH MAXIMUM FLEXIBILITY.

Significantly increase your efficiency while reducing your tool variety. ONE TOOL FOR ALL APPLICATIONS! Steel, stainless steel, aluminium or cast iron – the newly-developed geometry of the ATORN universal drill range offers perfect chip formation and reliable removal every time.

- STEEL MATERIALS
- STAINLESS STEELS
- NON-FERROUS METALS
- CAST MATERIALS

STEEL MATERIALS

St52 1.0570 | 9SMn28 1.0715 | St37 1.0038 | 42CrMo4 1.7225 | C45 1.0503 | 16MnCr5 1.7131 | C60 1.0601 | X155CrVMo12-1 1.2379 | C15 1.0401 | 36Mn5 1.1167 | C60E 1.1221 | X6Cr13 1.4000

STAINLESS STEELS

X5CrNiMo17-13-3 1.4301 | X2CrNiN18-10 1.4311 | X6CrNiMoTi 1.4571 | X5CrNiNb18-10 1.4546 | X10Cr13 1.4006 | X30Cr13 1.4028 | X10CrNiS18-9 1.4305

NON-FERROUS METALS

Al99 3.0205 | AlMgSi1 3.2315 | G-AlSi6Cu4 3.2151 | AlCuMg1 3.1325 | CuZn20 2.0250 | SE-Cu 2.0070 | CuZn37Al1 2.0510

CAST MATERIALS

GG10 0.6010 | GG20 0.6020 | GG25 0.6025 | GG30 0.6030 | GG35 0.6035 | GG40 0.6040 | GGG35.3 0.7033 | GGG-60 0.7060

THE NEW ATORN® UNI DRILL RANGE

MORE UNIVERSAL, MORE EFFICIENT, MORE RELIABLE.

The tool for virtually any application:
The new ATORN universal drill range can handle a range of materials. Thanks to the high-quality cutting material and new, innovative geometry, the drills offer outstanding drill performance. These drilling qualities cover a variety of different materials while maintaining the highest level of process safety and economic efficiency. Benefit from the enormous depth and breadth of this range.

UNIVERSAL USE
= One tool for all applications

UNIQUE GEOMETRY
= Reliable and precise results

NEWLY-DEVELOPED TiAlN PLUS COATING
= Maximum economic efficiency through a longer service life

THE NEW ATORN® UNI DRILL RANGE:

DISCOVER THE NEW ALL-ROUNDER FROM ATORN – THE FIRST CHOICE IN DRILLING

High wear resistance coupled with maximum toughness
through the newly-developed substrate

Significant increase in service life and reduced process temperature
thanks to newly-developed TiAlN Plus coating

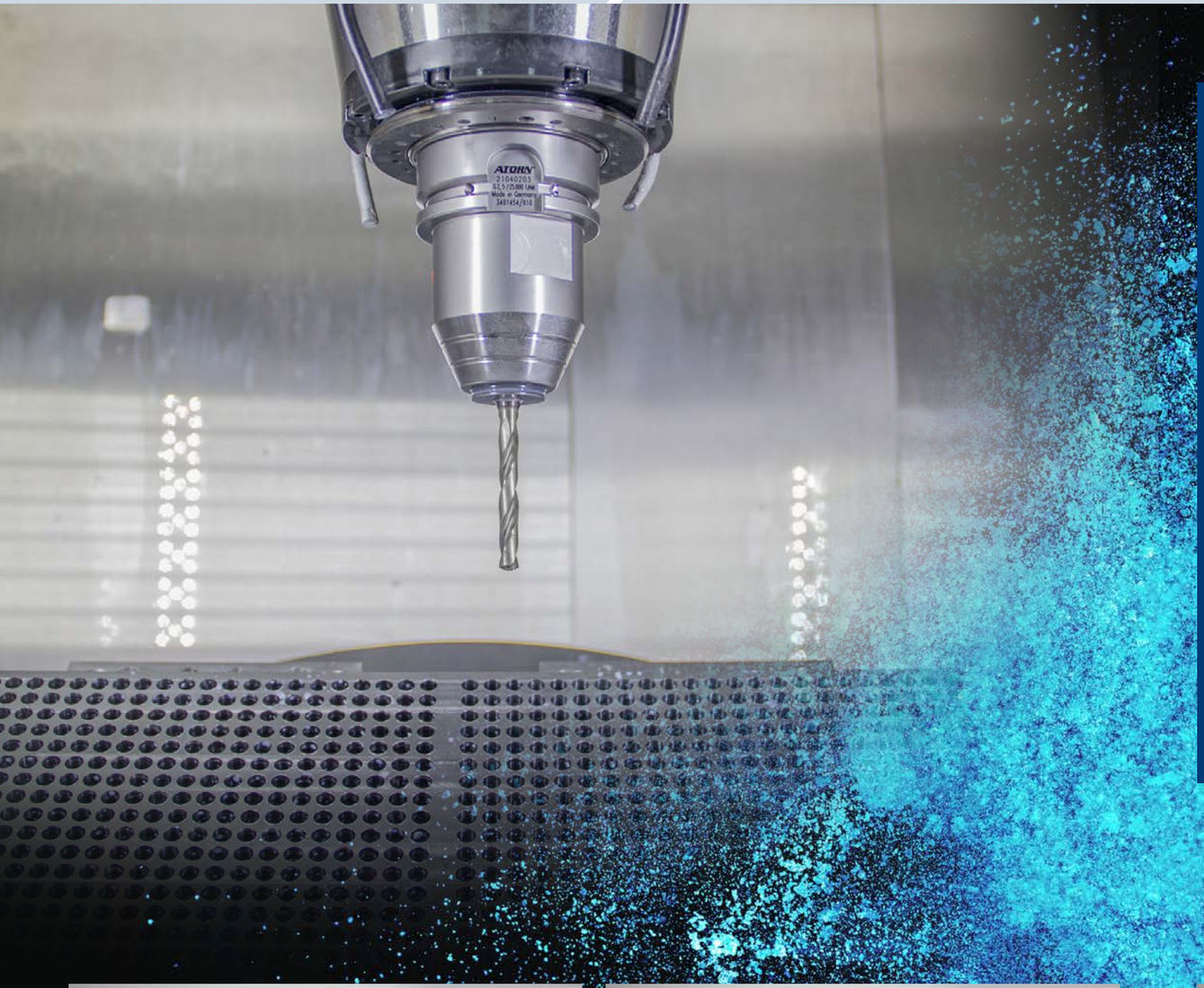
Low cutting forces
through straight main cutting edge

Perfect concentricity
through the h6 ground shaft

Less friction
through polished drill heels

Minimised breakages
through sturdy cutting geometry and micro finishing

Optimum chip removal
through the special, polished groove profile

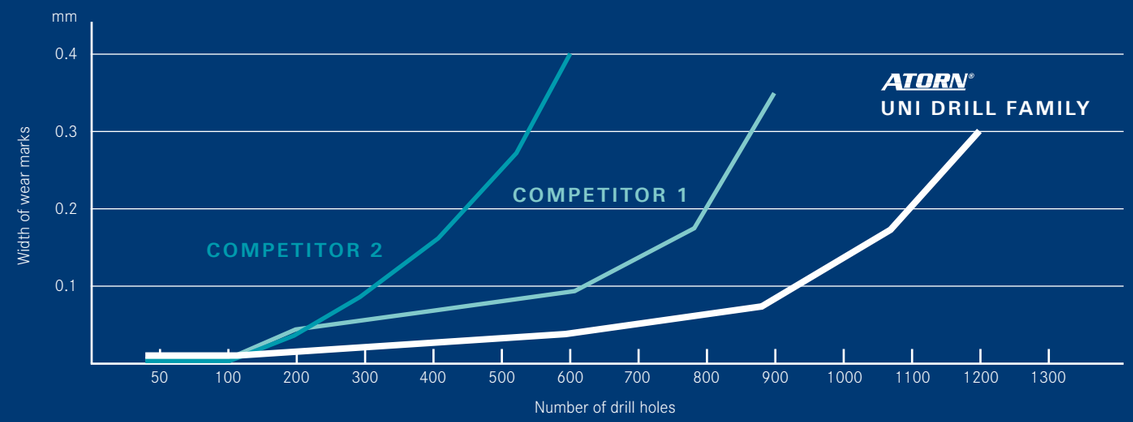


ATORN® UNI DRILL FAMILY

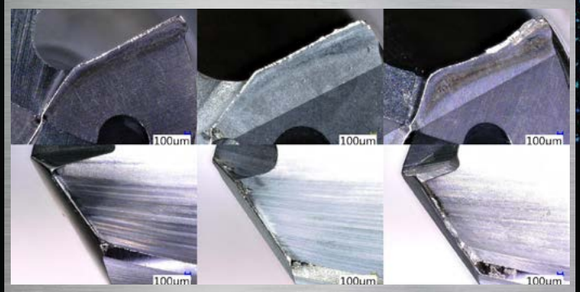
LIFE TEST WITH X155CrVMo12-1 (1.2379)

TEST CONDITIONS

Material to be processed:	X155CrVMo12-1 (1.2379)	Tool dimensions:	Ø 6.80 mm 5xD with IC
Face-milled flat material:	400 x 150 x 35	Workpiece clamping:	2x screw plug
Vc:	100 m/min	Machine:	Alzmetall GS800
f:	0.2 mm/U	Coolant concentration:	7.5%
Ap:	35-mm through-bore without feed reduction	Coolant pressure:	60 bar
		Tool clamping:	hydro-expansion chucks

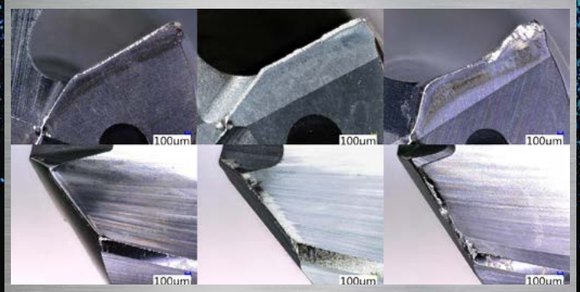


- Material: X155CrVMo12-1 (1.2379)
- Number of drill holes: 300 pieces
- Vc: 100 m/min
- f: 0.2 mm/U
- n: 5617 rpm
- Ap: 35-mm passage



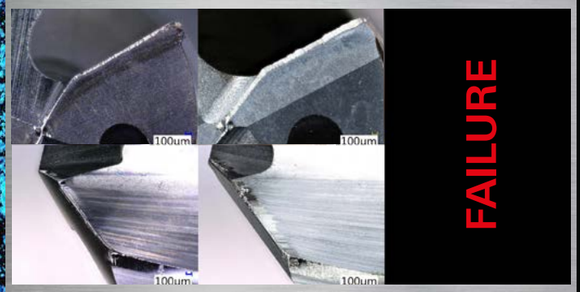
ATORN UNI | Competitor 1 | Competitor 2

- Material: X155CrVMo12-1 (1.2379)
- Number of drill holes: 600 pieces
- Vc: 100 m/min
- f: 0.2 mm/U
- n: 5617 rpm
- Ap: 35-mm passage



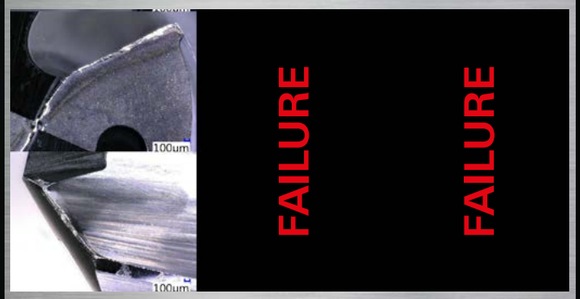
ATORN UNI | Competitor 1 | Competitor 2

- Material: X155CrVMo12-1 (1.2379)
- Number of drill holes: 900 pieces
- Vc: 100 m/min
- f: 0.2 mm/U
- n: 5617 rpm
- Ap: 35-mm passage



ATORN UNI | Competitor 1 | Competitor 2

- Material: X155CrVMo12-1 (1.2379)
- Number of drill holes: 1200 pieces
- Vc: 100 m/min
- f: 0.2 mm/U
- n: 5617 rpm
- Ap: 35-mm passage



ATORN UNI | Competitor 1 | Competitor 2

ATORN HIGH-PERFORMANCE DRILL SC TiAlN PLUS RANGE

Application:
For HPC drilling up to a strength of 1300 N/mm²

Design:
- Solid carbide TiAlNplus high-performance drill

Advantage:
- Economic drilling in a wide variety of materials with high cutting values
- Newly-developed geometry combined with a multi-layer coating that has been individually adapted for drilling ensures a significantly longer service life
- Cutting edge finishing reduces micro-fractures and increases the service life

ATORN® HIGH-PERFORMANCE DRILL SC TiAlN PLUS HPC 3xD WITH IC

VHM | TiAlN plus | 3xD | HPC UNI | 140° | IK | HA | HB

for universal use up to 1300 N/mm²

P. 40 P. 42

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11102... Ref. no.	EU 11102... Ref. no.
1.0	4	7	45	010	-
1.1	4	7	45	011	-
1.2	4	7	45	012	-
1.3	4	7	45	013	-
1.4	4	7	45	014	-

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11102... Ref. no.	EU 11102... Ref. no.
1.5	4	14	55	015	-
1.6	4	14	55	016	-
1.7	4	14	55	017	-
1.8	4	14	55	018	-
1.9	4	14	55	019	-

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11102... Ref. no.	EU 11102... Ref. no.
2.0	4	20	55	020	-
2.1	4	20	55	021	-
2.2	4	20	55	022	-
2.3	4	20	55	023	-
2.4	4	20	55	024	-
2.5	4	20	55	025	-
2.6	4	20	55	026	-
2.7	4	20	55	027	-
2.8	4	20	55	028	-
2.9	4	20	55	029	-
3.0	6	20	62	030	230
3.1	6	20	62	031	231
3.2	6	20	62	032	232
3.25	6	20	62	201	204
3.3	6	20	62	033	233
3.4	6	20	62	034	234
3.5	6	20	62	035	235
3.6	6	20	62	036	236
3.7	6	20	62	037	237
3.8	6	24	66	038	238
3.9	6	24	66	039	239
4.0	6	24	66	040	240
4.1	6	24	66	041	241
4.2	6	24	66	042	242
4.3	6	24	66	043	243
4.4	6	24	66	044	244
4.5	6	24	66	045	245
4.6	6	24	66	046	246
4.65	6	24	66	202	205
4.7	6	24	66	047	247
4.8	6	28	66	048	248
4.9	6	28	66	049	249
5.0	6	28	66	050	250
5.1	6	28	66	051	251
5.2	6	28	66	052	252
5.3	6	28	66	053	253
5.4	6	28	66	054	254
5.5	6	28	66	055	255
5.55	6	28	66	203	206
5.6	6	28	66	056	256
5.65	6	28	66	207	208
5.7	6	28	66	057	257
5.8	6	28	66	058	258
5.9	6	28	66	059	259
6.0	6	28	66	060	260
6.1	8	34	79	061	261
6.2	8	34	79	062	262
6.3	8	34	79	063	263
6.4	8	34	79	064	264
6.5	8	34	79	065	265
6.6	8	34	79	066	266
6.7	8	34	79	067	267
6.8	8	34	79	068	268
6.9	8	34	79	069	269
7.0	8	34	79	070	270
7.1	8	41	79	071	271
7.2	8	41	79	072	272
7.3	8	41	79	073	273
7.4	8	41	79	074	274
7.5	8	41	79	075	275
7.55	8	41	79	209	210
7.6	8	41	79	076	276
7.65	8	41	79	211	212
7.7	8	41	79	077	277
7.8	8	41	79	078	278
7.9	8	41	79	079	279
8.0	8	41	79	080	280
8.1	10	47	89	081	281
8.2	10	47	89	082	282

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11102... Ref. no.	EU 11102... Ref. no.
8.3	10	47	89	083	283
8.4	10	47	89	084	284
8.5	10	47	89	085	285
8.6	10	47	89	086	286
8.7	10	47	89	087	287
8.8	10	47	89	088	288
8.9	10	47	89	089	289
9.0	10	47	89	090	290
9.1	10	47	89	091	291
9.2	10	47	89	092	292
9.3	10	47	89	093	293
9.4	10	47	89	094	294
9.5	10	47	89	095	295
9.6	10	47	89	096	296
9.7	10	47	89	097	297
9.8	10	47	89	098	298
9.9	10	47	89	099	299
10.0	10	47	89	100	300
10.1	12	55	102	101	301
10.2	12	55	102	102	302
10.3	12	55	102	103	303
10.4	12	55	102	104	304
10.5	12	55	102	105	305
10.6	12	55	102	106	306
10.7	12	55	102	107	307
10.8	12	55	102	108	308
10.9	12	55	102	109	309
11.0	12	55	102	110	310
11.1	12	55	102	111	311
11.2	12	55	102	112	312
11.3	12	55	102	113	313
11.4	12	55	102	114	314
11.5	12	55	102	115	315
11.6	12	55	102	116	316
11.7	12	55	102	117	317
11.8	12	55	102	118	318
11.9	12	55	102	119	319
12.0	12	55	102	120	320
12.2	14	60	107	122	322
12.3	14	60	107	123	323
12.5	14	60	107	125	325
12.7	14	60	107	127	327
12.8	14	60	107	128	328
12.9	14	60	107	129	329
13.0	14	60	107	130	330
13.5	14	60	107	135	335
13.8	14	60	107	138	338
14.0	14	60	107	140	340
14.2	16	65	115	142	342
14.4	16	65	115	144	344
14.5	16	65	115	145	345
14.8	16	65	115	148	348
15.0	16	65	115	150	350
15.1	16	65	115	151	351
15.2	16	65	115	152	352
15.5	16	65	115	155	355
15.8	16	65	115	158	358
16.0	16	65	115	160	360
16.5	18	73	123	165	365
17.0	18	73	123	170	370
17.5	18	73	123	175	375
18.0	18	73	123	180	380
18.5	20	79	131	185	385
18.9	20	79	131	189	389
19.0	20	79	131	190	390
19.3	20	79	131	193	393
19.5	20	79	131	195	395
20.0	20	79	131	200	400

ATORN®

HIGH-PERFORMANCE DRILL SC TiAlN PLUS HPC 3xD WITHOUT IC

VHM | TiAlN plus | 3xD | HPC UNI | 140° | HA | HB

for universal use up to 1300 N/mm²

P. 40 P. 43

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	External	External
			Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm	EU 11104... Ref. no.	EU 11104... Ref. no.
1.0	4	7	45	010	-
1.1	4	7	45	011	-
1.2	4	7	45	012	-
1.3	4	7	45	013	-
1.4	4	7	45	014	-
1.5	4	14	55	015	-
1.6	4	14	55	016	-
1.7	4	14	55	017	-
1.8	4	14	55	018	-
1.9	4	14	55	019	-
2.0	4	20	55	020	-
2.1	4	20	55	021	-
2.2	4	20	55	022	-
2.3	4	20	55	023	-
2.4	4	20	55	024	-
2.5	4	20	55	025	-
2.6	4	20	55	026	-
2.7	4	20	55	027	-
2.8	4	20	55	028	-
2.9	4	20	55	029	-
3.0	6	20	62	030	230
3.1	6	20	62	031	231
3.2	6	20	62	032	232
3.25	6	20	62	201	204
3.3	6	20	62	033	233
3.4	6	20	62	034	234
3.5	6	20	62	035	235
3.6	6	20	62	036	236
3.7	6	20	62	037	237
3.8	6	24	66	038	238
3.9	6	24	66	039	239
4.0	6	24	66	040	240
4.1	6	24	66	041	241
4.2	6	24	66	042	242
4.3	6	24	66	043	243
4.4	6	24	66	044	244
4.5	6	24	66	045	245
4.6	6	24	66	046	246
4.65	6	24	66	202	205
4.7	6	24	66	047	247
4.8	6	28	66	048	248
4.9	6	28	66	049	249
5.0	6	28	66	050	250
5.1	6	28	66	051	251
5.2	6	28	66	052	252
5.3	6	28	66	053	253
5.4	6	28	66	054	254
5.5	6	28	66	055	255
5.55	6	28	66	203	206

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	External	External
			Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm	EU 11104... Ref. no.	EU 11104... Ref. no.
5.6	6	28	66	056	256
5.65	6	28	66	207	208
5.7	6	28	66	057	257
5.8	6	28	66	058	258
5.9	6	28	66	059	259
6.0	6	28	66	060	260
6.1	8	34	79	061	261
6.2	8	34	79	062	262
6.3	8	34	79	063	263
6.4	8	34	79	064	264
6.5	8	34	79	065	265
6.6	8	34	79	066	266
6.7	8	34	79	067	267
6.8	8	34	79	068	268
6.9	8	34	79	069	269
7.0	8	34	79	070	270
7.1	8	41	79	071	271
7.2	8	41	79	072	272
7.3	8	41	79	073	273
7.4	8	41	79	074	274
7.5	8	41	79	075	275
7.55	8	41	79	209	210
7.6	8	41	79	076	276
7.65	8	41	79	211	212
7.7	8	41	79	077	277
7.8	8	41	79	078	278
7.9	8	41	79	079	279
8.0	8	41	79	080	280
8.1	10	47	89	081	281
8.2	10	47	89	082	282
8.3	10	47	89	083	283
8.4	10	47	89	084	284
8.5	10	47	89	085	285
8.6	10	47	89	086	286
8.7	10	47	89	087	287
8.8	10	47	89	088	288
8.9	10	47	89	089	289
9.0	10	47	89	090	290
9.1	10	47	89	091	291
9.2	10	47	89	092	292
9.3	10	47	89	093	293
9.4	10	47	89	094	294
9.5	10	47	89	095	295
9.6	10	47	89	096	296
9.7	10	47	89	097	297
9.8	10	47	89	098	298
9.9	10	47	89	099	299
10.0	10	47	89	100	300
10.1	12	55	102	101	301

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	External	External
			Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm	EU 11104... Ref. no.	EU 11104... Ref. no.
10.2	12	55	102	102	302
10.3	12	55	102	103	303
10.4	12	55	102	104	304
10.5	12	55	102	105	305
10.6	12	55	102	106	306
10.7	12	55	102	107	307
10.8	12	55	102	108	308
10.9	12	55	102	109	309
11.0	12	55	102	110	310
11.1	12	55	102	111	311
11.2	12	55	102	112	312
11.3	12	55	102	113	313
11.4	12	55	102	114	314
11.5	12	55	102	115	315
11.6	12	55	102	116	316
11.7	12	55	102	117	317
11.8	12	55	102	118	318
11.9	12	55	102	119	319
12.0	12	55	102	120	320
12.2	14	60	107	122	322
12.5	14	60	107	125	325
12.8	14	60	107	128	328
13.0	14	60	107	130	330

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	External	External
			Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm	EU 11104... Ref. no.	EU 11104... Ref. no.
13.1	14	60	107	131	331
13.5	14	60	107	135	335
13.8	14	60	107	138	338
14.0	14	60	107	140	340
14.2	16	65	115	142	342
14.4	16	65	115	144	344
14.5	16	65	115	145	345
14.8	16	65	115	148	348
15.0	16	65	115	150	350
15.1	16	65	115	151	351
15.2	16	65	115	152	352
15.5	16	65	115	155	355
15.8	16	65	115	158	358
16.0	16	65	115	160	360
16.5	18	73	123	165	365
17.0	18	73	123	170	370
17.5	18	73	123	175	375
18.0	18	73	123	180	380
18.5	20	79	131	185	385
18.9	20	79	131	189	389
19.0	20	79	131	190	390
19.5	20	79	131	195	395
20.0	20	79	131	200	400

ATORN®

HIGH-PERFORMANCE DRILL SC TiAlN PLUS HPC 5xD WITH IC

VHM | TiAlN plus | 5xD | HPC UNI 140° | IK | HA | HB

for universal use up to 1300 N/mm²

P. 40 P. 42

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11105... Ref. no.	EU 11105... Ref. no.
1.0	4	8	55	010	-
1.1	4	12	55	011	-
1.2	4	12	55	012	-
1.3	4	12	55	013	-
1.4	4	12	55	014	-
1.5	4	12	55	015	-
1.6	4	16	55	016	-
1.7	4	16	55	017	-
1.8	4	16	55	018	-
1.9	4	16	55	019	-
2.0	4	21	57	020	-
2.1	4	21	57	021	-
2.2	4	21	57	022	-
2.3	4	21	57	023	-
2.4	4	21	57	024	-
2.5	4	21	57	025	-
2.6	4	21	57	026	-
2.7	4	21	57	027	-
2.8	4	21	57	028	-
2.9	4	21	57	029	-
3.0	6	28	66	030	230
3.1	6	28	66	031	231
3.2	6	28	66	032	232
3.25	6	28	66	201	204
3.3	6	28	66	033	233
3.4	6	28	66	034	234
3.5	6	28	66	035	235
3.6	6	28	66	036	236
3.7	6	28	66	037	237
3.8	6	36	74	038	238
3.85	6	36	74	213	214
3.9	6	36	74	039	239
4.0	6	36	74	040	240
4.1	6	36	74	041	241
4.2	6	36	74	042	242
4.3	6	36	74	043	243
4.4	6	36	74	044	244
4.5	6	36	74	045	245
4.6	6	36	74	046	246
4.65	6	36	74	202	205
4.7	6	36	74	047	247
4.8	6	44	82	048	248
4.9	6	44	82	049	249
5.0	6	44	82	050	250
5.1	6	44	82	051	251
5.2	6	44	82	052	252
5.3	6	44	82	053	253
5.4	6	44	82	054	254
5.5	6	44	82	055	255
5.55	6	44	82	203	206

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11105... Ref. no.	EU 11105... Ref. no.
5.6	6	44	82	056	256
5.65	6	44	82	207	208
5.7	6	44	82	057	257
5.8	6	44	82	058	258
5.9	6	44	82	059	259
6.0	6	44	82	060	260
6.1	8	53	91	061	261
6.2	8	53	91	062	262
6.3	8	53	91	063	263
6.4	8	53	91	064	264
6.5	8	53	91	065	265
6.6	8	53	91	066	266
6.7	8	53	91	067	267
6.8	8	53	91	068	268
6.9	8	53	91	069	269
7.0	8	53	91	070	270
7.1	8	53	91	071	271
7.2	8	53	91	072	272
7.3	8	53	91	073	273
7.4	8	53	91	074	274
7.5	8	53	91	075	275
7.55	8	53	91	209	210
7.6	8	53	91	076	276
7.65	8	53	91	211	212
7.7	8	53	91	077	277
7.8	8	53	91	078	278
7.9	8	53	91	079	279
8.0	8	53	91	080	280
8.1	10	61	103	081	281
8.2	10	61	103	082	282
8.3	10	61	103	083	283
8.4	10	61	103	084	284
8.5	10	61	103	085	285
8.6	10	61	103	086	286
8.7	10	61	103	087	287
8.8	10	61	103	088	288
8.9	10	61	103	089	289
9.0	10	61	103	090	290
9.1	10	61	103	091	291
9.2	10	61	103	092	292
9.3	10	61	103	093	293
9.4	10	61	103	094	294
9.5	10	61	103	095	295
9.55	10	61	103	215	216
9.6	10	61	103	096	296
9.7	10	61	103	097	297
9.8	10	61	103	098	298
9.9	10	61	103	099	299
10.0	10	61	103	100	300
10.1	12	71	118	101	301

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11105... Ref. no.	EU 11105... Ref. no.
10.2	12	71	118	102	302
10.3	12	71	118	103	303
10.4	12	71	118	104	304
10.5	12	71	118	105	305
10.6	12	71	118	106	306
10.7	12	71	118	107	307
10.8	12	71	118	108	308
10.9	12	71	118	109	309
11.0	12	71	118	110	310
11.1	12	71	118	111	311
11.2	12	71	118	112	312
11.3	12	71	118	113	313
11.4	12	71	118	114	314
11.5	12	71	118	115	315
11.6	12	71	118	116	316
11.7	12	71	118	117	317
11.8	12	71	118	118	318
11.9	12	71	118	119	319
12.0	12	71	118	120	320
12.1	14	77	124	121	321
12.2	14	77	124	122	322
12.4	14	77	124	124	324
12.5	14	77	124	125	325
12.6	14	77	124	126	326
12.8	14	77	124	128	328
13.0	14	77	124	130	330
13.1	14	77	124	131	331
13.2	14	77	124	132	332
13.3	14	77	124	133	333
13.5	14	77	124	135	335
13.8	14	77	124	138	338

			Shank	Straight shank, HA	HB straight shank
			Surface	TiAlN plus	TiAlN plus
			Cooling	Internal	Internal
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11105... Ref. no.	EU 11105... Ref. no.
14.0	14	77	124	140	340
14.2	16	83	133	142	342
14.3	16	83	133	143	343
14.4	16	83	133	144	344
14.5	16	83	133	145	345
14.8	16	83	133	148	348
15.0	16	83	133	150	350
15.1	16	83	133	151	351
15.2	16	83	133	152	352
15.25	16	83	133	217	218
15.3	16	83	133	153	353
15.5	16	83	133	155	355
15.8	16	83	133	158	358
16.0	16	83	133	160	360
16.2	18	93	143	162	362
16.3	18	93	143	163	363
16.5	18	93	143	165	365
16.8	18	93	143	168	368
17.0	18	93	143	170	370
17.3	18	93	143	173	373
17.5	18	93	143	175	375
18.0	18	93	143	180	380
18.5	20	101	153	185	385
18.9	20	101	153	189	389
19.0	20	101	153	190	390
19.2	20	101	153	192	392
19.3	20	101	153	193	393
19.5	20	101	153	195	395
19.7	20	101	153	197	397
20.0	20	101	153	200	400

ATORN®

HIGH-PERFORMANCE DRILL SC TiAlN PLUS HPC 5xD WITHOUT IC

VHM | TiAlN plus | 5xD | HPC UNI | 140° | HA | HB

for universal use up to 1300 N/mm²

P. 40 P. 43

				Shank	Straight shank, HA	HB straight shank
				Surface	TiAlN plus	TiAlN plus
				Cooling	External	External
				Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm		EU 11107... Ref. no.	EU 11107... Ref. no.
1.0	4	8	55		010	-
1.1	4	12	55		011	-
1.2	4	12	55		012	-
1.3	4	12	55		013	-
1.4	4	12	55		014	-
1.5	4	12	55		015	-
1.6	4	16	55		016	-
1.7	4	16	55		017	-
1.8	4	16	55		018	-
1.9	4	16	55		019	-
2.0	4	21	57		020	-
2.05	4	21	57		219	-
2.1	4	21	57		021	-
2.2	4	21	57		022	-
2.3	4	21	57		023	-
2.4	4	21	57		024	-
2.5	4	21	57		025	-
3.0	6	28	66		030	230
3.1	6	28	66		031	231
3.2	6	28	66		032	232
3.25	6	28	66		201	204
3.3	6	28	66		033	233
3.4	6	28	66		034	234
3.5	6	28	66		035	235
3.6	6	28	66		036	236
3.7	6	28	66		037	237
3.8	6	36	74		038	238
3.9	6	36	74		039	239
4.0	6	36	74		040	240
4.1	6	36	74		041	241
4.2	6	36	74		042	242
4.3	6	36	74		043	243
4.4	6	36	74		044	244
4.5	6	36	74		045	245
4.6	6	36	74		046	246
4.65	6	36	74		202	205
4.7	6	36	74		047	247
4.8	6	44	82		048	248
4.9	6	44	82		049	249
5.0	6	44	82		050	250
5.1	6	44	82		051	251
5.2	6	44	82		052	252
5.3	6	44	82		053	253
5.4	6	44	82		054	254
5.5	6	44	82		055	255
5.55	6	44	82		203	206
5.6	6	44	82		056	256
5.65	6	44	82		207	208
5.7	6	44	82		057	257
5.8	6	44	82		058	258

				Shank	Straight shank, HA	HB straight shank
				Surface	TiAlN plus	TiAlN plus
				Cooling	External	External
				Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm		EU 11107... Ref. no.	EU 11107... Ref. no.
5.9	6	44	82		059	259
6.0	6	44	82		060	260
6.1	8	53	91		061	261
6.2	8	53	91		062	262
6.3	8	53	91		063	263
6.4	8	53	91		064	264
6.5	8	53	91		065	265
6.6	8	53	91		066	266
6.7	8	53	91		067	267
6.8	8	53	91		068	268
6.9	8	53	91		069	269
7.0	8	53	91		070	270
7.1	8	53	91		071	271
7.2	8	53	91		072	272
7.3	8	53	91		073	273
7.4	8	53	91		074	274
7.5	8	53	91		075	275
7.55	8	53	91		209	210
7.6	8	53	91		076	276
7.65	8	53	91		211	212
7.7	8	53	91		077	277
7.8	8	53	91		078	278
7.9	8	53	91		079	279
8.0	8	53	91		080	280
8.1	10	61	103		081	281
8.2	10	61	103		082	282
8.3	10	61	103		083	283
8.4	10	61	103		084	284
8.5	10	61	103		085	285
8.6	10	61	103		086	286
8.7	10	61	103		087	287
8.8	10	61	103		088	288
8.9	10	61	103		089	289
9.0	10	61	103		090	290
9.1	10	61	103		091	291
9.2	10	61	103		092	292
9.3	10	61	103		093	293
9.4	10	61	103		094	294
9.5	10	61	103		095	295
9.6	10	61	103		096	296
9.7	10	61	103		097	297
9.8	10	61	103		098	298
9.9	10	61	103		099	299
10.0	10	61	103		100	300
10.1	12	71	118		101	301
10.2	12	71	118		102	302
10.3	12	71	118		103	303
10.4	12	71	118		104	304
10.5	12	71	118		105	305
10.6	12	71	118		106	306

				Shank	Straight shank, HA	HB straight shank
				Surface	TiAlN plus	TiAlN plus
				Cooling	External	External
				Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm		EU 11107... Ref. no.	EU 11107... Ref. no.
10.7	12	71	118		107	307
10.8	12	71	118		108	308
10.9	12	71	118		109	309
11.0	12	71	118		110	310
11.1	12	71	118		111	311
11.2	12	71	118		112	312
11.3	12	71	118		113	313
11.4	12	71	118		114	314
11.5	12	71	118		115	315
11.6	12	71	118		116	316
11.7	12	71	118		117	317
11.8	12	71	118		118	318
11.9	12	71	118		119	319
12.0	12	71	118		120	320
12.1	14	77	124		121	321
12.2	14	77	124		122	322
12.5	14	77	124		125	325
12.8	14	77	124		128	328
13.0	14	77	124		130	330
13.2	14	77	124		132	332
13.5	14	77	124		135	335

				Shank	Straight shank, HA	HB straight shank
				Surface	TiAlN plus	TiAlN plus
				Cooling	External	External
				Tolerance of cutting Ø	h7	h7
mm	mm	mm	mm		EU 11107... Ref. no.	EU 11107... Ref. no.
13.8	14	77	124		138	338
14.0	14	77	124		140	340
14.2	16	83	133		142	342
14.4	16	83	133		144	344
14.5	16	83	133		145	345
14.8	16	83	133		148	348
15.0	16	83	133		150	350
15.2	16	83	133		152	352
15.5	16	83	133		155	355
15.8	16	83	133		158	358
16.0	16	83	133		160	360
16.5	18	93	143		165	365
17.0	18	93	143		170	370
17.5	18	93	143		175	375
18.0	18	93	143		180	380
18.5	20	101	153		185	385
18.9	20	101	153		189	389
19.0	20	101	153		190	390
19.5	20	101	153		195	395
20.0	20	101	153		200	400

ATORN®

HIGH-PERFORMANCE DRILL SC TiAIN PLUS HPC 8xD WITH IC

VHM | TiAIN plus | 8xD | HPC UNI | 135° | IK | HA

for universal use up to 1300 N/mm²

High process reliability, even in extreme depths

through four drill heels

P. 40 P. 44

			Shank	Straight shank, HA
			Surface	TiAIN plus
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11108... Ref. no.
3.0	6	34	72	030
3.1	6	34	72	031
3.2	6	34	72	032
3.3	6	34	72	033
3.4	6	34	72	034
3.5	6	34	72	035
3.6	6	34	72	036
3.7	6	34	72	037
3.8	6	43	81	038
3.9	6	43	81	039
4.0	6	43	81	040
4.1	6	43	81	041
4.2	6	43	81	042
4.3	6	43	81	043
4.4	6	43	81	044
4.5	6	43	81	045
4.6	6	43	81	046
4.7	6	43	81	047
4.8	6	57	95	048
4.9	6	57	95	049
5.0	6	57	95	050
5.1	6	57	95	051
5.2	6	57	95	052
5.3	6	57	95	053
5.4	6	57	95	054
5.5	6	57	95	055
5.6	6	57	95	056
5.7	6	57	95	057
5.8	6	57	95	058
5.9	6	57	95	059
6.0	6	57	95	060
6.1	8	76	114	061
6.2	8	76	114	062
6.3	8	76	114	063
6.4	8	76	114	064
6.5	8	76	114	065
6.6	8	76	114	066
6.7	8	76	114	067
6.8	8	76	114	068
6.9	8	76	114	069
7.0	8	76	114	070
7.1	8	76	114	071
7.2	8	76	114	072
7.3	8	76	114	073
7.4	8	76	114	074
7.5	8	76	114	075
7.6	8	76	114	076
7.7	8	76	114	077

			Shank	Straight shank, HA
			Surface	TiAIN plus
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11108... Ref. no.
7.8	8	76	114	078
7.9	8	76	114	079
8.0	8	76	114	080
8.1	10	95	142	081
8.2	10	95	142	082
8.3	10	95	142	083
8.4	10	95	142	084
8.5	10	95	142	085
8.6	10	95	142	086
8.7	10	95	142	087
8.8	10	95	142	088
8.9	10	95	142	089
9.0	10	95	142	090
9.1	10	95	142	091
9.2	10	95	142	092
9.3	10	95	142	093
9.4	10	95	142	094
9.5	10	95	142	095
9.6	10	95	142	096
9.7	10	95	142	097
9.8	10	95	142	098
9.9	10	95	142	099
10.0	10	95	142	100
10.2	12	114	162	102
10.5	12	114	162	105
10.8	12	114	162	108
11.0	12	114	162	110
11.5	12	114	162	115
11.8	12	114	162	118
12.0	12	114	162	120
12.2	14	131	178	122
12.5	14	131	178	125
13.0	14	131	178	130
13.5	14	131	178	135
14.0	14	131	178	140
14.5	16	152	203	145
15.0	16	152	203	150
15.5	16	152	203	155
16.0	16	152	203	160
16.5	18	171	222	165
17.0	18	171	222	170
17.5	18	171	222	175
18.0	18	171	222	180
18.5	20	190	243	185
19.0	20	190	243	190
19.5	20	190	243	195
20.0	20	190	243	200

ATORN®

HIGH-PERFORMANCE DRILL SC TiAIN PLUS HPC 12xD WITH IC

VHM | TiAIN plus | 12xD | HPC UNI | 135° | IK | HA

for universal use up to 1300 N/mm²

High process reliability, even in extreme depths

through four drill heels

P. 40 P. 45

			Shank	Straight shank, HA
			Surface	TiAIN plus
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11110... Ref. no.
3.0	6	54	92	030
3.1	6	54	92	031
3.2	6	54	92	032
3.3	6	54	92	033
3.4	6	54	92	034
3.5	6	54	92	035
3.6	6	54	92	036
3.7	6	54	92	037
3.8	6	64	102	038
3.9	6	64	102	039
4.0	6	64	102	040
4.1	6	64	102	041
4.2	6	64	102	042
4.3	6	64	102	043
4.4	6	64	102	044
4.5	6	64	102	045
4.6	6	64	102	046
4.7	6	64	102	047
4.8	6	78	116	048
4.9	6	78	116	049
5.0	6	78	116	050
5.1	6	78	116	051
5.2	6	78	116	052
5.3	6	78	116	053
5.4	6	78	116	054
5.5	6	78	116	055
5.6	6	78	116	056
5.7	6	78	116	057
5.8	6	78	116	058
5.9	6	78	116	059
6.0	6	78	116	060
6.1	8	108	146	061
6.2	8	108	146	062
6.3	8	108	146	063
6.4	8	108	146	064
6.5	8	108	146	065
6.6	8	108	146	066
6.7	8	108	146	067
6.8	8	108	146	068
6.9	8	108	146	069
7.0	8	108	146	070
7.1	8	108	146	071
7.2	8	108	146	072
7.3	8	108	146	073
7.4	8	108	146	074
7.5	8	108	146	075
7.6	8	108	146	076
7.7	8	108	146	077
7.8	8	108	146	078
7.9	8	108	146	079

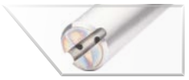
			Shank	Straight shank, HA
			Surface	TiAIN plus
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11110... Ref. no.
8.0	8	108	146	080
8.1	10	120	162	081
8.2	10	120	162	082
8.3	10	120	162	083
8.4	10	120	162	084
8.5	10	120	162	085
8.6	10	120	162	086
8.7	10	120	162	087
8.8	10	120	162	088
8.9	10	120	162	089
9.0	10	120	162	090
9.1	10	120	162	091
9.2	10	120	162	092
9.3	10	120	162	093
9.4	10	120	162	094
9.5	10	120	162	095
9.6	10	120	162	096
9.7	10	120	162	097
9.8	10	120	162	098
9.9	10	120	162	099
10.0	10	120	162	100
10.2	12	156	204	102
10.5	12	156	204	105
10.8	12	156	204	108
11.0	12	156	204	110
11.5	12	156	204	115
11.8	12	156	204	118
12.0	12	156	204	120
12.5	14	182	230	125
12.7	14	182	230	127
12.8	14	182	230	128
13.0	14	182	230	130
13.5	14	182	230	135
13.8	14	182	230	138
14.0	14	182	230	140
14.5	16	208	260	145
14.8	16	208	260	148
15.0	16	208	260	150
15.5	16	208	260	155
15.8	16	208	260	158
16.0	16	208	260	160
16.5	18	234	285	165
17.0	18	234	285	170
17.5	18	234	285	175
18.0	18	234	285	180
18.5	20	258	310	185
19.0	20	258	310	190
19.5	20	258	310	195
20.0	20	258	310	200

ATORN ULTRA M SOLID CARBIDE HIGH-PERFORMANCE DRILL RANGE

Application:
For HPC boring in stainless steel, titanium alloys, nickel alloys and special alloys.

Design:
- ULTRA M solid carbide high-performance drill

Advantage:
- Innovative cutting geometry with extremely smooth cutting edge
- Newly-developed form-fitting ULTRA M coating for improved service life
- Cutting edge preparation minimises micro-fractures on the cutting edge



ATORN® ULTRA M SOLID CARBIDE HIGH-PERFORMANCE DRILL HPC 3xD

VHM | ULTRA M | 3xD | HPC VA 140° | IK | HA | HB

For use in stainless steel and special alloys

P. 40 P. 45

			Shank	Straight shank, HA	HB straight shank
			Surface	ULTRA M	ULTRA M
			Cooling	Internal	Internal
	Tolerance of cutting Ø			m7	m7
mm	mm	mm	mm	EU 11142... Ref. no.	EU 11142... Ref. no.
3	6	20	62	030	230
3.1	6	20	62	031	231
3.2	6	20	62	032	232
3.25	6	20	62	201	204
3.3	6	20	62	033	233
3.4	6	20	62	034	234
3.5	6	20	62	035	235
3.6	6	20	62	036	236
3.7	6	20	62	037	237
3.8	6	24	66	038	238
3.9	6	24	66	039	239
4	6	24	66	040	240
4.1	6	24	66	041	241
4.2	6	24	66	042	242
4.3	6	24	66	043	243
4.4	6	24	66	044	244

			Shank	Straight shank, HA	HB straight shank
			Surface	ULTRA M	ULTRA M
			Cooling	Internal	Internal
	Tolerance of cutting Ø			m7	m7
mm	mm	mm	mm	EU 11142... Ref. no.	EU 11142... Ref. no.
4.5	6	24	66	045	245
4.6	6	24	66	046	246
4.65	6	24	66	202	205
4.7	6	28	66	047	247
4.8	6	28	66	048	248
4.9	6	28	66	049	249
5	6	28	66	050	250
5.1	6	28	66	051	251
5.2	6	28	66	052	252
5.3	6	28	66	053	253
5.4	6	28	66	054	254
5.5	6	28	66	055	255
5.55	6	28	66	203	206
5.6	6	28	66	056	256
5.7	6	28	66	057	257
5.8	6	28	66	058	258

			Shank	Straight shank, HA	HB straight shank
			Surface	ULTRA M	ULTRA M
			Cooling	Internal	Internal
	Tolerance of cutting Ø			m7	m7
mm	mm	mm	mm	EU 11142... Ref. no.	EU 11142... Ref. no.
5.9	6	28	66	059	259
6	6	28	66	060	260
6.1	8	34	79	061	261
6.2	8	34	79	062	262
6.3	8	34	79	063	263
6.4	8	34	79	064	264
6.5	8	34	79	065	265
6.6	8	34	79	066	266
6.7	8	34	79	067	267
6.8	8	34	79	068	268
6.9	8	34	79	069	269
7	8	34	79	070	270
7.1	8	41	79	071	271
7.2	8	41	79	072	272
7.3	8	41	79	073	273
7.4	8	41	79	074	274
7.5	8	41	79	075	275
7.6	8	41	79	076	276
7.7	8	41	79	077	277
7.8	8	41	79	078	278
7.9	8	41	79	079	279
8	8	41	79	080	280
8.1	10	47	89	081	281
8.2	10	47	89	082	282
8.3	10	47	89	083	283
8.4	10	47	89	084	284
8.5	10	47	89	085	285
8.6	10	47	89	086	286
8.7	10	47	89	087	287
8.8	10	47	89	088	288
8.9	10	47	89	089	289
9	10	47	89	090	290
9.1	10	47	89	091	291
9.2	10	47	89	092	292
9.25	10	47	89	601	602
9.3	10	47	89	093	293
9.4	10	47	89	094	294
9.5	10	47	89	095	295
9.6	10	47	89	096	296
9.7	10	47	89	097	297
9.8	10	47	89	098	298

			Shank	Straight shank, HA	HB straight shank
			Surface	ULTRA M	ULTRA M
			Cooling	Internal	Internal
	Tolerance of cutting Ø			m7	m7
mm	mm	mm	mm	EU 11142... Ref. no.	EU 11142... Ref. no.
9.9	10	47	89	099	299
10	10	47	89	100	300
10.1	12	55	102	101	301
10.2	12	55	102	102	302
10.3	12	55	102	103	303
10.4	12	55	102	104	304
10.5	12	55	102	105	305
10.6	12	55	102	106	306
10.7	12	55	102	107	307
10.8	12	55	102	108	308
10.9	12	55	102	109	309
11	12	55	102	110	310
11.1	12	55	102	111	311
11.2	12	55	102	112	312
11.3	12	55	102	113	313
11.4	12	55	102	114	314
11.5	12	55	102	115	315
11.6	12	55	102	116	316
11.7	12	55	102	117	317
11.8	12	55	102	118	318
11.9	12	55	102	119	319
12	12	55	102	120	320
12.5	14	60	107	125	325
12.7	14	60	107	127	327
13	14	60	107	130	330
13.5	14	60	107	135	335
14	14	60	107	140	340
14.5	16	65	115	145	345
15	16	65	115	150	350
15.5	16	65	115	155	355
16	16	65	115	160	360
16.5	18	73	123	165	365
16.9	18	73	123	169	369
17	18	73	123	170	370
17.5	18	73	123	175	375
18	18	73	123	180	380
18.5	20	79	131	185	385
18.9	20	79	131	189	389
19	20	79	131	190	390
19.5	20	79	131	195	395
20	20	79	131	200	400

ATORN® ULTRA M SOLID CARBIDE HIGH-PERFORMANCE DRILL HPC 5xD

VHM | ULTRA M | 5xD | HPC VA | 140° | IK | HA | HB

For use in stainless steel and special alloys

P. 40 P. 45

				Shank	Straight shank, HA	HB straight shank
				Surface	ULTRA M	ULTRA M
				Cooling	Internal	Internal
				Tolerance of cutting Ø	m7	m7
mm	h6 mm	mm	mm		EU 11147... Ref. no.	EU 11147... Ref. no.
3	6	28	66		030	230
3.1	6	28	66		031	231
3.2	6	28	66		032	232
3.25	6	28	66		201	204
3.3	6	28	66		033	233
3.4	6	28	66		034	234
3.5	6	28	66		035	235
3.6	6	28	66		036	236
3.7	6	28	66		037	237
3.8	6	36	74		038	238
3.9	6	36	74		039	239
4	6	36	74		040	240
4.1	6	36	74		041	241
4.2	6	36	74		042	242
4.3	6	36	74		043	243
4.4	6	36	74		044	244
4.5	6	36	74		045	245
4.6	6	36	74		046	246
4.65	6	36	74		202	205
4.7	6	36	74		047	247
4.8	6	44	82		048	248
4.9	6	44	82		049	249
5	6	44	82		050	250
5.1	6	44	82		051	251
5.2	6	44	82		052	252
5.3	6	44	82		053	253
5.4	6	44	82		054	254
5.5	6	44	82		055	255
5.55	6	44	82		203	206
5.6	6	44	82		056	256
5.7	6	44	82		057	257
5.8	6	44	82		058	258
5.9	6	44	82		059	259
6	6	44	82		060	260
6.1	8	53	91		061	261
6.2	8	53	91		062	262
6.3	8	53	91		063	263
6.4	8	53	91		064	264
6.5	8	53	91		065	265
6.6	8	53	91		066	266
6.7	8	53	91		067	267
6.8	8	53	91		068	268
6.9	8	53	91		069	269
7	8	53	91		070	270
7.1	8	53	91		071	271
7.2	8	53	91		072	272
7.3	8	53	91		073	273
7.4	8	53	91		074	274
7.5	8	53	91		075	275
7.6	8	53	91		076	276
7.7	8	53	91		077	277
7.8	8	53	91		078	278

				Shank	Straight shank, HA	HB straight shank
				Surface	ULTRA M	ULTRA M
				Cooling	Internal	Internal
				Tolerance of cutting Ø	m7	m7
mm	h6 mm	mm	mm		EU 11147... Ref. no.	EU 11147... Ref. no.
7.9	8	53	91		079	279
8	8	53	91		080	280
8.1	10	61	103		081	281
8.2	10	61	103		082	282
8.3	10	61	103		083	283
8.4	10	61	103		084	284
8.5	10	61	103		085	285
8.6	10	61	103		086	286
8.7	10	61	103		087	287
8.8	10	61	103		088	288
8.9	10	61	103		089	289
9	10	61	103		090	290
9.1	10	61	103		091	291
9.2	10	61	103		092	292
9.3	10	61	103		093	293
9.4	10	61	103		094	294
9.5	10	61	103		095	295
9.6	10	61	103		096	296
9.7	10	61	103		097	297
9.8	10	61	103		098	298
9.9	10	61	103		099	299
10	10	61	103		100	300
10.2	12	71	118		102	302
10.5	12	71	118		105	305
10.8	12	71	118		108	308
11	12	71	118		110	310
11.2	12	71	118		112	312
11.5	12	71	118		115	315
11.8	12	71	118		118	318
12	12	71	118		120	320
12.2	14	77	124		122	322
12.5	14	77	124		125	325
12.7	14	77	124		127	327
13	14	77	124		130	330
13.5	14	77	124		135	335
14	14	77	124		140	340
14.2	16	83	133		142	342
14.5	16	83	133		145	345
15	16	83	133		150	350
15.5	16	83	133		155	355
16	16	83	133		160	360
16.5	18	93	143		165	365
16.9	18	93	143		169	369
17	18	93	143		170	370
17.5	18	93	143		175	375
18	18	93	143		180	380
18.5	20	101	153		185	385
18.9	20	101	153		189	389
19	20	101	153		190	390
19.5	20	101	153		195	395
20	20	101	153		200	400

ATORN SOLID CARBIDE HIGH-PERFORMANCE DRILL ALU CC RANGE

Application:
For HPC boring in non-ferrous metals and cast iron.

Design:
- Solid carbide high-performance drill ALU CC

Advantage:
- Innovative cutting geometry with 15° twist angle and six drill heels ensure optimum chip removal
- Six drill heels ensure boring accuracy even at high cutting speeds

note:
Required coolant pressure: minimum 12 bar

ATORN® SOLID CARBIDE HIGH-PERFORMANCE DRILL ALU CC HPC 5xD

VHM | CC | 5xD | HPC ALU | 135° | IK | HA

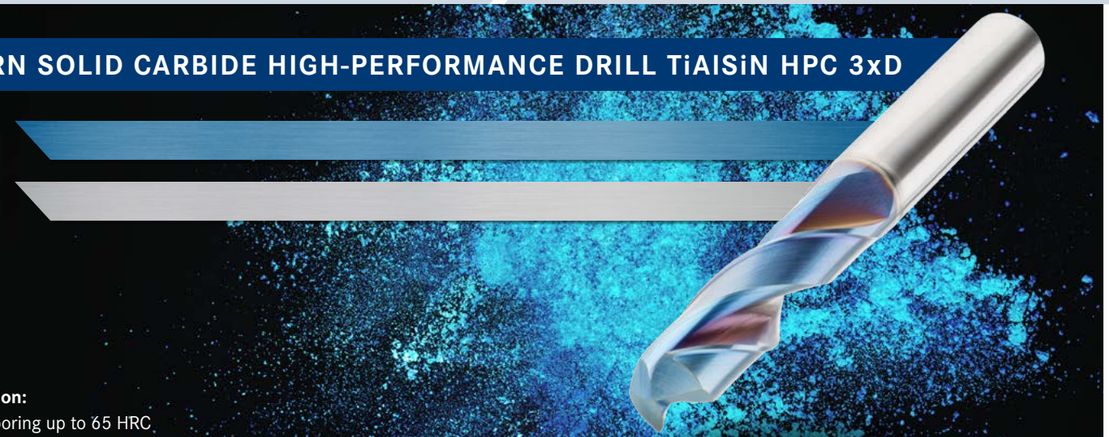
For use in non-ferrous metals

P. 40 P. 46

				Shank	Straight shank, HA
				Surface	CC
				Cooling	Internal
				Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm		EU 11158... Ref. no.
2.5	4	21	57		025
2.8	4	21	57		028
3	6	28	66		030
3.25	6	28	66		232
3.3	6	28	66		033
3.5	6	28	66		035
3.8	6	36	74		038
4	6	36	74		040
4.2	6	36	74		042
4.5	6	36	74		045
4.6	6	36	74		046
4.65	6	36	74		246
4.8	6	44	82		048
5	6	44	82		050
5.5	6	44	82		055
5.8	6	44	82		058
6	6	44	82		060
6.5	8	53	91		065
6.8	8	53	91		068
7	8	53	91		070
7.4	8	53	91		074
7.45	8	53	91		274

				Shank	Straight shank, HA
				Surface	CC
				Cooling	Internal
				Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm		EU 11158... Ref. no.
7.8	8	53	91		078
8	8	53	91		080
8.5	10	61	103		085
8.8	10	61	103		088
9	10	61	103		090
9.35	10	61	103		093
9.8	10	61	103		098
10	10	61	103		100
10.2	12	71	118		102
11	12	71	118		110
11.2	12	71	118		112
12	12	71	118		120
13	14	77	124		130
14	14	77	124		140
15	16	83	133		150
15.5	16	83	133		155
16	16	83	133		160
17	18	93	143		170
17.5	18	93	143		175
18	18	93	143		180
20	20	101	143		200

ATORN SOLID CARBIDE HIGH-PERFORMANCE DRILL TiAlSiN HPC 3xD



Application:
for HPC boring up to 65 HRC

Design:
- Reinforced core with special point thinning and cutting chisel edge
- No internal coolant feed for higher strength

Advantage:
- High centring accuracy
- Special coating for drilling hardened steels up to 65 HRC
- Extremely hard, low-friction and temperature-resistant TiAlN coating ensures a longer service life

note:
please always cool from the outside when drilling hard materials

ATORN®

SOLID CARBIDE HIGH-PERFORMANCE DRILL TiAlSiN HPC 3xD

VHM | TiAlSiN | 3xD | HPC HART | 140° | HA

For hard machining up to 65 HRC

P. 40 P. 46

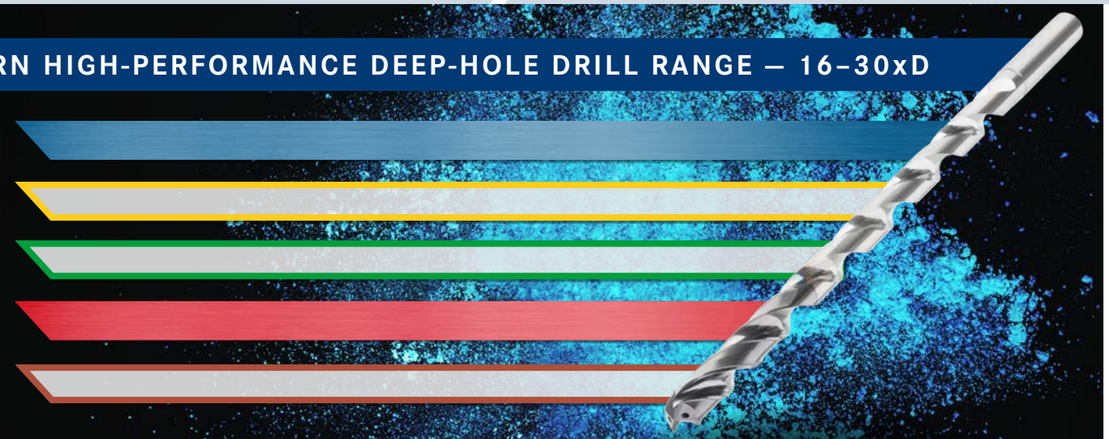
			Shank	Straight shank, HA
			Surface	TiAlSiN
			Cooling	External
			Tolerance of cutting Ø	h7
mm	mm	mm	mm	EU 11154... Ref. no.
1	4	7	45	010
1.3	4	7	45	013
1.5	4	14	55	015
1.6	4	14	55	016
1.7	4	14	55	017
1.8	4	14	55	018
1.9	4	14	55	019
2	4	20	55	020
2.1	4	20	55	021
2.2	4	20	55	022
2.3	4	20	55	023
2.5	4	20	55	025
2.6	4	20	55	026
2.7	4	20	55	027
2.8	4	20	55	028
2.9	4	20	55	029
3	6	20	62	030
3.1	6	20	62	031

			Shank	Straight shank, HA
			Surface	TiAlSiN
			Cooling	External
			Tolerance of cutting Ø	h7
mm	mm	mm	mm	EU 11154... Ref. no.
3.2	6	20	62	032
3.3	6	20	62	033
3.4	6	20	62	034
3.5	6	20	62	035
3.7	6	20	62	037
3.8	6	24	66	038
3.9	6	24	66	039
4	6	24	66	040
4.1	6	24	66	041
4.2	6	24	66	042
4.3	6	24	66	043
4.4	6	24	66	044
4.5	6	24	66	045
4.7	6	24	66	047
4.8	6	28	66	048
4.9	6	28	66	049
5	6	28	66	050
5.1	6	28	66	051

			Shank	Straight shank, HA
			Surface	TiAlSiN
			Cooling	External
			Tolerance of cutting Ø	h7
mm	mm	mm	mm	EU 11154... Ref. no.
5.2	6	28	66	052
5.3	6	28	66	053
5.4	6	28	66	054
5.5	6	28	66	055
5.6	6	28	66	056
5.7	6	28	66	057
5.8	6	28	66	058
5.9	6	28	66	059
6	6	28	66	060
6.1	8	34	79	061
6.2	8	34	79	062
6.5	8	34	79	065
6.6	8	34	79	066
6.7	8	34	79	067
6.8	8	34	79	068
6.9	8	34	79	069
7	8	34	79	070
7.1	8	41	79	071
7.2	8	41	79	072
7.3	8	41	79	073
7.5	8	41	79	075
7.6	8	41	79	076
7.7	8	41	79	077
7.8	8	41	79	078
7.9	8	41	79	079
8	8	41	79	080
8.1	10	47	89	081
8.3	10	47	89	083
8.5	10	47	89	085
8.6	10	47	89	086
8.7	10	47	89	087
8.8	10	47	89	088
8.9	10	47	89	089
9	10	47	89	090
9.2	10	47	89	092
9.5	10	47	89	095
9.6	10	47	89	096

			Shank	Straight shank, HA
			Surface	TiAlSiN
			Cooling	External
			Tolerance of cutting Ø	h7
mm	mm	mm	mm	EU 11154... Ref. no.
9.7	10	47	89	097
9.8	10	47	89	098
9.9	10	47	89	099
10	10	47	89	100
10.2	12	55	102	102
10.4	12	55	102	104
10.5	12	55	102	105
10.8	12	55	102	108
11	12	55	102	110
11.5	12	55	102	115
11.6	12	55	102	116
11.7	12	55	102	117
11.8	12	55	102	118
11.9	12	55	102	119
12	12	55	102	120
12.2	14	60	107	122
12.5	14	60	107	125
12.8	14	60	107	128
13	14	60	107	130
13.5	14	60	107	135
14	14	60	107	140
14.2	16	65	115	142
14.3	16	65	115	143
14.5	16	65	115	145
14.8	16	65	115	148
15	16	65	115	150
15.5	16	65	115	155
15.8	16	65	115	158
16	16	65	115	160
17	18	73	123	170
17.5	18	73	123	175
18	18	73	123	180
18.5	20	79	131	185
19	20	79	131	190
19.5	20	79	131	195
20	20	79	131	200

ATORN HIGH-PERFORMANCE DEEP-HOLE DRILL RANGE — 16–30xD



Application:
For HPC deep-hole drilling up to a strength of 1300 N/mm².

Design:
- Solid carbide high-performance deep-hole drill TiAlN and four drill heels

Advantage:
- Very good all-round properties and precise cutting performance with high cutting rates
- Unique, extremely hard, low-friction, temperature-resistant and form-fitting TiAlN coating ensures a longer service life
- Cutting edge preparation minimises micro-fractures on the cutting edge
- The angles and diameters are coordinated throughout the entire range

ATORN® SOLID CARBIDE NC SPOTTING DRILL TiAlN 142°

VHM | TiAlN | 142° | HB

for universal use up to 1300 N/mm²

Application:
For NC spot drilling on CNC machines.

Design:
- Spiral-fluted design with relief grinding

Advantage:
- 142° NC spotting drill provides a high-quality and precise hole for subsequent HPC drilling with a 140° tip angle
- Short design with precise drill point and cutting chisel ensure form-true and reliable spot drilling
- TiAlN coating for increased service life requirements

P. 40+41 P. 46

		Surface	TiAlN
		Tool chuck	HB straight shank
mm	mm	mm	EU 11169... Ref. no.
6	16	66	060
8	21	79	080
10	25	89	100

		Surface	TiAlN
		Tool chuck	HB straight shank
mm	mm	mm	EU 11169... Ref. no.
12	30	102	120
16	35	115	160
20	40	131	200

ATORN® SOLID CARBIDE HIGH-PERFORMANCE PILOT DRILL TiAlN 5xD

VHM | TiAlN | 5xD | HPC UNI | 140° | IK | HA

for universal use up to 1300 N/mm²

Application:
For placing a pilot hole for deep-hole drills from 12xD with HPC geometry up to a strength of 1300 N/mm².

Design:
- Solid carbide TiAlN high-performance drill

Advantage:
- Precision grinding for holes with very accurate fit and shape for demanding dimensional tolerance requirements
- Very precise guidance due to innovative geometry
- High-performance coating provides high cutting parameters and long service life
- The angles and diameters are coordinated throughout the entire range

P. 40+41 P. 42

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11181... Ref. no.
2.02	4	21	57	202
2.22	4	21	57	208
2.32	4	21	57	214
2.42	4	21	57	220
2.52	4	21	57	226
2.62	4	21	57	232
2.72	4	21	57	238
2.82	4	21	57	244
2.92	4	21	57	250
3.02	6	28	66	256
3.22	6	28	66	262
3.32	6	28	66	268
3.52	6	28	66	274
3.82	6	36	74	280
4.02	6	36	74	286
4.22	6	36	74	292
4.52	6	36	74	298
4.82	6	44	82	304
5.02	6	44	82	310
5.52	6	44	82	316

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11181... Ref. no.
5.82	6	44	82	322
6.02	6	44	82	328
6.52	8	53	91	334
6.82	8	53	91	340
7.02	8	53	91	346
7.52	8	53	91	352
7.82	8	53	91	364
8.02	8	53	91	370
8.52	10	61	103	376
8.82	10	61	103	382
9.02	10	61	103	388
9.52	10	61	103	394
9.82	10	61	103	400
10.02	10	61	103	406
10.22	12	71	118	412
10.82	12	71	118	418
11.02	12	71	118	424
11.52	12	71	118	430
11.82	12	71	118	436
12.02	12	71	118	442

ATORN® SOLID CARBIDE HIGH-PERFORMANCE DEEP HOLE DRILL TiAlN HPC 16xD

VHM | TiAlN | 16xD | HPC UNI | 135° | IK | HA

for universal use up to 1300 N/mm²

P. 40+41 P. 47

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11179... Ref. no.
3	6	60	100	430
3.2	6	60	100	432
3.3	6	60	100	433
3.5	6	60	100	435
3.8	6	75	115	438
4	6	75	115	440
4.2	6	75	115	442
4.5	6	90	130	445
4.8	6	90	130	448
5	6	90	130	450
5.5	6	108	150	455
5.8	6	108	150	458
6	6	108	150	460
6.5	8	125	165	465
6.8	8	125	165	468
7	8	125	165	470

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11179... Ref. no.
7.5	8	140	180	475
7.8	8	140	180	478
8	8	140	180	480
8.5	10	160	205	485
8.8	10	160	205	488
9	10	160	205	490
9.5	10	160	205	495
9.8	10	180	225	498
10	10	180	225	500
10.2	12	190	240	502
10.5	12	190	240	505
10.8	12	190	240	508
11	12	190	240	510
11.5	12	190	240	515
11.8	12	215	265	518
12	12	215	265	520

ATORN® SOLID CARBIDE HIGH-PERFORMANCE DEEP HOLE DRILL TiAlN HPC 20xD

VHM | TiAlN | 20xD | HPC UNI | 135° | IK | HA

For universal use up to 1300 N/mm²

P. 40+41 P. 47

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11181... Ref. no.
2	6	50	92	020
2.2	6	50	92	022
2.3	6	50	92	023
2.4	6	70	112	024
2.5	6	70	112	025
2.7	6	70	112	027
2.8	6	70	112	028
2.9	6	70	112	029
3	6	80	120	030
3.2	6	80	120	032
3.3	6	80	120	033
3.5	6	80	120	035
3.8	6	90	130	038
4	6	90	130	040
4.2	6	110	160	042
4.5	6	110	160	045
4.6	6	120	160	046
4.8	6	120	160	048
5	6	120	160	050
5.5	6	140	185	055
5.8	6	140	185	058

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11181... Ref. no.
6	6	140	185	060
6.5	8	160	210	065
6.8	8	160	210	068
7	8	160	210	070
7.5	8	180	230	075
7.8	8	180	230	078
8	8	180	230	080
8.5	10	195	260	085
8.8	10	230	290	088
9	10	230	290	090
9.5	10	230	290	095
9.8	10	230	290	098
10	10	230	290	100
10.2	12	268	315	102
10.5	12	268	315	105
10.8	12	268	315	108
11	12	268	315	110
11.5	12	268	315	115
11.8	12	268	315	118
12	12	268	315	120

ATORN® SOLID CARBIDE HIGH-PERFORMANCE DEEP HOLE DRILL TiAlN HPC 25xD

VHM | TiAlN | 25xD | HPC UNI | 135° | IK | HA

for universal use up to 1300 N/mm²

P. 40+41 P. 48

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11189... Ref. no.
3	6	98	135	230
3.2	6	98	135	232
3.3	6	110	150	233
3.5	6	110	150	235
3.8	6	120	160	238
4	6	120	160	240
4.2	6	120	160	242
4.5	6	135	180	245
4.8	6	135	180	248
5	6	135	180	250
5.5	6	168	205	255
5.8	6	168	205	258
6	6	168	205	260
6.5	8	200	240	265
6.8	8	200	240	268
7	8	200	240	270

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11189... Ref. no.
7.5	8	220	260	275
7.8	8	220	260	278
8	8	220	260	280
8.5	10	240	285	285
8.8	10	268	310	288
9	10	268	310	290
9.5	10	268	310	295
9.8	10	268	310	298
10	10	268	310	300
10.2	12	325	375	302
10.5	12	325	375	305
10.8	12	325	375	308
11	12	325	375	310
11.5	12	325	375	315
11.8	12	325	375	318
12	12	325	375	320

ATORN® SOLID CARBIDE HIGH-PERFORMANCE DEEP HOLE DRILL TiAlN HPC 30xD

VHM | TiAlN | 30xD | HPC UNI | 135° | IK | HA

for universal use up to 1300 N/mm²

P. 40+41 P. 48

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11182... Ref. no.
2	4	70	115	020
2.2	4	70	115	022
2.3	4	70	115	023
2.4	4	90	138	024
2.5	4	90	138	025
2.7	4	90	138	027
2.8	4	90	138	028
2.9	4	90	138	029
3	6	105	150	030
3.2	6	105	150	032
3.3	6	135	185	033
3.5	6	135	185	035
3.8	6	135	185	038
4	6	135	185	040
4.2	6	135	185	042
4.5	6	165	215	045
4.6	6	165	215	046
4.8	6	165	215	048
5	6	165	215	050
5.5	6	180	230	055
5.8	6	180	230	058

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11182... Ref. no.
6	6	180	230	060
6.5	8	215	280	065
6.8	8	230	280	068
7	8	230	280	070
7.5	8	230	280	075
7.8	8	265	315	078
8	8	265	315	080
8.5	10	295	350	085
8.8	10	330	380	088
9	10	330	380	090
9.5	10	330	380	095
9.8	10	330	380	098
10	10	330	380	100
10.2	12	380	430	102
10.5	12	380	430	105
10.8	12	380	430	108
11	12	380	430	110
11.5	12	380	430	115
11.8	12	380	430	118
12	12	380	430	120

ATORN SOLID CARBIDE HIGH-PERFORMANCE MICRO DRILL

Application:
For HPC drilling up to a strength of 1300 N/mm².

Design:
- High-performance drill, solid carbide, with universal precision grinding and 3 h6 straight shank

ATORN®

VHM | TiAlN | 5xD | HPC UNI | 130° | HA

SOLID CARBIDE MICRO DRILL HPC 5xD

for universal use up to 1300 N/mm²

P. 40 P. 48

			Shank	Straight shank, HA	Straight shank, HA
			Surface	TiAlN	uncoated
			Cooling	External	External
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11137... Ref. no.	EU 11137... Ref. no.
1.49	3	10	38	149	449
1.5	3	12	38	150	450
1.51	3	12	38	151	451
1.52	3	12	38	152	452
1.53	3	12	38	153	453
1.55	3	12	38	155	455
1.6	3	12	38	160	460
1.65	3	12	38	165	465
1.7	3	12	38	170	470
1.75	3	12	38	175	475
1.8	3	12	38	180	480
1.85	3	12	38	185	485
1.9	3	12	38	190	490
1.95	3	12	38	195	495
1.97	3	12	38	197	497
1.98	3	12	38	198	498
1.99	3	12	38	199	499
2	3	12	38	200	500
2.01	3	12	38	201	501
2.02	3	12	38	202	502
2.03	3	12	38	203	503
2.05	3	12	38	205	505
2.1	3	12	38	210	510
2.15	3	12	38	215	515

			Shank	Straight shank, HA	Straight shank, HA
			Surface	TiAlN	uncoated
			Cooling	External	External
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11137... Ref. no.	EU 11137... Ref. no.
2.2	3	12	38	220	520
2.25	3	12	38	225	525
2.3	3	12	38	230	530
2.35	3	12	38	235	535
2.4	3	12	38	240	540
2.45	3	12	38	245	545
2.5	3	12	38	250	550
2.51	3	12	38	251	551
2.52	3	12	38	252	552
2.53	3	12	38	253	553
2.55	3	12	38	255	555
2.56	3	12	38	256	556
2.65	3	12	38	265	565
2.7	3	12	38	270	570
2.75	3	12	38	275	575
2.8	3	12	38	280	580
2.85	3	12	38	285	585
2.9	3	12	38	290	590
2.95	3	12	38	295	595
2.96	3	12	38	296	596
2.97	3	12	38	297	597
2.98	3	12	38	298	598
2.99	3	12	38	299	599
3	3	12	38	300	600

			Shank	Straight shank, HA	Straight shank, HA
			Surface	TiAlN	uncoated
			Cooling	External	External
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11137... Ref. no.	EU 11137... Ref. no.
0.1	3	1	38	010	310
0.15	3	2	38	015	315
0.2	3	2.5	38	020	320
0.25	3	4	38	025	325
0.3	3	5.5	38	030	330
0.35	3	5.5	38	035	335
0.4	3	6	38	040	340
0.45	3	6	38	045	345
0.5	3	6	38	050	350
0.55	3	8	38	055	355
0.6	3	8	38	060	360
0.65	3	8	38	065	365
0.7	3	8	38	070	370
0.75	3	8	38	075	375
0.8	3	8	38	080	380
0.85	3	8	38	085	385
0.9	3	8	38	090	390
0.95	3	8	38	095	395

			Shank	Straight shank, HA	Straight shank, HA
			Surface	TiAlN	uncoated
			Cooling	External	External
		Tolerance of cutting Ø		h7	h7
mm	mm	mm	mm	EU 11137... Ref. no.	EU 11137... Ref. no.
0.97	3	8	38	097	397
0.98	3	8	38	098	398
0.99	3	8	38	099	399
1	3	10	38	100	400
1.01	3	10	38	101	401
1.02	3	10	38	102	402
1.03	3	10	38	103	403
1.05	3	10	38	105	405
1.1	3	10	38	110	410
1.15	3	10	38	115	415
1.2	3	10	38	120	420
1.25	3	10	38	125	425
1.3	3	10	38	130	430
1.35	3	10	38	135	435
1.4	3	10	38	140	440
1.45	3	10	38	145	445
1.47	3	10	38	147	447
1.48	3	10	38	148	448

ATORN SOLID CARBIDE HIGH-PERFORMANCE DRILL 180° TiAlN

Application:
For producing drill holes with 180° drill base in a single action for universal application up to 1000 N/mm².

Design:
- Heavy-duty solid carbide drill with 180° precision grinding and drill heels

Advantage:
- Drilling and counterboring in a single work step at high cutting speed
- Innovative geometry ensures good chip removal

ATORN® SOLID CARBIDE 180° HIGH-PERFORMANCE DRILL TiAlN 5xD

VHM | TiAlN | 5xD | 180° | IK | HA

for universal use up to 1000 N/mm²

P. 40 P. 49

note:
- Maximum angle of drilling surface 15°
- Correction factor = 0.25
- When spot drilling, multiply feed rate f [mm/U] by correction factor cf
- Spot drill with reduced feed until the tool cuts to 0.25xD over the total ø
- For angled spot drilling: Retract at double feed rate f [mm/U]
- After spot drilling at reduced feed rate (correction factor), drilling continues at feed rate f [mm/U] according to recommended cutting data without correction factors

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11168... Ref. no.
3	6	28	66	201
3.1	6	28	66	202
3.2	6	28	66	203
3.3	6	28	66	204
3.4	6	28	66	205
3.5	6	28	66	206
3.6	6	28	66	207
3.7	6	28	66	208
3.8	6	36	74	209
3.9	6	36	74	210
4	6	36	74	211
4.1	6	36	74	212
4.2	6	36	74	213
4.3	6	36	74	214
4.4	6	36	74	215
4.5	6	36	74	216

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11168... Ref. no.
4.6	6	36	74	217
4.65	6	36	74	218
4.7	6	36	74	219
4.8	6	44	82	220
4.9	6	44	82	221
5	6	44	82	222
5.1	6	44	82	223
5.2	6	44	82	224
5.3	6	44	82	225
5.4	6	44	82	226
5.5	6	44	82	227
5.55	6	44	82	228
5.6	6	44	82	229
5.7	6	44	82	230
5.8	6	44	82	231
5.9	6	44	82	232

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11168... Ref. no.
6	6	44	82	233
6.1	8	53	91	234
6.2	8	53	91	235
6.3	8	53	91	236
6.4	8	53	91	237
6.5	8	53	91	238
6.6	8	53	91	239
6.7	8	53	91	240
6.8	8	53	91	241
6.9	8	53	91	242
7	8	53	91	243
7.1	8	53	91	244
7.2	8	53	91	245
7.3	8	53	91	246
7.4	8	53	91	247
7.5	8	53	91	248
7.6	8	53	91	249
7.7	8	53	91	250
7.8	8	53	91	251
7.9	8	53	91	252
8	8	53	91	280
8.1	10	61	103	281
8.2	10	61	103	282
8.3	10	61	103	283
8.4	10	61	103	284
8.5	10	61	103	285
8.6	10	61	103	286
8.7	10	61	103	287
8.8	10	61	103	288
8.9	10	61	103	289
9	10	61	103	290
9.1	10	1	103	291
9.2	10	61	103	292
9.3	10	61	103	293
9.4	10	61	103	294
9.5	10	61	103	295
9.6	10	61	103	296
9.7	10	61	103	297
9.8	10	61	103	298
9.9	10	61	103	299
10	10	61	103	300
10.1	12	69	116	301
10.2	12	69	116	302

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
			Tolerance of cutting Ø	h7
mm	h6 mm	mm	mm	EU 11168... Ref. no.
10.3	12	69	116	303
10.4	12	69	116	304
10.5	12	69	116	305
10.6	12	69	116	306
10.7	12	69	116	307
10.8	12	69	116	308
10.9	12	69	116	309
11	12	69	116	310
11.1	12	69	116	311
11.2	12	69	116	312
11.3	12	69	116	313
11.4	12	69	116	314
11.5	12	69	116	315
11.6	12	69	116	316
11.7	12	69	116	317
11.8	12	69	116	318
11.9	12	69	116	319
12	12	69	116	320
12.5	14	75	122	321
12.8	14	75	122	322
13	14	75	122	323
13.5	14	75	122	324
13.8	14	75	122	325
14	14	75	122	326
14.5	16	81	131	327
14.8	16	81	131	328
15	16	81	131	350
15.5	16	81	131	351
15.8	16	81	131	352
16	16	81	131	353
16.5	18	91	141	354
16.8	18	91	141	355
17	18	91	141	356
17.5	18	91	141	357
17.8	18	91	141	358
18	18	91	141	380
18.5	20	99	151	381
18.8	20	99	151	382
19	20	99	151	383
19.5	20	99	151	384
19.8	20	99	151	385
20	20	99	151	400

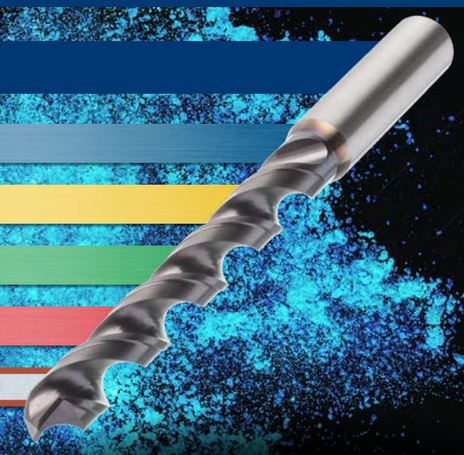
ATORN SOLID CARBIDE HIGH-PERFORMANCE DRILL REAMER TiAlN

Application:
For producing H7 bores in a single work step for universal use up to 1000 N/mm²

Design:
- High-performance drill reaming tool with two cutting bits and four frictional edges

Advantage:
- Drilling and reaming in h7 quality in a single work step at a high cutting speed
- Innovative geometry for productive and reliable machining of holes in h7 quality

ATORN TWIST DRILL TYPE UNI/VA HSSE V3



Application:
Universal use in all material groups up to a strength of 1300 N/mm²

Design:
- Twist drill with unified shaft

Advantage:
- Problem solver in low-performance machines without internal cooling in high-strength steels and stainless steels
- Extremely hard, low-friction and temperature-resistant TiAlN coating ensures a longer service life
- Drilling without centring
- Very high cutting values are possible

ATORN® SOLID CARBIDE HIGH-PERFORMANCE DRILL REAMER TiAlN 5xD

VHM | TiAlN | 5xD | 140° | IK | HA | H7

for universal use up to 1000 N/mm²

P. 40 P. 49

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
mm	h6 mm	mm	mm	EU 11175... Ref. no.
3.98	6	36	74	380
3.99	6	36	74	382
4	6	36	74	384
4.01	6	36	74	386
4.02	6	36	74	388
4.98	6	44	82	390
4.99	6	44	82	392
5	6	44	82	394
5.01	6	44	82	396
5.02	6	44	82	398
5.98	6	53	91	400
5.99	6	53	91	402
6	6	53	91	404
6.01	6	53	91	406
6.02	6	53	91	408
7.98	8	53	91	410
7.99	8	53	91	412

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	Internal
mm	h6 mm	mm	mm	EU 11175... Ref. no.
8	8	53	91	414
8.01	8	53	91	416
8.02	8	53	91	418
9.98	10	61	103	420
9.99	10	61	102	422
10	10	61	103	424
10.01	10	61	103	426
10.02	10	61	103	428
11.98	12	71	118	430
11.99	12	71	118	432
12	12	71	118	434
12.01	12	71	118	436
12.02	12	71	118	438
14	14	77	124	440
16	16	83	133	442
18	18	93	143	444
20	20	101	153	446

ATORN® TWIST DRILL TYPE UNI/VA HSSE-V3 TiAlN 3xD

HSSE V3 | TiAlN | 3xD | Typ VA | HA

for universal use up to 1300 N/mm²

P. 40 P. 50

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	External
			Tolerance of cutting Ø	h8
mm	h6 mm	mm	mm	EU 11036... Ref. no.
1	3	6	26	210
1.1	3	7	28	211
1.2	3	8	30	212
1.3	3	8	30	213
1.4	3	9	32	214
1.5	3	9	32	215
1.6	3	10	34	216
1.7	3	10	34	217
1.8	3	11	36	218
1.9	3	11	36	219
2	3	12	38	220
2.1	3	12	38	221
2.2	3	13	40	222
2.3	3	13	40	223
2.4	3	14	43	224
2.5	3	14	43	225
2.6	3	14	43	226
2.7	3	16	46	227
2.8	3	16	46	228
2.85	3	16	46	480
2.9	3	16	46	229

			Shank	Straight shank, HA
			Surface	TiAlN
			Cooling	External
			Tolerance of cutting Ø	h8
mm	h6 mm	mm	mm	EU 11036... Ref. no.
3	3	16	46	230
3.1	4	18	49	231
3.2	4	18	49	232
3.3	4	18	49	233
3.4	4	20	52	234
3.5	4	20	52	235
3.6	4	20	52	236
3.7	4	20	52	237
3.8	4	22	55	238
3.9	4	22	55	239
4	4	22	55	240
4.1	6	22	55	241
4.2	6	22	55	242
4.3	6	24	58	243
4.4	6	24	58	244
4.5	6	24	58	245
4.6	6	24	58	246
4.65	6	24	58	481
4.7	6	24	58	247
4.8	6	26	62	248
4.9	6	26	62	249

Shank	Straight shank, HA
Surface	TiAlN
Cooling	External
Tolerance of cutting Ø	h8

mm	h6 mm	mm	mm	EU 11036... Ref. no.
5	6	26	62	250
5.1	6	26	62	251
5.2	6	26	62	252
5.3	6	26	62	253
5.4	6	28	66	254
5.5	6	28	66	255
5.55	6	28	66	482
5.6	6	28	66	256
5.65	6	28	66	483
5.7	6	28	66	257
5.8	6	28	66	258
5.9	6	28	66	259
6	6	28	66	260
6.1	8	32	70	261
6.2	8	32	70	262
6.3	8	32	70	263
6.4	8	32	70	264
6.5	8	32	70	265
6.6	8	32	70	266
6.7	8	32	70	267
6.8	8	34	74	268
6.9	8	34	74	269
7	8	34	74	270
7.1	8	34	74	271
7.2	8	34	74	272
7.3	8	34	74	273
7.4	8	34	74	274
7.5	8	34	74	275
7.55	8	37	79	484
7.6	8	37	79	276
7.7	8	37	79	277
7.8	8	37	79	278
7.9	8	37	79	279
8	8	37	79	280
8.1	10	37	79	281
8.2	10	37	79	282
8.3	10	37	79	283
8.4	10	37	79	284
8.5	10	37	79	285
8.6	10	40	84	286
8.7	10	40	84	287
8.8	10	40	84	288
8.9	10	40	84	289

Shank	Straight shank, HA
Surface	TiAlN
Cooling	External
Tolerance of cutting Ø	h8

mm	h6 mm	mm	mm	EU 11036... Ref. no.
9	10	40	84	290
9.1	10	40	84	291
9.2	10	40	84	292
9.3	10	40	84	293
9.4	10	40	84	294
9.5	10	40	84	295
9.55	10	43	89	485
9.6	10	43	89	296
9.7	10	43	89	297
9.8	10	43	89	298
9.9	10	43	89	299
10	10	43	89	300
10.1	10	43	89	301
10.2	10	43	89	302
10.3	10	43	89	303
10.4	10	43	89	304
10.5	10	43	89	305
10.6	12	43	89	306
10.7	12	47	95	307
10.8	12	47	95	308
10.9	12	47	95	309
11	12	47	95	310
11.1	12	47	95	311
11.2	12	47	95	312
11.3	12	47	95	314
11.4	12	47	95	315
11.5	12	47	95	316
11.6	12	47	95	317
11.7	12	47	95	318
11.8	12	47	95	319
11.9	12	47	95	320
12	12	51	102	321
12.1	16	51	102	322
12.2	16	51	102	323
12.3	16	51	102	324
12.4	16	51	102	325
12.5	16	51	102	326
12.6	16	51	102	327
12.7	16	51	102	328
12.8	16	51	102	329
12.9	16	51	102	330
13	16	51	102	331

ATORN®

TWIST DRILL TYPE UNI/VA HSSE-V3 TiAlN 5xD

HSSE V3 | TiAlN | 5xD | Typ VA | HA

P. 40 P. 50

Shank	Straight shank, HA
Surface	TiAlN
Cooling	External
Tolerance of cutting Ø	h8

mm	h6 mm	mm	mm	EU 11036... Ref. no.
2	3	24	50	346
2.1	3	24	50	347
2.2	3	27	53	348
2.3	3	27	53	349

Shank	Straight shank, HA
Surface	TiAlN
Cooling	External
Tolerance of cutting Ø	h8

mm	h6 mm	mm	mm	EU 11036... Ref. no.
2.4	3	30	57	350
2.5	3	30	57	351
2.6	3	30	57	352
2.7	3	33	61	353

Shank	Straight shank, HA
Surface	TiAlN
Cooling	External
Tolerance of cutting Ø	h8

mm	h6 mm	mm	mm	EU 11036... Ref. no.
2.8	3	33	61	354
2.9	3	33	61	355
3	3	33	61	356
3.1	4	36	65	357
3.2	4	36	65	358
3.3	4	36	65	359
3.4	4	39	70	360
3.5	4	39	70	361
3.6	4	39	70	362
3.7	4	39	70	363
3.8	4	43	75	364
3.9	4	43	75	365
4	4	43	75	366
4.1	6	43	75	367
4.2	6	43	75	368
4.3	6	47	80	369
4.4	6	47	80	370
4.5	6	47	80	371
4.6	6	47	80	372
4.7	6	47	80	373
4.8	6	52	86	374
4.9	6	52	86	375
5	6	52	86	376
5.1	6	52	86	377
5.2	6	52	86	378
5.3	6	52	86	379
5.4	6	57	93	380
5.5	6	57	93	381
5.6	6	57	93	382
5.7	6	57	93	383
5.8	6	57	93	384
5.9	6	57	93	385
6	6	57	93	386
6.1	8	63	101	387
6.2	8	63	101	388
6.3	8	63	101	389
6.4	8	63	101	390
6.5	8	63	101	391
6.6	8	63	101	392
6.7	8	63	101	393
6.8	8	69	109	394
6.9	8	69	109	395
7	8	69	109	396
7.1	8	69	109	397
7.2	8	69	109	398
7.3	8	69	109	399
7.4	8	69	109	400
7.5	8	69	109	401
7.6	8	75	117	402
7.7	8	75	117	403
7.8	8	75	117	404
7.9	8	75	117	405

Shank	Straight shank, HA
Surface	TiAlN
Cooling	External
Tolerance of cutting Ø	h8

mm	h6 mm	mm	mm	EU 11036... Ref. no.
8	8	75	117	406
8.1	10	75	117	407
8.2	10	75	117	408
8.3	10	75	117	409
8.4	10	75	117	410
8.5	10	75	117	411
8.6	10	81	125	412
8.7	10	81	125	413
8.8	10	81	125	414
8.9	10	81	125	415
9	10	81	125	416
9.1	10	81	125	417
9.2	10	81	125	418
9.3	10	81	125	419
9.4	10	81	125	420
9.5	10	81	125	421
9.6	10	87	133	422
9.7	10	87	133	423
9.8	10	87	133	424
9.9	10	87	133	425
10	10	87	133	426
10.1	10	87	133	427
10.2	10	87	133	428
10.3	10	87	133	429
10.4	10	87	133	430
10.5	10	87	133	431
10.6	12	87	133	432
10.7	12	94	142	433
10.8	12	94	142	434
10.9	12	94	142	435
11	12	94	142	436
11.1	12	94	142	437
11.2	12	94	142	438
11.3	12	94	142	439
11.4	12	94	142	440
11.5	12	94	142	441
11.6	12	94	142	442
11.7	12	94	142	443
11.8	12	94	142	444
11.9	12	101	151	445
12	12	101	151	446
12.1	12	101	151	447
12.2	12	101	151	448
12.3	12	101	151	449
12.4	12	101	151	450
12.5	12	101	151	451
12.6	12	101	151	452
12.7	12	101	151	453
12.8	12	101	151	454
12.9	12	101	151	455
13	12	101	151	456

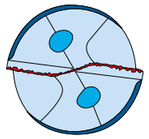
troubleshooting for solid carbide/HSSE drills

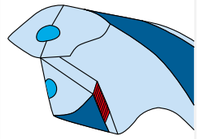
Flank wear

Flank wear is the preferred type of wear, if it is even.

Problem
- Cutting speed too high
- Insufficient amount of oil in the coolant
- Not enough cooling
- Concentricity fault

Countermeasures
- Reduce cutting speed
- Increase oil content in coolant
- Increase coolant amount
- Check concentricity



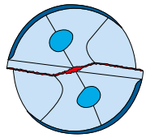


flank wear on chisel edge

Problem
- Cutting speed too low
- Feed too high
- Concentricity fault

Countermeasure
- Increase cutting speed
- Reduce feed
- Check concentricity

The drilling quality is reduced as the self-centring capability is no longer guaranteed.

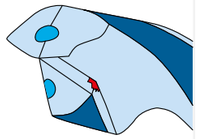


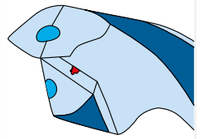
chipping

chipping occurs mainly when machining pre-drilled holes, when the tip angle of the pilot hole is smaller.

Problem
- Tip angles do not correspond
- Unstable conditions
- Concentricity fault
- Not enough cooling

Countermeasure
- Check tip angle
- Check clamping
- Check concentricity
- Increase cooling

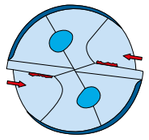


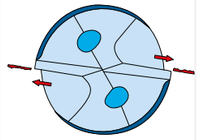


Built-up edge

Problem
- Cutting speed too high/too low
- Insufficient amount of oil in the coolant

Countermeasure
- Increase cutting speed so that the built-up edge moves to the centre
- Decrease cutting speed so that the built-up edge moves to the outer edge or is avoided
- Increase oil content in coolant

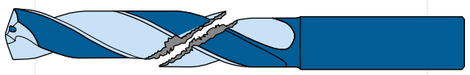




drill breakage

Problem
- Cutting speed too low
- Unstable conditions
- Concentricity fault
- Feed too high
- Chips are accumulating

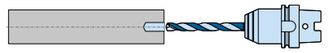
Countermeasure
- Increase cutting speed
- Check clamping
- Check concentricity
- Reduce feed
- Increase cooling



process description, deep hole drilling

Drilling pilot holes

- In order to get an accurate pitch, we recommend centring with our NC spotting drill no. 11169.
- For the pilot hole, we recommend our no. 11181.
- these are 0.02 mm larger in diameter than the corresponding deep-hole drills and have a tip angle of 140°.
- the pilot hole should be at least 3xD in depth, to a maximum of 5xD.

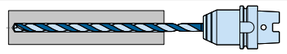


entering the pilot bore hole with the deep hole drill

Deep hole drills up to 30xD
- Please enter the pilot hole at a low rotation speed (n= 300 rpm) and a low feed rate (Vf=1000 mm/min). Stop the feed 1–2 mm before reaching the hole base. then increase the rotation speed continuously until reaching the final speed. allow sufficient idling time to ensure that the cooling pump has built up enough pressure.

deep hole drilling

- carry out deep hole drilling with the recommended cutting values, do not remove chips.
- For cross-drilled holes or exiting, reduce the feed by 50%.



extending the deep hole drill

- Retract the deep hole drill by about 1-2 mm from the base of the hole.
- Reduce the rotation speed (n= 300 rpm) and remove the drill from the hole at a low feed rate (Vf=1000 mm/min). The cooling system must be switched off during this process.

USAGE VALUES, SC-TIALNPLUS HPC TWIST DRILL, 3XD–5XD, WITH IC

11102010-212

11102204-400
11105230-400

11105010-218

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
1. Steels									
1.1 Carbon steel	< 900	9 S 20	100-140	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.2 Construction steel	<500	ST 37-2	100-140	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.3 Structural steel	> 500	ST 60-2	95-135	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.4 Heat-treated steel	<1000	42 CrMo 4	85-110	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.5 Steel casting	<1000	GS-45	70-110	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.6 Case-hardened steel	<1200	16 MnCr 5	80-120	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	40-70	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.8 Heat-treated steel	>1000	43 CrMo 4	40-85	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.9 Nitriding steel	<1300	31 CrMoV 9	85-100	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.10 Tool steel	<1300	X 38 CrMoV 5 1	35-85	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
2. Stainless steels									
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	40-60	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
3. Non-ferrous metals									
3.1 Long-chipping aluminium	<500	Al99.9	200-300	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.2 Short-chipping aluminium	<500	G-AlSi12	180-220	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	100-150	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	120-180	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	160-190	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	250-280	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.7 Thermoplastic	<100	PVC, acrylic glass	30-100	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.8 Duroplast	<150	Bakelite, melamine	30-80	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP	30-70	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.10 Graphite	<60	C8000	85-130	0.02-0.085	0.085-0.1	0.1-0.15	0.15-0.21	0.21-0.225	0.225-0.38
3.11 Composite materials									
4. Cast metal									
4.1 Cast iron with lamellar graphite	<260 HB	GG10	85-130	0,042-0,125	0,125-0.18	0.18-0.25	0.25-0.35	0.35-0.4	0.4-0.46
4.2 Nodular cast iron	<310 HB	GGG 40	70-110	0,025-0,075	0,075-0,125	0,125-0,175	0,175-0,225	0,225-0.3	0.3-0,375
4.3 Ductile iron	<280 HB	GTW-55	70-110	0,025-0,075	0,075-0,125	0,125-0,175	0,175-0,225	0.225-0.3	0.3-0,375

USAGE VALUES, SC-TIALNPLUS HPC TWIST DRILL, 3XD–5XD, WITHOUT IC

11104010-212

11104230-400
11107230-400

11107010-219

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
1. Steels									
1.1 Carbon steel	< 900	9 S 20	90-120	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.2 Construction steel	<500	ST 37-2	90-120	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.3 Construction steel	> 500	ST 60-2	90-120	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.4 Heat-treated steel	<1000	42 CrMo 4	80-95	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.5 Steel casting	<1000	GS-45	60-95	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.6 Case-hardened steel	<1200	16 MnCr 5	70-105	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	30-60	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.8 Heat-treated steel	>1000	43 CrMo 4	30-75	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.9 Nitriding steel	<1300	31 CrMoV 9	75-85	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.10 Tool steel	<1300	X 38 CrMoV 5 1	30-70	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
2. Stainless steels									
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	30-50	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
3. Non-ferrous metals									
3.1 Long-chipping aluminium	<500	Al99.9	200-250	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.2 Short-chipping aluminium	<500	G-AlSi12	160-200	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	90-135	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	110-160	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	150-170	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	220-260	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.7 Thermoplastic	<100	PVC, acrylic glass	30-80	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.8 Duroplast	<150	Bakelite, melamine	30-70	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP	30-60	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.10 Graphite	<60	C8000	75-110	0.02-0.085	0.085-0.1	0.1-0.15	0.15-0.21	0.21-0.225	0.225-0.38
3.11 Composite materials									
4. Cast metal									
4.1 Cast iron with lamellar graphite	<260 HB	GG10	75-110	0.042-0.125	0.125-0.18	0.18-0.25	0.25-0.35	0.35-0.4	0.4-0.46
4.2 Nodular cast iron	<310 HB	GGG 40	60-100	0.025-0.075	0.075-0.125	0.125-0.175	0.175-0.225	0.225-0.3	0.3-0.375
4.3 Ductile iron	<280 HB	GTW-55	60-100	0.025-0.075	0.075-0.125	0.125-0.175	0.175-0.225	0.225-0.3	0.3-0.375

USAGE VALUES, SC-TIALNPLUS HPC TWIST DRILL, 8XD, WITH IC

11108030-200

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
1. Steels									
1.1 Carbon steel	< 900	9 S 20	100-140	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.2 Construction steel	<500	ST 37-2	100-140	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.3 Construction steel	> 500	ST 60-2	95-135	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.4 Heat-treated steel	<1000	42 CrMo 4	85-110	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.5 Steel casting	<1000	GS-45	70-110	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.6 Case-hardened steel	<1200	16 MnCr 5	80-120	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	40-70	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.8 Heat-treated steel	>1000	43 CrMo 4	40-85	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.9 Nitriding steel	<1300	31 CrMoV 9	85-100	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.10 Tool steel	<1300	X 38 CrMoV 5 1	35-85	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
2. Stainless steels									
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	40-60	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
3. Non-ferrous metals									
3.1 Long-chipping aluminium	<500	Al99.9	200-300	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.2 Short-chipping aluminium	<500	G-AlSi12	180-220	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	100-150	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	120-180	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	160-190	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	250-280	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.7 Thermoplastic	<100	PVC, acrylic glass	30-100	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.8 Duroplast	<150	Bakelite, melamine	30-80	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP	30-70	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.10 Graphite	<60	C8000	85-130	0.02-0.085	0.085-0.1	0.1-0.15	0.15-0.21	0.21-0.225	0.225-0.38
3.11 Composite materials									
4. Cast metal									
4.1 Cast iron with lamellar graphite	<260 HB	GG10	85-130	0.042-0.125	0.125-0.18	0.18-0.25	0.25-0.35	0.35-0.4	0.4-0.46
4.2 Nodular cast iron	<310 HB	GGG 40	70-110	0.025-0.075	0.075-0.125	0.125-0.175	0.175-0.225	0.225-0.3	0.3-0.375
4.3 Ductile iron	<280 HB	GTW-55	70-110	0.025-0.075	0.075-0.125	0.125-0.175	0.175-0.225	0.225-0.3	0.3-0.375

USAGE VALUES, SC-TIALNPLUS HPC TWIST DRILL, 12XD, WITH IC

11110030-200

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
1. Steels									
1.1 Carbon steel	< 900	9 S 20	100-140	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.2 Construction steel	<500	ST 37-2	100-140	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.3 Construction steel	> 500	ST 60-2	95-135	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.4 Heat-treated steel	<1000	42 CrMo 4	85-110	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.5 Steel casting	<1000	GS-45	70-110	0.027-0.08	0.08-0.15	0.15-0.21	0.21-0.27	0.27-0.32	0.32-0.37
1.6 Case-hardened steel	<1200	16 MnCr 5	80-120	0.03-0.09	0.09-0.16	0.16-0.22	0.22-0.28	0.28-0.34	0.34-0.38
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	40-70	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.8 Heat-treated steel	>1000	43 CrMo 4	40-85	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.9 Nitriding steel	<1300	31 CrMoV 9	85-100	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
1.10 Tool steel	<1300	X 38 CrMoV 5 1	35-85	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
2. Stainless steels									
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	40-60	0.017-0.045	0.045-0.08	0.08-0.12	0.12-0.15	0.15-0.2	0.2-0.25
3. Non-ferrous metals									
3.1 Long-chipping aluminium	<500	Al99.9	200-300	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.2 Short-chipping aluminium	<500	G-AlSi12	180-220	0.03-0.12	0.12-0.18	0.18-0.22	0.22-0.32	0.32-0.37	0.37-0.4
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	100-150	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	120-180	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	160-190	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	250-280	0.02-0.01	0.01-0.15	0.15-0.2	0.2-0.3	0.3-0.32	0.32-0.35
3.7 Thermoplastic	<100	PVC, acrylic glass	30-100	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.8 Duroplast	<150	Bakelite, melamine	30-80	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP	30-70	0.03-0.08	0.08-0.12	0.12-0.17	0.17-0.23	0.23-0.26	0.26-0.35
3.10 Graphite	<60	C8000	85-130	0.02-0.085	0.085-0.1	0.1-0.15	0.15-0.21	0.21-0.225	0.225-0.38
3.11 Composite materials									
4. Cast metal									
4.1 Cast iron with lamellar graphite	<260 HB	GG10	85-130	0.042-0.125	0.125-0.18	0.18-0.25	0.25-0.35	0.35-0.4	0.4-0.46
4.2 Nodular cast iron	<310 HB	GGG 40	70-110	0.025-0.075	0.075-0.125	0.125-0.175	0.175-0.225	0.225-0.3	0.3-0.375
4.3 Ductile iron	<280 HB	GTW-55	70-110	0.025-0.075	0.075-0.125	0.125-0.175	0.175-0.225	0.225-0.3	0.3-0.375

USAGE VALUES, SC HPC VA TWIST DRILL, 3XD–5XD, COATED, WITH IC

11142030-601

11142204-603

11147030-203

11142207-602, 11147204-400, 11147207-600

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
1. Steels									
1.1 Carbon steel	< 900	9 S 20							
1.2 Construction steel	<500	ST 37-2							
1.3 Construction steel	> 500	ST 60-2							
1.4 Heat-treated steel	<1000	42 CrMo 4							
1.5 Steel casting	<1000	GS-45							
1.6 Case-hardened steel	<1200	16 MnCr 5							
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	70-80	0.02-0.08	0.08-0.1	0.1-0.16	0.16-0.2	0.2-0.25	0.25-0.31
1.8 Heat-treated steel	>1000	43 CrMo 4							
1.9 Nitriding steel	<1300	31 CrMoV 9							
1.10 Tool steel	<1300	X 38 CrMoV 5 1							
2. Stainless steels									
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	50-60	0.01-0.04	0.04-0.06	0.06-0.08	0.08-0.1	0.1-0.12	0.12-0.16
5. Special alloys									
5.1 Titanium alloy	<1200	TiAl5Sn2.5	25-35	0.01-0.04	0.04-0.06	0.06-0.08	0.08-0.1	0.1-0.12	0.12-0.16
5.2 Nickel-based alloy	<1400	NiCr21Mo	25-35	0.01-0.04	0.04-0.06	0.06-0.08	0.08-0.1	0.1-0.12	0.12-0.16
5.3 Super alloys	<1400	X45CrSi 9 3	25–30	0.01-0.04	0.04-0.06	0.06-0.08	0.08-0.1	0.1-0.12	0.12-0.16

USAGE VALUES, SC ALU TWIST DRILL, 5XD, COATED, WITH IC

11158

				f [mm/U] with diameter				
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-2	2–5	5–12	12-16	16-20
3. Non-ferrous metals								
3.1 Long-chipping aluminium	<500	Al99.9	350-400	0.15-0.225	0.225-0.3	0.3-0.38	0.38-0.6	0.6-0.7
3.2 Short-chipping aluminium	<500	G-AlSi12	350-400	0.15-0.225	0.225-0.3	0.3-0.38	0.38-0.6	0.6-0.7
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	180-200	0.08-0.11	0.11-0.23	0.23-0.32	0.32-0.45	0.45-0.52
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	180-200	0.08-0.11	0.11-0.23	0.23-0.32	0.32-0.45	0.45-0.52
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	180-200	0.08-0.11	0.11-0.23	0.23-0.32	0.32-0.45	0.45-0.52
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	180-200	0.08-0.11	0.11-0.23	0.23-0.32	0.32-0.45	0.45-0.52
3.7 Thermoplastic	<100	PVC, acrylic glass						
3.8 Duroplast	<150	Bakelite, melamine						
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP						
3.10 Graphite	<60	C8000						
3.11 Composite materials								

USAGE VALUES, SC TWIST DRILL, 3XD, HARD

11154010-200

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
6. Hard materials									
6.1 Hardened steel -55 HRC	-55 HRC	x40CrMoV5-1	16-28	0.03-0.06	0.06-0.08	0.08-0.09	0.09-0.11	0.11-0.13	0.13-0.15
6.2 Hardened steel -65 HRC	< 65 HRC	90MnCrV8	10-16	0.02-0.04	0.04-0.06	0.06-0.07	0.07-0.08	0.08-0.09	0.09-0.1

USAGE VALUES, SC NC SPOTTING DRILL

11018530-701

11017530-701

11169

11017, 11018, 11018361-461, 11017361-461

				f [mm/U] with diameter			
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	3–6	6-10	10-16	16-25
1. Steels							
1.1 Carbon steel	< 900	9 S 20	60-90	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
1.2 Construction steel	<500	ST 37-2	60-85	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
1.3 Construction steel	> 500	ST 60-2	60-75	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.18
1.4 Heat-treated steel	<1000	42 CrMo 4	40-75	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.18
1.5 Steel casting	<1000	GS-45	40-75	0.05-0.11	0.11-0.12	0.12-0.13	0.13-0.15
1.6 Case-hardened steel	<1200	16 MnCr 5	50-70	0.05-0.11	0.11-0.12	0.12-0.13	0.13-0.15
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	20–30	0.05-0.11	0.11-0.12	0.12-0.13	0.13-0.15
1.8 Heat-treated steel	>1000	43 CrMo 4	30-50	0.05-0.11	0.11-0.12	0.12-0.13	0.13-0.15
1.9 Nitriding steel	<1300	31 CrMoV 9	30-50	0.05-0.11	0.11-0.12	0.12-0.13	0.13-0.15
1.10 Tool steel	<1300	X 38 CrMoV 5 1	30-50	0.05-0.11	0.11-0.12	0.12-0.13	0.13-0.15
2. Stainless steels							
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	15–30	0.05-0.11	0.11-0.12	0.12-0.13	0.13-0.14
3. Non-ferrous metals							
3.1 Long-chipping aluminium	<500	Al99.9	150-250	0.05-0.14	0.14-0.16	0.16-0.18	0.18-0.22
3.2 Short-chipping aluminium	<500	G-AlSi12	150-210	0.05-0.14	0.14-0.16	0.16-0.18	0.18-0.22
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	50-90	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	55-100	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	100-150	0.05-0.14	0.14-0.16	0.16-0.18	0.18-0.22
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	120-170	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
3.7 Thermoplastic	<100	PVC, acrylic glass	40-60	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
3.8 Duroplast	<150	Bakelite, melamine	40-50	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP	40-50	0.05-0.13	0.13-0.14	0.14-0.15	0.15-0.2
3.10 Graphite	<60	C8000	10-25	0.08-0.09	0.09-0.1	0.1-0.15	0.15-0.2
3.11 Composite materials							
4. Cast metal							
4.1 Cast iron with lamellar graphite	<260 HB	GG10	60-70	0.05-0.12	0.12-0.13	0.13-0.15	0.15-0.17
4.2 Nodular cast iron	<310 HB	GGG 40	60-70	0.05-0.12	0.12-0.13	0.13-0.15	0.15-0.17
4.3 Ductile iron	<280 HB	GTW-55	60-70	0.05-0.12	0.12-0.13	0.13-0.15	0.15-0.17
5. Special alloys							
5.1 Titanium alloy	<1200	TiAl5Sn2.5	15–30	0.03-0.05	0.05-0.06	0.06-0.07	0.07-0.08
5.2 Nickel-based alloy	<1400	NiCr21Mo	15–30	0.03-0.05	0.05-0.06	0.06-0.07	0.07-0.08
5.3 Super alloys	<1400	X45CrSi 9 3	15–30	0.03-0.05	0.05-0.06	0.06-0.07	0.07-0.08

USAGE VALUES, SC DEEP HOLE DRILL, 16XD–20XD, COATED, WITH IC

11179430-520

11181020-120

				f [mm/U] with diameter			
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8-12
1. Steels							
1.1 Carbon steel	< 900	9 S 20	80-120	0.75-0.85	0.85-0.1	0.1-0.15	0.15-0.21
1.2 Construction steel	<500	ST 37-2	80-120	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
1.3 Construction steel	> 500	ST 60-2	80-120	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
1.4 Heat-treated steel	<1000	42 CrMo 4	80-110	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.17
1.5 Steel casting	<1000	GS-45	80-100	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.6 Case-hardened steel	<1200	16 MnCr 5	80-110	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	50-70	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.8 Heat-treated steel	>1000	43 CrMo 4	80-100	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.9 Nitriding steel	<1300	31 CrMoV 9	80-110	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.10 Tool steel	<1300	X 38 CrMoV 5 1	60-100	0.04-0.05	0.05-0.085	0.085-0.12	0.12-0.15
2. Stainless steels							
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	40-70	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
3. Non-ferrous metals							
3.1 Long-chipping aluminium	<500	Al99.9	170-250	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.2 Short-chipping aluminium	<500	G-AlSi12	120-190	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	100-150	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	100-130	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	130-190	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	130-190	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.7 Thermoplastic	<100	PVC, acrylic glass	40-80	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.8 Duroplast	<150	Bakelite, melamine	40-60	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP	40-60	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.10 Graphite	<60	C8000	90-110	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.11 Composite materials							
4. Cast metal							
4.1 Cast iron with lamellar graphite	<260 HB	GG10	70-110	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.2
4.2 Nodular cast iron	<310 HB	GGG 40	70-110	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.2
4.3 Ductile iron	<280 HB	GTW-55	70-110	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.2
5. Special alloys							
5.1 Titanium alloy	<1200	TiAl5Sn2.5	20–30	0.055-0.065	0.065-0.075	0.075-0.09	0.09-0.12
5.2 Nickel-based alloy	<1400	NiCr21Mo	20–30	0.055-0.065	0.065-0.075	0.075-0.09	0.09-0.12
5.3 Super alloys	<1400	X45CrSi 9 3	20–30	0.055-0.065	0.065-0.075	0.075-0.09	0.09-0.12

USAGE VALUES, SC DEEP HOLE DRILL, 25XD–30XD, COATED, WITH IC

11189230-320

11182

				f [mm/U] with diameter			
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8-12
1. Steels							
1.1 Carbon steel	< 900	9 S 20	70-110	0.75-0.85	0.85-0.1	0.1-0.15	0.15-0.21
1.2 Construction steel	<500	ST 37-2	70-110	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
1.3 Construction steel	> 500	ST 60-2	80-110	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
1.4 Heat-treated steel	<1000	42 CrMo 4	70-100	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.17
1.5 Steel casting	<1000	GS-45	70-90	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.6 Case-hardened steel	<1200	16 MnCr 5	60-100	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	40-60	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.8 Heat-treated steel	>1000	43 CrMo 4	45-70	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.9 Nitriding steel	<1300	31 CrMoV 9	45-80	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
1.10 Tool steel	<1300	X 38 CrMoV 5 1	50-90	0.04-0.05	0.05-0.085	0.085-0.12	0.12-0.15
2. Stainless steels							
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	30-60	0.07-0.08	0.08-0.09	0.09-0.12	0.12-0.15
3. Non-ferrous metals							
3.1 Long-chipping aluminium	<500	Al99.9	170-250	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.2 Short-chipping aluminium	<500	G-AlSi12	120-190	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	100-150	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	100-130	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	130-190	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	130-190	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.7 Thermoplastic	<100	PVC, acrylic glass	40-80	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.8 Duroplast	<150	Bakelite, melamine	40-60	0.085-0.095	0.095-0.12	0.12-0.17	0.17-0.23
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP	40-60	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.10 Graphite	<60	C8000	90-110	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.21
3.11 Composite materials							
4. Cast metal							
4.1 Cast iron with lamellar graphite	<260 HB	GG10	70-100	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.2
4.2 Nodular cast iron	<310 HB	GGG 40	70-100	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.2
4.3 Ductile iron	<280 HB	GTW-55	70-100	0.075-0.085	0.085-0.1	0.1-0.15	0.15-0.2
5. Special alloys							
5.1 Titanium alloy	<1200	TiAl5Sn2.5	20–30	0.055-0.065	0.065-0.075	0.075-0.09	0.09-0.12
5.2 Nickel-based alloy	<1400	NiCr21Mo	20–30	0.055-0.065	0.065-0.075	0.075-0.09	0.09-0.12
5.3 Super alloys	<1400	X45CrSi 9 3	20–30	0.055-0.065	0.065-0.075	0.075-0.09	0.09-0.12

USAGE VALUE, SOLID CARBIDE HPC MICRO DRILL, WITHOUT IC

11137010-300

11137310-600

				f [mm/U] with diameter				
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0.1-1	1-1.5	1.5-2	2-2.5	2.5-3
1. Steels								
1.1 Carbon steel	< 900	9 S 20	70-110	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
1.2 Construction steel	<500	ST 37-2	60-100	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
1.3 Construction steel	> 500	ST 60-2	60-90	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
1.4 Heat-treated steel	<1000	42 CrMo 4	50-65	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
1.5 Steel casting	<1000	GS-45	50-70	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
1.6 Case-hardened steel	<1200	16 MnCr 5	50-60	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	20-40	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
1.8 Heat-treated steel	>1000	43 CrMo 4	40-55	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
1.9 Nitriding steel	<1300	31 CrMoV 9	40-60	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
1.10 Tool steel	<1300	X 38 CrMoV 5 1	20-35	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
2. Stainless steels								
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	20-35	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
3. Non-ferrous metals								
3.1 Long-chipping aluminium	<500	Al99.9	150-230	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.08	0.08-0.09
3.2 Short-chipping aluminium	<500	G-AlSi12	120-180	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.08	0.08-0.09
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	80-140	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	80-120	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	100-180	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.08	0.08-0.09
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	100-160	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.08	0.08-0.09
3.7 Thermoplastic	<100	PVC, acrylic glass	30-60	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.08	0.08-0.09
3.8 Duroplast	<150	Bakelite, melamine	30-60	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.08	0.08-0.09
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP						
3.10 Graphite	<60	C8000	60-100	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.08	0.08-0.09
4. Cast metal								
4.1 Cast iron with lamellar graphite	<260 HB	GG10	60-110	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
4.2 Nodular cast iron	<310 HB	GGG 40	60-110	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
4.3 Ductile iron	<280 HB	GTW-55	60-110	0.035-0.045	0.045-0.055	0.055-0.06	0.06-0.075	0.075-0.08
5. Special alloys								
5.1 Titanium alloy	<1200	TiAl5Sn2.5	10-40	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
5.2 Nickel-based alloy	<1400	NiCr21Mo	10-30	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07
5.3 Super alloys	<1400	X45CrSi 9 3	10-30	0.03-0.04	0.04-0.05	0.05-0.055	0.055-0.065	0.065-0.07

USAGE VALUES, SC 180° DRILL, HPC, 5XD, WITH IC

11168201-400

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
1. Steels									
1.1 Carbon steel	< 900	9 S 20	70-100	0.02-0.08	0.08-0.14	0.14-0.18	0.18-0.23	0.23-0.24	0.24-0.3
1.2 Construction steel	<500	ST 37-2	70-95	0.02-0.08	0.08-0.14	0.14-0.18	0.18-0.23	0.23-0.24	0.24-0.3
1.3 Construction steel	> 500	ST 60-2	70-90	0.02-0.08	0.08-0.14	0.14-0.18	0.18-0.23	0.23-0.24	0.24-0.3
1.4 Heat-treated steel	<1000	42 CrMo 4	60-70	0.02-0.08	0.08-0.14	0.14-0.18	0.18-0.23	0.23-0.24	0.24-0.3
1.5 Steel casting	<1000	GS-45	50-70	0.02-0.06	0.06-0.12	0.12-0.15	0.15-0.2	0.2-0.22	0.22-0.28
1.6 Case-hardened steel	<1200	16 MnCr 5	40-50	0.02-0.06	0.06-0.12	0.12-0.15	0.15-0.2	0.2-0.22	0.22-0.28
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13							
1.8 Heat-treated steel	>1000	43 CrMo 4	40-50	0.02-0.06	0.06-0.12	0.12-0.15	0.15-0.2	0.2-0.22	0.22-0.28
1.9 Nitriding steel	<1300	31 CrMoV 9	40-50	0.02-0.06	0.06-0.12	0.12-0.15	0.15-0.2	0.2-0.22	0.22-0.28
1.10 Tool steel	<1300	X 38 CrMoV 5 1	40-50	0.02-0.08	0.08-0.12	0.12-0.18	0.18-0.25	0.25-0.3	0.3-0.35
3. Non-ferrous metals									
3.1 Long-chipping aluminium	<500	Al99.9	100-250	0.03-0.18	0.18-0.25	0.25-0.3	0.3-0.35	0.35-0.38	0.38-0.42
3.2 Short-chipping aluminium	<500	G-AlSi12	100-200	0.03-0.18	0.18-0.25	0.25-0.3	0.3-0.35	0.35-0.38	0.38-0.42
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	100-150	0.03-0.18	0.18-0.25	0.25-0.3	0.3-0.35	0.35-0.38	0.38-0.42
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	100-180	0.03-0.18	0.18-0.25	0.25-0.3	0.3-0.35	0.35-0.38	0.38-0.42
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	100-150	0.03-0.18	0.18-0.25	0.25-0.3	0.3-0.35	0.35-0.38	0.38-0.42
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	100-180	0.03-0.18	0.18-0.25	0.25-0.3	0.3-0.35	0.35-0.38	0.38-0.42
3.7 Thermoplastic	<100	PVC, acrylic glass							
3.8 Duroplast	<150	Bakelite, melamine							
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP							
3.10 Graphite	<60	C8000							
3.11 Composite materials									
4. Cast metal									
4.1 Cast iron with lamellar graphite	<260 HB	GG10	60-100	0.02-0.08	0.08-0.14	0.14-0.18	0.18-0.23	0.23-0.24	0.24-0.3
4.2 Nodular cast iron	<310 HB	GGG 40	60-100	0.02-0.08	0.08-0.14	0.14-0.18	0.18-0.23	0.23-0.24	0.24-0.3
4.3 Ductile iron	<280 HB	GTW-55	60-100	0.02-0.08	0.08-0.14	0.14-0.18	0.18-0.23	0.23-0.24	0.24-0.3

USAGE VALUES, SC DRILL REAMER, HPC, 5XD, WITH IC

11175380-446

				f [mm/U] with diameter					
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	0-3	3-5	5-8	8–12	12-16	16-20
1. Steels									
1.1 Carbon steel	< 900	9 S 20	80-110	0.02-0.01	0.01-0.18	0.18-0.23	0.23-0.3	0.3-0.35	0.35-0.42
1.2 Construction steel	<500	ST 37-2	80-100	0.02-0.01	0.01-0.18	0.18-0.23	0.23-0.3	0.3-0.35	0.35-0.42
1.3 Construction steel	> 500	ST 60-2	80-90	0.02-0.01	0.01-0.18	0.18-0.23	0.23-0.3	0.3-0.35	0.35-0.42
1.4 Heat-treated steel	<1000	42 CrMo 4	60-70	0.01-0.16	0.16-0.2	0.2-0.3	0.3-0.32	0.32-0.38	0.38-0.36
1.5 Steel casting	<1000	GS-45	50-70	0.01-0.16	0.16-0.2	0.2-0.3	0.3-0.32	0.32-0.38	0.38-0.36
1.6 Case-hardened steel	<1200	16 MnCr 5	40-50	0.02-0.01	0.01-0.16	0.16-0.2	0.2-0.3	0.3-0.32	0.32-0.38
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13							
1.8 Heat-treated steel	>1000	43 CrMo 4	40-50	0.02-0.08	0.08-0.12	0.12-0.18	0.18-0.25	0.25-0.3	0.3-0.35
1.9 Nitriding steel	<1300	31 CrMoV 9	40-50	0.02-0.08	0.08-0.12	0.12-0.18	0.18-0.25	0.25-0.3	0.3-0.35
1.10 Tool steel	<1300	X 38 CrMoV 5 1	40-50	0.02-0.08	0.08-0.12	0.12-0.18	0.18-0.25	0.25-0.3	0.3-0.35
4. Cast metal									
4.1 Cast iron with lamellar graphite	<260 HB	GG10	60-90	0.02-0.01	0.01-0.18	0.18-0.23	0.23-0.3	0.3-0.35	0.35-0.42
4.2 Nodular cast iron	<310 HB	GGG 40	60-90	0.02-0.01	0.01-0.18	0.18-0.23	0.23-0.3	0.3-0.35	0.35-0.42
4.3 Ductile iron	<280 HB	GTW-55	60-90	0.02-0.01	0.01-0.18	0.18-0.23	0.23-0.3	0.3-0.35	0.35-0.42

USAGE VALUES, HSSE V3 TWIST DRILL, 3XD–5XD

11036210-485

11036346-456

				f [mm/U] with diameter				
	Strength [N/mm²]	Designation in accordance with DIN:	Vc [m/min]	1-3	3-5	5-8	8–12	12-13
1. Steels								
1.1 Carbon steel	< 900	9 S 20	50-60	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.2 Construction steel	<500	ST 37-2	50-60	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.3 Construction steel	> 500	ST 60-2	40-55	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.4 Heat-treated steel	<1000	42 CrMo 4	20-35	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.5 Steel casting	<1000	GS-45	18-26	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.6 Case-hardened steel	<1200	16 MnCr 5	18-22	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.7 Ferritic/martensitic stainless steel	<1100	X 10 Cr 13	15–20	0.01-0.06	0.06-0.1	0.1-0.16	0.16-0.24	0.24-0.26
1.8 Heat-treated steel	>1000	43 CrMo 4	18-24	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.9 Nitriding steel	<1300	31 CrMoV 9	18-22	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
1.10 Tool steel	<1300	X 38 CrMoV 5 1	18-22	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
2. Stainless steels								
2.1 Austenitic stainless steel	<1100	G-X 2 CrNiMo 18 15	13-18	0.01-0.06	0.06-0.1	0.1-0.16	0.16-0.24	0.24-0.26
3. Non-ferrous metals								
3.1 Long-chipping aluminium	<500	Al99.9	60-100	0.02-0.18	0.18-0.3	0.3-0.4	0.4-0.45	0.45-0.55
3.2 Short-chipping aluminium	<500	G-AlSi12	30-60	0.02-0.18	0.18-0.3	0.3-0.4	0.4-0.45	0.45-0.55
3.3 Copper alloy Bronze, long-chipping	<1200	CuSn4	50-60	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
3.4 Copper alloy Bronze, short-chipping	<850	CuNi12Zn24	20-45	0.03-0.13	0.13-0.18	0.18-0.24	0.24-0.34	0.34-0.36
3.5 Copper alloy Brass, long-chipping	<600	Cu Zn 20	20-35	0.02-0.18	0.18-0.3	0.3-0.4	0.4-0.45	0.45-0.55
3.6 Copper alloy Brass, short-chipping	<600	Cu Zn 39 Pb 3	30-60	0.02-0.18	0.18-0.3	0.3-0.4	0.4-0.45	0.45-0.55
3.7 Thermoplastic	<100	PVC, acrylic glass						
3.8 Duroplast	<150	Bakelite, melamine						
3.9 Fibre-reinforced plastics	<1500	CFRP, GFRP						
3.10 Graphite	<60	C8000						
3.11 Composite materials								
4. Cast metal								
4.1 Cast iron with lamellar graphite	<260 HB	GG10	25-50	0.03-0.16	0.16-0.22	0.22-0.28	0.28-0.35	0.35-0.4
4.2 Nodular cast iron	<310 HB	GGG 40	32-40	0.03-0.16	0.16-0.22	0.22-0.28	0.28-0.35	0.35-0.4
4.3 Ductile iron	<280 HB	GTW-55	32-40	0.03-0.16	0.16-0.22	0.22-0.28	0.28-0.35	0.35-0.4

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