

INDEXABLE DRILLS

Indexable drills

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C

Indexable drills Product overview

Indexable insert drill







ZD03	ZSD02	ZSD03	ZSD04	ZSD05	
16-58	15-63	15-63	15-63	15-63	Diameter
C22	C10	C13	C16	C19	Page

Drilling insert










SPGT-EM	SPGT-PM	SPMX-EM	SPMX-LM	SPMX-XM	SPMX-XR	WCMX-53	WCMX-D	
05 06 07 09 11 14	05 06 07 09 11 14	05 06 07 09 11 14	05 06 07 09 11 14	05 06 07 09 11 14	05 06 07 09 11 14	03 04 05 06 08	06 08	Edge length
B299	B299	C26	C26	C25	C25	C28	C28	Page



WCMX-PG	
03 04 05 06 08	Edge length
C28	Page

Drilling

XM P M




Single-sided chip breaker for medium machining operations. All-round geometry with excellent chip control for steel and cast iron.

LM P M




Single-sided chip breaker for medium machining operations. All-round geometry with excellent chip control for soft steel.

XR P M




Geometry for soft cuts with excellent chip control for steels

PM P M K




For machining of steel, stainless steel and cast iron.

EM P M S




For machining of steel, stainless steel and heat-resistant alloys.

PG P K




For machining of steel and cast iron.

Indexable drills Chip breaker overview

Drilling

D P M K





For machining of steel, stainless steel and cast iron.

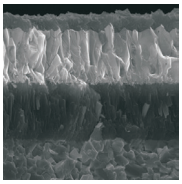
53 P M K N



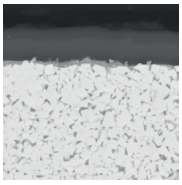
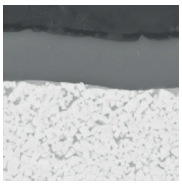
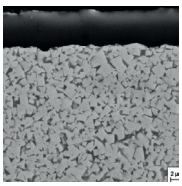
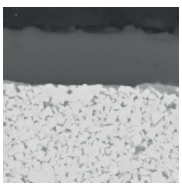
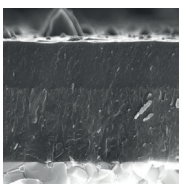


For machining of steel, stainless steel, cast iron and non-ferrous metals.

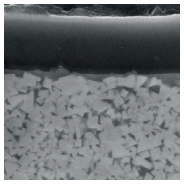
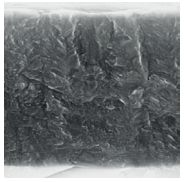
Coated cemented carbide CVD

Grade	ISO	Micro structure	Grade description
YB6338	P20 - P40 K20 - K40		CVD coated P20–P40/K20–K40 carbide substrate for operation with higher cutting speed and feed rate in steel and cast iron.
YBD252	K20 - K35		CVD coated K20–K35 carbide substrate. Optimized for medium to roughing operation of cast iron and Steel. Good wear resistance and toughness at higher cutting speed.

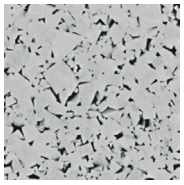
Coated cemented carbide PVD

Grade	ISO	Micro structure	Grade description
YBG105	S05 - S20		PVD multilayer coated S05–S20 carbide substrate for finishing to medium application of super alloy material but also stainless steel. Good wear resistance and thermal stability in a wide application field.
YBG202	P10 - P30 M10 - M25		PVD coated M10–M25/P10–P30 carbide substrate for finishing to medium application of stainless steel and steel (milling). Good wear resistance in a wide application field.
YBS203	S15 - S25		For processing heat-resistant materials. A special carbon substrate and the latest PVD coating technology enable a very good wear behaviour, high fracture toughness and high thermal stability.
YBG205	P10 - P30 M20 - M40 S15-S25		PVD multilayer coated P10–P30/M20–M40/S15–S25 carbide substrate for finishing to medium machining of stainless steel, super alloys and steel (milling). Excellent wear resistance and thermal stability in a wide range of applications.
YBG205H	P10 - P30 M20 - M40 S15 - S25		PVD-coated carbide grade with TiAlN composite coating for applications ranging from finishing to semi-finishing of steel, stainless steel and heat-resistant materials. The coating is extremely hard and resistant to thermal shocks and cracking in a wide range of applications.

Coated cemented carbide PVD

Grade	ISO	Micro structure	Grade description
YB9320	P10 - P30 M10 - M25		PVD multilayer coated P10–P30/M10–M25 carbide substrate for finishing to medium machining of stainless steel, super alloys and steel (grooving/milling). Optimised coating stability for higher wear resistance and thermal stability in a wide range of application.
YBG212	P25 - P35 M25-M40		PVD coated M25–M40/P25–P35 carbide substrate for steel and stainless steel. Especially for inner insert at drilling operation.

Uncoated cemented carbide

Grade	ISO	Micro structure	Grade description
YD201	K10 - K30 N10 - N30		Uncoated N10–N30/K10–K30 carbide substrate for medium application in aluminum and other material.

Notes

Application fields of grades – indexable drills

	ISO	HC[1] (CVD)	HC[1] (PVD)	HT	HW	PCBN & PCD
P	P01					
	P10	YBD252, YB6338	YBG202, YBG205(H), YBG212			
	P20					
	P30					
	P40					
M	M01					
	M10		YBG202, YB9320, YBG205(H), YBS203, YBG212			
	M20					
	M30					
	M40					
K	K01					
	K10	YBD252, YB6338	YBG202, YBG205(H), YBG212			
	K20					
	K30					
	K40					
N	N01					
	N10				YD201	
	N20					
	N30					
S	S01					
	S10		YBG202, YB9320, YBG205(H), YBS203, YBG212			
	S20					
	S30					
H	H01					
	H10					
	H20					
	H30					

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous alloys
S	Heat-resistant alloys
H	Hardened materials

HC[1] Coated cemented carbide
HT Uncoated cermet
HW Uncoated cemented carbide

ZSD – 03 300 – XP – 32 S P 09 – 02

1	2	3	4	5	6	7	8	9

Type

Code	Description
ZSD	Indexable drill (SPMX*)
ZTD	Indexable drill (SPGT*)
ZD	Indexable drill (WCMX*)

1

L/D relation

Code	Description
02	2 x D
03	3 x D
04	4 x D
05	5 x D

2

Diameter [mm]

Code	Description
130	13
...	

3

Shank type

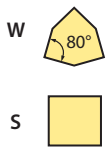
Code	Description
XP	Weldon shank

4

Coupling size [mm]

5

Insert shape



6

Clearance angle

Code	Description
C	7°
P	11°

7

Cutting edge length [mm]

Code	Insert shape W	Insert shape S
03	3,8	
04	4,3	
05	5,4	5
06	6,5	6
08	8,7	7,94
09		9,8
11		11,5
12		12,7
14		14,3

8

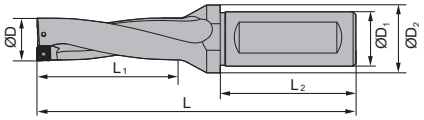
Number of teeth

9

Indexable drills seriesIndexable drills series

ZSD02





Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD02-150-XP20-SP05-02	✻	•	15	20	25	33	50	100	0.179	SPMX050204**
ZSD02-155-XP20-SP05-02	✻	•	15.5	20	25	34	50	101	0.185	SPMX050204**
ZSD02-160-XP20-SP05-02	✻	•	16	20	25	35	50	102	0.189	SPMX050204**
ZSD02-165-XP20-SP05-02	✻	•	16.5	20	25	36	50	103	0.193	SPMX050204**
ZSD02-170-XP20-SP05-02	✻	•	17	20	25	37	50	104	0.201	SPMX050204**
ZSD02-175-XP20-SP05-02	✻	•	17.5	20	25	38	50	105	0.207	SPMX050204**
ZSD02-180-XP25-SP06-02	✻	•	18	25	32	39	56	113	0.304	SPMX060204**
ZSD02-185-XP25-SP06-02	✻	•	18.5	25	32	40	56	114	0.308	SPMX060204**
ZSD02-190-XP25-SP06-02	✻	•	19	25	32	41	56	115	0.313	SPMX060204**
ZSD02-195-XP25-SP06-02	✻	•	19.5	25	32	42	56	116	0.317	SPMX060204**
ZSD02-200-XP25-SP06-02	✻	•	20	25	32	43	56	117	0.323	SPMX060204**
ZSD02-205-XP25-SP06-02	✻	•	20.5	25	32	44	56	118	0.327	SPMX060204**
ZSD02-210-XP25-SP06-02	✻	•	21	25	32	45	56	119	0.33	SPMX060204**
ZSD02-215-XP25-SP06-02	✻	•	21.5	25	32	46	56	120	0.341	SPMX060204**
ZSD02-220-XP25-SP06-02	✻	•	22	25	32	47	56	121	0.346	SPMX060204**
ZSD02-225-XP25-SP07-02	✻	•	22.5	25	32	48	56	122	0.34	SPMX07T308**
ZSD02-230-XP25-SP07-02	✻	•	23	25	32	49	56	123	0.348	SPMX07T308**
ZSD02-235-XP25-SP07-02	✻	•	23.5	25	32	50	56	124	0.353	SPMX07T308**
ZSD02-240-XP25-SP07-02	✻	•	24	25	32	51	56	125	0.36	SPMX07T308**
ZSD02-245-XP25-SP07-02	✻	•	24.5	25	32	52	56	126	0.367	SPMX07T308**
ZSD02-250-XP25-SP07-02	✻	•	25	25	32	53	56	127	0.373	SPMX07T308**
ZSD02-255-XP25-SP07-02	✻	•	25.5	25	32	54	56	128	0.382	SPMX07T308**
ZSD02-260-XP25-SP07-02	✻	•	26	25	32	55	56	129	0.391	SPMX07T308**
ZSD02-265-XP25-SP07-02	✻	○	26.5	25	32	56	56	130	0.4	SPMX07T308**
ZSD02-270-XP25-SP07-02	✻	•	27	25	32	57	56	131	0.409	SPMX07T308**
ZSD02-275-XP25-SP07-02	✻	•	27.5	25	32	58	56	132	0.418	SPMX07T308**
ZSD02-280-XP32-SP09-02	✻	•	28	32	37	59	60	139	0.599	SPMX090408**
ZSD02-285-XP32-SP09-02	✻	○	28.5	32	37	60	60	140	0.61	SPMX090408**
ZSD02-290-XP32-SP09-02	✻	•	29	32	37	60	60	141	0.619	SPMX090408**
ZSD02-295-XP32-SP09-02	✻	○	29.5	32	37	62	60	142	0.629	SPMX090408**
ZSD02-300-XP32-SP09-02	✻	•	30	32	37	61	60	143	0.64	SPMX090408**
ZSD02-305-XP32-SP09-02	✻	○	30.5	32	37	64	60	144	0.651	SPMX090408**
ZSD02-310-XP32-SP09-02	✻	•	31	32	37	65	60	145	0.663	SPMX090408**

• Ex stock ○ On demand

✻ Internal cooling

System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD02-315-XP32-SP09-02	✻	○	31.5	32	37	66	60	146	0.674	SPMX090408**
ZSD02-320-XP32-SP09-02	✻	●	32	32	37	67	60	147	0.687	SPMX090408**
ZSD02-325-XP32-SP09-02	✻	○	32.5	32	37	68	60	148	0.7	SPMX090408**
ZSD02-330-XP32-SP09-02	✻	●	33	32	37	69	60	149	0.713	SPMX090408**
ZSD02-335-XP32-SP09-02	✻	○	33.5	32	37	70	60	150	0.727	SPMX090408**
ZSD02-340-XP40-SP11-02	✻	●	34	40	47	71	70	166	1.101	SPMX110408**
ZSD02-350-XP40-SP11-02	✻	●	35	40	47	73	70	168	1.136	SPMX110408**
ZSD02-360-XP40-SP11-02	✻	●	36	40	47	75	70	170	1.166	SPMX110408**
ZSD02-370-XP40-SP11-02	✻	●	37	40	47	77	70	172	1.202	SPMX110408**
ZSD02-380-XP40-SP11-02	✻	●	38	40	47	79	70	174	1.235	SPMX110408**
ZSD02-390-XP40-SP11-02	✻	●	39	40	47	81	70	176	1.271	SPMX110408**
ZSD02-400-XP40-SP11-02	✻	●	40	40	47	83	70	178	1.311	SPMX110408**
ZSD02-410-XP40-SP11-02	✻	●	41	40	47	85	70	180	1.347	SPMX110408**
ZSD02-420-XP40-SP11-02	✻	○	42	40	52	87	70	189	1.491	SPMX110408**
ZSD02-430-XP40-SP14-02	✻	○	43	40	52	89	70	191	1.496	SPMX140512**
ZSD02-440-XP40-SP14-02	✻	○	44	40	52	91	70	193	1.499	SPMX140512**
ZSD02-450-XP40-SP14-02	✻	○	45	40	52	93	70	195	1.535	SPMX140512**
ZSD02-460-XP40-SP14-02	✻	○	46	40	52	95	70	197	1.562	SPMX140512**
ZSD02-470-XP40-SP14-02	✻	○	47	40	52	97	70	199	1.644	SPMX140512**
ZSD02-480-XP40-SP14-02	✻	○	48	40	52	99	70	201	1.697	SPMX140512**
ZSD02-490-XP40-SP14-02	✻	○	49	40	52	102	70	203	1.757	SPMX140512**
ZSD02-500-XP40-SP14-02	✻	○	50	40	52	103	70	205	1.817	SPMX140512**
ZSD02-510-XP50-SP14-02	✻	○	51	50	57	105	80	217	2.46	SPMX140512**
ZSD02-520-XP50-SP14-02	✻	○	52	50	57	107	80	219	2.527	SPMX140512**
ZSD02-530-XP50-SP14-02	✻	○	53	50	57	109	80	221	2.594	SPMX140512**
ZSD02-540-XP50-SP09-04	✻	○	54	50	57	111	80	223	2.612	SPMX090408**
ZSD02-550-XP50-SP09-04	✻	○	55	50	57	113	80	225	2.673	SPMX090408**
ZSD02-560-XP50-SP09-04	✻	○	56	50	57	115	80	227	2.747	SPMX090408**
ZSD02-570-XP50-SP09-04	✻	○	57	50	57	117	80	229	2.816	SPMX090408**
ZSD02-580-XP50-SP09-04	✻	○	58	50	57	119	80	231	2.889	SPMX090408**
ZSD02-590-XP50-SP09-04	✻	○	59	50	57	121	80	233	2.967	SPMX090408**
ZSD02-600-XP50-SP09-04	✻	○	60	50	57	123	80	235	3.115	SPMX090408**
ZSD02-610-XP50-SP09-04	✻	○	61	50	57	125	80	237	3.195	SPMX090408**
ZSD02-620-XP50-SP09-04	✻	○	62	50	57	127	80	239	3.285	SPMX090408**
ZSD02-630-XP50-SP09-04	✻	○	63	50	57	129	80	241	3.368	SPMX090408**

● Ex stock ○ On demand

✻ Internal cooling

Spare parts

	Insert	SPMX050204**	SPMX060204**	SPMX07T308**	SPMX090408**	SPMX110408**	SPMX140512**
	Screw	I60M2×4.3 (0.5Nm)	I60M2.2×5.5 (0.8Nm)	I60M2.5×6.5 (1.0Nm)	I60M3.5×8 (2.7Nm)	I60M4×10 (3.4Nm)	I60M5×13 (6.7Nm)
	Wrench	WT06IP	WT07IP	WT07IP	WT15IP	WT15IP	WT20IP

System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Insert



C26

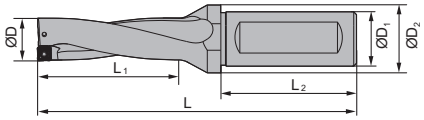
System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Indexable drills seriesIndexable drills series

ZSD03







Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD03-150-XP20-SP05-02	✻	•	15	20	25	48	50	114	0.189	SPMX050204**
ZSD03-155-XP20-SP05-02	✻	•	15.5	20	25	50	50	116	0.192	SPMX050204**
ZSD03-160-XP20-SP05-02	✻	•	16	20	25	51	50	117	0.201	SPMX050204**
ZSD03-165-XP20-SP05-02	✻	•	16.5	20	25	53	50	119	0.203	SPMX050204**
ZSD03-170-XP20-SP05-02	✻	•	17	20	25	54	50	120	0.205	SPMX050204**
ZSD03-175-XP20-SP05-02	✻	•	17.5	20	25	56	50	122	0.206	SPMX050204**
ZSD03-180-XP25-SP06-02	✻	•	18	25	32	57	56	131	0.319	SPMX060204**
ZSD03-185-XP25-SP06-02	✻	•	18.5	25	32	59	56	133	0.326	SPMX060204**
ZSD03-190-XP25-SP06-02	✻	•	19	25	32	60	56	134	0.332	SPMX060204**
ZSD03-195-XP25-SP06-02	✻	•	19.5	25	32	62	56	136	0.339	SPMX060204**
ZSD03-200-XP25-SP06-02	✻	•	20	25	32	63	56	137	0.344	SPMX060204**
ZSD03-205-XP25-SP06-02	✻	•	20.5	25	32	65	56	139	0.352	SPMX060204**
ZSD03-210-XP25-SP06-02	✻	•	21	25	32	66	56	140	0.368	SPMX060204**
ZSD03-215-XP25-SP06-02	✻	•	21.5	25	32	68	56	142	0.37	SPMX060204**
ZSD03-220-XP25-SP06-02	✻	•	22	25	32	69	56	143	0.375	SPMX060204**
ZSD03-225-XP25-SP07-02	✻	•	22.5	25	32	71	56	145	0.397	SPMX07T308**
ZSD03-230-XP25-SP07-02	✻	•	23	25	32	72	56	147	0.383	SPMX07T308**
ZSD03-235-XP25-SP07-02	✻	•	23.5	25	32	74	56	149	0.395	SPMX07T308**
ZSD03-240-XP25-SP07-02	✻	•	24	25	32	75	56	150	0.406	SPMX07T308**
ZSD03-245-XP25-SP07-02	✻	•	24.5	25	32	77	56	152	0.423	SPMX07T308**
ZSD03-250-XP25-SP07-02	✻	•	25	25	32	78	56	153	0.431	SPMX07T308**
ZSD03-255-XP25-SP07-02	✻	•	25.5	25	32	80	56	155	0.44	SPMX07T308**
ZSD03-260-XP25-SP07-02	✻	•	26	25	32	81	56	156	0.453	SPMX07T308**
ZSD03-265-XP25-SP07-02	✻	•	26.5	25	32	83	56	158	0.467	SPMX07T308**
ZSD03-270-XP25-SP07-02	✻	•	27	25	32	84	56	160	0.504	SPMX07T308**
ZSD03-275-XP25-SP07-02	✻	•	27.5	25	32	86	56	162	0.682	SPMX07T308**
ZSD03-280-XP32-SP09-02	✻	•	28	32	37	87	60	169	0.707	SPMX090408**
ZSD03-285-XP32-SP09-02	✻	○	28.5	32	37	89	60	171	0.689	SPMX090408**
ZSD03-290-XP32-SP09-02	✻	•	29	32	37	90	60	172	0.739	SPMX090408**
ZSD03-295-XP32-SP09-02	✻	○	29.5	32	37	92	60	174	0.72	SPMX090408**
ZSD03-300-XP32-SP09-02	✻	•	30	32	37	93	60	175	0.754	SPMX090408**
ZSD03-305-XP32-SP09-02	✻	•	30.5	32	37	95	60	177	0.754	SPMX090408**
ZSD03-310-XP32-SP09-02	✻	•	31	32	37	96	60	178	0.771	SPMX090408**

• Ex stock ○ On demand

✻ Internal cooling

System code > C9 | Grade selection > C8 | Technical info > C193 | Cutting data > C30

Indexable drills Drilling bodies

Article	✲	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD03-315-XP32-SP09-02	✲	○	31.5	32	37	98	60	180	0.788	SPMX090408**
ZSD03-318-XP32-SP09-02	✲	○	31.8	32	37	98	60	180	0.768	SPMX090408**
ZSD03-320-XP32-SP09-02	✲	•	32	32	37	99	60	181	0.806	SPMX090408**
ZSD03-325-XP32-SP09-02	✲	○	32.5	32	37	101	60	183	0.825	SPMX090408**
ZSD03-330-XP32-SP09-02	✲	•	33	32	37	102	60	184	0.847	SPMX090408**
ZSD03-340-XP40-SP11-02	✲	•	34	40	47	105	70	200	1.208	SPMX110408**
ZSD03-350-XP40-SP11-02	✲	•	35	40	47	108	70	203	1.248	SPMX110408**
ZSD03-360-XP40-SP11-02	✲	•	36	40	47	111	70	206	1.302	SPMX110408**
ZSD03-370-XP40-SP11-02	✲	•	37	40	47	114	70	209	1.341	SPMX110408**
ZSD03-375-XP40-SP11-02	✲	○	37.5	40	47	116	70	211	1.475	SPMX110408**
ZSD03-380-XP40-SP11-02	✲	•	38	40	47	117	70	212	1.395	SPMX110408**
ZSD03-385-XP40-SP11-02	✲	○	38.5	40	47	119	70	214	1.42	SPMX110408**
ZSD03-390-XP40-SP11-02	✲	•	39	40	47	120	70	215	1.447	SPMX110408**
ZSD03-400-XP40-SP11-02	✲	•	40	40	47	123	70	218	1.505	SPMX110408**
ZSD03-410-XP40-SP11-02	✲	•	41	40	47	126	70	221	1.549	SPMX110408**
ZSD03-420-XP40-SP11-02	✲	○	42	40	52	129	70	231	1.716	SPMX110408**
ZSD03-430-XP40-SP14-02	✲	•	43	40	52	132	70	234	1.656	SPMX140512**
ZSD03-440-XP40-SP14-02	✲	○	44	40	52	135	70	237	1.708	SPMX140512**
ZSD03-450-XP40-SP14-02	✲	○	45	40	52	138	70	240	1.776	SPMX140512**
ZSD03-460-XP40-SP14-02	✲	○	46	40	52	141	70	243	1.851	SPMX140512**
ZSD03-470-XP40-SP14-02	✲	○	47	40	52	144	70	245	1.924	SPMX140512**
ZSD03-478-XP32-SP14-02	✲	○	47.8	40	52	146	70	248	1.986	SPMX140512**
ZSD03-480-XP40-SP14-02	✲	○	48	40	52	147	70	249	2.003	SPMX140512**
ZSD03-490-XP40-SP14-02	✲	○	49	40	52	150	70	252	2.094	SPMX140512**
ZSD03-500-XP40-SP14-02	✲	○	50	40	52	153	70	255	2.184	SPMX140512**
ZSD03-510-XP50-SP14-02	✲	○	51	50	57	156	80	268	2.882	SPMX140512**
ZSD03-520-XP50-SP14-02	✲	○	52	50	57	159	80	271	2.974	SPMX140512**
ZSD03-530-XP50-SP14-02	✲	○	53	50	57	162	80	274	3.071	SPMX140512**
ZSD03-540-XP50-SP09-04	✲	○	54	50	57	165	80	277	3.116	SPMX090408**
ZSD03-550-XP50-SP09-04	✲	○	55	50	57	168	80	280	3.208	SPMX090408**
ZSD03-560-XP50-SP09-04	✲	○	56	50	57	171	80	283	3.315	SPMX090408**
ZSD03-570-XP50-SP09-04	✲	○	57	50	57	174	80	286	3.499	SPMX090408**
ZSD03-580-XP50-SP09-04	✲	○	58	50	57	177	80	289	3.53	SPMX090408**
ZSD03-590-XP50-SP09-04	✲	○	59	50	57	180	80	292	3.649	SPMX090408**
ZSD03-600-XP50-SP09-04	✲	○	60	50	57	183	80	295	3.838	SPMX090408**
ZSD03-610-XP50-SP09-04	✲	○	61	50	57	186	80	298	3.961	SPMX090408**
ZSD03-620-XP50-SP09-04	✲	○	62	50	57	189	80	301	4.103	SPMX090408**
ZSD03-630-XP50-SP09-04	✲	○	63	50	57	192	80	304	4.238	SPMX090408**

• Ex stock ○ On demand

✲ Internal cooling

Spare parts

	Insert	SPMX050204**	SPMX060204**	SPMX07T308**	SPMX090408**	SPMX110408**	SPMX140512**
	Screw	I60M2×4.3 (0.5Nm)	I60M2.2×5.5 (0.8Nm)	I60M2.5×6.5 (1.0Nm)	I60M3.5×8 (2.7Nm)	I60M4×10 (3.4Nm)	I60M5×13 (6.7Nm)
	Wrench	WT06IP	WT07IP	WT07IP	WT15IP	WT15IP	WT20IP

System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Insert



C26

A Turning
B Milling
C Drilling
D Technical Information
E Index

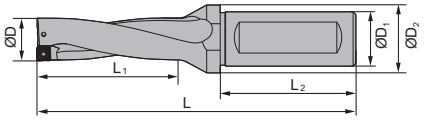
System code > C9 | Grade selection > C8 | Technical info > C193 | Cutting data > C30

Indexable drills seriesIndexable drills series

ZSD04







Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD04-150-XP20-SP05-02	✻	•	15	20	25	63	50	129	0.2	SPMX050204**
ZSD04-155-XP20-SP05-02	✻	•	15.5	20	25	65	50	131	0.203	SPMX050204**
ZSD04-160-XP20-SP05-02	✻	•	16	20	25	67	50	133	0.207	SPMX050204**
ZSD04-165-XP20-SP05-02	✻	•	16.5	20	25	69	50	135	0.214	SPMX050204**
ZSD04-170-XP20-SP05-02	✻	•	17	20	25	71	50	137	0.218	SPMX050204**
ZSD04-175-XP20-SP05-02	✻	•	17.5	20	25	73	50	139	0.222	SPMX050204**
ZSD04-180-XP25-SP06-02	✻	•	18	25	32	75	56	149	0.34	SPMX060204**
ZSD04-185-XP25-SP06-02	✻	•	18.5	25	32	77	56	151	0.341	SPMX060204**
ZSD04-190-XP25-SP06-02	✻	•	19	25	32	79	56	153	0.369	SPMX060204**
ZSD04-195-XP25-SP06-02	✻	•	19.5	25	32	81	56	155	0.382	SPMX060204**
ZSD04-200-XP25-SP06-02	✻	•	20	25	32	83	56	157	0.367	SPMX060204**
ZSD04-205-XP25-SP06-02	✻	•	20.5	25	32	85	56	159	0.37	SPMX060204**
ZSD04-210-XP25-SP06-02	✻	•	21	25	32	87	56	161	0.413	SPMX060204**
ZSD04-215-XP25-SP06-02	✻	•	21.5	25	32	89	56	163	0.426	SPMX060204**
ZSD04-220-XP25-SP06-02	✻	•	22	25	32	91	56	165	0.441	SPMX060204**
ZSD04-225-XP25-SP07-02	✻	•	22.5	25	32	93	56	167	0.407	SPMX07T308**
ZSD04-230-XP25-SP07-02	✻	•	23	25	32	95	56	170	0.421	SPMX07T308**
ZSD04-235-XP25-SP07-02	✻	•	23.5	25	32	97	56	172	0.483	SPMX07T308**
ZSD04-240-XP25-SP07-02	✻	•	24	25	32	99	56	174	0.502	SPMX07T308**
ZSD04-245-XP25-SP07-02	✻	•	24.5	25	32	101	56	176	0.517	SPMX07T308**
ZSD04-250-XP25-SP07-02	✻	•	25	25	32	103	56	178	0.52	SPMX07T308**
ZSD04-255-XP25-SP07-02	✻	•	25.5	25	32	105	56	181	0.5	SPMX07T308**
ZSD04-260-XP25-SP07-02	✻	•	26	25	32	107	56	182	0.512	SPMX07T308**
ZSD04-265-XP25-SP07-02	✻	•	26.5	25	32	109	56	184	0.52	SPMX07T308**
ZSD04-270-XP25-SP07-02	✻	•	27	25	32	111	56	187	0.617	SPMX07T308**
ZSD04-275-XP25-SP07-02	✻	•	27.5	25	32	113	56	190	0.642	SPMX07T308**
ZSD04-280-XP32-SP09-02	✻	○	28	32	37	115	60	199	0.748	SPMX090408**
ZSD04-285-XP32-SP09-02	✻	○	28.5	32	37	117	60	201	0.81	SPMX090408**
ZSD04-290-XP32-SP09-02	✻	•	29	32	37	119	60	203	0.793	SPMX090408**
ZSD04-295-XP32-SP09-02	✻	○	29.5	32	37	121	60	205	0.883	SPMX090408**
ZSD04-300-XP32-SP09-02	✻	•	30	32	37	123	60	207	0.832	SPMX090408**
ZSD04-305-XP32-SP09-02	✻	•	30.5	32	37	125	60	209	0.854	SPMX090408**
ZSD04-310-XP32-SP09-02	✻	•	31	32	37	127	60	211	0.872	SPMX090408**

• Ex stock ○ On demand

✻ Internal cooling

System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD04-315-XP32-SP09-02	✻	○	31.5	32	37	129	60	213	0.894	SPMX090408**
ZSD04-320-XP32-SP09-02	✻	●	32	32	37	131	60	215	0.922	SPMX090408**
ZSD04-325-XP32-SP09-02	✻	○	32.5	32	37	133	60	217	0.946	SPMX090408**
ZSD04-330-XP32-SP09-02	✻	●	33	32	37	135	60	219	0.973	SPMX090408**
ZSD04-335-XP32-SP09-02	✻	○	33.5	32	37	137	60	221	1	SPMX090408**
ZSD04-340-XP40-SP11-02	✻	●	34	40	47	139	70	234	1.326	SPMX110408**
ZSD04-350-XP40-SP11-02	✻	●	35	40	47	143	70	238	1.384	SPMX110408**
ZSD04-360-XP40-SP11-02	✻	●	36	40	47	147	70	242	1.445	SPMX110408**
ZSD04-370-XP40-SP11-02	✻	●	37	40	47	151	70	246	1.499	SPMX110408**
ZSD04-380-XP40-SP11-02	✻	●	38	40	47	155	70	250	1.563	SPMX110408**
ZSD04-390-XP40-SP11-02	✻	●	39	40	47	159	70	254	1.629	SPMX110408**
ZSD04-400-XP40-SP11-02	✻	●	40	40	47	163	70	258	1.697	SPMX110408**
ZSD04-405-XP40-SP11-02	✻	●	40.5	40	47	165	70	260	1.737	SPMX110408**
ZSD04-410-XP40-SP11-02	✻	●	41	40	47	167	70	262	1.775	SPMX110408**
ZSD04-420-XP40-SP11-02	✻	○	42	40	52	171	70	273	1.948	SPMX110408**
ZSD04-430-XP40-SP14-02	✻	○	43	40	52	175	70	277	1.952	SPMX140512**
ZSD04-440-XP40-SP14-02	✻	○	44	40	52	179	70	281	1.962	SPMX140512**
ZSD04-450-XP40-SP14-02	✻	○	45	40	52	183	70	285	2.06	SPMX140512**
ZSD04-460-XP40-SP14-02	✻	○	46	40	52	187	70	289	2.157	SPMX140512**
ZSD04-470-XP40-SP14-02	✻	●	47	40	52	191	70	293	2.256	SPMX140512**
ZSD04-480-XP40-SP14-02	✻	○	48	40	52	195	70	297	2.361	SPMX140512**
ZSD04-490-XP40-SP14-02	✻	○	49	40	52	199	70	301	2.489	SPMX140512**
ZSD04-500-XP40-SP14-02	✻	○	50	40	52	203	70	305	2.589	SPMX140512**
ZSD04-510-XP50-SP14-02	✻	○	51	50	57	207	80	319	3.292	SPMX140512**
ZSD04-520-XP50-SP14-02	✻	○	52	50	57	211	80	323	3.435	SPMX140512**
ZSD04-530-XP50-SP14-02	✻	○	53	50	57	215	80	327	3.574	SPMX140512**
ZSD04-540-XP50-SP09-04	✻	○	54	50	57	219	80	331	3.604	SPMX090408**
ZSD04-550-XP50-SP09-04	✻	○	55	50	57	223	80	335	3.731	SPMX090408**
ZSD04-560-XP50-SP09-04	✻	○	56	50	57	227	80	339	3.868	SPMX090408**
ZSD04-570-XP50-SP09-04	✻	○	57	50	57	231	80	343	4.01	SPMX090408**
ZSD04-580-XP50-SP09-04	✻	○	58	50	57	235	80	347	4.156	SPMX090408**
ZSD04-590-XP50-SP09-04	✻	○	59	50	57	239	80	351	4.312	SPMX090408**
ZSD04-600-XP50-SP09-04	✻	○	60	50	57	243	80	355	4.558	SPMX090408**
ZSD04-610-XP50-SP09-04	✻	○	61	50	57	247	80	359	4.72	SPMX090408**
ZSD04-620-XP50-SP09-04	✻	○	62	50	57	251	80	363	4.886	SPMX090408**
ZSD04-630-XP50-SP09-04	✻	○	63	50	57	255	80	367	5.068	SPMX090408**

● Ex stock ○ On demand

✻ Internal cooling

Spare parts

	Insert	SPMX050204**	SPMX060204**	SPMX07T308**	SPMX090408**	SPMX110408**	SPMX140512**
	Screw	I60M2×4.3 (0.5Nm)	I60M2.2×5.5 (0.8Nm)	I60M2.5×6.5 (1.0Nm)	I60M3.5×8 (2.7Nm)	I60M4×10 (3.4Nm)	I60M5×13 (6.7Nm)
	Wrench	WT06IP	WT07IP	WT07IP	WT15IP	WT15IP	WT20IP

System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Insert



C26

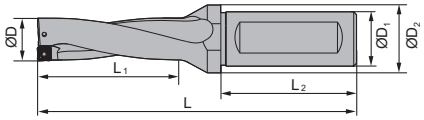
System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Indexable drills seriesIndexable drills series

ZSD05







Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD05-150-XP20-SP05-02	✻	•	15	20	25	78	50	144	0.206	SPMX050204**
ZSD05-155-XP20-SP05-02	✻	•	15.5	20	25	81	50	147	0.214	SPMX050204**
ZSD05-160-XP20-SP05-02	✻	•	16	20	25	83	50	149	0.219	SPMX050204**
ZSD05-165-XP20-SP05-02	✻	•	16.5	20	25	86	50	152	0.223	SPMX050204**
ZSD05-170-XP20-SP05-02	✻	•	17	20	25	88	50	154	0.23	SPMX050204**
ZSD05-175-XP20-SP05-02	✻	•	17.5	20	25	91	50	157	0.239	SPMX050204**
ZSD05-180-XP25-SP06-02	✻	•	18	25	32	93	56	167	0.355	SPMX060204**
ZSD05-185-XP25-SP06-02	✻	•	18.5	25	32	96	56	170	0.36	SPMX060204**
ZSD05-190-XP25-SP06-02	✻	•	19	25	32	98	56	172	0.369	SPMX060204**
ZSD05-195-XP25-SP06-02	✻	•	19.5	25	32	101	56	175	0.382	SPMX060204**
ZSD05-200-XP25-SP06-02	✻	•	20	25	32	103	56	177	0.39	SPMX060204**
ZSD05-205-XP25-SP06-02	✻	•	20.5	25	32	106	56	180	0.401	SPMX060204**
ZSD05-210-XP25-SP06-02	✻	•	21	25	32	108	56	182	0.413	SPMX060204**
ZSD05-215-XP25-SP06-02	✻	•	21.5	25	32	111	56	185	0.426	SPMX060204**
ZSD05-220-XP25-SP06-02	✻	•	22	25	32	113	56	187	0.441	SPMX060204**
ZSD05-225-XP25-SP07-02	✻	•	22.5	25	32	116	56	190	0.442	SPMX07T308**
ZSD05-230-XP25-SP07-02	✻	•	23	25	32	118	56	194	0.461	SPMX07T308**
ZSD05-235-XP25-SP07-02	✻	•	23.5	25	32	121	56	197	0.483	SPMX07T308**
ZSD05-240-XP25-SP07-02	✻	•	24	25	32	123	56	199	0.497	SPMX07T308**
ZSD05-245-XP25-SP07-02	✻	•	24.5	25	32	126	56	202	0.517	SPMX07T308**
ZSD05-250-XP25-SP07-02	✻	•	25	25	32	128	56	204	0.533	SPMX07T308**
ZSD05-255-XP25-SP07-02	✻	•	25.5	25	32	131	56	207	0.555	SPMX07T308**
ZSD05-260-XP25-SP07-02	✻	•	26	25	32	133	56	209	0.571	SPMX07T308**
ZSD05-265-XP25-SP07-02	✻	•	26.5	25	32	136	56	212	0.593	SPMX07T308**
ZSD05-270-XP25-SP07-02	✻	•	27	25	32	138	56	214	0.617	SPMX07T308**
ZSD05-275-XP25-SP07-02	✻	•	27.5	25	32	141	56	217	0.642	SPMX07T308**
ZSD05-280-XP32-SP09-02	✻	•	28	32	37	143	60	223	0.791	SPMX090408**
ZSD05-285-XP32-SP09-02	✻	○	28.5	32	37	146	60	226	0.814	SPMX090408**
ZSD05-290-XP32-SP09-02	✻	•	29	32	37	148	60	228	0.837	SPMX090408**
ZSD05-295-XP32-SP09-02	✻	○	29.5	32	37	151	60	231	0.861	SPMX090408**
ZSD05-300-XP32-SP09-02	✻	•	30	32	37	153	60	233	0.943	SPMX090408**
ZSD05-310-XP32-SP09-02	✻	•	31	32	37	158	60	238	0.943	SPMX090408**
ZSD05-315-XP32-SP09-02	✻	○	31.5	32	37	161	60	241	0.972	SPMX090408**

• Ex stock ○ On demand

✻ Internal cooling

System code > C9 | Grade selection > C8 | Technical info > C193 | Cutting data > C30

Indexable drills Drilling bodies

Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZSD05-320-XP32-SP09-02	✻	•	32	32	37	163	60	243	1.001	SPMX090408**
ZSD05-325-XP32-SP09-02	✻	○	32.5	32	37	166	60	246	1.033	SPMX090408**
ZSD05-330-XP32-SP09-02	✻	•	33	32	37	168	60	249	1.067	SPMX090408**
ZSD05-335-XP32-SP09-02	✻	○	33.5	32	37	171	60	253	1.106	SPMX090408**
ZSD05-340-XP40-SP11-02	✻	•	34	40	47	173	70	268	1.44	SPMX110408**
ZSD05-350-XP40-SP11-02	✻	•	35	40	47	178	70	273	1.505	SPMX110408**
ZSD05-360-XP40-SP11-02	✻	•	36	40	47	183	70	278	1.575	SPMX110408**
ZSD05-370-XP40-SP11-02	✻	•	37	40	47	188	70	283	1.723	SPMX110408**
ZSD05-380-XP40-SP11-02	✻	•	38	40	47	193	70	288	1.723	SPMX110408**
ZSD05-390-XP40-SP11-02	✻	•	39	40	47	198	70	293	1.808	SPMX110408**
ZSD05-400-XP40-SP11-02	✻	•	40	40	47	203	70	298	1.894	SPMX110408**
ZSD05-410-XP40-SP11-02	✻	•	41	40	47	208	70	303	1.991	SPMX110408**
ZSD05-420-XP40-SP11-02	✻	○	42	40	52	213	70	315	2.182	SPMX110408**
ZSD05-430-XP40-SP14-02	✻	•	43	40	52	218	70	320	2.11	SPMX140512**
ZSD05-440-XP40-SP14-02	✻	•	44	40	52	223	70	325	2.22	SPMX140512**
ZSD05-450-XP40-SP14-02	✻	•	45	40	52	228	70	330	2.331	SPMX140512**
ZSD05-460-XP40-SP14-02	✻	•	46	40	52	233	70	335	2.45	SPMX140512**
ZSD05-470-XP40-SP14-02	✻	○	47	40	52	238	70	340	2.582	SPMX140512**
ZSD05-480-XP40-SP14-02	✻	•	48	40	52	243	70	345	2.693	SPMX140512**
ZSD05-490-XP40-SP14-02	✻	•	19	40	52	248	70	350	2.823	SPMX140512**
ZSD05-500-XP40-SP14-02	✻	•	50	40	52	253	70	355	2.958	SPMX140512**
ZSD05-510-XP50-SP14-02	✻	○	51	50	57	258	80	370	3.7	SPMX140512**
ZSD05-520-XP50-SP14-02	✻	○	52	50	57	263	80	375	3.848	SPMX140512**
ZSD05-530-XP50-SP14-02	✻	○	53	50	57	268	80	380	3.998	SPMX140512**
ZSD05-540-XP50-SP09-04	✻	○	54	50	57	273	80	385	4.035	SPMX090408**
ZSD05-550-XP50-SP09-04	✻	○	55	50	57	278	80	390	4.203	SPMX090408**
ZSD05-560-XP50-SP09-04	✻	○	56	50	57	283	80	395	4.368	SPMX090408**
ZSD05-570-XP50-SP09-04	✻	○	57	50	57	288	80	400	4.671	SPMX090408**
ZSD05-580-XP50-SP09-04	✻	○	58	50	57	293	80	405	4.866	SPMX090408**
ZSD05-590-XP50-SP09-04	✻	○	59	50	57	298	80	410	5.047	SPMX090408**
ZSD05-600-XP50-SP09-04	✻	○	60	50	57	303	80	415	5.192	SPMX090408**
ZSD05-610-XP50-SP09-04	✻	○	61	50	57	308	80	420	5.4	SPMX090408**
ZSD05-620-XP50-SP09-04	✻	○	62	50	57	313	80	425	5.619	SPMX090408**
ZSD05-630-XP50-SP09-04	✻	○	63	50	57	318	80	430	5.834	SPMX090408**

• Ex stock ○ On demand

✻ Internal cooling

Spare parts

	Insert	SPMX050204**	SPMX060204**	SPMX07T308**	SPMX090408**	SPMX110408**	SPMX140512**
	Screw	I60M2×4.3 (0.5Nm)	I60M2.2×5.5 (0.8Nm)	I60M2.5×6.5 (1.0Nm)	I60M3.5×8 (2.7Nm)	I60M4×10 (3.4Nm)	I60M5×13 (6.7Nm)
	Wrench	WT06IP	WT07IP	WT07IP	WT15IP	WT15IP	WT20IP

System code > C9 Grade selection > C8 Technical info > C193 Cutting data > C30

Insert



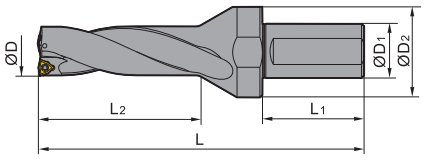
C26

System code > C9 | Grade selection > C8 | Technical info > C193 | Cutting data > C30

Indexable drills seriesIndexable drills series

ZD03





Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZD03-160-XP25-WC03-02	✻	•	16	25	32	56	52	129	0.33	WCMX0302**
ZD03-170-XP25-WC03-02	✻	•	17	25	32	56	55	133	0.33	WCMX0302**
ZD03-180-XP25-WC03-02	✻	•	18	25	32	56	58	137	0.35	WCMX0302**
ZD03-190-XP25-WC03-02	✻	•	19	25	32	56	61	140	0.36	WCMX0302**
ZD03-200-XP25-WC03-02	✻	•	20	25	32	56	64	143	0.37	WCMX0302**
ZD03-210-XP25-WC04-02	✻	•	21	25	45	56	67	153	0.51	WCMX0402**
ZD03-220-XP25-WC04-02	✻	•	22	25	45	56	70	156	0.54	WCMX0402**
ZD03-230-XP25-WC04-02	✻	•	23	25	45	56	73	159	0.55	WCMX0402**
ZD03-240-XP25-WC04-02	✻	•	24	25	45	56	76	162	0.57	WCMX0402**
ZD03-250-XP25-WC04-02	✻	•	25	25	45	56	79	165	0.6	WCMX0402**
ZD03-260-XP32-WC05-02	✻	•	26	32	55	60	83	176	0.93	WCMX0503**
ZD03-270-XP32-WC05-02	✻	•	27	32	55	60	86	180	0.97	WCMX0503**
ZD03-280-XP32-WC05-02	✻	•	28	32	55	60	89	184	1.01	WCMX0503**
ZD03-290-XP32-WC05-02	✻	•	29	32	55	60	92	188	1.05	WCMX0503**
ZD03-300-XP32-WC05-02	✻	•	30	32	55	60	95	192	1.08	WCMX0503**
ZD03-310-XP40-WC06-02	✻	•	31	40	60	70	98	203	1.44	WCMX06T3**
ZD03-320-XP40-WC06-02	✻	•	32	40	60	70	101	206	1.48	WCMX06T3**
ZD03-330-XP40-WC06-02	✻	•	33	40	60	70	104	209	1.52	WCMX06T3**
ZD03-340-XP40-WC06-02	✻	•	34	40	60	70	107	212	1.55	WCMX06T3**
ZD03-350-XP40-WC06-02	✻	•	35	40	60	70	110	215	1.61	WCMX06T3**
ZD03-360-XP40-WC06-02	✻	•	36	40	60	70	113	218	1.66	WCMX06T3**
ZD03-370-XP40-WC06-02	✻	•	37	40	60	70	116	221	1.71	WCMX06T3**
ZD03-380-XP40-WC06-02	✻	•	38	40	60	70	119	225	1.76	WCMX06T3**
ZD03-390-XP40-WC06-02	✻	•	39	40	60	70	122	228	1.82	WCMX06T3**
ZD03-400-XP40-WC06-02	✻	•	40	40	60	70	125	231	1.93	WCMX06T3**
ZD03-410-XP40-WC06-02	✻	•	41	40	60	70	128	234	1.94	WCMX06T3**
ZD03-420-XP40-WC08-02	✻	•	42	40	60	70	131	239	2.18	WCMX0804**
ZD03-430-XP40-WC08-02	✻	•	43	40	60	70	134	242	2.245	WCMX0804**
ZD03-440-XP40-WC08-02	✻	•	44	40	60	70	137	245	2.34	WCMX0804**
ZD03-450-XP40-WC08-02	✻	•	45	40	60	70	140	248	2.34	WCMX0804**
ZD03-460-XP40-WC08-02	✻	•	46	40	60	70	143	251	2.49	WCMX0804**
ZD03-470-XP40-WC08-02	✻	•	47	40	60	70	146	253	2.88	WCMX0804**
ZD03-480-XP40-WC08-02	✻	•	48	40	70	70	149	255	2.55	WCMX0804**

• Ex stock ○ On demand

✻ Internal cooling

System code C9 Grade selection C8 Technical info C193 Cutting data C30

Article	✻	Stock	Dimensions [mm]							Inserts
			ØD	ØD1	ØD2	L1	L2	L	kg	
ZD03-490-XP40-WC08-02	✻	○	49	40	70	70	152	257	2.619	WCMX0804**
ZD03-500-XP40-WC08-02	✻	•	50	40	70	70	155	259	2.62	WCMX0804**
ZD03-520-XP40-WC08-02	✻	○	52	40	70	70	70	263	2.808	WCMX0804**
ZD03-530-XP40-WC08-02	✻	○	53	40	70	70	164	265	2.906	WCMX0804**
ZD03-540-XP40-WC08-02	✻	•	54	40	70	70	167	267	2.983	WCMX0804**
ZD03-550-XP40-WC08-02	✻	○	55	40	70	70	170	269	3.126	WCMX0804**
ZD03-560-XP40-WC08-02	✻	○	56	40	70	70	173	271	3.157	WCMX0804**
ZD03-580-XP40-WC08-02	✻	•	58	40	70	70	179	275	3.501	WCMX0804**

• Ex stock ○ On demand

✻ Internal cooling

Spare parts

	Insert	WCMX0302**	WCMX0402**	WCMX0503**	WCMX06T3**	WCMX0804**
	Screw	I60M2.5×6.5 (1.0Nm)	I60M2.5×6.5T (1.0Nm)	I60M3×7 (1.8Nm)	I60M3×7 (1.8Nm)	I60M3.5×10.4 (2.7Nm)
	Wrench	WT06IP	WT07IP	WT15IP	WT15IP	WT20IP

Insert



Medium Cut

C28

System code C9 | Grade selection C8 | Technical info C193 | Cutting data C30

Indexable drills ISO code – inserts

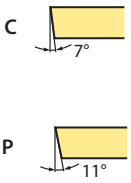
W	C	M	X	08	04	12	R	–	PG
1	2	3	4	5	6	7	8		9

Insert shape



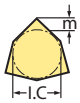
1

Clearance angle



2

Tolerance class





Code	I.C [mm]	m [mm]	S [mm]
G	±0,025	±0,025	±0,130
M	±0,05–0,13	±0,08–0,18	±0,130

3

Fastening features (metric)

Insert shape



X Special

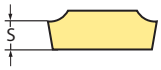
4

Cutting edge length l [mm]

I.C [mm]	Insert shape	
		
	S	W
3,8		**03**
4,3		**04**
5,4		**05**
6,35	**06**	
6,5		**06**
8,0		**08**
8,7	**08**	
9,252	**09**	
12,7	**12**	

5

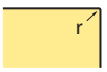
Insert thickness S [mm]



Code	S	Code	S
00	0,79	**05**	5,56
T0	0,99	**T5**	5,95
01	1,59	**06**	6,35
T1	1,98	**T6**	6,75
02	2,38	**07**	7,94
T2	2,58	**09**	9,52
03	3,18	**T9**	9,72
T3	3,97	**11**	11,11
04	4,76	**12**	12,70
T4	4,96		

6

Nose radius r [mm]



Code	r
04	0,4
08	0,8
12	1,2

7

Rotation direction

Code	Description
R	Right
L	Left

8

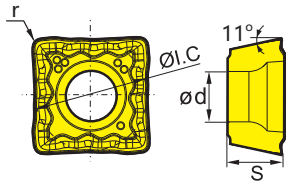
Chip breaker overview (on page C3)

9

SPMX	L	I.C	S	d
05 02	5	5	2.38	2.2
06 02	6	6	2.38	2.5
07 T3	7.94	7.94	3.97	2.8
09 04	9.8	9.8	4.3	4.1
11 04	11.5	11.5	4.76	4.4
14 05	14.3	14.3	5.2	5.5

Drilling inserts

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

SP** milling insert			HC[1] (CVD)							HC[1] (PVD)							HW
		P															
		M															
		K															
		N															
		S															
		H															
ISO		r	YB6338	YBD252						YBG105	YBG202	YBS203	YBG205	YBG205H	YB9320	YBG212	YD201
XM	**SPMX050204-XM**	0.4	○												●		
	SPMX060204-XM	0.4	○									●			●		
	SPMX07T308-XM	0.8	●									●			●		
	SPMX090408-XM	0.8	○												●		
	SPMX110408-XM	0.8	○												●		
	SPMX140512-XM	1.2	○												●		
XR	**SPMX050204-XR**	0.4												●			
	SPMX060204-XR	0.4												●			
	SPMX07T308-XR	0.8												●			
	SPMX090408-XR	0.8												●			
	SPMX110408-XR	0.8												●			
	SPMX140512-XR	1.2												●			

● Ex stock ○ On demand

HC[1] Coated carbide
HW Uncoated carbide

Tool holder

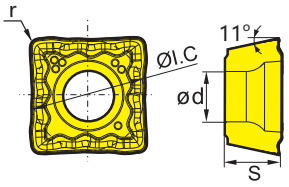
ZSD02	ZSD03	ZSD04	ZSD05
			
C10	C13	C16	C19

System code C24 | Grade selection C8 | Technical info C293 | Cutting data C30

SPMX	L	I.C	S	d
05 02	5	5	2.38	2.2
06 02	6	6	2.38	2.5
07 T3	7.94	7.94	3.97	2.8
09 04	9.8	9.8	4.3	4.1
11 04	11.5	11.5	4.76	4.4
14 05	14.3	14.3	5.2	5.5

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

Drilling inserts



SP** milling insert			HC¹ (CVD)							HC¹ (PVD)							HW
		P															
		M															
		K															
		N															
		S															
		H															
ISO		r	YB6338	YBD252						YBG105	YBG202	YBS203	YBG205	YBG205H	YB9320	YBG212	YD201
EM	SPMX050204-EM	0.4										○			●		
	SPMX060204-EM	0.4										○			●		
	SPMX07T308-EM	0.8										○			●		
	SPMX090408-EM	0.8										○			●		
	SPMX110408-EM	0.8										○			●		
	SPMX140512-EM	1.2										○			●		
LM	SPMX050204-LM	0.4													○		
	SPMX060204-LM	0.4													○		
	SPMX07T308-LM	0.8													○		
	SPMX090408-LM	0.8													○		
	SPMX110408-LM	0.8													○		
	SPMX140512-LM	1.2													○		

● Ex stock ○ On demand

HC¹ Coated carbide
HW Uncoated carbide

Tool holder

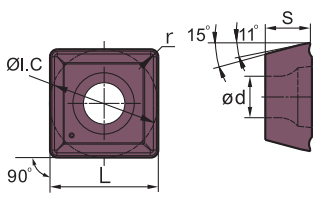
ZSD02	ZSD03	ZSD04	ZSD05
			
C10	C13	C16	C19

System code > C24 Grade selection > C8 Technical info > C293 Cutting data > C30

SPGT	L	I.C	S	d
05 02	5	5	2.38	2.2
06 02	6	6	2.38	2.6
07 T3	7.94	7.94	3.97	2.8
09 04	9.8	9.8	4.76	4.2
11 04	11.5	11.5	4.76	4.4
14 05	14.3	14.3	5.2	5.75

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

Drilling inserts



SP** drilling insert			HC¹ (CVD)							HC¹ (PVD)							HW
		P															
		M															
		K															
		N															
		S															
		H															
ISO		r	YB6338	YBD252						YBG105	YBG202	YBS203	YBG205	YBG205H	YB9320	YBG212	YD201
PM	**SPGT050204-PM**	0.4	○										○			○	
	SPGT060204-PM	0.4	○										○			○	
	SPGT07T308-PM	0.8	●										●	○		●	
	SPGT090408-PM	0.8	●										●			●	
	SPGT110408-PM	0.8	●										●			●	
	SPGT140512-PM	1.2	●										●			●	
EM	**SPGT050204-EM**	0.4											○			○	
	SPGT060204-EM	0.4											○			○	
	SPGT07T308-EM	0.8											●			●	
	SPGT090408-EM	0.8											●			●	
	SPGT110408-EM	0.8											●			●	
	SPGT140512-EM	1.2											●			●	

● Ex stock ○ On demand

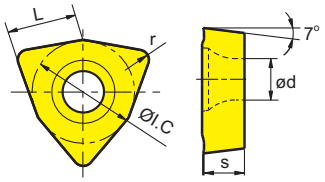
HC¹ Coated carbide
HW Uncoated carbide

System code > C24 Grade selection > C8 Technical info > C293 Cutting data > C30

WCMX	L	I.C	S	d
03 02	3.8	5.56	2.38	2.8
04 02	4.3	6.35	2.38	3.1
05 03	5.4	7.94	3.18	3.2
06 T3	6.5	9.525	3.97	3.7
08 04	8.7	12.7	4.76	4.3

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

Drilling inserts



WC** drilling insert			HC¹ (CVD)							HC¹ (PVD)							HW
		P															
		M															
		K															
		N															
		S															
		H															
ISO		r	YB6338	YBD252						YBG105	YBG202	YBS203	YBG205	YBG205H	YB9320	YBG212	YD201
53	**WCMX030208R-53**	0.8	●								○						
	WCMX040208R-53	0.8	●								○						
	WCMX050308R-53	0.8	●								○						
	WCMX06T308R-53	0.8	●								○						○
	WCMX080412R-53	1.2	●								○						
D	**WCMX06T308-D**	0.8	○														
	WCMX080412-D	1.2	○														
PG	**WCMX030208R-PG**	0.8									○						
	WCMX040208R-PG	0.8									○						
	WCMX050308R-PG	0.8	○								○		○				
	WCMX06T308R-PG	0.8									○						
	WCMX080412R-PG	1.2									○						

● Ex stock ○ On demand

HC¹ Coated carbide
HW Uncoated carbide

Tool holder
ZD03



C22

System code C24 | Grade selection C8 | Technical info C293 | Cutting data C30

Notes

Indexable drills

Material group		Composition / structure / heat treatment		HB	Machining group	ZSD* SPMX04		ZSD* SPMX05/06		
						v_c [m/min]	f [mm]	v_c [m/min]	f [mm]	
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	200-300	0,05-0,08	200-300	0,05-0,10	
		approx. 0,45 % C	annealed	190	2	200-300	0,05-0,08	200-300	0,05-0,10	
		approx. 0,45 % C	tempered	250	3	200-300	0,05-0,08	200-300	0,05-0,10	
		approx. 0,75 % C	annealed	270	4	200-300	0,05-0,08	200-300	0,05-0,10	
		approx. 0,75 % C	tempered	300	5	200-300	0,05-0,08	200-300	0,05-0,10	
	Low-alloyed steel		annealed	180	6	140-220	0,05-0,08	140-220	0,05-0,10	
			tempered	275	7	140-220	0,05-0,08	140-220	0,05-0,10	
			tempered	300	8	140-220	0,05-0,08	140-220	0,05-0,10	
			tempered	350	9	140-220	0,05-0,08	140-220	0,05-0,10	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	120-180	0,05-0,08	120-180	0,05-0,10	
			hardened and tempered	325	11	120-180	0,05-0,08	120-180	0,05-0,10	
M	Stainless steel	ferritic/martensitic	annealed	200	12	110-230	0,05-0,08	110-230	0,05-0,10	
		martensitic	tempered	240	13	110-230	0,05-0,08	110-230	0,05-0,10	
		austenitic	quench hardened	180	14	110-230	0,05-0,08	110-230	0,05-0,10	
		austenitic-ferritic		230	15	110-230	0,05-0,08	110-230	0,05-0,10	
K	Grey cast iron	perlitic/ferritic		180	16	170-240	0,05-0,08	170-240	0,05-0,10	
		perlitic (martensitic)		260	17	170-240	0,05-0,08	170-240	0,05-0,10	
	Cast iron with spheroidal graphite	ferritic		160	18	130-200	0,05-0,08	130-200	0,05-0,10	
		perlitic		250	19	130-200	0,05-0,08	130-200	0,05-0,10	
	Malleable cast iron	ferritic		130	20	120-220	0,05-0,08	120-220	0,05-0,10	
		perlitic		230	21	120-220	0,05-0,08	120-220	0,05-0,10	
N	Aluminium wrought alloys	cannot be hardened		60	22					
		hardenable	hardened	100	23					
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24					
		≤ 12 % Si, hardenable	hardened	90	25					
		> 12 % Si, cannot be hardened		130	26					
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27					
		CuZn, CuSnZn		90	28					
		CuSn, Pb-free copper, electrolytic copper		100	29					
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30					
			hardened	280	31					
		Ni or Co bass	annealed	250	32					
			hardened	350	33					
			cast	320	34					
	Titanium alloys	pure titanium		R_m 400	35					
		α and β alloys	hardened	R_m 1050	36					
H	Hardened steel		hardened and tempered	55 HRC	37					
			hardened and tempered	60 HRC	38					
	Hard cast iron		cast	400	39					
	Hardened cast iron		hardened and tempered	55 HRC	40					
X	Non-metallic materials	Thermoplasts			41					
		Thermosetting plastics			42					
		Plastic, glass-fibre reinforced GFRP			43					
		Plastic, carbon fibre reinforced CFRP			44					
		Graphite			45					
		Wood			46					

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.
With hole depths of 5xD adjust the cutting data accordingly to the application.
For examples of material for cutting tool groups view page D11.

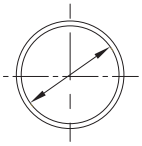
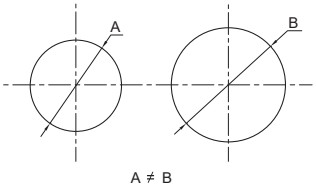
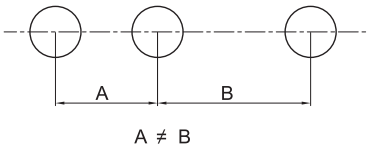
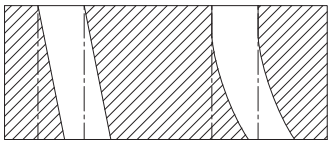
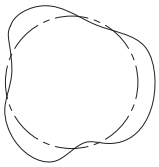
	ZSD*		ZSD*		ZTD*		ZTD*		ZTD*		ZD03		ZD03		
	SPMX07/09		SPMX11/14		SPGT05/06		SPGT07/09		SPGT11/14		WCMX03-05		WCMX06-08		
	v_c [m/min]	f [mm]	v_c [m/min]	f [mm]	v_c [m/min]	f [mm]	v_c [m/min]	f [mm]	v_c [m/min]	f [mm]	v_c [m/min]	f [mm]	v_c [m/min]	f [mm]	
	200-300	0,06-0,14	200-300	0,08-0,17	200-300	0,05-0,08	200-300	0,06-0,11	200-300	0,08-0,14	200-300	0,05-0,08	200-300	0,06-0,11	
	200-300	0,06-0,14	200-300	0,08-0,17	200-300	0,05-0,08	200-300	0,06-0,11	200-300	0,08-0,14	200-300	0,05-0,08	200-300	0,06-0,11	
	200-300	0,06-0,14	200-300	0,08-0,17	200-300	0,05-0,08	200-300	0,06-0,11	200-300	0,08-0,14	200-300	0,05-0,08	200-300	0,06-0,11	
	200-300	0,06-0,14	200-300	0,08-0,17	200-300	0,05-0,08	200-300	0,06-0,11	200-300	0,08-0,14	200-300	0,05-0,08	200-300	0,06-0,11	
	200-300	0,06-0,14	200-300	0,08-0,17	200-300	0,05-0,08	200-300	0,06-0,11	200-300	0,08-0,14	200-300	0,05-0,08	200-300	0,06-0,11	
	140-220	0,06-0,14	140-220	0,09-0,19	140-220	0,05-0,08	140-220	0,07-0,12	140-220	0,09-0,16	140-220	0,05-0,08	140-220	0,07-0,12	
	140-220	0,06-0,14	140-220	0,09-0,19	140-220	0,05-0,08	140-220	0,07-0,12	140-220	0,09-0,16	140-220	0,05-0,08	140-220	0,07-0,12	
	140-220	0,06-0,14	140-220	0,09-0,19	140-220	0,05-0,08	140-220	0,07-0,12	140-220	0,09-0,16	140-220	0,05-0,08	140-220	0,07-0,12	
	140-220	0,06-0,14	140-220	0,09-0,19	140-220	0,05-0,08	140-220	0,07-0,12	140-220	0,09-0,16	140-220	0,05-0,08	140-220	0,07-0,12	
	120-180	0,06-0,14	120-180	0,09-0,19	120-180	0,05-0,08	120-180	0,07-0,12	120-180	0,09-0,16	120-180	0,05-0,08	120-180	0,07-0,12	
	120-180	0,06-0,14	120-180	0,09-0,19	120-180	0,05-0,08	120-180	0,07-0,12	120-180	0,09-0,16	120-180	0,05-0,08	120-180	0,07-0,12	
	110-230	0,06-0,14	110-230	0,08-0,17	110-230	0,05-0,08	110-230	0,06-0,11	110-230	0,08-0,14	110-230	0,05-0,08	110-230	0,06-0,11	
	110-230	0,06-0,14	110-230	0,08-0,17	110-230	0,05-0,08	110-230	0,06-0,11	110-230	0,08-0,14	110-230	0,05-0,08	110-230	0,06-0,11	
	110-230	0,06-0,14	110-230	0,08-0,17	110-230	0,05-0,08	110-230	0,06-0,11	110-230	0,08-0,14	110-230	0,05-0,08	110-230	0,06-0,11	
	110-230	0,06-0,14	110-230	0,08-0,17	110-230	0,05-0,08	110-230	0,06-0,11	110-230	0,08-0,14	110-230	0,05-0,08	110-230	0,06-0,11	
	170-240	0,08-0,16	170-240	0,12-0,24	170-240	0,05-0,08	170-240	0,08-0,14	170-240	0,12-0,21	170-240	0,05-0,08	170-240	0,08-0,14	
	170-240	0,08-0,16	170-240	0,12-0,24	170-240	0,05-0,08	170-240	0,08-0,14	170-240	0,12-0,21	170-240	0,05-0,08	170-240	0,08-0,14	
	130-200	0,08-0,16	130-200	0,12-0,24	130-200	0,05-0,08	130-200	0,08-0,14	130-200	0,12-0,21	130-200	0,05-0,08	130-200	0,08-0,14	
	130-200	0,08-0,16	130-200	0,12-0,24	130-200	0,05-0,08	130-200	0,08-0,14	130-200	0,12-0,21	130-200	0,05-0,08	130-200	0,08-0,14	
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	120-220	0,08-0,16	120-220	0,12-0,24	120-220	0,05-0,08	120-220	0,08-0,14	120-220	0,12-0,21	120-220	0,05-0,08	120-220	0,08-0,14	

Technical information

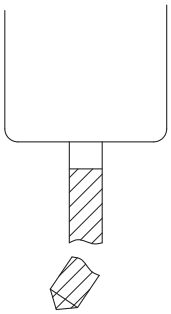
Trouble shooting – drilling	**C194-C198**
Technical information – drilling	**C199-C205**
Special tools – drilling	**C206**

C

Trouble shooting – solid carbide drills

Error	Reason	Countermeasure
Oversized holes 	– Insufficient clamping of workpiece and/or tool – Large radial run out – Point relief is off centre	– Use precision clamping – Reduce spindle play – Check and adjust clamped drill
	– Asymmetric point angle – Large radial run out – Point relief is off centre	– Regrind drill – Check quality of regrinding
Irregular hole size 	– Asymmetric point angle – Large radial run out – Point relief is off centre – High wear	– Use precision clamping – Reduce spindle play – Check and adjust clamped drill
	– Insufficient clamping of work piece and/or tool – Large radial run out – Point relief is off centre – High wear	– Use precision clamping – Reduce spindle play – Check and adjust clamped drill
	– Feed rate too high	– Reduce feed rate
	– Insufficient coolant	– Increase amount of coolant or change coolant supply
Low position accuracy 	– Insufficient clamping and spindle positio-ning – Large radial run out of spindle	– Improve positioning of machine – Use precision clamping – Calibrate spindle – Check and adjust clamped drill
	– The feed direction is not vertical to the workpiece surface	– Adjust feed rate vertically to workpiece surface
	– Tool isn't aligned with centre of spindle (lathe machines	– Centre the tool
Bad drill run out 	– High tool wear	– Regrind drill
	– Poor drill accuracy	– Improve positioning of drill
	– Asymmetric point angle – Large radial run out – Point relief is off centre	– Regrind drill – Check quality of regrinding
	– Insufficient tool stability	– Improve stability of tool
	– Uneven workpiece surface – Tool isn't aligned with centre of spindle (lathe machines)	– Before boring align the workpiece horizontally to the drill or pre-machine the workpiece
Inaccurate hole (roundness) 	– Asymmetric point angle – Large radial run out – Point relief is off centre – High wear	– Regrind drill – Check quality of regrinding
	– Insufficient clamping of work piece and/or tool – Large radial run out of spindle	– Use precision clamping – Calibrate spindle – Check and adjust clamped drill
	– Clearance angle too large	– Regrind the drill
	– Insufficient tool stability	– Improve tool stability

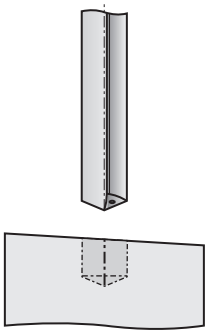
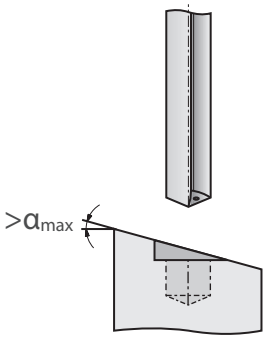
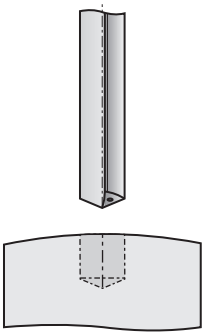
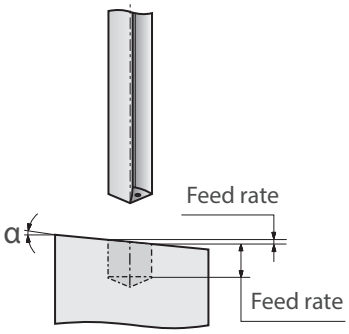
Trouble shooting – solid carbide drills

Error	Reason	Countermeasure
Bad surface quality	– Bad drill regrinding	– Improve regrinding
	– Insufficient amount of coolant or coolant method	– Change coolant supply – Increase amount of coolant
	– Insufficient clamping – Large radial run out of spindle	– Use precision clamping – Calibrate spindle
	– Feed rate too high	– Reduce feed rate
	– High wear of cutting edge – High welding	– Regrind drill – Use a coated drill
	– Bad chip removal	– Chose a suitable drill (with an accordingly flute, helical angle etc.) – Adjust cutting speed (reduce feed rate, etc.)
Bad cylindricity 	– No symmetrical point angle – Large radial run out (drilling) – Centre insert is off centre – Large cutting edge wear – Feed rate too low	– Regrind drill – Check regrind – Increase feed rate
Breakage of drill 	– Insufficient clamping of tool and/or workpiece	– Improve stability of tool and clamping of workpiece
	– Clearance angle too small	– Use a drill with bigger clearance angle or regrind
	– Feed rate too high	– Reduce feed rate
	– Excessive wear	– Regrind drill
	– Chip jamming	– Chose a suitable drill (considering flute geometry, helical angle, etc.) – Adjust cutting speed – Reduce feed rate
	– Drilling in uneven surfaces	– Increase rigidity of drill and clamping of machine and workpiece – Use drill with sharp centre insert – Pre-drill a centre hole – Create a straight surface (e.g. with solid carbide milling cutter) – Use a guide bush or bush plate
Chipping on the drill 	– Hard surface or blow holes	– Check material and chose suitable grade – Change cutting conditions (cutting speed, feed rate or machining method)
	– Feed rate too high	– Reduce feed rate
	– Insufficient coolant	– Improve/increase coolant supply
Chipping on the cutting edge 	– Poor clamping – Large radial run out	– Use a more precise clamping device – Adjust the spindle
	– Cutting speed and feed rate too high	– Reduce cutting speed and feed rate
	– Clearance angle too large	– Use a drill with smaller clearance angle or regrind

Trouble shooting – solid carbide drills

Error	Reason	Countermeasure
Excessive wear 	– Overdue regrinding	– Regrind in time
	– Drill tip not in centre position	– Adjust drill with centre of spindle
	– Cutting speed too high	– Reduce cutting speed
	– Cutting angle not suitable	– Chose right cutting angle
	– Material not suitable	– Chose suitable material
	– Insufficient cooling	– Use suitable cooling
Wear and chipping on point relief	– Feed rate too high	– Reduce feed rate
	– Cutting angle not suitable	– Chose right cutting angle
	– Material not suitable	– Chose suitable material
	– Clearance angle too small	– Regrind drill
Breakage on margin	– Guide bush too large	– Change guide bush
Built up edge on margin	– High wear and heat	– Regrind drill
	– Insufficient cooling	– Change cooling method
	– Incorrect coolant	– Change coolant
	– Workpiece material is too soft	– Use drill with smaller clearance angle
High vibrations	– Clearance angle too large	– Regrind drill
	– Drill stability too low	– Improve stability
Swarf clogs the drill	– Long chips – Chip removal not fluent	– Optimise cutting data – Change drill or adjust machine
One-side wear	– Drill tip not centred	– Adjust drill with centre of spindle
	– Poor clamping	– Improve drill clamping – Check concentricity

Trouble shooting – PC series

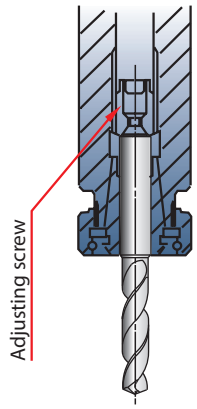
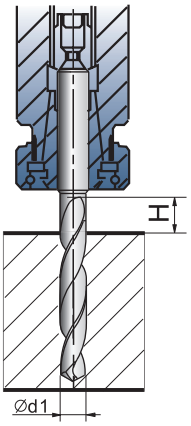
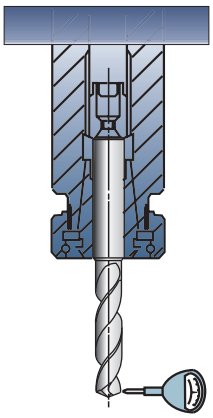
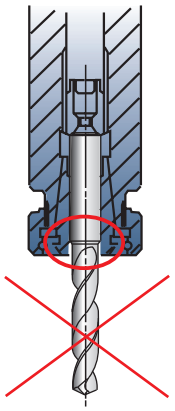
Machining	Recommendation
Sloped surface 	– Inclined surfaces should be pre-machined (chamfering). 
Inclined surface 	– Reduce feed rate accordingly.  Inclination angle / Max. feed rate 1° / 80% 2° / 50% 3° / 30%

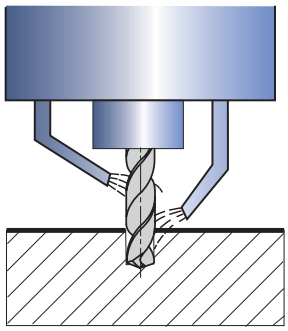
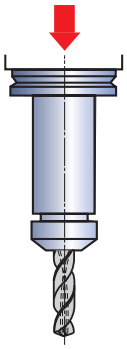
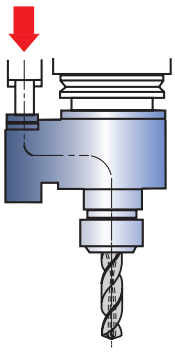
Trouble shooting – solid carbide reamers

Problem	Solution
Oversized hole	– Reduce the diameter of the reamer. – Check concentricity of the reamer and hole. – Check the radial run-out of the reamer. – Check the shank of the reamer for scratches. – Select a suitable coolant. – Adjust the cutting parameters.
Hole too small	– Increase the diameter of the reamer. – Reduce the cutting speed. – Reduce allowance. – Regrind or replace the reamer. – Ensure sufficient cooling.
Poor hole roundness and straightness	– Guarantee concentricity of the reamer chamfer. – Reduce overhang. – Check radial run-out after the reamer is clamped. – Adjust concentricity of the reamer and hole. – Check and ensure drill geometry.
Poor surface quality	– Reduce the cutting speed. – Ensure correct reaming allowance. – Check the cutting chamfer length of the reamer for wear and built-up edge. – Ensure stability of the machine, tool holder and reamer. – Chose the reamer according to the application. – Check the hole allowance.
Poor bore quality	– Pull out the reamer in cutting direction. – Reduce the cutting speed. – Use reamers with more teeth. – Check for concentricity and radial run-out. – Improve coolant supply. – Chose the optimal coolant lubrication.
Reamer breakage and thermal damage	– The guide chamfer is insufficient. Check the drill and drilling axis. – Adjust machining allowance. – Ensure sufficient coolant supply. – Adjust the cutting speed and feed rate. – Improve the stability of the machine, the tool holder and the cutting tool. – Change or regrind the cutting tool if the cutter wear is too high.
Damage on reamer shank	– Check clamping sleeve and tool holder for damage.
Short tool life	– Check coolant supply. – Change from straight fluted to helical fluted reamers. – Check all factors affecting machining precision.
Scratched hole surface	– Check the cutting edge for built-up edges and if necessary correct the cutting data. – Improve clamping of the work piece.
Trumpet-shaped entry hole	– Improve clamping of the work piece. – Check radial run-out of the clamped reamer. – The centre of the reamer may not be aligned with the centre of the hole. Adjust concentricity.

Solid carbide drills

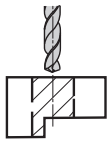
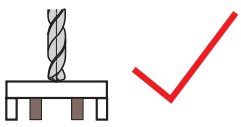
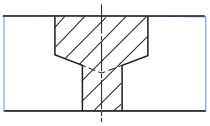
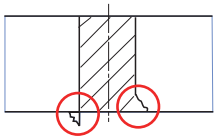
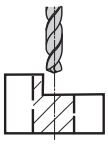
Operation notes

Correct drill clamping	Max. drilling length	Radial run-out	Wrong drill clamping
			
Use precision collets	H = 1,5 x d1	Radial run-out <0.02 mm	Don't clamp on the drill flutes.

External coolant method	Internal coolant method	
		
The coolant liquid should shoot to the end and the centre of the drill as shown in the figure.	Coolant pressure is about 0.5–1 mpa (coolant pressure is 2–3 mpa when the diameter is less than 5 mm), coolant volume: 1.5–4 L/min	

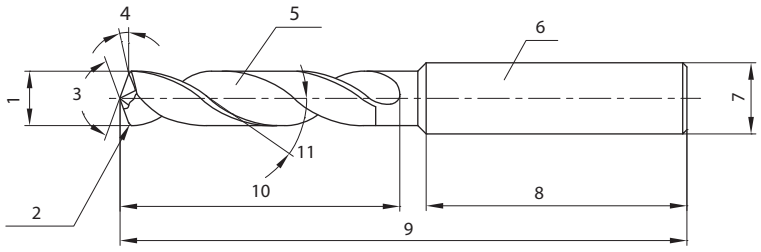
Handling of coolants:

1. Small chip particles and dust can cause jamming in the oil hole. A fine mesh filter should be used.
2. Dirt and dust particles will adhere to the oil hole and lead to unsmooth coolant flow. Regularly change the coolant. Please ensure proper coolant supply.

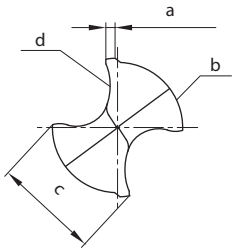
Interrupted cutting	Thin work pieces	Stepped holes	Burrs and work piece chippings on exit
 Reduce the feed rate when drilling interrupted cut.	  If bending occurs, add a supporter.	 – First drill the larger hole, then the smaller hole. – We can offer multiple step and chamfer drills on request.	 – Reduce the feed rate approx. by half when the drill exits. – Use a drill with a different point angle.
 Machine a countersink with an end mill prior to drilling.			

Solid carbide drills

Terminology

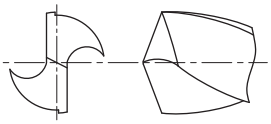
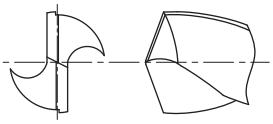
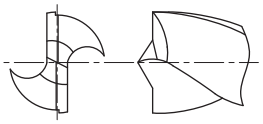


1. Drilling diameter
2. Chamfer
3. Point angle
4. Clearance angle
5. Chip pocket
6. Shank
7. Shank diameter
8. Shank length
9. Overall length
10. Flute length
11. Helical angle



a. Margin width
b. Body clearance
c. Land width
d. Primary cutting edge

Cutting edge type

Shape	 (Conical)	 (Dual flats)	 (Centring tip)
Features	– The flank face is conical and the clearance angel increases toward the centre of drill. – Wide applications, commonly used both for soft and hard materials.	– The flank face is dual flats, to facilitate cutting and initial entering. – Often used for small diameter drills.	– This shape has two-stage point angles for perfect centring capabilities and reduces burrs. – It is the first choice for drilling thin plate.

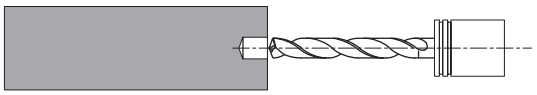
Solid carbide drills

Drill specification and cutting parameters

Chip pocket	The chip pocket ensures that the chips are removed out of the hole during processing.
Helical angle	The helical angle describes the pitch of the flute. It's specified according to the to be machined material. hardened materials — small ⟵ helical angle ⟶ large — tough materials
Cutting edge length or spiral length	The cutting edge length needs to be specified according to the drilling depth, guide bushing length and the whole regrinding length. The larger the helical angle, the lower the stability. Since it greatly influences the tool life, it should be as small as possible. The recommended min. spiral length is the drilling depth plus 1.5 times of the hole diameter.
Point angle	Generally the point angle is 140°, for special applications it should be set differently. tough materials, easy to machine — small ⟵ point angle ⟶ large — hardened materials and high-performance drilling
Core diameter	The core diameter is an important factor and influences the stability and the chip flow. low axial cutting force, low stability, for easy to machine materials — small ⟵ core diameter ⟶ large — high axial cutting force, high stability, for hardened materials or cross holes
Chamfer width	The chamfer width influences the guidance and friction of the drill during machining. low friction and bad drill guidance — small ⟵ chamfer width ⟶ large — high friction and good drill guidance
Back taper	The drill diameter is slightly reduced from cutting edge to shank to reduce friction during machining.
Body clearance	The area behind the chamfer width. The body clearance is necessary to reduce friction during machining.

Deep hole drilling

1 Preparation of the pilot hole with 1534SP03C*



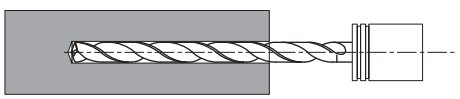
– Point angle of pilot drill must be bigger than SL drill.
– Diameter of pilot drill must be 0.01–0.04 mm bigger than SL drill.
– The pilot hole should be 1–3×D.

2 Entering the pilot hole with SL drill



– Entering the pilot hole with low cutting speed. (VC: 20–30 m/min)
– Stop 1–3 mm before end of pilot hole. (Vf = 0)
– Increase cutting speed up to recommended parameter and then start drilling at feed rate.

3 Manufacturing the deep hole



– Drilling with suitable cutting speed and feed rate.
In case of cross holes feed rate should be reduced to 0.05 mm/rev..

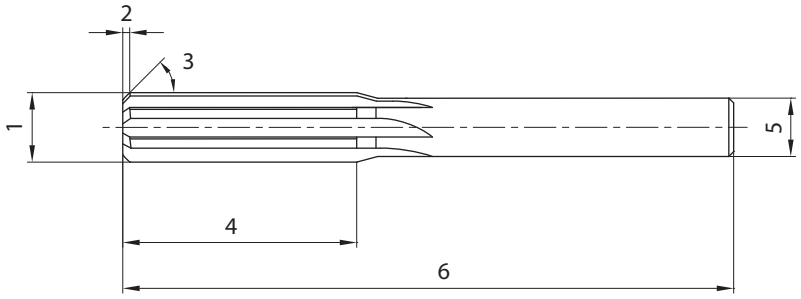
4 Pulling out the drill



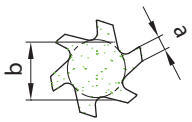
– After reaching the required depth reduce the cutting speed (VC: 20–30 m/min) and pull out the drill at high feed rate. (Vf: 2000 mm/min)

Solid carbide reamers

Terminology

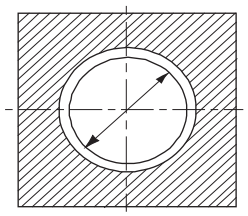


1.Nominal diameter
2.Chamfer length
3.Entry angle
4.Cutting edge length
5.Shank diameter
6.Total length

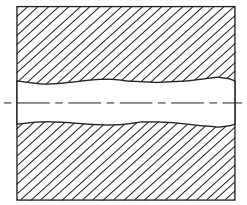


a.Cutting edge thickness
b.Core diameter

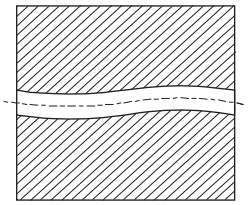
Reaming is semi-finishing and finishing of a previously formed hole within a narrow tolerance for higher surface quality, perfect roundness, cylindricity, etc.. To achieve a precisely reamed hole, the right choice of reamer and reamer diameter is important. In addition to that, the bore tolerance, the material and the machining conditions need to be taken into account. Furthermore the bore quality is strongly influenced by the radial run-out of the cutting tool.



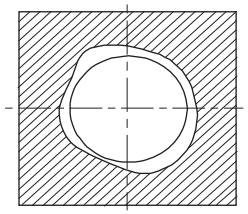
Diameter tolerance/Allowance



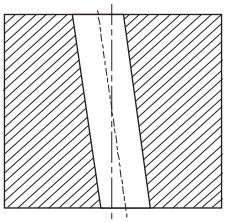
Cylindricity



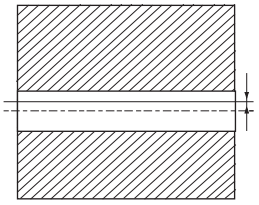
Straightness



Roundness



Vertical deviation



Off centre

Solid carbide thread formers

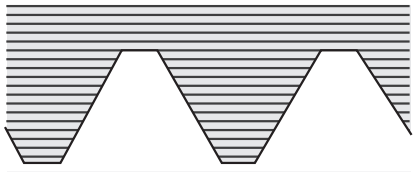
What is thread forming?

The material fibres aren't severed but compressed at the base of the thread. This is why no material is lost unlike when thread cutting.

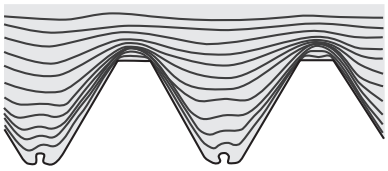
Advantages of thread forming:
- The thread is formed much more precisely.
- The thread is more resilient.
- The threads have a very smooth surface.
- Higher rotation speeds and feed rates possible than in thread cutting.
- Longer tool life increases the productivity.

Disadvantages of thread forming:
- Higher requirements on the hole tolerance.
- Can't be used as hand tool.
- Greater heat build-up than in thread drilling.
- Limited material choice.
- Often the use of a release agent is necessary.

Thread formers should be used in materials with good cold formability. Next to steel, stainless steel and aluminium alloys, these include light metals and light metal alloys with a yield strength of 1200 N/mm^2. Basically, all long-chipping materials are suitable.



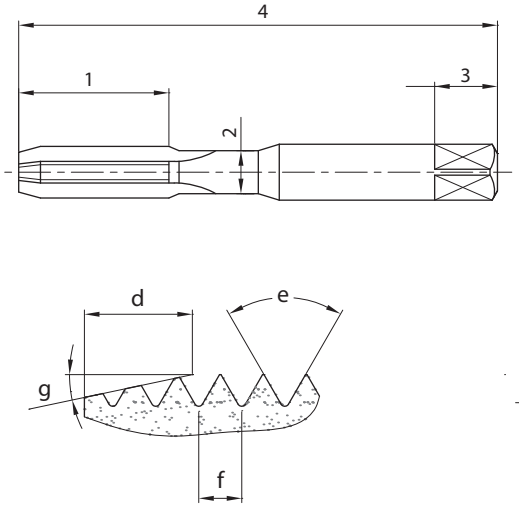
Fibre orientation after thread cutting



Fibre orientation after thread forming

Solid carbide taps

Terminology



Chamfer and thread profile

1.Thread length
2.Neck diameter
3.Square head length
4.Total length

a.Core diameter
b.Cutting edge thickness
c.Chip pocket

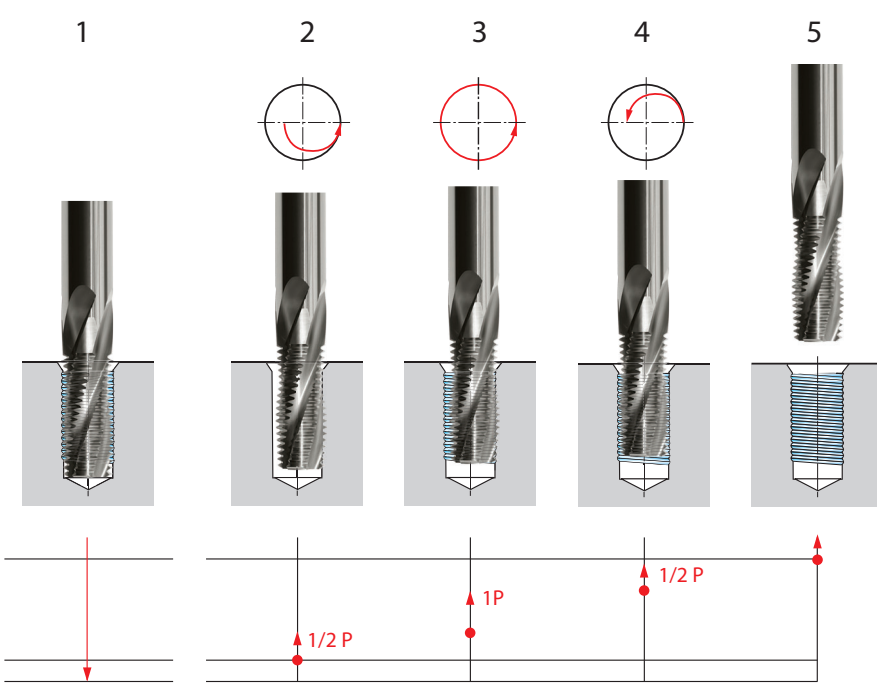
d.Chamfer length
e.Thread profile angle
f.Pitch
g.Chamfer angle

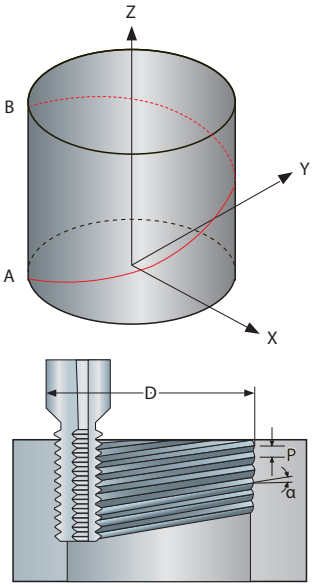
Chip space and application

Chip space type	Features	Application
 Helical flute tap	– Helical flute – No chips inside the hole – Good entering performance – Simple centring	– For long-chipping materials – Suitable for blind holes – Usage in holes with groove
 Straight flute tap	– Straight flute – Stable cutting edge – Easy regrinding	– For hard machining – For short-chipping materials – For through holes and blind holes – For wear material

Solid carbide thread milling cutters

Solid carbide thread milling cutters with cylindrical shank – example

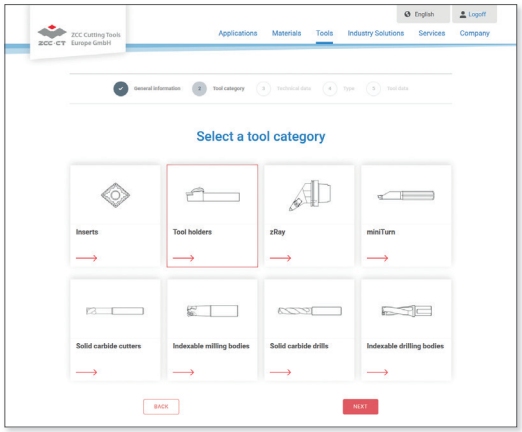




α Helix angle
D Diameter
p Pitch

Go directly to the special tool tailored for your drilling applications

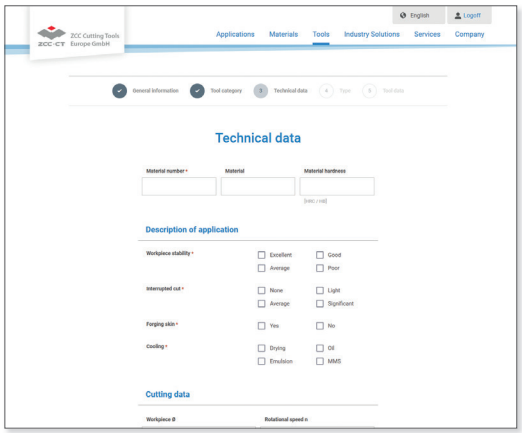
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