



How to choose the right U drills

Shape

Product category

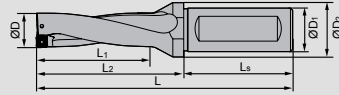
Indexable shallow drills

Inserts specification

Including type, dimension, grade and stock.

ZSD02 2D

3D

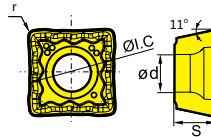


Type	Stock	Basic dimension(mm)								Applicable inserts	Insert screw	Wrench
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L				
ZSD02-120-XP20-SP04-02	▲	12.0	20	25	27	44	50	94	SPMX040203-XM/LM/EM/XR	I60M1.8x4	WT05IP	
ZSD02-125-XP20-SP04-02	▲	12.5	20	25	28	45	50	95	SPMX040203-XM/LM/EM/XR	I60M1.8x4	WT05IP	
ZSD02-130-XP20-SP04-02	▲	13.0	20	25	29	46	50	96	SPMX040203-XM/LM/EM/XR	I60M1.8x4	WT05IP	
ZSD02-135-XP20-SP04-02	▲	13.5	20	25	30	47	50	97	SPMX040203-XM/LM/EM/XR	I60M1.8x4	WT05IP	
ZSD02-140-XP20-SP04-02	▲	14.0	20	25	31	48	50	98	SPMX040203-XM/LM/EM/XR	I60M1.8x4	WT05IP	
ZSD02-145-XP20-SP04-02	▲	14.5	20	25	32	49	50	99	SPMX040203-XM/LM/EM/XR	I60M1.8x4	WT05IP	
ZSD02-150-XP20-SP05-02	▲	15.0	20	25	33	50	50	100	SPMX050204-XM/LM/EM/XR	I60M2x4.3	WT06P	
ZSD02-155-XP20-SP05-02	▲	15.5	20	25	34	51	50	101	SPMX050204-XM/LM/EM/XR	I60M2x4.3	WT06P	
ZSD02-160-XP20-SP05-02	▲	16.0	20	25	35	52	50	102	SPMX050204-XM/LM/EM/XR	I60M2x4.3	WT06P	
ZSD02-165-XP20-SP05-02	▲	16.5	20	25	36	53	50	103	SPMX050204-XM/LM/EM/XR	I60M2x4.3	WT06P	
ZSD02-170-XP20-SP05-02	▲	17.0	20	25	37	54	50	104	SPMX050204-XM/LM/EM/XR	I60M2x4.3	WT06P	
ZSD02-175-XP20-SP05-02	▲	17.5	20	25	38	55	50	105	SPMX050204-XM/LM/EM/XR	I60M2x4.3	WT06P	
ZSD02-180-XP25-SP06-02	▲	18.0	25	32	39	57	56	113	SPMX060204-XM/LM/EM/XR	I60M2.2x5.5	WT07IP	
ZSD02-185-XP25-SP06-02	▲	18.5	25	32	40	58	56	114	SPMX060204-XM/LM/EM/XR	I60M2.2x5.5	WT07IP	
ZSD02-190-XP25-SP06-02	▲	19.0	25	32	41	59	56	115	SPMX060204-XM/LM/EM/XR	I60M2.2x5.5	WT07IP	
ZSD02-195-XP25-SP06-02	▲	19.5	25	32	42	60	56	116	SPMX060204-XM/LM/EM/XR	I60M2.2x5.5	WT07IP	
ZSD02-200-XP25-SP06-02	▲	20.0	25	32	43	61	56	117	SPMX060204-XM/LM/EM/XR	I60M2.2x5.5	WT07IP	
ZSD02-205-XP25-SP06-02	▲	20.5	25	32	44	62	56	118	SPMX060204-XM/LM/EM/XR	I60M2.2x5.5	WT07IP	

▲ Stock available △ Make-to-order

ZSD applicable inserts

-EM



Type	Basic dimension(mm)				CVD grade		PVD grade		
	Ø1.C	s	Ød	r	YB6338(Peripheral edge)	YBM215(Inner/peripheral edge)	YBS203(Inner/peripheral edge)	YB9320(Inner/peripheral edge)	
SPMX040203-EM	4.0	2.38	2.2	0.3	★	●	●	★	
SPMX050204-EM	5.0	2.38	2.2	0.4	★	●	●	★	
SPMX060204-EM	6.0	2.38	2.5	0.4	★	●	●	★	
SPMX07T308-EM	7.94	3.97	2.8	0.8	★	●	●	★	
SPMX090408-EM	9.8	4.3	4.1	0.8	★	●	●	★	
SPMX110408-EM	11.5	4.76	4.4	0.8	★	●	●	★	
SPMX140512-EM	14.3	5.2	5.5	1.2	★	●	●	★	

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

Shape

Product category

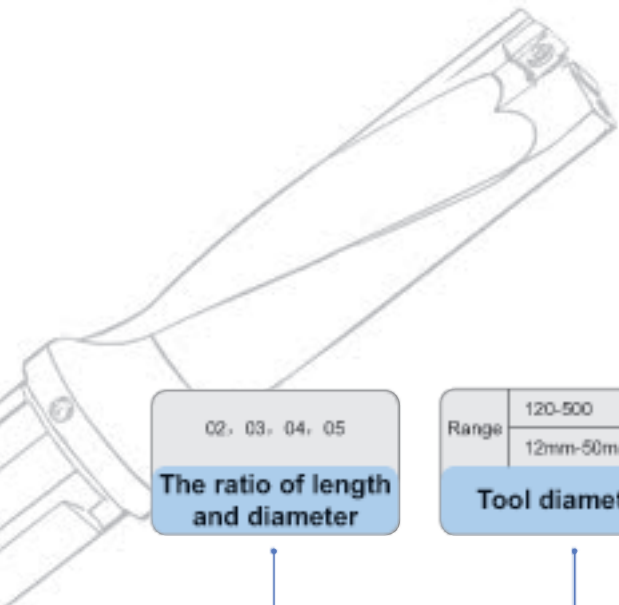
Inserts specification

Including type, dimension, grade and stock.



U drills code key

U drills code key



Code	Edge length	
	W	S
03	3.8	
04	4.3	
05	5.4	5.0
06	6.5	6.0
07		7.94
08	8.7	
09		9.8
11		11.5

02, 03, 04, 05
The ratio of length and diameter

Range	120-500
	12mm-50mm

Tool diameter

W	
S	

Insert shape

C	7°
P	11°

Insert clearance angle

ZSD 02 - 120 - XP 20 - S P 04 - 02

Tool type

Code	Description
ZTD	Double helical inner coolant indexable shallow drill
ZSD	Indexable shallow drill

Coupling structure and type

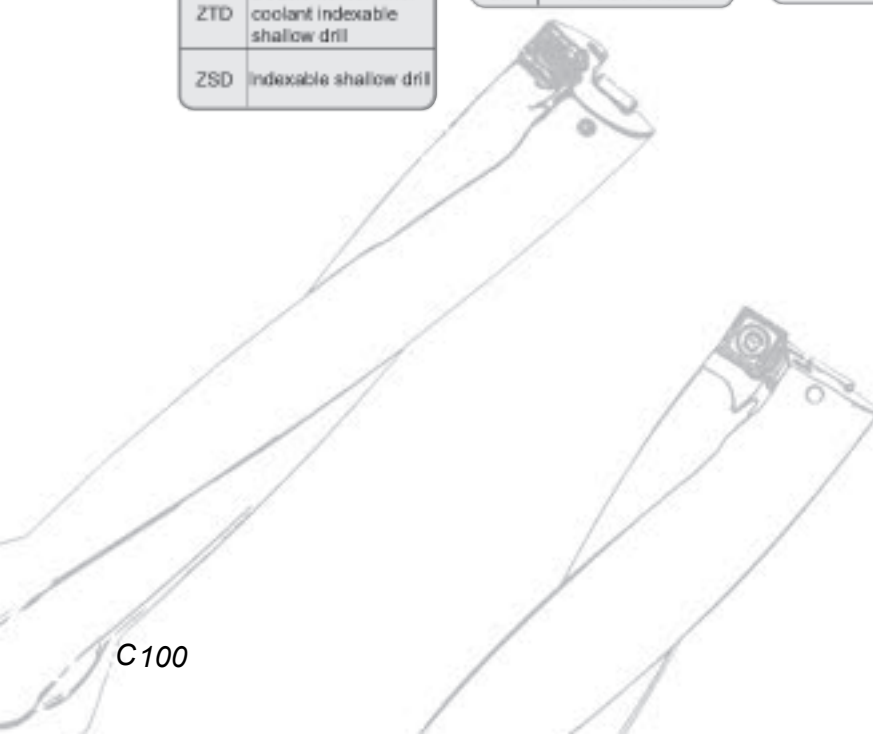
Code	Description
XP	Weldon shank

Coupling size(mm)

20, 25, 32, 40

Number of tooth

Drilling tools
U drills code key



High Efficiency Indexable Drill

ZSD series



- Unique waved-edge geometry structure produces steady cutting and smooth chip evacuation;
- Insert designed for double balanced radial run-out control for achieving high accuracy and precision even in long overhang applications;
- Wiper technology produces excellent surface quality and diameter dimension consistency;
- Strong impact-resistance and highly rigid design structure helps achieve high speed, high efficiency, and high stability machining;
- Economical four-edges insert, design suitable for Deep-hole drilling in 2D~5D.



▲ -EM
Geometry for soft steels to prevent chip-wrapping.

▲ -XM
General-purpose geometry for stable machining operations.

▲ -LM
Geometry for Stainless steel and sticky chip materials.

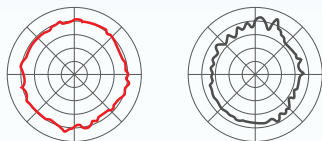
▲ -XR
Machining of hard materials, strengthen cutting edges.

There are three types of geometry, suitable for high efficiency and stability machining in multiple materials.

Case study

Workpiece material: 45#steel (HB170-220)
 Tool: ZSD05-160-XP20-SP05-02
 Insert: SPMX050204-XM/YB9320
 Cutting data: $V_c=120\text{m/min}$, $f=0.07\text{mm/r}$,
 $a_p=80\text{mm}$
 Cooling: Internal coolant supply

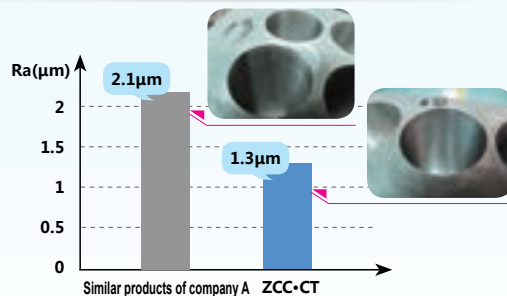
• Aperture cylindricity



ZCC-CT Similar products of company A

Cylindricity	0.03mm	0.15mm
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• Hole surface quality



Conclusion: under the same working conditions, the machined hole surface quality by ZSD series indexable insert drill contributes to better hole precision than A company's similar products.



CVD coating grade

YB6338 (peripheral inserts)

- ▶ Substrate of a tough gradient cemented carbide, enriched with surface bonding phase, nano-dioxygen gradient transition layer, and crystal core pre-implantation coating technology, improves the inserts' wear and heat resistance.
- ▶ Suitable for high-speed, high-feed, and stable working conditions, it is the first choice for drilling of steel.

PVD coating grade

YB9315 (peripheral/central inserts)

• Multilayer nano-coating PVD grade

- ▶ Significantly enhanced on wear resistance & heat resistance, adopting the gradient transition technology, effectively improvement on stress and interface states of the coating layers. Reducing stress concentration, increase the strengths between coating layer and substrate, improve the cutting tool's stability, suitable for M materials drilling machining.

YBS203 (peripheral/central inserts)

• High performance grade for S materials

- ▶ Alloy toughness enhancement technology improves the tool's resistance to crack propagation and high temperature oxidation while ensuring high wear resistance.
- ▶ Adopting a new hard alloy matrix formula greatly improves the high-temperature performance and extends tool life.

YB9320 (peripheral/central inserts)

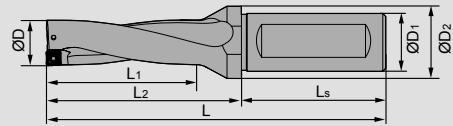
• General purpose for drilling in P, M, K, N materials



- ▶ The atomic rearrangement technology realizes the long-range orderly arrangement of different coating materials to achieve a perfect match between hardness and toughness, effectively solving the problem of high temperature instability at the interface of multiple coatings and improving the high temperature performance of the coating.
- ▶ High-toughness substrate and TiAlN-based nano multilayer coating, unique ion etching technology, strengthen the cutting edge, and improve the bonding strength between the coating and the substrate.
- ▶ Advanced surface treatment technology, optimized stress distribution, better overall performance.



U drills

ZSD02 2D



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD1	ØD2	L1	L2	Ls	L			
ZSD02-120-XP20-SP04-02	▲	12.0	20	25	27	44	50	94	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD02-125-XP20-SP04-02	▲	12.5	20	25	28	45	50	95	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD02-130-XP20-SP04-02	▲	13.0	20	25	29	46	50	96	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD02-135-XP20-SP04-02	▲	13.5	20	25	30	47	50	97	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD02-140-XP20-SP04-02	▲	14.0	20	25	31	48	50	98	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD02-145-XP20-SP04-02	▲	14.5	20	25	32	49	50	99	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD02-150-XP20-SP05-02	▲	15.0	20	25	33	50	50	100	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD02-155-XP20-SP05-02	▲	15.5	20	25	34	51	50	101	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD02-160-XP20-SP05-02	▲	16.0	20	25	35	52	50	102	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD02-165-XP20-SP05-02	▲	16.5	20	25	36	53	50	103	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD02-170-XP20-SP05-02	▲	17.0	20	25	37	54	50	104	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD02-175-XP20-SP05-02	▲	17.5	20	25	38	55	50	105	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD02-180-XP25-SP06-02	▲	18.0	25	32	39	57	56	113	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-185-XP25-SP06-02	▲	18.5	25	32	40	58	56	114	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-190-XP25-SP06-02	▲	19.0	25	32	41	59	56	115	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-195-XP25-SP06-02	▲	19.5	25	32	42	60	56	116	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-200-XP25-SP06-02	▲	20.0	25	32	43	61	56	117	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-205-XP25-SP06-02	▲	20.5	25	32	44	62	56	118	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-210-XP25-SP06-02	▲	21.0	25	32	45	63	56	119	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-215-XP25-SP06-02	▲	21.5	25	32	46	64	56	120	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-220-XP25-SP06-02	▲	22.0	25	32	47	65	56	121	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD02-225-XP25-SP07-02	▲	22.5	25	32	48	66	56	122	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-230-XP25-SP07-02	▲	23.0	25	32	49	67	56	123	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-235-XP25-SP07-02	▲	23.5	25	32	50	68	56	124	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-240-XP25-SP07-02	▲	24.0	25	32	51	69	56	125	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-245-XP25-SP07-02	▲	24.5	25	32	52	70	56	126	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-250-XP25-SP07-02	▲	25.0	25	32	53	71	56	127	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-255-XP25-SP07-02	▲	25.5	25	32	54	72	56	128	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-260-XP25-SP07-02	▲	26.0	25	32	55	73	56	129	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-265-XP25-SP07-02	▲	26.5	25	32	56	74	56	130	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-270-XP25-SP07-02	▲	27.0	25	32	57	75	56	131	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP

▲Stock available △Make-to-order

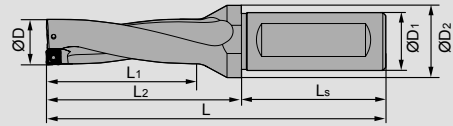
Drilling tools

U drills



U drills



ZSD02 2D



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw	Wrench
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD02-275-XP25-SP07-02	▲	27.5	25	32	58	76	56	132	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD02-280-XP32-SP09-02	▲	28.0	32	37	59	79	60	139	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-285-XP32-SP09-02	▲	28.5	32	37	60	80	60	140	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-290-XP32-SP09-02	▲	29.0	32	37	61	81	60	141	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-295-XP32-SP09-02	▲	29.5	32	37	62	82	60	142	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-300-XP32-SP09-02	▲	30.0	32	37	63	83	60	143	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-305-XP32-SP09-02	▲	30.5	32	37	64	84	60	144	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-310-XP32-SP09-02	▲	31.0	32	37	65	85	60	145	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-315-XP32-SP09-02	▲	31.5	32	37	66	86	60	146	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-320-XP32-SP09-02	▲	32.0	32	37	67	87	60	147	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-325-XP32-SP09-02	▲	32.5	32	37	68	88	60	148	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-330-XP32-SP09-02	▲	33.0	32	37	69	89	60	149	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-335-XP32-SP09-02	▲	33.5	32	37	70	90	60	150	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD02-340-XP40-SP11-02	▲	34.0	40	47	71	96	70	166	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-345-XP40-SP11-02	△	34.5	40	47	72	97	70	167	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-350-XP40-SP11-02	▲	35.0	40	47	73	98	70	168	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-355-XP40-SP11-02	△	35.5	40	47	74	99	70	169	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-360-XP40-SP11-02	▲	36.0	40	47	75	100	70	170	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-365-XP40-SP11-02	△	36.5	40	47	76	101	70	171	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-370-XP40-SP11-02	▲	37.0	40	47	77	102	70	172	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-375-XP40-SP11-02	△	37.5	40	47	78	103	70	173	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-380-XP40-SP11-02	▲	38.0	40	47	79	104	70	174	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-385-XP40-SP11-02	△	38.5	40	47	80	105	70	175	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-390-XP40-SP11-02	▲	39.0	40	47	81	106	70	176	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-395-XP40-SP11-02	△	39.5	40	47	82	107	70	177	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-400-XP40-SP11-02	▲	40.0	40	47	83	108	70	178	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-405-XP40-SP11-02	△	40.5	40	47	84	109	70	179	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-410-XP40-SP11-02	▲	41.0	40	47	85	110	70	180	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-415-XP40-SP11-02	△	41.5	40	47	86	111	70	181	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-420-XP40-SP11-02	▲	42.0	40	52	87	119	70	189	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD02-425-XP40-SP14-02	△	42.5	40	52	88	120	70	190	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP

▲Stock available △Make-to-order



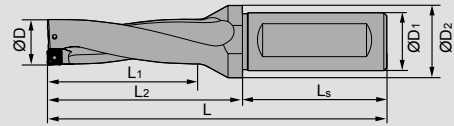
Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD02-430-XP40-SP14-02	▲	43.0	40	52	89	121	70	191	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-435-XP40-SP14-02	△	43.5	40	52	90	122	70	192	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-440-XP40-SP14-02	▲	44.0	40	52	91	123	70	193	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-445-XP40-SP14-02	△	44.5	40	52	92	124	70	194	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-450-XP40-SP14-02	▲	45.0	40	52	93	125	70	195	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-455-XP40-SP14-02	△	45.5	40	52	94	126	70	196	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-460-XP40-SP14-02	▲	46.0	40	52	95	127	70	197	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-465-XP40-SP14-02	△	46.5	40	52	96	128	70	198	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-470-XP40-SP14-02	▲	47.0	40	52	97	129	70	199	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-475-XP40-SP14-02	△	47.5	40	52	98	130	70	200	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-480-XP40-SP14-02	▲	48.0	40	52	99	131	70	201	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-485-XP40-SP14-02	△	48.5	40	52	100	132	70	202	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-490-XP40-SP14-02	▲	49.0	40	52	101	133	70	203	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-495-XP40-SP14-02	△	49.5	40	52	102	134	70	204	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD02-500-XP40-SP14-02	▲	50.0	40	52	103	135	70	205	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP



▲Stock available △Make-to-order



U drills



ZSD03 3D



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD1	ØD2	L1	L2	Ls	L			
ZSD03-120-XP20-SP04-02	▲	12.0	20	25	39	55	50	105	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD03-125-XP20-SP04-02	▲	12.5	20	25	41	57	50	107	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD03-130-XP20-SP04-02	▲	13.0	20	25	42	58	50	108	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD03-135-XP20-SP04-02	▲	13.5	20	25	44	60	50	110	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD03-140-XP20-SP04-02	▲	14.0	20	25	45	61	50	111	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD03-145-XP20-SP04-02	▲	14.5	20	25	47	63	50	113	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD03-150-XP20-SP05-02	▲	15.0	20	25	48	64	50	114	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD03-155-XP20-SP05-02	▲	15.5	20	25	50	66	50	116	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD03-160-XP20-SP05-02	▲	16.0	20	25	51	67	50	117	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD03-165-XP20-SP05-02	▲	16.5	20	25	53	69	50	119	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD03-170-XP20-SP05-02	▲	17.0	20	25	54	70	50	120	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD03-175-XP20-SP05-02	▲	17.5	20	25	56	72	50	122	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD03-180-XP25-SP06-02	▲	18.0	25	32	57	75	56	131	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-185-XP25-SP06-02	▲	18.5	25	32	59	77	56	133	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-190-XP25-SP06-02	▲	19.0	25	32	60	78	56	134	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-195-XP25-SP06-02	▲	19.5	25	32	62	80	56	136	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-200-XP25-SP06-02	▲	20.0	25	32	63	81	56	137	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-205-XP25-SP06-02	▲	20.5	25	32	65	83	56	139	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-210-XP25-SP06-02	▲	21.0	25	32	66	84	56	140	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-215-XP25-SP06-02	▲	21.5	25	32	68	86	56	142	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-220-XP25-SP06-02	▲	22.0	25	32	69	87	56	143	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD03-225-XP25-SP07-02	▲	22.5	25	32	71	89	56	145	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-230-XP25-SP07-02	▲	23.0	25	32	72	91	56	147	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-235-XP25-SP07-02	▲	23.5	25	32	74	93	56	149	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-240-XP25-SP07-02	▲	24.0	25	32	75	94	56	150	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-245-XP25-SP07-02	▲	24.5	25	32	77	96	56	152	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP

▲Stock available △Make-to-order



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD03-250-XP25-SP07-02	▲	25.0	25	32	78	97	56	153	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-255-XP25-SP07-02	▲	25.5	25	32	80	99	56	155	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-260-XP25-SP07-02	▲	26.0	25	32	81	100	56	156	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-265-XP25-SP07-02	▲	26.5	25	32	83	102	56	158	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-270-XP25-SP07-02	▲	27.0	25	32	84	104	56	160	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-275-XP25-SP07-02	▲	27.5	25	32	86	106	56	162	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD03-280-XP32-SP09-02	▲	28.0	32	37	87	109	60	169	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-285-XP32-SP09-02	▲	28.5	32	37	89	111	60	171	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-290-XP32-SP09-02	▲	29.0	32	37	90	112	60	172	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-295-XP32-SP09-02	▲	29.5	32	37	92	114	60	174	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-300-XP32-SP09-02	▲	30.0	32	37	93	115	60	175	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-305-XP32-SP09-02	▲	30.5	32	37	95	117	60	177	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-310-XP32-SP09-02	▲	31.0	32	37	96	118	60	178	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-315-XP32-SP09-02	▲	31.5	32	37	98	120	60	180	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-320-XP32-SP09-02	▲	32.0	32	37	99	121	60	181	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-325-XP32-SP09-02	▲	32.5	32	37	101	123	60	183	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-330-XP32-SP09-02	▲	33.0	32	37	102	124	60	184	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-335-XP32-SP09-02	▲	33.5	32	37	104	126	60	186	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD03-340-XP40-SP11-02	▲	34.0	40	47	105	130	70	200	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-345-XP40-SP11-02	△	34.5	40	47	107	132	70	202	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-350-XP40-SP11-02	▲	35.0	40	47	108	133	70	203	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-355-XP40-SP11-02	△	35.5	40	47	100	135	70	205	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-360-XP40-SP11-02	▲	36.0	40	47	111	136	70	206	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-365-XP40-SP11-02	△	36.5	40	47	113	138	70	208	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-370-XP40-SP11-02	▲	37.0	40	47	114	139	70	209	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-375-XP40-SP11-02	△	37.5	40	47	116	141	70	211	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-380-XP40-SP11-02	▲	38.0	40	47	117	142	70	212	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-385-XP40-SP11-02	△	38.5	40	47	119	144	70	214	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-390-XP40-SP11-02	▲	39.0	40	47	120	145	70	215	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-395-XP40-SP11-02	△	39.5	40	47	122	147	70	217	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-400-XP40-SP11-02	▲	40.0	40	47	123	148	70	218	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-405-XP40-SP11-02	△	40.5	40	47	125	150	70	220	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-410-XP40-SP11-02	▲	41.0	40	47	126	151	70	221	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-415-XP40-SP11-02	△	41.5	40	47	128	153	70	223	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD03-420-XP40-SP11-02	▲	42.0	40	52	129	161	70	231	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP

▲Stock available △Make-to-order

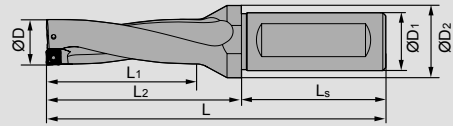
Drilling tools



U drills



U drills

ZSD03 3D



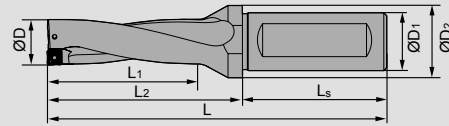
Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD03-425-XP40-SP14-02	△	42.5	40	52	131	163	70	233	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-430-XP40-SP14-02	▲	43.0	40	52	132	164	70	234	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-435-XP40-SP14-02	△	43.5	40	52	134	166	70	236	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-440-XP40-SP14-02	▲	44.0	40	52	135	167	70	237	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-445-XP40-SP14-02	△	44.5	40	52	137	169	70	239	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-450-XP40-SP14-02	▲	45.0	40	52	138	170	70	240	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-455-XP40-SP14-02	△	45.5	40	52	140	172	70	242	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-460-XP40-SP14-02	▲	46.0	40	52	141	173	70	243	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-465-XP40-SP14-02	△	46.5	40	52	142	175	70	245	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-470-XP40-SP14-02	▲	47.0	40	52	144	176	70	246	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-475-XP40-SP14-02	△	47.5	40	52	146	178	70	248	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-480-XP40-SP14-02	▲	48.0	40	52	147	179	70	249	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-485-XP40-SP14-02	△	48.5	40	52	149	181	70	251	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-490-XP40-SP14-02	▲	49.0	40	52	150	182	70	252	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-495-XP40-SP14-02	△	49.5	40	52	152	184	70	254	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP
ZSD03-500-XP40-SP14-02	▲	50.0	40	52	153	185	70	255	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP



▲Stock available △Make-to-order



U drills

ZSD04 4D



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD04-120-XP20-SP04-02	▲	12.0	20	25	51	67	50	117	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD04-125-XP20-SP04-02	▲	12.5	20	25	53	69	50	119	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD04-130-XP20-SP04-02	▲	13.0	20	25	55	71	50	121	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD04-135-XP20-SP04-02	▲	13.5	20	25	57	73	50	123	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD04-140-XP20-SP04-02	▲	14.0	20	25	59	75	50	125	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD04-145-XP20-SP04-02	▲	14.5	20	25	61	77	50	127	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD04-150-XP20-SP05-02	▲	15.0	20	25	63	79	50	129	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD04-155-XP20-SP05-02	▲	15.5	20	25	65	81	50	131	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD04-160-XP20-SP05-02	▲	16.0	20	25	67	83	50	133	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD04-165-XP20-SP05-02	▲	16.5	20	25	69	85	50	135	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD04-170-XP20-SP05-02	▲	17.0	20	25	71	87	50	137	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD04-175-XP20-SP05-02	▲	17.5	20	25	73	89	50	139	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD04-180-XP25-SP06-02	▲	18.0	25	32	75	93	56	149	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-185-XP25-SP06-02	▲	18.5	25	32	77	95	56	151	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-190-XP25-SP06-02	▲	19.0	25	32	79	97	56	153	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-195-XP25-SP06-02	▲	19.5	25	32	81	99	56	155	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-200-XP25-SP06-02	▲	20.0	25	32	83	101	56	157	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-205-XP25-SP06-02	▲	20.5	25	32	85	103	56	159	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-210-XP25-SP06-02	▲	21.0	25	32	87	105	56	161	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-215-XP25-SP06-02	▲	21.5	25	32	89	107	56	163	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-220-XP25-SP06-02	▲	22.0	25	32	91	109	56	165	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD04-225-XP25-SP07-02	▲	22.5	25	32	93	111	56	167	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-230-XP25-SP07-02	▲	23.0	25	32	95	114	56	170	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-235-XP25-SP07-02	▲	23.5	25	32	97	116	56	172	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-240-XP25-SP07-02	▲	24.0	25	32	99	118	56	174	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-245-XP25-SP07-02	▲	24.5	25	32	101	120	56	176	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-250-XP25-SP07-02	▲	25.0	25	32	103	122	56	178	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-250-XP32-SP07-02	▲	25.0	32	37	103	122	60	182	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-255-XP25-SP07-02	▲	25.5	25	32	105	125	56	181	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-255-XP32-SP07-02	▲	25.5	32	37	105	125	60	185	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD04-260-XP25-SP07-02	▲	26.0	25	32	107	126	56	182	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP

▲Stock available △Make-to-order

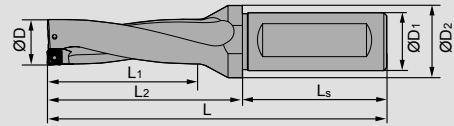
Drilling tools



U drills



U drills



ZSD04 4D



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD1	ØD2	L1	L2	Ls	L			
ZSD04-260-XP32-SP07-02	▲	26.0	32	37	107	126	60	186	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT071P
ZSD04-265-XP25-SP07-02	▲	26.5	25	32	109	128	56	184	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT071P
ZSD04-265-XP32-SP07-02	▲	26.5	32	37	109	128	60	188	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT071P
ZSD04-270-XP25-SP07-02	▲	27.0	25	32	111	131	56	187	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT071P
ZSD04-270-XP32-SP07-02	▲	27.0	32	37	111	131	60	191	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT071P
ZSD04-275-XP25-SP07-02	▲	27.5	25	32	113	134	56	190	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT071P
ZSD04-275-XP32-SP07-02	▲	27.5	32	37	113	134	60	194	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT071P
ZSD04-280-XP32-SP09-02	▲	28.0	32	37	115	139	60	199	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-285-XP32-SP09-02	▲	28.5	32	37	117	141	60	201	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-290-XP32-SP09-02	▲	29.0	32	37	119	143	60	203	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-295-XP32-SP09-02	▲	29.5	32	37	121	145	60	205	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-300-XP32-SP09-02	▲	30.0	32	37	123	147	60	207	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-305-XP32-SP09-02	▲	30.5	32	37	125	149	60	209	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-310-XP32-SP09-02	▲	31.0	32	37	127	151	60	211	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-315-XP32-SP09-02	▲	31.5	32	37	129	153	60	213	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-320-XP32-SP09-02	▲	32.0	32	37	131	155	60	215	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-320-XP40-SP09-02	▲	32.0	40	47	131	155	70	225	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-325-XP32-SP09-02	▲	32.5	32	37	133	157	60	217	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-325-XP40-SP09-02	▲	32.5	40	47	133	157	70	227	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-330-XP32-SP09-02	▲	33.0	32	37	135	159	60	219	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-330-XP40-SP09-02	▲	33.0	40	47	135	159	70	229	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-335-XP32-SP09-02	▲	33.5	32	37	137	161	60	221	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-335-XP40-SP09-02	▲	33.5	40	47	137	161	70	231	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT151P
ZSD04-340-XP40-SP11-02	▲	34.0	40	47	139	164	70	234	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P
ZSD04-345-XP40-SP11-02	△	34.5	40	47	141	166	70	236	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P
ZSD04-350-XP40-SP11-02	▲	35.0	40	47	143	168	70	238	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P
ZSD04-355-XP40-SP11-02	△	35.5	40	47	145	170	70	240	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P
ZSD04-360-XP40-SP11-02	▲	36.0	40	47	147	172	70	242	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P
ZSD04-365-XP40-SP11-02	△	36.5	40	47	149	174	70	244	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P
ZSD04-370-XP40-SP11-02	▲	37.0	40	47	151	176	70	246	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P
ZSD04-375-XP40-SP11-02	△	37.5	40	47	153	178	70	248	SPMX110408- XM/LM/EM/XR	I60M4×10	WT151P

▲Stock available △Make-to-order



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD04-380-XP40-SP11-02	▲	38.0	40	47	155	180	70	250	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-385-XP40-SP11-02	△	38.5	40	47	157	182	70	252	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-390-XP40-SP11-02	▲	39.0	40	47	159	184	70	254	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-395-XP40-SP11-02	△	39.5	40	47	161	186	70	256	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-400-XP40-SP11-02	▲	40.0	40	47	163	188	70	258	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-405-XP40-SP11-02	△	40.5	40	47	165	190	70	260	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-410-XP40-SP11-02	▲	41.0	40	47	167	192	70	262	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-415-XP40-SP11-02	△	41.5	40	47	169	194	70	264	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-420-XP40-SP11-02	▲	42.0	40	52	171	203	70	273	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-420-XP50-SP11-02	△	42.0	50	57	171	203	80	283	SPMX110408-XM/LM/EM/XR	I60M4×10	WT15IP
ZSD04-425-XP40-SP14-02	△	42.5	40	52	173	205	70	275	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-425-XP50-SP14-02	△	42.5	50	57	173	205	80	285	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-430-XP40-SP14-02	▲	43.0	40	52	175	207	70	277	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-430-XP50-SP14-02	△	43.0	50	57	175	207	80	287	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-435-XP40-SP14-02	△	43.5	40	52	177	209	70	279	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-435-XP50-SP14-02	△	43.5	50	57	177	209	80	289	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-440-XP40-SP14-02	▲	44.0	40	52	179	211	70	281	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-440-XP50-SP14-02	△	44.0	50	57	179	211	80	291	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-445-XP40-SP14-02	△	44.5	40	52	181	213	70	283	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-445-XP50-SP14-02	△	44.5	50	57	181	213	80	293	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-450-XP40-SP14-02	▲	45.0	40	52	183	215	70	285	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-450-XP50-SP14-02	△	45.0	50	57	183	225	80	295	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-455-XP40-SP14-02	△	45.5	40	52	185	217	70	287	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-455-XP50-SP14-02	△	45.5	50	57	185	217	80	297	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-460-XP40-SP14-02	▲	46.0	40	52	187	219	70	289	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-460-XP50-SP14-02	△	46.0	50	57	187	219	80	299	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-465-XP40-SP14-02	△	46.5	40	52	189	221	70	291	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-465-XP50-SP14-02	△	46.5	50	57	189	221	80	301	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-470-XP40-SP14-02	▲	47.0	40	52	191	223	70	293	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-470-XP50-SP14-02	△	47.0	50	57	191	223	80	303	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-475-XP40-SP14-02	△	47.5	40	52	193	225	70	295	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-475-XP50-SP14-02	△	47.5	50	57	193	225	80	305	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-480-XP40-SP14-02	▲	48.0	40	52	195	227	70	297	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-480-XP50-SP14-02	△	48.0	50	57	195	227	80	307	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-485-XP40-SP14-02	△	48.5	40	52	197	229	70	299	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-485-XP50-SP14-02	△	48.5	50	57	197	229	80	309	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-490-XP40-SP14-02	▲	49.0	40	52	199	231	70	301	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-490-XP50-SP14-02	△	49.0	50	57	199	231	80	311	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-495-XP40-SP14-02	△	49.5	40	52	201	233	70	303	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-495-XP50-SP14-02	△	49.5	50	57	201	233	80	313	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-500-XP40-SP14-02	▲	50.0	40	52	203	235	70	305	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP
ZSD04-500-XP50-SP14-02	△	50.0	50	57	203	235	80	315	SPMX140512-XM/LM/EM/XR	I60M5×13	WT20IP

▲Stock available △Make-to-order

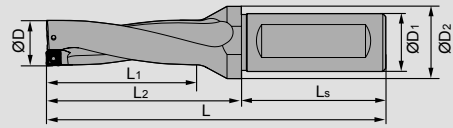
Drilling tools

U drills



U drills



ZSD05 5D



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw	Wrench
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD05-120-XP20-SP04-02	▲	12.0	20	25	63	79	50	129	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD05-125-XP20-SP04-02	▲	12.5	20	25	66	82	50	132	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD05-130-XP20-SP04-02	▲	13.0	20	25	68	84	50	134	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD05-135-XP20-SP04-02	▲	13.5	20	25	71	87	50	137	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD05-140-XP20-SP04-02	▲	14.0	20	25	73	89	50	139	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD05-145-XP20-SP04-02	▲	14.5	20	25	76	91	50	141	SPMX040203-XM/LM/EM/XR	I60M1.8×4.5	WT05IP
ZSD05-150-XP20-SP05-02	▲	15.0	20	25	78	94	50	144	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD05-155-XP20-SP05-02	▲	15.5	20	25	81	97	50	147	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD05-160-XP20-SP05-02	▲	16.0	20	25	83	99	50	149	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD05-165-XP20-SP05-02	▲	16.5	20	25	86	102	50	152	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD05-170-XP20-SP05-02	▲	17.0	20	25	88	104	50	154	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD05-175-XP20-SP05-02	▲	17.5	20	25	91	107	50	157	SPMX050204-XM/LM/EM/XR	I60M2×4.3	WT06P
ZSD05-180-XP25-SP06-02	▲	18.0	25	32	93	112	56	167	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-185-XP25-SP06-02	▲	18.5	25	32	96	114	56	170	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-190-XP25-SP06-02	▲	19.0	25	32	98	116	56	172	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-195-XP25-SP06-02	▲	19.5	25	32	101	119	56	175	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-200-XP25-SP06-02	▲	20.0	25	32	103	121	56	177	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-205-XP25-SP06-02	▲	20.5	25	32	106	124	56	180	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-210-XP25-SP06-02	▲	21.0	25	32	108	126	56	182	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-215-XP25-SP06-02	▲	21.5	25	32	111	129	56	185	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-220-XP25-SP06-02	▲	22.0	25	32	113	131	56	187	SPMX060204-XM/LM/EM/XR	I60M2.2×5.5	WT07IP
ZSD05-225-XP25-SP07-02	▲	22.5	25	32	116	134	56	190	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-230-XP25-SP07-02	▲	23.0	25	32	118	138	56	194	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-235-XP25-SP07-02	▲	23.5	25	32	121	141	56	197	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-240-XP25-SP07-02	▲	24.0	25	32	123	143	56	199	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-245-XP25-SP07-02	▲	24.5	25	32	126	146	56	202	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-250-XP25-SP07-02	▲	25.0	25	32	128	148	56	204	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-250-XP32-SP07-02	▲	25.0	32	37	128	148	60	208	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-255-XP25-SP07-02	▲	25.5	25	32	131	151	56	207	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-255-XP32-SP07-02	▲	25.5	32	37	131	151	60	211	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-260-XP25-SP07-02	▲	26.0	25	32	133	153	56	209	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-260-XP32-SP07-02	▲	26.0	32	37	133	153	60	213	SPMX07T308-XM/LM/EM/XR	I60M2.5×6.5	WT07IP

▲ Stock available △ Make-to-order



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD ₁	ØD ₂	L ₁	L ₂	L _s	L			
ZSD05-265-XP25-SP07-02	▲	26.5	25	32	136	156	56	212	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-265-XP32-SP07-02	▲	26.5	32	37	136	156	60	216	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-270-XP25-SP07-02	▲	27.0	25	32	138	158	56	214	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-270-XP32-SP07-02	▲	27.0	32	37	138	158	60	218	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-275-XP25-SP07-02	▲	27.5	25	32	141	161	56	217	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-275-XP32-SP07-02	▲	27.5	32	37	141	161	60	221	SPMX07T308- XM/LM/EM/XR	I60M2.5×6.5	WT07IP
ZSD05-280-XP32-SP09-02	▲	28.0	32	37	143	163	60	223	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-285-XP32-SP09-02	▲	28.5	32	37	146	166	60	226	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-290-XP32-SP09-02	▲	29.0	32	37	148	168	60	228	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-295-XP32-SP09-02	▲	29.5	32	37	151	171	60	231	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-300-XP32-SP09-02	▲	30.0	32	37	153	173	60	233	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-305-XP32-SP09-02	▲	30.5	32	37	156	176	60	236	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-310-XP32-SP09-02	▲	31.0	32	37	158	178	60	238	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-315-XP32-SP09-02	▲	31.5	32	37	161	181	60	241	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-320-XP32-SP09-02	▲	32.0	32	37	163	183	60	243	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-320-XP40-SP09-02	▲	32.0	40	47	163	183	70	253	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-325-XP32-SP09-02	▲	32.5	32	37	166	186	60	246	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-325-XP40-SP09-02	▲	32.5	40	47	166	186	70	256	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-330-XP32-SP09-02	▲	33.0	32	37	168	189	60	249	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-330-XP40-SP09-02	▲	33.0	40	47	168	189	70	259	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-335-XP32-SP09-02	▲	33.5	32	37	171	193	60	253	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-335-XP40-SP09-02	▲	33.5	40	47	171	193	70	263	SPMX090408- XM/LM/EM/XR	I60M3.5×8	WT15IP
ZSD05-340-XP40-SP11-02	▲	34.0	40	47	173	198	70	268	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-345-XP40-SP11-02	△	34.5	40	47	176	201	70	271	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-350-XP40-SP11-02	▲	35.0	40	47	178	203	70	273	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-355-XP40-SP11-02	△	35.5	40	47	181	206	70	276	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-360-XP40-SP11-02	▲	36.0	40	47	183	208	70	278	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-365-XP40-SP11-02	△	36.5	40	47	186	211	70	281	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-370-XP40-SP11-02	▲	37.0	40	47	188	213	70	283	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-375-XP40-SP11-02	△	37.5	40	47	191	216	70	286	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-380-XP40-SP11-02	▲	38.0	40	47	193	218	70	288	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-385-XP40-SP11-02	△	38.5	40	47	196	221	70	291	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-390-XP40-SP11-02	▲	39.0	40	47	198	223	70	293	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-395-XP40-SP11-02	△	39.5	40	47	201	226	70	296	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-400-XP40-SP11-02	▲	40.0	40	47	203	228	70	298	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-405-XP40-SP11-02	△	40.5	40	47	206	231	70	301	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-410-XP40-SP11-02	▲	41.0	40	47	208	233	70	303	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-415-XP40-SP11-02	△	41.5	40	47	211	236	70	306	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-420-XP40-SP11-02	▲	42.0	40	52	213	245	70	315	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-420-XP50-SP11-02	△	42.0	50	57	213	245	80	325	SPMX110408- XM/LM/EM/XR	I60M4×10	WT15IP
ZSD05-425-XP40-SP14-02	△	42.5	40	52	216	248	70	318	SPMX140512- XM/LM/EM/XR	I60M5×13	WT20IP

▲Stock available △Make-to-order

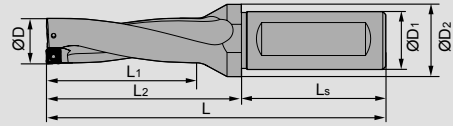
Drilling tools



U drills



U drills

ZSD05 5D



Type	Stock	Basic dimension(mm)							Applicable inserts	Insert screw 	Wrench 
		ØD	ØD1	ØD2	L1	L2	Ls	L			
ZSD05-425-XP50-SP14-02	△	42.5	50	57	216	248	80	328	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-430-XP40-SP14-02	▲	43.0	40	52	218	250	70	320	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-430-XP50-SP14-02	△	43.0	50	57	218	250	80	330	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-435-XP40-SP14-02	△	43.5	40	52	221	253	70	323	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-435-XP50-SP14-02	△	43.5	50	57	221	253	80	333	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-440-XP40-SP14-02	▲	44.0	40	52	223	255	70	325	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-440-XP50-SP14-02	△	44.0	50	57	223	255	80	335	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-445-XP40-SP14-02	△	44.5	40	52	226	258	70	328	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-445-XP50-SP14-02	△	45.5	50	57	226	258	80	338	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-450-XP40-SP14-02	▲	45.0	40	52	228	260	70	330	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-450-XP50-SP14-02	△	45.0	50	57	228	260	80	340	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-455-XP40-SP14-02	△	45.5	40	52	231	263	70	333	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-455-XP50-SP14-02	△	45.5	50	57	231	263	80	343	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-460-XP40-SP14-02	▲	46.0	40	52	233	265	70	335	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-460-XP50-SP14-02	△	46.0	50	57	233	265	80	345	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-465-XP40-SP14-02	△	46.5	40	52	236	268	70	338	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-465-XP50-SP14-02	△	46.5	50	57	236	268	80	348	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-470-XP40-SP14-02	▲	47.0	40	52	238	270	70	340	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-470-XP50-SP14-02	△	47.0	50	57	238	270	80	350	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-475-XP40-SP14-02	△	47.5	40	52	241	273	70	343	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-475-XP50-SP14-02	△	47.5	50	57	241	273	80	353	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-480-XP40-SP14-02	▲	48.0	40	52	243	275	70	345	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-480-XP50-SP14-02	△	48.0	50	57	246	275	80	355	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-485-XP40-SP14-02	△	48.5	40	52	246	278	70	348	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-485-XP50-SP14-02	△	48.5	50	57	246	278	80	358	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-490-XP40-SP14-02	▲	49.0	40	52	248	280	70	350	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-490-XP50-SP14-02	△	49.0	50	57	248	280	80	360	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-495-XP40-SP14-02	△	49.5	40	52	251	283	70	353	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-495-XP50-SP14-02	△	49.5	50	57	251	283	80	363	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-500-XP40-SP14-02	▲	50.0	40	52	253	285	70	355	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP
ZSD05-500-XP50-SP14-02	△	50.0	50	57	253	285	80	365	SPMX140512-XM/LM/EM/XR	160M5×13	WT20IP

▲Stock available △Make-to-order

Silver fox -New indexable drills for shallow holes

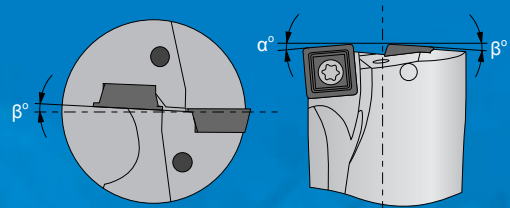
1 Internal coolant hose connector, which is used in lathe.

2 New tool body material with greatly improved tool rigidity.

3 Tool body with specially treated coating for superior lubricating performance.

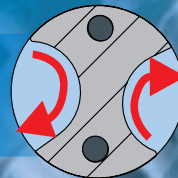
*Innovative technology
fully upgrading*

Optimized flutes and double spiraled internal coolant holes for high efficient drilling.



4 Optimized structure for better chip breaking, lower vibration during cutting, higher machining precision.

5 Extremely large chip pocket, innovative liquid angle, for smoother chip evacuation.



Case

Tool applied: ZTD04-260-XP25-SP07-02

Insert applied: SPGT07T308-PM /YBG205(Peripheral edge)

SPGT07T308-PM /YBG212(Inner edge)

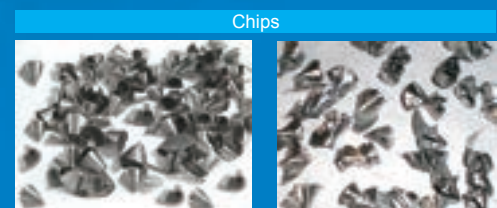
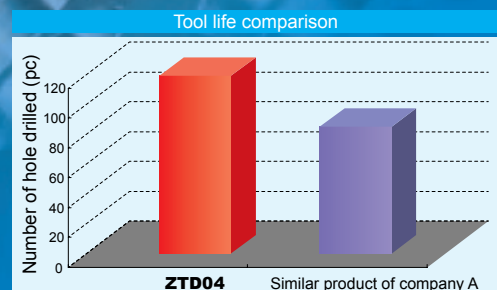
Workpiece material: 50Mn(HB240)

Cooling system: Double helical internal cooling

Cutting parameters: $V_c=130\text{m/min}$; $f=210\text{mm/min}$; $a_p=90\text{mm}$



Machining situation



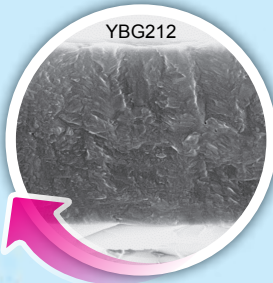
ZTD04-260-XP25-SP07-02

Similar product of company A

- Optimized cutting edge design ensures more stable cutting and better chip breaking.
- Meeting the requirements of central edge and peripheral edge with economy and efficiency.
- Perfect combination of grade and chipbreaker solves all your difficulties in machining.



Inner edge insert



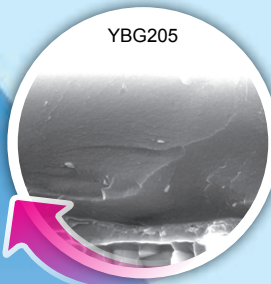
YBG212

YBG212

- Special coating technology makes insert surface smooth, reducing friction and ensuring unobstructed chip flow.
- Unique nano coating, stronger combination of substrate and highly wear-resistant TiAlN coating, higher toughness and hardness.
- Good thermal stability and chemical stability of coating provide more effective protection for the cutting edge.
- Ultra-fine solid carbide substrate with high toughness ensures high strength of cutting edge.



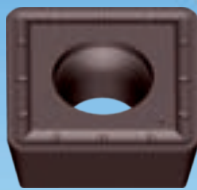
Peripheral edge insert



YBG205

YBG205

- Ultra-fine TiAlN base nano coating added with wear-resistant and heat-resistant rare elements greatly improves over-all properties.
- Special coating technology ensures stronger combination of substrate and coating.
- Thin PVD coating, sharp cutting edge.
- Fine grain WC base solid carbide with high hardness and high toughness.
- Special surface treatment after coating improves surface finish while eliminating harmful stress.



Peripheral edge insert



YB6338




YB6338

The tool life can increase over 50% for machining P material under steady working condition.

- Substrate of a tough gradient cemented carbide, enriched with surface bonding phase, nano-dioxygen gradient transition layer, and crystal core pre-implantation coating technology, improves the inserts' wear and heat resistance.
- Suitable for high-speed, high-feed, and stable working conditions, it is the first choice for drilling of steel.

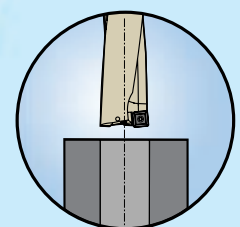
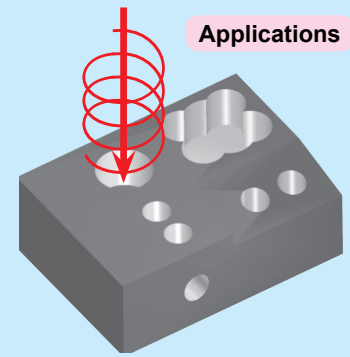
Because of the low speed of inner edge and the poor working condition, there is high requirement for insert toughness. Therefore, YBG212 with good over-all properties is recommended for inner edge and YBG205 with high wear resistance for peripheral edge.

Case

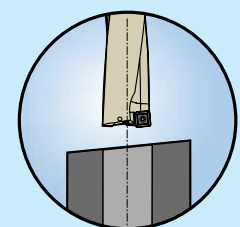
Workpiece		Cooling system	Double helical internal cooling	
		Insert applied	SPGT07T308-PM/YBG205	Similar product of company A
Workpiece material	42CrMo (HRC25)	Comparison of insert abrasion (after 15 minutes of machining)		
Cutting parameters	$V_c=150\text{m/min}$ $f_r=0.12\text{mm/r}$ $a_p=80\text{mm}$			



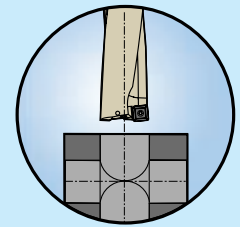
If stationary drilling method is used, the small ejected discs may lead to accidents when workpiece is drilled through, so please see to it that the machine has adequate safety measurements.



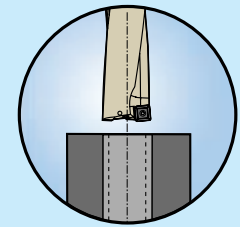
1 Common drilling



2 inclined face drilling



3 Cross-hole drilling



4 Counter boring

Safety information

Breakage

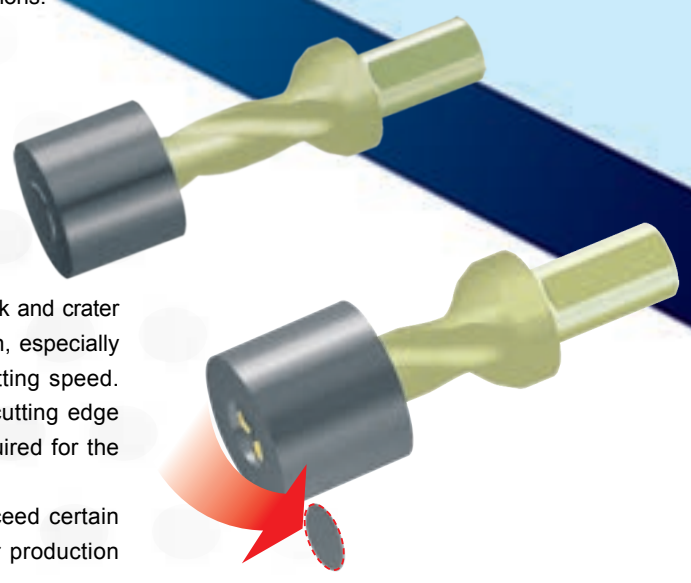
Chipping on cutting edges can be caused by various conditions:

- Off-center drill.
- Tool overhang or feed rate is too large.
- Incorrect inserts seating, tip seat was damaged.
- Poor insert stability.
- Insufficient coolant supply.
- Incorrect insert chipbreaker or grade.

Insert abrasion

The two most common types of insert abrasion are flank and crater abrasion. The flank abrasion is generally natural abrasion, especially on the peripheral insert which is applied with higher cutting speed. However, this abrasion will finally result that the insert cutting edge cannot achieve the tolerance and/or surface quality required for the machining.

In drilling operations, if flank and crater abrasion exceed certain values, the inserts should be changed without delay for production security.

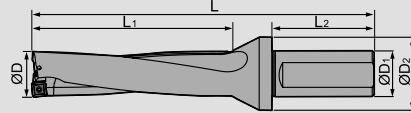




U drills

U drills

ZTD02 2D



Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		ØD	ØD1	ØD2	L1	L2	L			
ZTD02-130-XP20-SP04-02	▲	13	20	25	31	50	98	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD02-140-XP20-SP04-02	▲	14	20	25	33	50	100	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD02-150-XP20-SP05-02	▲	15	20	25	35	50	102	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD02-160-XP20-SP05-02	▲	16	20	25	37	50	104	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD02-170-XP25-SP05-02	▲	17	25	32	39	56	117	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD02-180-XP25-SP06-02	▲	18	25	32	41	56	119	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-190-XP25-SP06-02	▲	19	25	32	43	56	121	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-200-XP25-SP06-02	▲	20	25	32	45	56	123	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-210-XP25-SP06-02	▲	21	25	32	47	56	125	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD02-220-XP25-SP07-02	▲	22	25	32	49	56	127	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-230-XP25-SP07-02	▲	23	25	32	51	56	129	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-240-XP25-SP07-02	▲	24	25	32	53	56	131	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-250-XP25-SP07-02	▲	25	25	32	55	56	133	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-260-XP25-SP07-02	▲	26	25	32	57	56	135	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-270-XP25-SP07-02	▲	27	25	32	59	56	137	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD02-280-XP32-SP09-02	▲	28	32	37	61	60	146	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-290-XP32-SP09-02	▲	29	32	37	63	60	148	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-300-XP32-SP09-02	▲	30	32	37	65	60	150	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-310-XP32-SP09-02	▲	31	32	37	67	60	152	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-320-XP32-SP09-02	▲	32	32	37	69	60	154	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-330-XP32-SP09-02	▲	33	32	37	71	60	156	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD02-340-XP40-SP11-02	▲	34	40	47	73	70	173	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-350-XP40-SP11-02	▲	35	40	47	75	70	175	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-360-XP40-SP11-02	▲	36	40	47	77	70	177	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-370-XP40-SP11-02	▲	37	40	47	79	70	179	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-380-XP40-SP11-02	▲	38	40	47	81	70	181	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-390-XP40-SP11-02	▲	39	40	47	83	70	183	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-400-XP40-SP11-02	▲	40	40	47	85	70	185	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-410-XP40-SP11-02	▲	41	40	47	87	70	187	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD02-420-XP40-SP14-02	△	42	40	52	89	70	199	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-430-XP40-SP14-02	△	43	40	52	91	70	201	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-440-XP40-SP14-02	△	44	40	52	93	70	203	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-450-XP40-SP14-02	△	45	40	52	95	70	205	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-460-XP40-SP14-02	△	46	40	52	97	70	207	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-470-XP40-SP14-02	△	47	40	52	99	70	209	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-480-XP40-SP14-02	△	48	40	52	101	70	211	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-490-XP40-SP14-02	△	49	40	52	103	70	213	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD02-500-XP40-SP14-02	△	50	40	52	105	70	215	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

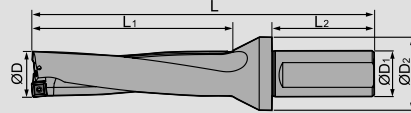
Drilling tools

U drills



U drills

ZTD03 3D



Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		ØD	ØD1	ØD2	L1	L2	L			
ZTD03-130-XP20-SP04-02	▲	13	20	25	44	50	111	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD03-140-XP20-SP04-02	▲	14	20	25	47	50	114	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD03-150-XP20-SP05-02	▲	15	20	25	50	50	117	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD03-160-XP20-SP05-02	▲	16	20	25	53	50	120	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD03-170-XP25-SP05-02	▲	17	25	32	56	56	134	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD03-180-XP25-SP06-02	▲	18	25	32	59	56	137	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-190-XP25-SP06-02	▲	19	25	32	62	56	140	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-200-XP25-SP06-02	▲	20	25	32	65	56	143	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-210-XP25-SP06-02	▲	21	25	32	68	56	146	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD03-220-XP25-SP07-02	▲	22	25	32	71	56	149	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-230-XP25-SP07-02	▲	23	25	32	74	56	152	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-240-XP25-SP07-02	▲	24	25	32	77	56	155	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-250-XP25-SP07-02	▲	25	25	32	80	56	158	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-260-XP25-SP07-02	▲	26	25	32	83	56	161	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-270-XP25-SP07-02	▲	27	25	32	86	56	164	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD03-280-XP32-SP09-02	▲	28	32	37	89	60	174	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-290-XP32-SP09-02	▲	29	32	37	92	60	177	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-300-XP32-SP09-02	▲	30	32	37	95	60	180	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-310-XP32-SP09-02	▲	31	32	37	98	60	183	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-320-XP32-SP09-02	▲	32	32	37	101	60	186	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-330-XP32-SP09-02	▲	33	32	37	104	60	189	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD03-340-XP40-SP11-02	▲	34	40	47	107	70	207	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-350-XP40-SP11-02	▲	35	40	47	110	70	210	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-360-XP40-SP11-02	▲	36	40	47	113	70	213	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-370-XP40-SP11-02	▲	37	40	47	116	70	216	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-380-XP40-SP11-02	▲	38	40	47	119	70	219	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-390-XP40-SP11-02	▲	39	40	47	122	70	222	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-400-XP40-SP11-02	▲	40	40	47	125	70	225	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-410-XP40-SP11-02	▲	41	40	47	128	70	228	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD03-420-XP40-SP14-02	△	42	40	52	131	70	241	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-430-XP40-SP14-02	△	43	40	52	134	70	244	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-440-XP40-SP14-02	△	44	40	52	137	70	247	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-450-XP40-SP14-02	△	45	40	52	140	70	250	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-460-XP40-SP14-02	△	46	40	52	143	70	253	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-470-XP40-SP14-02	△	47	40	52	146	70	256	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-480-XP40-SP14-02	△	48	40	52	149	70	259	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-490-XP40-SP14-02	△	49	40	52	152	70	262	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD03-500-XP40-SP14-02	△	50	40	52	155	70	265	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Drilling tools

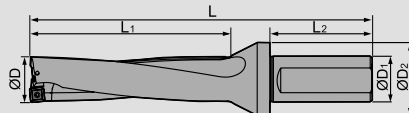
U drills



U drills

U drills

ZTD04 4D



Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		ØD	ØD1	ØD2	L1	L2	L			
ZTD04-130-XP20-SP04-02	▲	13	20	25	57	50	124	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD04-140-XP20-SP04-02	▲	14	20	25	61	50	128	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD04-150-XP20-SP05-02	▲	15	20	25	65	50	132	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD04-160-XP20-SP05-02	▲	16	20	25	69	50	136	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD04-170-XP25-SP05-02	▲	17	25	32	73	56	151	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD04-180-XP25-SP06-02	▲	18	25	32	77	56	155	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-190-XP25-SP06-02	▲	19	25	32	81	56	159	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-200-XP25-SP06-02	▲	20	25	32	85	56	163	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-210-XP25-SP06-02	▲	21	25	32	89	56	167	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD04-220-XP25-SP07-02	▲	22	25	32	93	56	171	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-230-XP25-SP07-02	▲	23	25	32	97	56	175	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-240-XP25-SP07-02	▲	24	25	32	101	56	179	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-250-XP25-SP07-02	▲	25	25	32	105	56	183	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-260-XP25-SP07-02	▲	26	25	32	109	56	187	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-270-XP25-SP07-02	▲	27	25	32	113	56	191	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD04-280-XP32-SP09-02	▲	28	32	37	117	60	202	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-290-XP32-SP09-02	▲	29	32	37	121	60	206	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-300-XP32-SP09-02	▲	30	32	37	125	60	210	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-310-XP32-SP09-02	▲	31	32	37	129	60	214	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-320-XP32-SP09-02	▲	32	32	37	133	60	218	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-330-XP32-SP09-02	▲	33	32	37	137	60	222	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD04-340-XP40-SP11-02	▲	34	40	47	141	70	241	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-350-XP40-SP11-02	▲	35	40	47	145	70	245	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-360-XP40-SP11-02	▲	36	40	47	149	70	249	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-370-XP40-SP11-02	▲	37	40	47	153	70	253	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-380-XP40-SP11-02	▲	38	40	47	157	70	257	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-390-XP40-SP11-02	▲	39	40	47	161	70	261	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-400-XP40-SP11-02	▲	40	40	47	165	70	265	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-410-XP40-SP11-02	▲	41	40	47	169	70	269	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD04-420-XP40-SP14-02	△	42	40	52	173	70	283	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-430-XP40-SP14-02	△	43	40	52	177	70	287	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-440-XP40-SP14-02	△	44	40	52	181	70	291	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-450-XP40-SP14-02	△	45	40	52	185	70	295	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-460-XP40-SP14-02	△	46	40	52	189	70	299	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-470-XP40-SP14-02	△	47	40	52	193	70	303	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-480-XP40-SP14-02	△	48	40	52	197	70	307	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-490-XP40-SP14-02	△	49	40	52	201	70	311	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD04-500-XP40-SP14-02	△	50	40	52	205	70	315	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

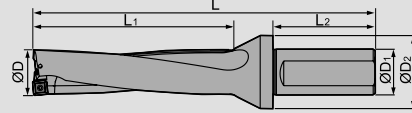
Drilling tools

U drills



U drills

ZTD05 5D



Type	Stock	Basic dimension(mm)						Applicable inserts	Insert screw	Wrench
		ØD	ØD1	ØD2	L1	L2	L			
ZTD05-130-XP20-SP04-02	▲	13	20	25	70	50	137	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD05-140-XP20-SP04-02	▲	14	20	25	75	50	142	SPGT04T102-PM/EM	I60M1.8×4	WT05IP
ZTD05-150-XP20-SP05-02	▲	15	20	25	80	50	147	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD05-160-XP20-SP05-02	▲	16	20	25	85	50	152	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD05-170-XP25-SP05-02	▲	17	25	32	90	56	168	SPGT050204-PM/EM	I60M2×4.3	WT06P
ZTD05-180-XP25-SP06-02	▲	18	25	32	95	56	173	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-190-XP25-SP06-02	▲	19	25	32	100	56	178	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-200-XP25-SP06-02	▲	20	25	32	105	56	183	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-210-XP25-SP06-02	▲	21	25	32	110	56	188	SPGT060204-PM/EM	I60M2.2×5.5	WT07IP
ZTD05-220-XP25-SP07-02	▲	22	25	32	115	56	193	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-230-XP25-SP07-02	▲	23	25	32	120	56	198	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-240-XP25-SP07-02	▲	24	25	32	125	56	203	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-250-XP25-SP07-02	▲	25	25	32	130	56	208	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-260-XP25-SP07-02	▲	26	25	32	135	56	213	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-270-XP25-SP07-02	▲	27	25	32	140	56	218	SPGT07T308-PM/EM	I60M2.5×6.5	WT07IP
ZTD05-280-XP32-SP09-02	▲	28	32	37	145	60	230	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-290-XP32-SP09-02	▲	29	32	37	150	60	235	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-300-XP32-SP09-02	▲	30	32	37	155	60	240	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-310-XP32-SP09-02	▲	31	32	37	160	60	245	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-320-XP32-SP09-02	▲	32	32	37	165	60	250	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-330-XP32-SP09-02	▲	33	32	37	170	60	255	SPGT090408-PM/EM	I60M3.5×8	WT15IP
ZTD05-340-XP40-SP11-02	▲	34	40	47	175	70	275	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-350-XP40-SP11-02	▲	35	40	47	180	70	280	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-360-XP40-SP11-02	▲	36	40	47	185	70	285	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-370-XP40-SP11-02	▲	37	40	47	190	70	290	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-380-XP40-SP11-02	▲	38	40	47	195	70	295	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-390-XP40-SP11-02	▲	39	40	47	200	70	300	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-400-XP40-SP11-02	▲	40	40	47	205	70	305	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-410-XP40-SP11-02	▲	41	40	47	210	70	310	SPGT110408-PM/EM	I60M4×10	WT15IP
ZTD05-420-XP40-SP14-02	△	42	40	52	215	70	325	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-430-XP40-SP14-02	△	43	40	52	220	70	330	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-440-XP40-SP14-02	△	44	40	52	225	70	335	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-450-XP40-SP14-02	△	45	40	52	230	70	340	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-460-XP40-SP14-02	△	46	40	52	235	70	345	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-470-XP40-SP14-02	△	47	40	52	240	70	350	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-480-XP40-SP14-02	△	48	40	52	245	70	355	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-490-XP40-SP14-02	△	49	40	52	250	70	360	SPGT140512-PM/EM	I60M5×13	WT20IP
ZTD05-500-XP40-SP14-02	△	50	40	52	255	70	365	SPGT140512-PM/EM	I60M5×13	WT20IP

▲Stock available △Make-to-order

Drilling tools

U drills



U drills code key

U drills code key

Code	Insert shap
S	
W	

Insert shape / code

Code	Nose Height m Tolerance(mm)	Inscribed Circle ØI.C Tolerance(mm)	Thickness S Tolerance(mm)	Code	Nose Height m Tolerance(mm)	Inscribed Circle ØI.C Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025	J	±0.005	±0.05-±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05-±0.13	±0.025
C	±0.013	±0.025	±0.025	L	±0.025	±0.05-±0.13	±0.025
H	±0.013	±0.013	±0.025	M	±0.08-±0.18	±0.05-±0.13	±0.13
E	±0.025	±0.025	±0.025	N	±0.08-±0.18	±0.05-±0.13	±0.025
G	±0.025	±0.025	±0.13	U	±0.13-±0.38	±0.08-±0.25	±0.13

Tolerance



Clearance angle of main cutting edge

Code	Clearance angle	Code	Clearance angle
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Other clearance angle

Chipbreaker and clamping system

Metric							
Code	With/Without hole	With/Without chipbreaker	Section plane of insert	Code	With/Without hole	With/Without chipbreaker	Section plane of insert
B	With	Without	> 65°	N	Without	Without	
H	With	Single-side	> 65°	R	Without	Single-side	
C	With	Without	> 65°	F	Without	Double-side	
J	With	Double-side	> 65°	A	With	Without	
W	With	Without	< 65°	M	With	Single-side	
T	With	Single-side	< 65°	G	With	Double-side	
Q	With	Without	< 65°	X	---	---	Special
U	With	Double-side	< 65°				



Code	Length	
	W	S
03	3.8	
04	4.3	
05	5.4	
06	6.5	6.35
08	8.7	8.0
09		9.525
12		12.7

Length of cutting edge

Thickness is defined as the height from the bottom of insert to the highest part of cutting edge.

Code	Insert thickness (mm)	Code	Insert thickness (mm)
00	0.79	05	5.96
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		

Insert thickness

08 04 12 R - PG

Nose radius

Code	Description
04	0.4mm
08	0.8mm
12	1.2mm

Cutting direction

Code	Description
R	Right hand
L	Left hand
N	Neutral

Chipbreaker code



Indexable inserts for U drills

ZSD applicable inserts

-EM

Type	Basic dimension(mm)				CVD grade				PVD grade			
	ØI.C	s	ød	r	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX040203-EM	4.0	2.38	2.2	0.3	★	●	●	★	★	●	●	★
SPMX050204-EM	5.0	2.38	2.2	0.4	★	●	●	★	★	●	●	★
SPMX060204-EM	6.0	2.38	2.5	0.4	★	●	●	★	★	●	●	★
SPMX07T308-EM	7.94	3.97	2.8	0.8	★	●	●	★	★	●	●	★
SPMX090408-EM	9.8	4.3	4.1	0.8	★	●	●	★	★	●	●	★
SPMX110408-EM	11.5	4.76	4.4	0.8	★	●	●	★	★	●	●	★
SPMX140512-EM	14.3	5.2	5.5	1.2	★	●	●	★	★	●	●	★

★ Recommended grade (always stock available)
 ● Available grade (always stock available)
 ○ Make-to-order

-LM

Type	Basic dimension(mm)				CVD grade				PVD grade			
	ØI.C	s	ød	r	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX040203-LM	4.0	2.38	2.2	0.3	★	●	●	★	★	●	●	★
SPMX050204-LM	5.0	2.38	2.2	0.4	★	●	●	★	★	●	●	★
SPMX060204-LM	6.0	2.38	2.5	0.4	★	●	●	★	★	●	●	★
SPMX07T308-LM	7.94	3.97	2.8	0.8	★	●	●	★	★	●	●	★
SPMX090408-LM	9.8	4.3	4.1	0.8	★	●	●	★	★	●	●	★
SPMX110408-LM	11.5	4.76	4.4	0.8	★	●	●	★	★	●	●	★
SPMX140512-LM	14.3	5.2	5.5	1.2	★	●	●	★	★	●	●	★

★ Recommended grade (always stock available)
 ● Available grade (always stock available)
 ○ Make-to-order

-XM

Type	Basic dimension(mm)				CVD grade				PVD grade			
	ØI.C	s	ød	r	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX040203-XM	4.0	2.38	2.2	0.3	★	●	●	★	★	●	●	★
SPMX050204-XM	5.0	2.38	2.2	0.4	★	●	●	★	★	●	●	★
SPMX060204-XM	6.0	2.38	2.5	0.4	★	●	●	★	★	●	●	★
SPMX07T308-XM	7.94	3.97	2.8	0.8	★	●	●	★	★	●	●	★
SPMX090408-XM	9.8	4.3	4.1	0.8	★	●	●	★	★	●	●	★
SPMX110408-XM	11.5	4.76	4.4	0.8	★	●	●	★	★	●	●	★
SPMX140512-XM	14.3	5.2	5.5	1.2	★	●	●	★	★	●	●	★

★ Recommended grade (always stock available)
 ● Available grade (always stock available)
 ○ Make-to-order

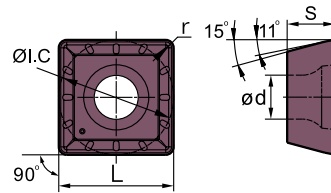
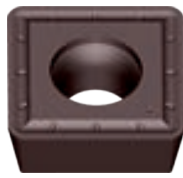
-XR

Type	Basic dimension(mm)				CVD grade				PVD grade			
	ØI.C	s	ød	r	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)	YB6338 (Peripheral edge)	YB9315 (Inner/peripheral edge)	YBS203 (Inner/peripheral edge)	YB9320 (Inner/peripheral edge)
SPMX040203-XR	4.0	2.38	2.2	0.3	★	●	●	★	★	●	●	★
SPMX050204-XR	5.0	2.38	2.2	0.4	★	●	●	★	★	●	●	★
SPMX060204-XR	6.0	2.38	2.5	0.4	★	●	●	★	★	●	●	★
SPMX07T308-XR	7.94	3.97	2.8	0.8	★	●	●	★	★	●	●	★
SPMX090408-XR	9.8	4.3	4.1	0.8	★	●	●	★	★	●	●	★
SPMX110408-XR	11.5	4.76	4.4	0.8	★	●	●	★	★	●	●	★
SPMX140512-XR	14.3	5.2	5.5	1.2	★	●	●	★	★	●	●	★

★ Recommended grade (always stock available)
 ● Available grade (always stock available)
 ○ Make-to-order

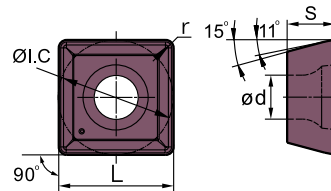


ZTD applicable inserts



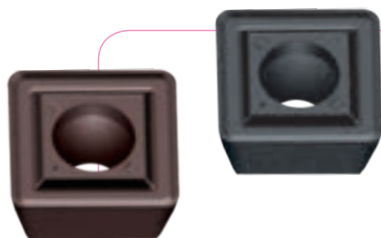
Type	Basic dimension(mm)					Grade		
	L	ØI.C	s	ød	r	YB6338 (peripheral edge)	YBG205 (peripheral edge)	YBG212 (inner edge)
SPGT050204-PM	5	5	2.38	2.2	0.4	★	★	★
SPGT060204-PM	6	6	2.38	2.6	0.4	★	★	★
SPGT07T308-PM	7.94	7.94	3.97	2.8	0.8	★	★	★
SPGT090408-PM	9.8	9.8	4.3	4.2	0.8	★	★	★
SPGT110408-PM	11.5	11.5	4.76	4.4	0.8	★	★	★
SPGT140512-PM	14.3	14.3	5.2	5.75	1.2	★	★	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order



Type	Basic dimension(mm)					Grade		
	L	ØI.C	s	ød	r	YB6338 (peripheral edge)	YBG205 (peripheral edge)	YBG212 (inner edge)
SPGT050204-EM	5	5	2.38	2.2	0.4	★	★	★
SPGT060204-EM	6	6	2.38	2.6	0.4	★	★	★
SPGT07T308-EM	7.94	7.94	3.97	2.8	0.8	★	★	★
SPGT090408-EM	9.8	9.8	4.3	4.2	0.8	★	★	★
SPGT110408-EM	11.5	11.5	4.76	4.4	0.8	★	★	★
SPGT140512-EM	14.3	14.3	5.2	5.75	1.2	★	★	★

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order



-EM chipbreaker characteristics

Recommended chipbreaker for M kind materials drilling. With G-class accuracy, sharp cutting edges, and high strength, better performance of resist impacts. Inserts meet the required of machining adhesive material, It is also properly suited for machining Austenite Stainless steel etc adhesive materials.



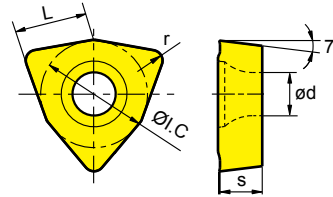
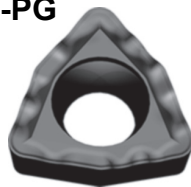
Indexable inserts for U drills

ZTD03 applicable inserts

-53



-PG

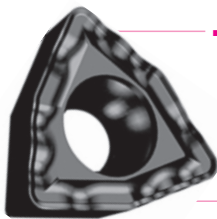


Type	Basic dimension(mm)					Grade	
	L	ØI.C	s	d	r	YBG202	YB6338
WCMX030208R-53	3.8	5.56	2.38	2.8	0.8	★	★
WCMX040208R-53	4.3	6.35	2.38	3.1	0.8	★	★
WCMX050308R-53	5.4	7.94	3.18	3.2	0.8	★	★
WCMX06T308R-53	6.5	9.525	3.97	3.7	0.8	★	★
WCMX080412R-53	8.7	12.7	4.76	4.3	1.2	★	★
WCMX030208R-PG	3.8	5.56	2.38	2.8	0.8	★	●
WCMX040208R-PG	4.3	6.35	2.38	3.1	0.8	★	●
WCMX050308R-PG	5.4	7.94	3.18	3.2	0.8	★	●
WCMX06T308R-PG	6.5	9.525	3.97	3.7	0.8	★	●
WCMX080412R-PG	8.7	12.7	4.76	4.3	1.2	★	●

★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

Drilling tools

Indexable inserts for U drills



-PG chipbreaker characteristics

Unique design of corrugated edge ensures high edge strength and good chip breaking performance, for machining of carbon steel and alloy steel.



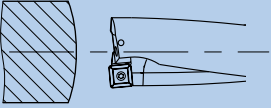
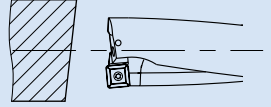
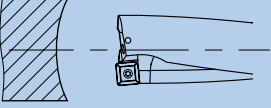
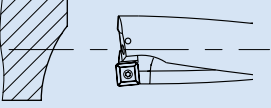
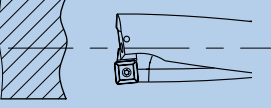
-53 chipbreaker characteristics

Sharp cutting edge beneficial to gaining low roughness surface, mainly applicable for low load cutting of aluminum alloy, mild steel and cast iron.



Initial drill penetration

Initial drill penetration is an important factor for successful drilling. One way of ensuring good hole quality is to make sure the penetration surface of the workpiece is vertical to the drill centre axis. In addition, an indexable drill can carry out initial penetration of convex, concave, inclined and irregular surfaces by adjusting feed rates.

Workpiece surface	Countermeasures
	For a convex surface, the conditions are relatively good and the centre of the drill ideally makes contact with the workpiece first, thus normal feed can be adopted.
	When penetrating an inclined surface, the cutting edges will be unevenly loaded, which may result in the premature drill abrasion. If the angle of the inclined surface is larger than 2°, the feed should be reduced to 1/3 of the value recommended for the drill.
	When drilling into concave surface, drill center axis normally tends to go off-center, the feed should be reduced to 1/3 of the value recommended for the drill.
	When drilling into non-symmetric curved surfaces, the drill tends to deviate from the centre because it is penetrating an inclined surface. The feed should be reduced to lower than the value recommended for the initial penetration of concave surfaces.
	When drilling into irregular surface, the insert faces the risk of chipping, which may also occur when drilling through the workpiece. Therefore, the feed rate should be reduced.

Calculations for shallow drilling

Cutting speed(Vc)

$$V_c = \frac{D_c \times \pi \times n}{1000}$$

V_c (m/min): cutting speed
D_c(mm): drill diameter
n (rev/min): rotating speed

◆ Example

Spindle speed is 1600 rev/min, drill diameter is 20mm, thus cutting speed is:

$$V_c = \frac{D_c \times \pi \times n}{1000} = \frac{20 \times 3.14 \times 1600}{1000} = 100 \text{ (m/min)}$$

Feed speed

$$V_f = f_r \times n \text{ (mm/min)}$$

V_f (mm/min): feed speed
f_r (mm/rev): feed rate per revolution
n (rev/min): spindle speed

◆ Example

Spindle speed is 1500 rev/min, feed rate per revolution is 0.1mm/rev, thus feed speed is:

$$V_f = f_r \times n = 0.1 \times 1500 = 150 \text{ (mm/min)}$$

Machining time

$$T_c = \frac{I_d \times i}{n \times f_r}$$

T_c (min): machining time
f_r (mm/rev): feed rate per revolution
i: number of holes I_d (mm): drilling depth
n (rev/min): spindle speed

◆ Example

Drilling a hole with a diameter of 20mm and a depth of 40mm, cutting speed is 100m/min and feed rate per revolution is 0.1mm/rev. Calculate the drilling time.

$$n = \frac{V_c \times 1000}{D_c \times \pi} = \frac{100 \times 1000}{20 \times 3.14} = 1600 \text{ (rev/min)}$$

$$T_c = \frac{I_d \times i}{n \times f_r} = \frac{40 \times 1}{1600 \times 0.1} = 0.25 \text{ (min)}$$

Metal removal rate

$$Q = \frac{V_f \times \pi \times D_c^2}{4 \times 1000}$$

Q (cm³/min): metal removal rate
D_c(mm): drill diameter
V_f (mm/min): feed speed

◆ Example

Drill diameter is 20mm, feed speed is 160mm/rev, thus metal removal rate is:

$$Q = \frac{V_f \times \pi \times D_c^2}{4 \times 1000} = \frac{160 \times 3.14 \times 20^2}{4 \times 1000} = 50.24 \text{ (cm}^3\text{/min)}$$



Recommended cutting parameters for ZSD

ISO	Materials	Hardness HB	Diameter Dc mm	Feed rate fn mm/r	Cutting speed Vc m/min
P	Carbon steel	80-200	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.09 0.06-0.10 0.07-0.11	200(170-240)
	Low alloy steel	150-260	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.14 0.08-0.16	170(140-220)
	High alloy steel	150-320	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.16 0.08-0.18	150(120-180)
	Cast steel	180-250	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.08 0.05-0.08 0.06-0.10 0.07-0.11	140(120-170)
M	Stainless steel Ferrite Martensite	150-270	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.16 0.08-0.18	160(110-230)
	Austenite	150-275	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.11 0.06-0.13 0.08-0.14	140(110-220)
K	Malleable cast iron	150-230	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.10 0.05-0.14 0.08-0.16 0.10-0.20	160(120-220)
	Gray cast iron	150-220	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.10 0.05-0.14 0.08-0.16 0.10-0.20	200(170-240)
	Nodular cast iron	160-250	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.09 0.05-0.12 0.06-0.14 0.08-0.16	160(130-200)
N	Non ferrous meatal	60-110	12.0-21.5 22.0-33.5 34.0-41.5 42.0-50.0	0.04-0.10 0.05-0.14 0.08-0.16 0.10-0.20	300(250-350)



Recommended cutting parameters for ZTD

ISO	Materials	Hardness HB	Diameter Dc mm	Feed rate fn mm/r	Cutting speed Vc m/min
P	Carbon steel	80-200	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.09 0.06-0.10 0.07-0.11 0.08-0.12	200(170-240)
	Low alloy steel	150-260	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.14 0.08-0.16 0.10-0.20	170(140-220)
	High alloy steel	150-320	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.16 0.08-0.18 0.10-0.22	150(120-180)
	Cast steel	180-250	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.08 0.05-0.08 0.06-0.10 0.07-0.11 0.07-0.12	140(120-170)
M	Stainless steel Ferrite Martensite	150-270	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.16 0.08-0.18 0.10-0.22	160(110-230)
	Austenite	150-275	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.11 0.06-0.13 0.08-0.14 0.10-0.16	140(110-220)
K	Malleable cast iron	150-230	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	160(120-220)
	Gray cast iron	150-220	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	200(170-240)
	Nodular cast iron	160-250	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.09 0.05-0.12 0.06-0.14 0.08-0.16 0.10-0.20	160(130-200)
N	Non ferrous metals	60-110	13.0-21.0 22.0-33.0 34.0-41.0 42.0-50.0 51.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	300(250-350)



ZTK series

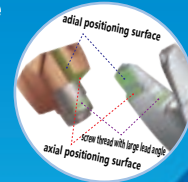
Interchangeable head drill

High-performance Interchangeable head drill with unique structure design, can reduce machining cost and improve production efficiency, Achieve high precision and high efficiency cutting.

➤ Double helical internal coolant holes, provide accurate cooling supply and good chip control during machining;

➤ Double clamping Both axial, radial positioning surface and thread interface coordinately clamping to ensure stable and reliable tool head assembly;

➤ Unique cutting edge design, with good versatility can ensure smooth cutting, achieve low resistance and efficient machining.



For AL-LD
Low resistance design, achieve high efficiency cutting

General-purpose machining-GD
The combination of curve and straight cutting edge generates good universality

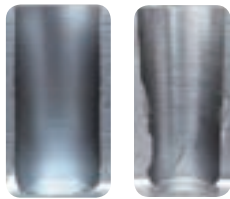
For Cast iron-KD
Enhanced cutting edge prolong tool life

Three types of drill-head, able to meet requirements for various materials, prolong tool life, achieve machining stability.

Case study

Excellent machining accuracy

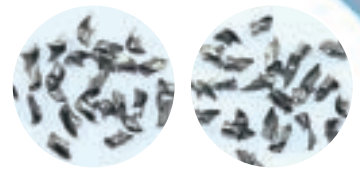
Tool holder specification : ZTK03-ED125-G16C
Tool head specification : EDC1260-060-GD
Workpiece material: 42CrMo (HRC30)
Cutting data: $V_c=100\text{m/min}$;
 $f=0.20\text{mm/r}$; $ap=30\text{mm}$
Cooling type: internal coolant supply



ZTK Similar products of company A

Excellent chip-breaking performance

Tool holder specification: ZTK03-ED160-G20C
Tool head specification: EDC1630-080-GD
Workpiece material: 50Mn (HB240)
Cutting data: $V_c=120\text{m/min}$;
 $f=0.30\text{mm/r}$;
 $ap=30\text{mm}$

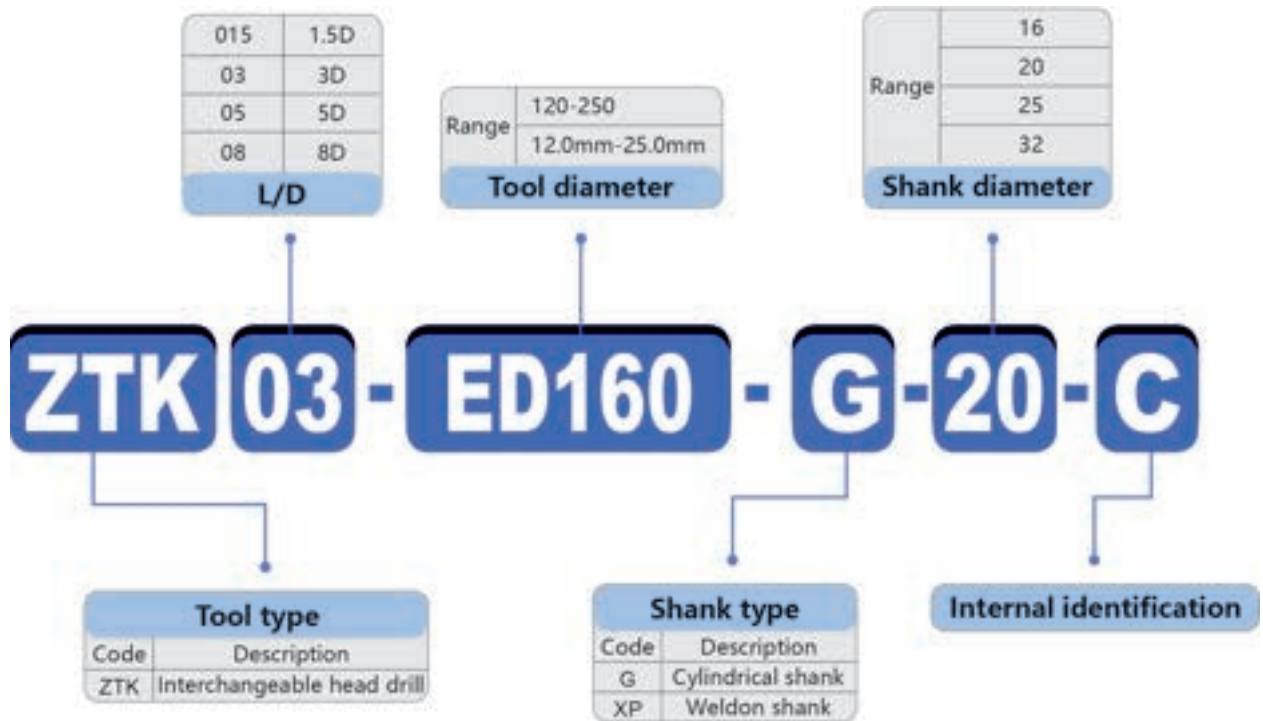


ZTK Similar products of company A

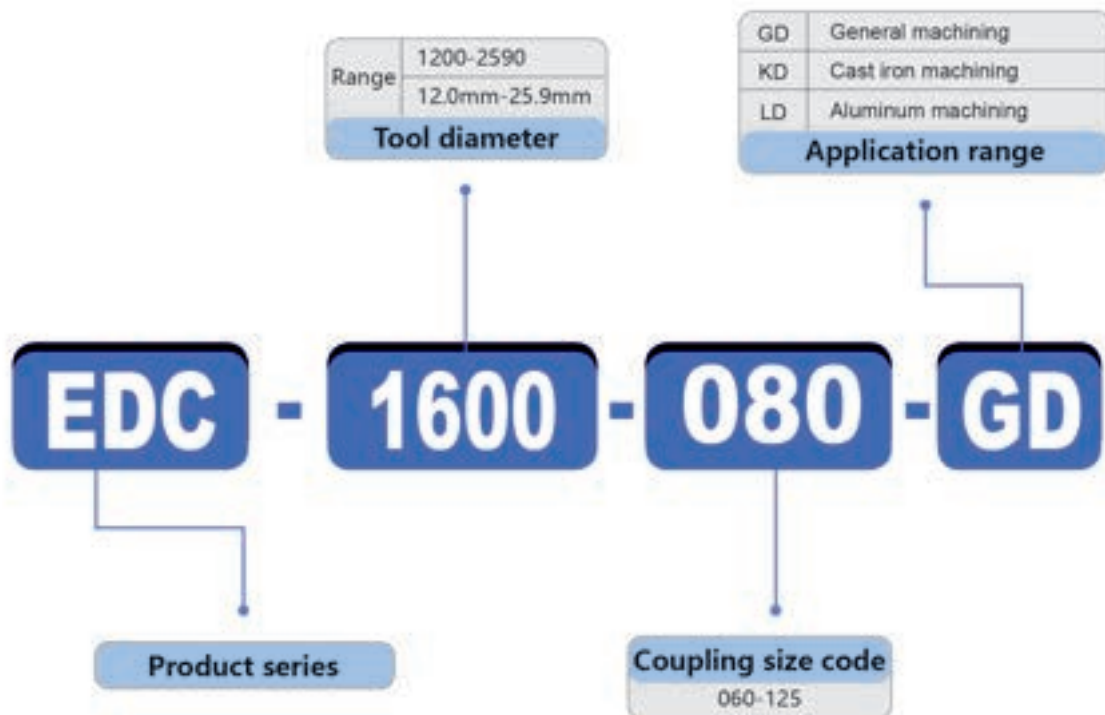
Conclusion: Under the same working conditions, the surface accuracy, verticality and chip breaking performance of our ZTK series interchangeable drill holes are better than similar products of Company A.



Code key of Interchangeable head drill tool holder



Code key of Interchangeable head drill head

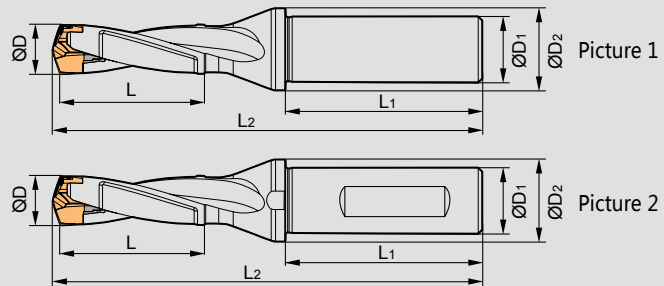




Interchangeable head drill

ZTK015 1.5D

Used for shanks with 12.0mm – 25.9mm diameter drill head



Type	Stock	Basic dimension(mm)							Coupling	Shank form	Wrench
		ØD	L	ØD1	ØD2	L1	L2				
ZTK015 Cylindrical shank	-ED120-G16C	▲	12-12.9	18.0	16	20	48	83.0	060	Picture 1	ZTK12-15.9
	-ED130-G16C	▲	13-13.9	19.5	16	20	48	85.5	065	Picture 1	ZTK12-15.9
	-ED140-G20C	▲	14-14.9	21.0	20	25	50	91.0	070	Picture 1	ZTK12-15.9
	-ED150-G20C	▲	15-15.9	22.5	20	25	50	96.5	075	Picture 1	ZTK12-15.9
	-ED160-G20C	▲	16-16.9	24.0	20	25	50	100.0	080	Picture 1	ZTK16-20.9
	-ED170-G20C	▲	17-17.9	25.5	20	25	50	102.5	085	Picture 1	ZTK16-20.9
	-ED180-G25C	▲	18-18.9	27.0	25	32	56	112.0	090	Picture 1	ZTK16-20.9
	-ED190-G25C	▲	19-19.9	28.5	25	32	56	114.5	095	Picture 1	ZTK16-20.9
	-ED200-G25C	▲	20-20.9	30.0	25	32	56	116.0	100	Picture 1	ZTK16-20.9
	-ED210-G25C	▲	21-21.9	31.5	25	32	56	125.5	105	Picture 1	ZTK21-25.9
	-ED220-G25C	▲	22-22.9	33.0	25	32	56	128.0	110	Picture 1	ZTK21-25.9
	-ED230-G32C	▲	23-23.9	34.5	32	42	60	131.5	115	Picture 1	ZTK21-25.9
	-ED240-G32C	▲	24-24.9	36.0	32	42	60	134.0	120	Picture 1	ZTK21-25.9
-ED250-G32C	▲	25-25.9	37.5	32	42	60	137.5	125	Picture 1	ZTK21-25.9	
Weldon shank	-ED120-XP16C	▲	12-12.9	18.0	16	20	48	83.0	060	Picture 2	ZTK12-15.9
	-ED130-XP16C	▲	13-13.9	19.5	16	20	48	85.5	065	Picture 2	ZTK12-15.9
	-ED140-XP20C	▲	14-14.9	21.0	20	25	50	91.0	070	Picture 2	ZTK12-15.9
	-ED150-XP20C	▲	15-15.9	22.5	20	25	50	96.5	075	Picture 2	ZTK12-15.9
	-ED160-XP20C	▲	16-16.9	24.0	20	25	50	100.0	080	Picture 2	ZTK16-20.9
	-ED170-XP20C	▲	17-17.9	25.5	20	25	50	102.5	085	Picture 2	ZTK16-20.9
	-ED180-XP25C	▲	18-18.9	27.0	25	32	56	112.0	090	Picture 2	ZTK16-20.9
	-ED190-XP25C	▲	19-19.9	28.5	25	32	56	114.5	095	Picture 2	ZTK16-20.9
	-ED200-XP25C	▲	20-20.9	30.0	25	32	56	116.0	100	Picture 2	ZTK16-20.9
	-ED210-XP25C	▲	21-21.9	31.5	25	32	56	125.5	105	Picture 2	ZTK21-25.9
	-ED220-XP25C	▲	22-22.9	33.0	25	32	56	128.0	110	Picture 2	ZTK21-25.9
	-ED230-XP32C	▲	23-23.9	34.5	32	42	60	131.5	115	Picture 2	ZTK21-25.9
	-ED240-XP32C	▲	24-24.9	36.0	32	42	60	134.0	120	Picture 2	ZTK21-25.9
-ED250-XP32C	▲	25-25.9	37.5	32	42	60	137.5	125	Picture 2	ZTK21-25.9	

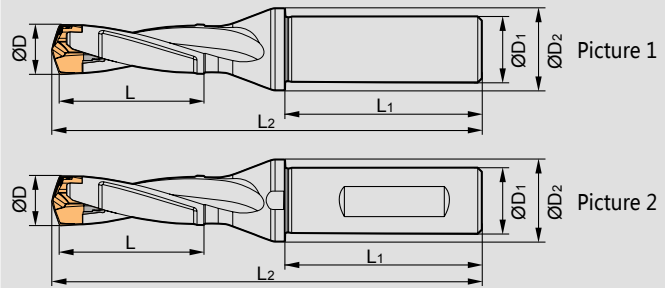
▲Regular Stock △Made-to-order



Interchangeable head drill

ZTK03 3D

Used for shanks with 12.0mm – 25.9mm diameter drill head



Type	Stock	Basic dimension(mm)							Coupling	Shank form	Wrench
		ØD	L	ØD ₁	ØD ₂	L ₁	L ₂				
ZTK03 Cylindrical shank	▲ -ED120-G16C	▲	12-12.4	36.0	16	20	48	101.0	060	Picture 1	ZTK12-15.9
	▲ -ED125-G16C	▲	12.5-12.9	37.0	16	20	48	103.0	060	Picture 1	ZTK12-15.9
	▲ -ED130-G16C	▲	13-13.4	39.0	16	20	48	105.0	065	Picture 1	ZTK12-15.9
	▲ -ED135-G16C	▲	13.5-13.9	41.0	16	20	48	107.0	065	Picture 1	ZTK12-15.9
	▲ -ED140-G20C	▲	14-14.4	42.0	20	25	50	112.0	070	Picture 1	ZTK12-15.9
	▲ -ED145-G20C	▲	14.5-14.9	44.0	20	25	50	114.0	070	Picture 1	ZTK12-15.9
	▲ -ED150-G20C	▲	15-15.9	45.0	20	25	50	119.0	075	Picture 1	ZTK12-15.9
	▲ -ED160-G20C	▲	16-16.9	48.0	20	25	50	124.0	080	Picture 1	ZTK16-20.9
	▲ -ED170-G20C	▲	17-17.9	51.0	20	25	50	128.0	085	Picture 1	ZTK16-20.9
	▲ -ED180-G25C	▲	18-18.9	54.0	25	32	56	139.0	090	Picture 1	ZTK16-20.9
	▲ -ED190-G25C	▲	19-19.9	57.0	25	32	56	143.0	095	Picture 1	ZTK16-20.9
	▲ -ED200-G25C	▲	20-20.9	60.0	25	32	56	146.0	100	Picture 1	ZTK16-20.9
	▲ -ED210-G25C	▲	21-21.9	63.0	25	32	56	157.0	105	Picture 1	ZTK21-25.9
	▲ -ED220-G25C	▲	22-22.9	66.0	25	32	56	161.0	110	Picture 1	ZTK21-25.9
	▲ -ED230-G32C	▲	23-23.9	69.0	32	42	60	166.0	115	Picture 1	ZTK21-25.9
▲ -ED240-G32C	▲	24-24.9	72.0	32	42	60	170.0	120	Picture 1	ZTK21-25.9	
▲ -ED250-G32C	▲	25-25.9	75.0	32	42	60	175.0	125	Picture 1	ZTK21-25.9	
Weldon shank	▲ -ED120-XP16C	▲	12-12.4	36.0	16	20	48	101.0	060	Picture 2	ZTK12-15.9
	▲ -ED125-XP16C	▲	12.5-12.9	37.0	16	20	48	103.0	060	Picture 2	ZTK12-15.9
	▲ -ED130-XP16C	▲	13-13.4	39.0	16	20	48	105.0	065	Picture 2	ZTK12-15.9
	▲ -ED135-XP16C	▲	13.5-13.9	41.0	16	20	48	107.0	065	Picture 2	ZTK12-15.9
	▲ -ED140-XP20C	▲	14-14.4	42.0	20	25	50	112.0	070	Picture 2	ZTK12-15.9
	▲ -ED145-XP20C	▲	14.5-14.9	44.0	20	25	50	114.0	070	Picture 2	ZTK12-15.9
	▲ -ED150-XP20C	▲	15-15.9	45.0	20	25	50	119.0	075	Picture 2	ZTK12-15.9
	▲ -ED160-XP20C	▲	16-16.9	48.0	20	25	50	124.0	080	Picture 2	ZTK16-20.9
	▲ -ED170-XP20C	▲	17-17.9	51.0	20	25	50	128.0	085	Picture 2	ZTK16-20.9
	▲ -ED180-XP25C	▲	18-18.9	54.0	25	32	56	139.0	090	Picture 2	ZTK16-20.9
	▲ -ED190-XP25C	▲	19-19.9	57.0	25	32	56	143.0	095	Picture 2	ZTK16-20.9
	▲ -ED200-XP25C	▲	20-20.9	60.0	25	32	56	146.0	100	Picture 2	ZTK16-20.9
	▲ -ED210-XP25C	▲	21-21.9	63.0	25	32	56	157.0	105	Picture 2	ZTK21-25.9
	▲ -ED220-XP25C	▲	22-22.9	66.0	25	32	56	161.0	110	Picture 2	ZTK21-25.9
	▲ -ED230-XP32C	▲	23-23.9	69.0	32	42	60	166.0	115	Picture 2	ZTK21-25.9
▲ -ED240-XP32C	▲	24-24.9	72.0	32	42	60	170.0	120	Picture 2	ZTK21-25.9	
▲ -ED250-XP32C	▲	25-25.9	75.0	32	42	60	175.0	125	Picture 2	ZTK21-25.9	

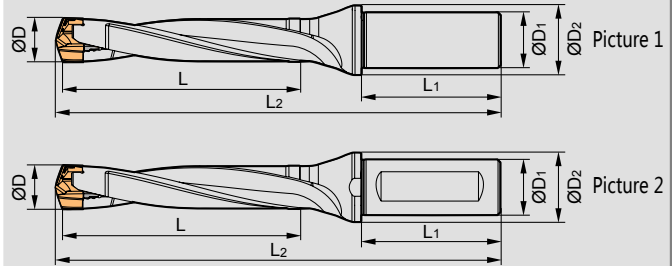
▲Regular Stock △Made-to-order



Interchangeable head drill

ZTK05 5D

Used for shanks with 12.0mm – 25.9mm diameter drill head



Type	Stock	Basic dimension(mm)						Coupling	Shank form	Wrench
		ØD	L	ØD ₁	ØD ₂	L ₁	L ₂			
Cylindrical shank	▲	12-12.4	60.0	16	20	48	125.0	060	Picture 1	ZTK12-15.9
	▲	12.5-12.9	62.0	16	20	48	128.0	060	Picture 1	ZTK12-15.9
	▲	13-13.4	65.0	16	20	48	131.0	065	Picture 1	ZTK12-15.9
	▲	13.5-13.9	68.0	16	20	48	134.0	065	Picture 1	ZTK12-15.9
	▲	14-14.4	70.0	20	25	50	141.0	070	Picture 1	ZTK12-15.9
	▲	14.5-14.9	73.0	20	25	50	143.0	070	Picture 1	ZTK12-15.9
	▲	15-15.9	75.0	20	25	50	149.0	075	Picture 1	ZTK12-15.9
	▲	16-16.9	80.0	20	25	50	156.0	080	Picture 1	ZTK16-20.9
	▲	17-17.9	85.0	20	25	50	162.0	085	Picture 1	ZTK16-20.9
	▲	18-18.9	90.0	25	32	56	175.0	090	Picture 1	ZTK16-20.9
	▲	19-19.9	95.0	25	32	56	181.0	095	Picture 1	ZTK16-20.9
	▲	20-20.9	100.0	25	32	56	188.0	100	Picture 1	ZTK16-20.9
	▲	21-21.9	105.0	25	32	56	199.0	105	Picture 1	ZTK21-25.9
	▲	22-22.9	110.0	25	32	56	205.0	110	Picture 1	ZTK21-25.9
	▲	23-23.9	115.0	32	42	60	212.0	115	Picture 1	ZTK21-25.9
▲	24-24.9	120.0	32	42	60	218.0	120	Picture 1	ZTK21-25.9	
▲	25-25.9	125.0	32	42	60	225.0	125	Picture 1	ZTK21-25.9	
Weld on shank	▲	12-12.4	60.0	16	20	48	125.0	060	Picture 2	ZTK12-15.9
	▲	12.5-12.9	62.0	16	20	48	128.0	060	Picture 2	ZTK12-15.9
	▲	13-13.4	65.0	16	20	48	131.0	065	Picture 2	ZTK12-15.9
	▲	13.5-13.9	68.0	16	20	48	134.0	065	Picture 2	ZTK12-15.9
	▲	14-14.4	70.0	20	25	50	141.0	070	Picture 2	ZTK12-15.9
	▲	14.5-14.9	73.0	20	25	50	143.0	070	Picture 2	ZTK12-15.9
	▲	15-15.9	75.0	20	25	50	149.0	075	Picture 2	ZTK12-15.9
	▲	16-16.9	80.0	20	25	50	156.0	080	Picture 2	ZTK16-20.9
	▲	17-17.9	85.0	20	25	50	162.0	085	Picture 2	ZTK16-20.9
	▲	18-18.9	90.0	25	32	56	175.0	090	Picture 2	ZTK16-20.9
	▲	19-19.9	95.0	25	32	56	181.0	095	Picture 2	ZTK16-20.9
	▲	20-20.9	100.0	25	32	56	188.0	100	Picture 2	ZTK16-20.9
	▲	21-21.9	105.0	25	32	56	199.0	105	Picture 2	ZTK21-25.9
	▲	22-22.9	110.0	25	32	56	205.0	110	Picture 2	ZTK21-25.9
	▲	23-23.9	115.0	32	42	60	212.0	115	Picture 2	ZTK21-25.9
▲	24-24.9	120.0	32	42	60	218.0	120	Picture 2	ZTK21-25.9	
▲	25-25.9	125.0	32	42	60	225.0	125	Picture 2	ZTK21-25.9	

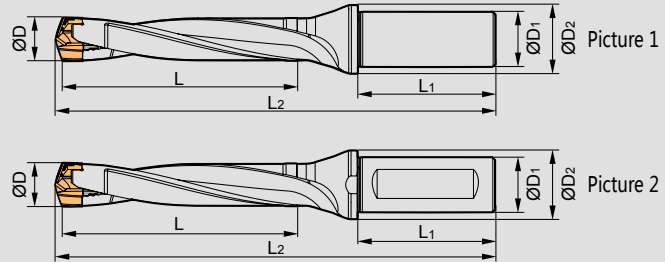
▲Regular Stock △Made-to-order



Interchangeable head drill

ZTK08 8D

Used for shanks with 12.0mm – 25.9mm diameter drill head



Type	Stock	Basic dimension(mm)							Coupling	Shank form	Wrench
		ØD	L	ØD ₁	ØD ₂	L ₁	L ₂				
Cylindrical shank	▲	12-12.4	96.0	16	20	48	161.0	060	Picture 1	ZTK12-15.9	
	▲	12.5-12.9	99.5	16	20	48	165.5	060	Picture 1	ZTK12-15.9	
	▲	13-13.4	104.0	16	20	48	170.0	065	Picture 1	ZTK12-15.9	
	▲	13.5-13.9	108.5	16	20	48	174.5	065	Picture 1	ZTK12-15.9	
	▲	14-14.4	112.0	20	25	50	183.0	070	Picture 1	ZTK12-15.9	
	▲	14.5-14.9	116.5	20	25	50	186.5	070	Picture 1	ZTK12-15.9	
	▲	15-15.9	120.0	20	25	50	194.0	075	Picture 1	ZTK12-15.9	
	▲	16-16.9	128.0	20	25	50	204.0	080	Picture 1	ZTK16-20.9	
	▲	17-17.9	136.0	20	25	50	213.0	085	Picture 1	ZTK16-20.9	
	▲	18-18.9	144.0	25	32	56	229.0	090	Picture 1	ZTK16-20.9	
	▲	19-19.9	152.0	25	32	56	238.0	095	Picture 1	ZTK16-20.9	
	▲	20-20.9	160.0	25	32	56	248.0	100	Picture 1	ZTK16-20.9	
	▲	21-21.9	168.0	25	32	56	262.0	105	Picture 1	ZTK21-25.9	
	▲	22-22.9	176.0	25	32	56	271.0	110	Picture 1	ZTK21-25.9	
	▲	23-23.9	184.0	32	42	60	281.0	115	Picture 1	ZTK21-25.9	
Weldon shank	▲	24-24.9	192.0	32	42	60	290.0	120	Picture 1	ZTK21-25.9	
	▲	25-25.9	200.0	32	42	60	300.0	125	Picture 1	ZTK21-25.9	
	▲	12-12.4	96.0	16	20	48	161.0	060	Picture 2	ZTK12-15.9	
	▲	12.5-12.9	99.5	16	20	48	165.5	060	Picture 2	ZTK12-15.9	
	▲	13-13.4	104.0	16	20	48	170.0	065	Picture 2	ZTK12-15.9	
	▲	13.5-13.9	108.5	16	20	48	174.5	065	Picture 2	ZTK12-15.9	
	▲	14-14.4	112.0	20	25	50	183.8	070	Picture 2	ZTK12-15.9	
	▲	14.5-14.9	116.5	20	25	50	186.5	070	Picture 2	ZTK12-15.9	
	▲	15-15.9	120.0	20	25	50	194.0	075	Picture 2	ZTK12-15.9	
	▲	16-16.9	128.0	20	25	50	204.0	080	Picture 2	ZTK16-20.9	
	▲	17-17.9	136.0	20	25	50	213.0	085	Picture 2	ZTK16-20.9	
	▲	18-18.9	144.0	25	32	56	229.0	090	Picture 2	ZTK16-20.9	
	▲	19-19.9	152.0	25	32	56	238.0	095	Picture 2	ZTK16-20.9	
	▲	20-20.9	160.0	25	32	56	248.0	100	Picture 2	ZTK16-20.9	
	▲	21-21.9	168.0	25	32	56	262.0	105	Picture 2	ZTK21-25.9	
▲	22-22.9	176.0	25	32	56	271.0	110	Picture 2	ZTK21-25.9		
▲	23-23.9	184.0	32	42	60	281.0	115	Picture 2	ZTK21-25.9		
▲	24-24.9	192.0	32	42	60	290.0	120	Picture 2	ZTK21-25.9		
▲	25-25.9	200.0	32	42	60	300.0	125	Picture 2	ZTK21-25.9		

▲Regular Stock △Made-to-order

Drilling tools

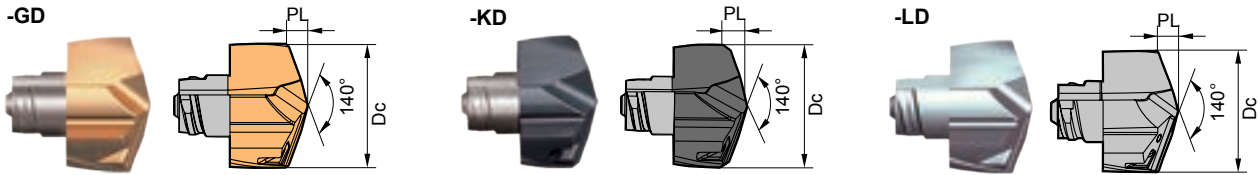
Interchangeable head drills



Interchangeable head drills

EDC Interchangeable head drill

Diameter 12.0mm – 25.9mm



Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	Dc	PL			
EDC1200-060-GD/KD/LD	▲	12.0	2.18	ZTK015-ED120-□□	060	ZTK12-15.9
EDC1210-060-GD/KD/LD	△	12.1	2.20	ZTK03-ED120-□□		
EDC1220-060-GD/KD/LD	△	12.2	2.22	ZTK05-ED120-□□		
EDC1230-060-GD/KD/LD	△	12.3	2.24	ZTK08-ED120-□□		
EDC1240-060-GD/KD/LD	△	12.4	2.26			
EDC1250-060-GD/KD/LD	▲	12.5	2.27	ZTK015-ED120-□□		
EDC1260-060-GD/KD/LD	△	12.6	2.29	ZTK03-ED125-□□		
EDC1270-060-GD/KD/LD	△	12.7	2.31	ZTK05-ED125-□□		
EDC1280-060-GD/KD/LD	△	12.8	2.33	ZTK08-ED125-□□		
EDC1290-060-GD/KD/LD	△	12.9	2.35			
EDC1300-065-GD/KD/LD	▲	13.0	2.36	ZTK015-ED130-□□	065	
EDC1310-065-GD/KD/LD	△	13.1	2.38	ZTK03-ED130-□□		
EDC1320-065-GD/KD/LD	△	13.2	2.40	ZTK05-ED130-□□		
EDC1330-065-GD/KD/LD	△	13.3	2.42	ZTK08-ED130-□□		
EDC1340-065-GD/KD/LD	△	13.4	2.44			
EDC1350-065-GD/KD/LD	▲	13.5	2.46	ZTK015-ED130-□□		
EDC1360-065-GD/KD/LD	△	13.6	2.47	ZTK03-ED135-□□		
EDC1370-065-GD/KD/LD	△	13.7	2.49	ZTK05-ED135-□□		
EDC1380-065-GD/KD/LD	△	13.8	2.51	ZTK08-ED135-□□		
EDC1390-065-GD/KD/LD	△	13.9	2.53			
EDC1400-070-GD/KD/LD	▲	14.0	2.55	ZTK015-ED140-□□	070	
EDC1410-070-GD/KD/LD	△	14.1	2.56	ZTK03-ED140-□□		
EDC1420-070-GD/KD/LD	△	14.2	2.58	ZTK05-ED140-□□		
EDC1430-070-GD/KD/LD	△	14.3	2.60	ZTK08-ED140-□□		
EDC1440-070-GD/KD/LD	△	14.4	2.62			
EDC1450-070-GD/KD/LD	▲	14.5	2.64	ZTK015-ED140-□□		
EDC1460-070-GD/KD/LD	△	14.6	2.66	ZTK03-ED145-□□		
EDC1470-070-GD/KD/LD	△	14.7	2.67	ZTK05-ED145-□□		
EDC1480-070-GD/KD/LD	△	14.8	2.69	ZTK08-ED145-□□		
EDC1490-070-GD/KD/LD	△	14.9	2.71			

▲Regular Stock △Made-to-order

Drilling tools

Interchangeable head drills



Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	Dc	PL			
EDC1500-075-GD/KD/LD	▲	15.0	2.73	ZTK015-ED150-□□ ZTK03-ED150-□□ ZTK05-ED150-□□ ZTK08-ED150-□□	075	ZTK12-15.9
EDC1510-075-GD/KD/LD	△	15.1	2.75			
EDC1520-075-GD/KD/LD	△	15.2	2.76			
EDC1530-075-GD/KD/LD	△	15.3	2.78			
EDC1540-075-GD/KD/LD	△	15.4	2.80			
EDC1550-075-GD/KD/LD	▲	15.5	2.82			
EDC1560-075-GD/KD/LD	△	15.6	2.84			
EDC1570-075-GD/KD/LD	△	15.7	2.86			
EDC1580-075-GD/KD/LD	△	15.8	2.87			
EDC1590-075-GD/KD/LD	△	15.9	2.89			
EDC1600-080-GD/KD/LD	▲	16.0	2.91			
EDC1610-080-GD/KD/LD	△	16.1	2.93			
EDC1620-080-GD/KD/LD	△	16.2	2.95			
EDC1630-080-GD/KD/LD	△	16.3	2.96			
EDC1640-080-GD/KD/LD	△	16.4	2.98			
EDC1650-080-GD/KD/LD	▲	16.5	3.00			
EDC1660-080-GD/KD/LD	△	16.6	3.02			
EDC1670-080-GD/KD/LD	△	16.7	3.04			
EDC1680-080-GD/KD/LD	△	16.8	3.06			
EDC1690-080-GD/KD/LD	△	16.9	3.07			
EDC1700-085-GD/KD/LD	▲	17.0	3.09	ZTK015-ED170-□□ ZTK03-ED170-□□ ZTK05-ED170-□□ ZTK08-ED170-□□	085	ZTK16-20.9
EDC1710-085-GD/KD/LD	△	17.1	3.11			
EDC1720-085-GD/KD/LD	△	17.2	3.13			
EDC1730-085-GD/KD/LD	△	17.3	3.15			
EDC1740-085-GD/KD/LD	△	17.4	3.16			
EDC1750-085-GD/KD/LD	▲	17.5	3.18			
EDC1760-085-GD/KD/LD	△	17.6	3.20			
EDC1770-085-GD/KD/LD	△	17.7	3.22			
EDC1780-085-GD/KD/LD	△	17.8	3.24			
EDC1790-085-GD/KD/LD	△	17.9	3.26			
EDC1800-090-GD/KD/LD	▲	18.0	3.27			
EDC1810-090-GD/KD/LD	△	18.1	3.29			
EDC1820-090-GD/KD/LD	△	18.2	3.31			
EDC1830-090-GD/KD/LD	△	18.3	3.33			

▲Regular Stock △Made-to-order

▶ Applicable material table

◎Very suitable ○Suitable

Workpiece material										
Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC						
○	◎	◎			○	◎	◎	◎		

Drilling tools

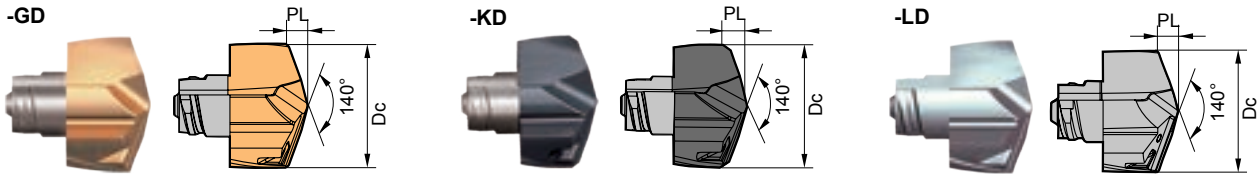
Interchangeable head drills



Interchangeable head drills

EDC Interchangeable head drill

Diameter 12.0mm – 25.9mm



Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	Dc	PL			
EDC1840-090-GD/KD/LD	△	18.4	3.35	ZTK015-ED180-□□ ZTK03-ED180-□□ ZTK05-ED180-□□ ZTK08-ED180-□□	090	ZTK16-20.9
EDC1850-090-GD/KD/LD	▲	18.5	3.36			
EDC1860-090-GD/KD/LD	△	18.6	3.38			
EDC1870-090-GD/KD/LD	△	18.7	3.40			
EDC1880-090-GD/KD/LD	△	18.8	3.42			
EDC1890-090-GD/KD/LD	△	18.9	3.44			
EDC1900-095-GD/KD/LD	▲	19.0	3.46	ZTK015-ED190-□□ ZTK03-ED190-□□ ZTK05-ED190-□□ ZTK08-ED190-□□	095	
EDC1910-095-GD/KD/LD	△	19.1	3.47			
EDC1920-095-GD/KD/LD	△	19.2	3.49			
EDC1930-095-GD/KD/LD	△	19.3	3.51			
EDC1940-095-GD/KD/LD	△	19.4	3.53			
EDC1950-095-GD/KD/LD	▲	19.5	3.55			
EDC1960-095-GD/KD/LD	△	19.6	3.56	ZTK015-ED200-□□ ZTK03-ED200-□□ ZTK05-ED200-□□ ZTK08-ED200-□□	100	
EDC1970-095-GD/KD/LD	△	19.7	3.58			
EDC1980-095-GD/KD/LD	△	19.8	3.60			
EDC1990-095-GD/KD/LD	△	19.9	3.62			
EDC2000-100-GD/KD/LD	▲	20.0	3.64			
EDC2010-100-GD/KD/LD	△	20.1	3.66			
EDC2020-100-GD/KD/LD	△	20.2	3.67	ZTK015-ED210-□□ ZTK03-ED210-□□ ZTK05-ED210-□□ ZTK08-ED210-□□	105	
EDC2030-100-GD/KD/LD	△	20.3	3.69			
EDC2040-100-GD/KD/LD	△	20.4	3.71			
EDC2050-100-GD/KD/LD	▲	20.5	3.73			
EDC2060-100-GD/KD/LD	△	20.6	3.75			
EDC2070-100-GD/KD/LD	△	20.7	3.77			
EDC2080-100-GD/KD/LD	△	20.8	3.78			
EDC2090-100-GD/KD/LD	△	20.9	3.80			
EDC2100-105-GD/KD/LD	▲	21.0	3.82			
EDC2110-105-GD/KD/LD	△	21.1	3.84			
EDC2120-105-GD/KD/LD	△	21.2	3.86			
EDC2130-105-GD/KD/LD	△	21.3	3.88			
EDC2140-105-GD/KD/LD	△	21.4	3.89			

▲Regular Stock △Made-to-order

Drilling tools

Interchangeable head drills



Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	Dc	PL			
EDC2150-105-GD/KD/LD	▲	21.5	3.91	ZTK015-ED210-□□ ZTK03-ED210-□□ ZTK05-ED210-□□ ZTK08-ED210-□□	105	ZTK21-25.9
EDC2160-105-GD/KD/LD	△	21.6	3.93			
EDC2170-105-GD/KD/LD	△	21.7	3.95			
EDC2180-105-GD/KD/LD	△	21.8	3.97			
EDC2190-105-GD/KD/LD	△	21.9	3.98			
EDC2200-110-GD/KD/LD	▲	22.0	4.00	ZTK015-ED220-□□ ZTK03-ED220-□□ ZTK05-ED220-□□ ZTK08-ED220-□□	110	
EDC2210-110-GD/KD/LD	△	22.1	4.02			
EDC2220-110-GD/KD/LD	△	22.2	4.04			
EDC2230-110-GD/KD/LD	△	22.3	4.06			
EDC2240-110-GD/KD/LD	△	22.4	4.08			
EDC2250-110-GD/KD/LD	▲	22.5	4.09			
EDC2260-110-GD/KD/LD	△	22.6	4.11			
EDC2270-110-GD/KD/LD	△	22.7	4.13			
EDC2280-110-GD/KD/LD	△	22.8	4.15	ZTK015-ED230-□□ ZTK03-ED230-□□ ZTK05-ED230-□□ ZTK08-ED230-□□	115	
EDC2290-110-GD/KD/LD	△	22.9	4.17			
EDC2300-115-GD/KD/LD	▲	23.0	4.18			
EDC2310-115-GD/KD/LD	△	23.1	4.20			
EDC2320-115-GD/KD/LD	△	23.2	4.22			
EDC2330-115-GD/KD/LD	△	23.3	4.24			
EDC2340-115-GD/KD/LD	△	23.4	4.26			
EDC2350-115-GD/KD/LD	▲	23.5	4.27			
EDC2360-115-GD/KD/LD	△	23.6	4.29			
EDC2370-115-GD/KD/LD	△	23.7	4.31			
EDC2380-115-GD/KD/LD	△	23.8	4.33			
EDC2390-115-GD/KD/LD	△	23.9	4.35			

▲Regular Stock △Made-to-order

Drilling tools

Interchangeable head drills

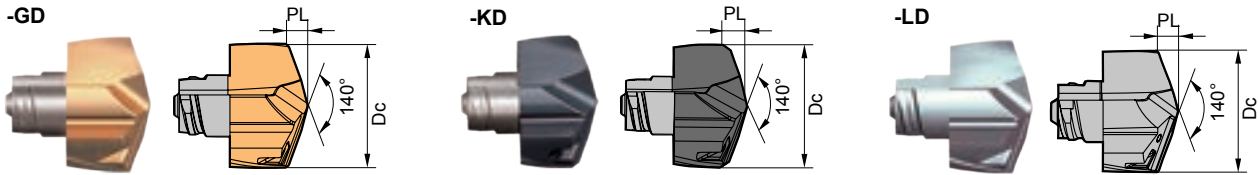
▶ Applicable material table

◎Very suitable ○Suitable

Workpiece material										
Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC						
○	◎	◎			○	◎	◎	◎		

EDC Interchangeable head drill

Diameter 12.0mm – 25.9mm



Type	Grade	Basic dimension(mm)		Compatible tool holder	Coupling	Wrench
	KDG3013	Dc	PL			
EDC2400-120-GD/KD/LD	▲	24.0	4.37	ZTK015-ED240-□□ ZTK03-ED240-□□ ZTK05-ED240-□□ ZTK08-ED240-□□	120	ZTK21-25.9
EDC2410-120-GD/KD/LD	△	24.1	4.38			
EDC2420-120-GD/KD/LD	△	24.2	4.40			
EDC2430-120-GD/KD/LD	△	24.3	4.42			
EDC2440-120-GD/KD/LD	△	24.4	4.44			
EDC2450-120-GD/KD/LD	▲	24.5	4.46			
EDC2460-120-GD/KD/LD	△	24.6	4.48			
EDC2470-120-GD/KD/LD	△	24.7	4.49			
EDC2480-120-GD/KD/LD	△	24.8	4.51			
EDC2490-120-GD/KD/LD	△	24.9	4.53			
EDC2500-125-GD/KD/LD	▲	25.0	4.55	ZTK015-ED250-□□ ZTK03-ED250-□□ ZTK05-ED250-□□ ZTK08-ED250-□□	125	ZTK21-25.9
EDC2510-125-GD/KD/LD	△	25.1	4.57			
EDC2520-125-GD/KD/LD	△	25.2	4.58			
EDC2530-125-GD/KD/LD	△	25.3	4.60			
EDC2540-125-GD/KD/LD	△	25.4	4.62			
EDC2550-125-GD/KD/LD	▲	25.5	4.64			
EDC2560-125-GD/KD/LD	△	25.6	4.66			
EDC2570-125-GD/KD/LD	△	25.7	4.68			
EDC2580-125-GD/KD/LD	△	25.8	4.69			
EDC2590-125-GD/KD/LD	△	25.9	4.70			

▲Regular Stock △Made-to-order

▶ Applicable material table

◎Very suitable ○Suitable

Workpiece material										
Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC						
○	◎	◎			○	◎	◎	◎		



● Geometry selection and hole tolerance

Geometry	-GD				-KD				-LD			
Workpiece materials application ranges												
L/D	1.5D、3D、5D		8D		1.5D、3D、5D		8D		1.5D、3D、5D		8D	
	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm	12-18mm	18-26mm
Tolerance of hole	0/+0.043	0/+0.052	0/+0.070	0/+0.084	0/+0.043	0/+0.052	0/+0.070	0/+0.084	0/+0.043	0/+0.052	0/+0.070	0/+0.084

● Cooling requirements

Internal coolant supply	External coolant supply (Drilling depth < 2D)	No dry cutting

● User guide for drills with 8D shanks

1

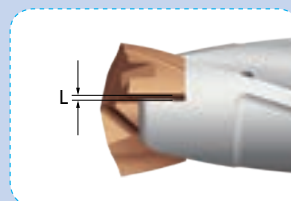
2

3

Assembly instructions :

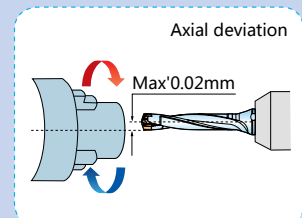
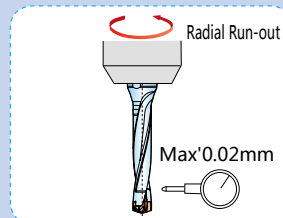


After inserting the tip into the shanks, tighten it with a wrench. When removing, turn the wrench in the opposite direction.



There will be a gap on radial direction after tightening with wrench L=0.05~0.1mm(the gap will be eliminated in cutting automatically).

Maximum deviation in assembly :





● Suitable workpiece shape

Processing content	Workpiece	Points for attention during processing
Plane surface		<ol style="list-style-type: none"> 1. For Stainless steel machining, suggest set up feed rate below 0.15mm/rev from entrance to 0.5D depth position; 2. In order to removal chip, suggest internal cooling, Recommend internal coolant for better chip control, combine internal and external coolant when machining stainless steel materials.
Overlapping plate		<ol style="list-style-type: none"> 1. In order to prevent dislocation, when processing the overlapping plate, The workpieces needed to be fixed.
Concave hole		<ol style="list-style-type: none"> 1. There could be interrupted cuts, suggest to set feed rate under half of the recommended cutting parameters before peripheral edges fully entering the hole; 2. Fine adjustment are recommended when long chips appearing at entrance.
Cylindrical surface hole		<ol style="list-style-type: none"> 1. It can be used for hole machining on the central axis of the shaft. 2. The curve part not recommend. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> Center part machining </div> <div style="text-align: center;"> Curve part machining </div> </div>

Drilling tools

Interchangeable head drills

● Workpiece shape not recommend

Processing content	Overlapped hole	Slope	Half-section	Reaming
workpiece shape				



Recommended cutting parameters of Interchangeable drills

Workpiece materials	Cutting speed (m/min)	Diameter (mm)											
		12		14		16		18		20		25	
		Revolution speed min ⁻¹	Feed rate mm/r	Revolution speed min ⁻¹	Feed rate mm/r	Revolution speed min ⁻¹	Feed rate mm/r	Revolution speed min ⁻¹	Feed rate mm/r	Revolution speed min ⁻¹	Feed rate mm/r	Revolution speed min ⁻¹	Feed rate mm/r
P Soft steel HB≤180	80-150	3200	0.20~0.30	2700	0.22~0.35	2400	0.25~0.36	2100	0.28~0.38	1900	0.30~0.40	1500	0.32~0.42
	Carbon steel Alloy steel ~30HRC	3200	0.20~0.30	2700	0.22~0.35	2400	0.25~0.36	2100	0.28~0.38	1900	0.30~0.40	1500	0.32~0.42
	Pre-hardened steel ~40HRC	50-80	1900	0.20~0.30	1600	0.22~0.35	1400	0.25~0.36	1200	0.28~0.38	1100	0.30~0.40	900
M Stainless steel	50-80	1600	0.12~0.20	1300	0.13~0.22	1200	0.14~0.25	1050	0.15~0.28	950	0.16~0.30	700	0.17~0.32
K Cast iron	80-150	3200	0.20~0.30	2700	0.22~0.35	2400	0.25~0.36	2100	0.28~0.38	1900	0.30~0.40	1500	0.32~0.42
	Nodular cast iron	60-120	2400	0.20~0.30	2100	0.22~0.35	1800	0.25~0.36	1600	0.28~0.38	1400	0.30~0.40	1100
N Aluminum alloy	90-200	4000	0.25~0.35	3400	0.28~0.38	3000	0.30~0.40	2600	0.33~0.43	2400	0.35~0.45	2000	0.40~0.50

Note: please set feed rate below to the recommendation parameter referring to the drill head diameters increasing(1.5D→3D→5D→8D).

Criteria: for 1.5D, 3D, 5D=80% or below, 8D=60% or below.

Cooling: adopt internal cooling or external cooling drilling no more than 2D, dry cutting is prohibited!



How to choose the right solid carbide reamers

How to choose the right solid carbide reamers

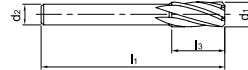
- Shape
- Product type
- Product name
- Product category

Shape size

Reamers

Solid carbide reamer with straight shank and right helical flute

3101H7



H7

Type	Basic dimension(mm)				Number of tooth	Recommended grade YK10F
	d ₁	d ₂ (h7)	l ₁	l ₂		
3101H7-0400	4.0	3.55	56	20	4	☆
3101H7-0450	4.5	4.00	63	22	6	☆
3101H7-0500	5.0	4.00	63	22	6	☆
3101H7-0550	5.5	5.00	63	22	6	☆
3101H7-0600	6.0	5.00	63	22	6	☆
3101H7-0650	6.5	5.00	63	22	6	☆
3101H7-0700	7.0	6.30	71	25	6	☆
3101H7-0750	7.5	6.30	71	25	6	☆
3101H7-0800	8.0	6.30	71	25	6	☆
3101H7-0850	8.5	8.00	71	25	6	☆
3101H7-0900	9.0	8.00	71	25	6	☆
3101H7-0950	9.5	8.00	71	25	6	☆
3101H7-1000	10.0	8.00	71	25	6	☆
3101H7-1050	10.5	8.00	71	25	6	☆
3101H7-1100	11.0	10.00	80	28	6	☆
3101H7-1150	11.5	10.00	80	28	6	☆
3101H7-1200	12.0	10.00	80	28	6	☆
3101H7-1250	12.5	10.00	80	28	6	☆
3101H7-1300	13.0	10.00	80	28	6	☆
3101H7-1350	13.5	12.5	90	32	6	☆
3101H7-1400	14.0	12.5	90	32	6	☆
3101H7-1450	14.5	12.5	90	32	6	☆
3101H7-1500	15.0	12.5	90	32	6	☆
3101H7-1550	15.5	12.5	90	32	6	☆
3101H7-1600	16.0	12.5	90	32	6	☆
3101H7-1700	17.0	12.5	90	32	6	☆
3101H7-1800	18.0	16.00	100	36	6	☆
3101H7-1900	19.0	16.00	100	36	6	☆
3101H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Applicable material table

Very suitable Suitable

Grade	Workpiece material										
	Mild steel HBs180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
YK10F			~40HRC	~50HRC	~60HRC		○	○	○	○	

Code key C147 Cutting parameters C151 Technical information C152-C154 Non-standard customization C155

- Applicable workpiece material range
- Hole precision class and shank type

- Specification Type, basic dimensions ,number of tooth and grade.
- Code key, cutting parameter, technical information, non-standard customization



Reamers

Solid carbide reamers overview ● C146

Icons information ● C146

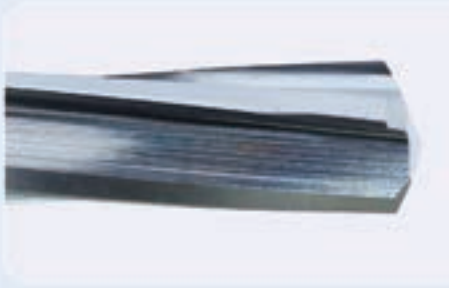
Solid carbide reamer code key ● C147

Detail information of solid carbide reamers ● C148-C150

Recommended cutting parameters for solid carbide reamers ● C151




Technical information for solid carbide reamers ● C152-154

Non-standard customized solid carbide reamers ● C155





Solid carbide reamers overview

Name	Type	Shape	Diameter range	Workpiece material								Page	
				P		M	K	N		S	H	Specification	Cutting parameters
				Mild steel	Common steel	Stainless steel	Cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy	High hardness steel		
Right helical flute reamer	3101H7		Ø4-Ø20				⊙	⊙	⊙			C148	C151
Straight flute reamer	3102H7		Ø4-Ø20				⊙	⊙	⊙			C149	C151
Left helical flute reamer	3103H7		Ø4-Ø20				⊙	⊙	⊙			C150	C151

⊙ Very suitable ○ Suitable

Drilling tools

Reaming Tools

Solid carbide reamers icons information

Precision class of reamed hole

H7

The precision class of reamed hole reaches H7 specified in GB/T1800-1804

Shank type

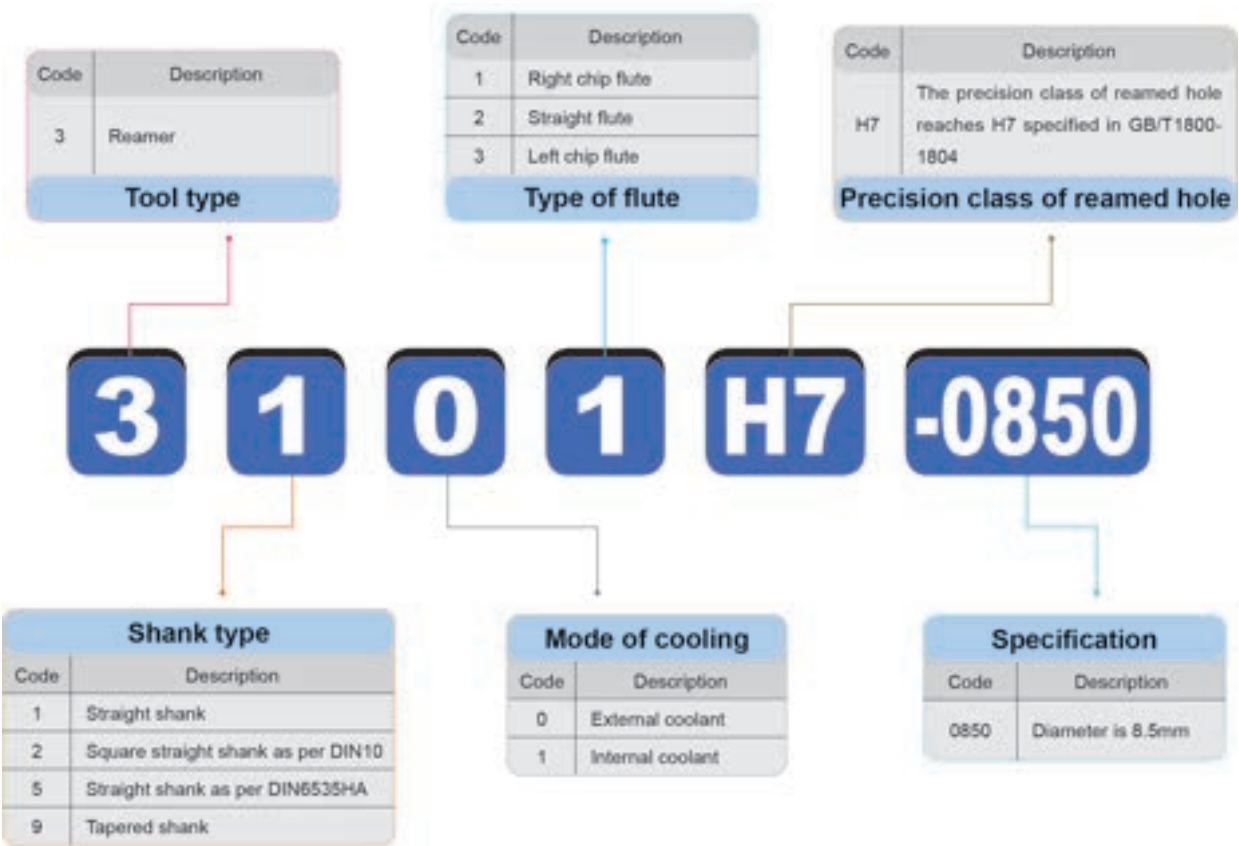


Straight shank

Solid carbide reamers overview



Solid carbide reamer code key



Drilling tools

Reaming Tools

Solid carbide reamer code key

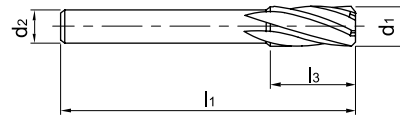




Solid carbide reamer with straight shank and right helical flute

Solid carbide reamer with straight shank and right helical flute

3101H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	d1	d2(h7)	l1	l3		YK10F
3101H7-0400	4.0	3.55	56	20	4	☆
3101H7-0450	4.5	4.00	63	22	6	☆
3101H7-0500	5.0	4.00	63	22	6	☆
3101H7-0550	5.5	5.00	63	22	6	☆
3101H7-0600	6.0	5.00	63	22	6	☆
3101H7-0650	6.5	5.00	63	22	6	☆
3101H7-0700	7.0	6.30	71	25	6	☆
3101H7-0750	7.5	6.30	71	25	6	☆
3101H7-0800	8.0	6.30	71	25	6	☆
3101H7-0850	8.5	8.00	71	25	6	☆
3101H7-0900	9.0	8.00	71	25	6	☆
3101H7-0950	9.5	8.00	71	25	6	☆
3101H7-1000	10.0	8.00	71	25	6	☆
3101H7-1050	10.5	8.00	71	25	6	☆
3101H7-1100	11.0	10.00	80	28	6	☆
3101H7-1150	11.5	10.00	80	28	6	☆
3101H7-1200	12.0	10.00	80	28	6	☆
3101H7-1250	12.5	10.00	80	28	6	☆
3101H7-1300	13.0	10.00	80	28	6	☆
3101H7-1350	13.5	12.5	90	32	6	☆
3101H7-1400	14.0	12.5	90	32	6	☆
3101H7-1450	14.5	12.5	90	32	6	☆
3101H7-1500	15.0	12.5	90	32	6	☆
3101H7-1550	15.5	12.5	90	32	6	☆
3101H7-1600	16.0	12.5	90	32	6	☆
3101H7-1700	17.0	12.5	90	32	6	☆
3101H7-1800	18.0	16.00	100	36	6	☆
3101H7-1900	19.0	16.00	100	36	6	☆
3101H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Drilling tools

Reaming Tools

Solid carbide reamer with straight shank and right helical flute

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
		~40HRC	~50HRC	~60HRC						
YK10F						◎	◎	◎	◎	

Code key

C147

Cutting parameters

C151

Technical information

C152-C154

Non-standard customization tools

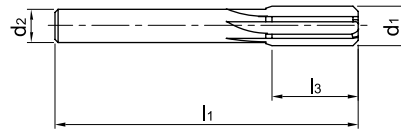
C155



Solid carbide reamer with straight shank and right helical flute

Solid carbide reamer with straight shank and straight flute

3102H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	d1	d2(h7)	l1	l3		YK10F
3102H7-0400	4.0	3.55	56	20	4	☆
3102H7-0450	4.5	4.00	63	22	6	☆
3102H7-0500	5.0	4.00	63	22	6	☆
3102H7-0550	5.5	5.00	63	22	6	☆
3102H7-0600	6.0	5.00	63	22	6	☆
3102H7-0650	6.5	5.00	63	22	6	☆
3102H7-0700	7.0	6.30	71	25	6	☆
3102H7-0750	7.5	6.30	71	25	6	☆
3102H7-0800	8.0	6.30	71	25	6	☆
3102H7-0850	8.5	8.00	71	25	6	☆
3102H7-0900	9.0	8.00	71	25	6	☆
3102H7-0950	9.5	8.00	71	25	6	☆
3102H7-1000	10.0	8.00	71	25	6	☆
3102H7-1050	10.5	8.00	71	25	6	☆
3102H7-1100	11.0	10.00	80	28	6	☆
3102H7-1150	11.5	10.00	80	28	6	☆
3102H7-1200	12.0	10.00	80	28	6	☆
3102H7-1250	12.5	10.00	80	28	6	☆
3102H7-1300	13.0	10.00	80	28	6	☆
3102H7-1350	13.5	12.5	90	32	6	☆
3102H7-1400	14.0	12.5	90	32	6	☆
3102H7-1450	14.5	12.5	90	32	6	☆
3102H7-1500	15.0	12.5	90	32	6	☆
3102H7-1550	15.5	12.5	90	32	6	☆
3102H7-1600	16.0	12.5	90	32	6	☆
3102H7-1700	17.0	12.5	90	32	6	☆
3102H7-1800	18.0	16.00	100	36	6	☆
3102H7-1900	19.0	16.00	100	36	6	☆
3102H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

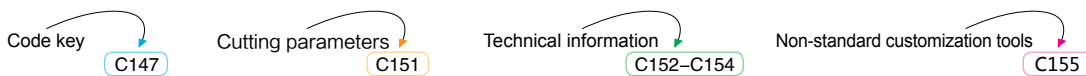
Drilling tools
Reaming Tools

Solid carbide reamer with straight shank and right helical flute

Applicable material table

⊙ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
		~40HRC	~50HRC	~60HRC						
YK10F						⊙	⊙	⊙	⊙	

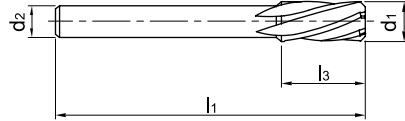




Solid carbide reamer with straight shank and right helical flute

Solid carbide reamer with straight shank and left helical flute

3103H7



H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	d ₁	d ₂ (h7)	l ₁	l ₃		YK10F
3103H7-0400	4.0	3.55	56	20	4	☆
3103H7-0450	4.5	4.00	63	22	6	☆
3103H7-0500	5.0	4.00	63	22	6	☆
3103H7-0550	5.5	5.00	63	22	6	☆
3103H7-0600	6.0	5.00	63	22	6	☆
3103H7-0650	6.5	5.00	63	22	6	☆
3103H7-0700	7.0	6.30	71	25	6	☆
3103H7-0750	7.5	6.30	71	25	6	☆
3103H7-0800	8.0	6.30	71	25	6	☆
3103H7-0850	8.5	8.00	71	25	6	☆
3103H7-0900	9.0	8.00	71	25	6	☆
3103H7-0950	9.5	8.00	71	25	6	☆
3103H7-1000	10.0	8.00	71	25	6	☆
3103H7-1050	10.5	8.00	71	25	6	☆
3103H7-1100	11.0	10.00	80	28	6	☆
3103H7-1150	11.5	10.00	80	28	6	☆
3103H7-1200	12.0	10.00	80	28	6	☆
3103H7-1250	12.5	10.00	80	28	6	☆
3103H7-1300	13.0	10.00	80	28	6	☆
3103H7-1350	13.5	12.5	90	32	6	☆
3103H7-1400	14.0	12.5	90	32	6	☆
3103H7-1450	14.5	12.5	90	32	6	☆
3103H7-1500	15.0	12.5	90	32	6	☆
3103H7-1550	15.5	12.5	90	32	6	☆
3103H7-1600	16.0	12.5	90	32	6	☆
3103H7-1700	17.0	12.5	90	32	6	☆
3103H7-1800	18.0	16.00	100	36	6	☆
3103H7-1900	19.0	16.00	100	36	6	☆
3103H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Drilling tools

Reaming Tools

Solid carbide reamer with straight shank and right helical flute

Applicable material table

⊙ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
		~40HRC	~50HRC	~60HRC						
YK10F						⊙	⊙	⊙	⊙	

Code key

C147

Cutting parameters

C151

Technical information

C152-C154

Non-standard customization tools

C155



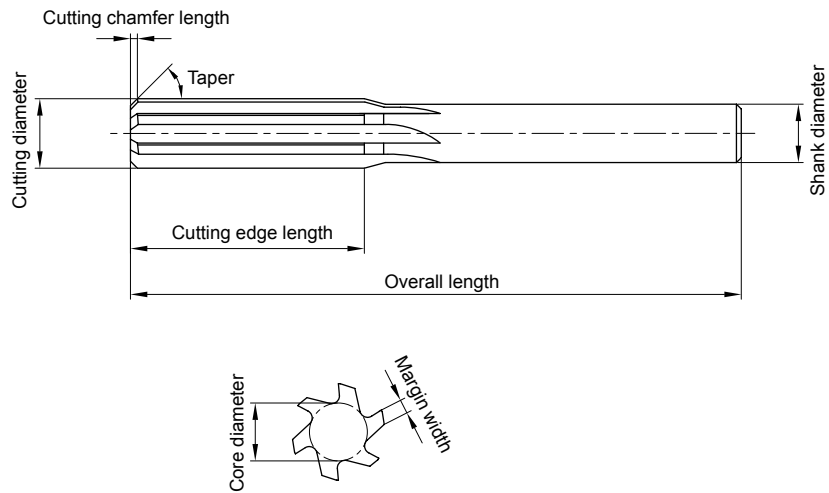
3101H7★3102H7★3103H7

Workpiece material	Cast iron Nodular cast iron			Copper alloy			Casting aluminium alloy		
	8~16m/min			10~25m/min			15~30 m/min		
Cutting speed	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)
4	950	0.04~0.06	0.1~0.2	1600	0.04~0.06	0.1~0.2	2000	0.04~0.06	0.1~0.2
5	760	0.05~0.09	0.1~0.2	1300	0.05~0.09	0.1~0.2	1600	0.05~0.09	0.1~0.2
6	640	0.06~0.12	0.1~0.2	1050	0.06~0.12	0.1~0.2	1300	0.06~0.12	0.1~0.2
7	550	0.07~0.14	0.1~0.2	910	0.07~0.14	0.1~0.2	1150	0.07~0.14	0.1~0.2
8	480	0.08~0.16	0.1~0.2	800	0.08~0.16	0.1~0.2	1000	0.08~0.16	0.1~0.2
9	430	0.09~0.18	0.1~0.2	710	0.09~0.18	0.1~0.2	890	0.09~0.18	0.1~0.2
10	380	0.10~0.20	0.1~0.2	640	0.10~0.20	0.1~0.2	800	0.10~0.20	0.1~0.2
11	350	0.11~0.22	0.1~0.2	580	0.11~0.22	0.1~0.2	720	0.11~0.22	0.1~0.2
12	320	0.12~0.24	0.1~0.2	530	0.12~0.24	0.1~0.2	660	0.12~0.24	0.1~0.2
13	290	0.13~0.26	0.1~0.2	490	0.13~0.26	0.1~0.2	610	0.13~0.26	0.1~0.2
14	270	0.14~0.28	0.1~0.2	460	0.14~0.28	0.1~0.2	570	0.14~0.28	0.1~0.2
15	250	0.15~0.30	0.1~0.2	430	0.15~0.30	0.1~0.2	530	0.15~0.30	0.1~0.2
16	240	0.16~0.32	0.1~0.2	400	0.16~0.32	0.1~0.2	500	0.16~0.32	0.1~0.2
17	225	0.18~0.34	0.1~0.2	380	0.18~0.34	0.1~0.2	470	0.18~0.34	0.1~0.2
18	210	0.20~0.36	0.1~0.2	350	0.20~0.36	0.1~0.2	440	0.20~0.36	0.1~0.2
19	200	0.22~0.38	0.1~0.2	340	0.22~0.38	0.1~0.2	420	0.22~0.38	0.1~0.2
20	190	0.24~0.40	0.1~0.2	320	0.24~0.40	0.1~0.2	400	0.24~0.40	0.1~0.2

1. Please select the holder with high rigidity and high precision.
2. Make sure coolant supply is sufficient.
3. Please adjust cutting parameters according workpiece and machine rigidity.



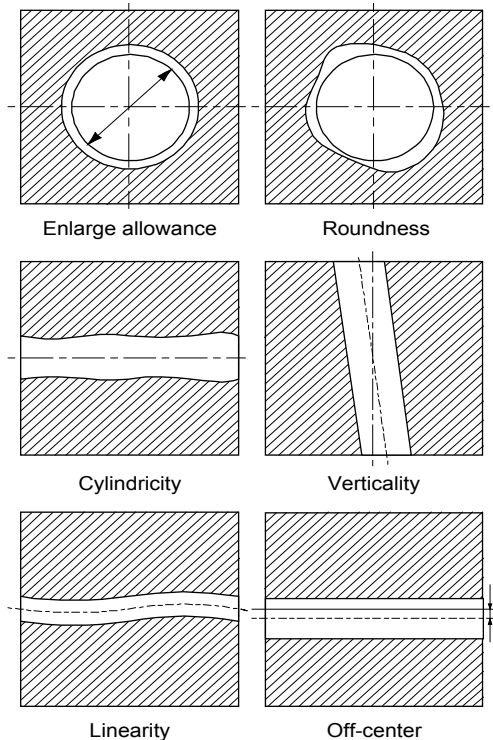
Terminology of reamer



Reaming is the semi-finishing and finishing of an existing hole to achieve precise size, high surface quality, perfect roundness and cylindricity, etc.

In order to gain precise hole in reaming process, the reamer diameter must be defined correctly. Therefore, it is necessary to consider the allowance which is determined by workpiece material and machining conditions. It is also necessary to select the cutting conditions correctly in addition to using high precision reamer to achieve good surface quality.

The reaming precision is mainly determined by diameter and radial run-out. With respect to cutting condition, it is better to select low speed cutting to improve machining precision, but the upper limit should be considered carefully for higher machining efficiency.





Common problems and solutions for reaming

Common problems	Solutions
Oversized holes	<ol style="list-style-type: none"> 1.Reduce diameter of reamer. 2.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 3.Radial run-out of reamer is too large. Good radial run-out is a key to successful reaming. 4.Scratches on reamer shank. 5.When using bushing and bushing, ensure shank is clean. 6.Select a suitable coolant. 7.Adjust cutting parameters.
Undersized holes	<ol style="list-style-type: none"> 1.Increase diameter of reamer. 2.Reduce rotating speed. 3.Reduce the margin width. 4.Excessive tool abrasion, please conduct cutting after regrinding. 5.Thermal expansion coefficient of workpiece is too large. Please keep it cooled enough.
Poor hole roundness and linearity	<ol style="list-style-type: none"> 1.Ensure better roundness of reamer chamfer. 2.Reamer rigidity is low. Make the overhang as short as possible in conditions of non-inference. 3.Check radial run-out after clamping reamer. 4.Adjust the concentricity of hole and reamer. 5.Ensure reaming allowance equality.
Poor hole surface quality	<ol style="list-style-type: none"> 1.The hole surface roughness of entering part is bad. 2.Reduce rotating speed. 3.Ensure correct reaming allowance. The allowance being too large or too small would result in bad surface roughness. 4.Select the reamer with large chip pocket to avoid chip jamming. 5.Increase clearance angle of reamer entering part. 6.Check whether there is built-up on chamfer and margin land. 7.Increase the rigidity of machine, holder and reamer. 8.Check out whether the type of reamer head is suitable for the workpiece. 9.Increase the margin width and land width appropriately.
Hole precision is low	<ol style="list-style-type: none"> 1.In return pass, the reamer should be pulled out of hole rotating at the same direction as before. Opposite rotation must be prohibited. 2.Reduce rotating speed. 3.Select the reamer with more lips. 4.Increase the margin width appropriately to enhance the guiding performance and extrusion effect. 5.Improve reamer lubricating property by surface treatment. 6.Select a suitable coolant.



Common problems and solutions for reaming

Common problems	Solutions
Reamer breakage, thermal damage	<ol style="list-style-type: none"> 1.The guide hole is defective before reaming, for example, linearity is not good. 2.Adjust machining allowance to avoid tool breakage caused by too large allowance. 3.If the chip removal is obstructed, select a reamer with larger chip pocket. 4.Ensure sufficient coolant supply. 5.Adjust rotating speed and feed speed appropriately. 6.Increase the rigidity of machine, holder and reamer. 7.Improve the sharpness of reamer to make cutting easy and fast. 8.Excessive abrasion occurs on cutting edge, which means tool life has expired. It is recommended to change or regrind tool.
Damage on reamer shank	<ol style="list-style-type: none"> 1.Check whether the shank hardness is enough. Too low hardness would cause deformation, and too high hardness may cause breakage. 2.Check the conjunction of holder and bushing. Do not use a defective holder.
Short tool life	<ol style="list-style-type: none"> 1.Enhance the hardness of reamer cutting edge. 2.Select the reamer made by advanced material. 3.Check the coolant. 4.Use surface treatment for reamer such as nitride process. 5.Change the straight flute to helical flute. 6.Check all factors affecting machining precision.
Scratches on hole surface	<ol style="list-style-type: none"> 1.Make sure no built-up is on the reamer surface. 2.Improve workpiece holding.
Trumpet-shaped entry hole	<ol style="list-style-type: none"> 1.Improve workpiece holding. 2.Check radial run-out after clamping reamer. 3.The center of reamer is not in alignment with the hole center. Adjust the concentricity of hole and reamer.
Oversized holes	<ol style="list-style-type: none"> 1.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 2.Improve workpiece holding.



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Hole information and workpiece material

Hole shape to be machined:

Through hole Blind hole

Size of processed hole= mm

Tolerance of processed hole=

Depth of processed hole= mm

Material grade to be processed:

Grey cast iron

Ductile Iron

Aluminum alloy

Silicon Aluminum Alloy Si < 10%

Silicon Aluminum Alloy Si > 10%

Tensile strength= N/mm²

Hardness= (Units: HRC, HB, etc.)

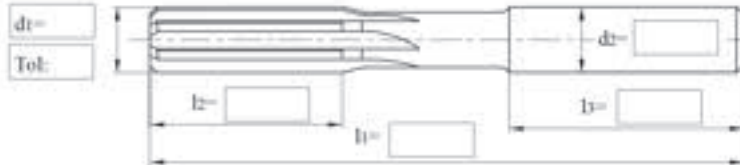
Tool Information

Direction of cutting tools' rotation

Right-handed rotation

Straight flute

Left-handed rotation



Lead angle forms

45°

15°

30°

<30°

Coolant type

Internal coolant

External coolant

Coating

Coated

Non-Coated

Shank form

DIN6535

Form HA

Form HB

Form HE

Ordinary straight handle

With flat tail handle DIN 1809

More Taper Shank MT

Special shapes

Note:

Order Quantity: PCS

Expected delivery date:

Quotation:

Confirmation:

Date:

Drilling tools

Reaming Tools

Non-standard customization for special application



Forming Taps

Chip-free internal threading tools



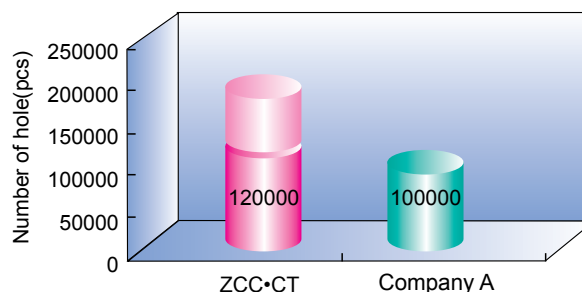
- ◆ Super micro grain cemented carbide with good toughness and abrasion resistance has long tool life.
- ◆ With particularly section-sharp design has good rigidity and strength.
- ◆ Thanks to the special technique treatment on cutting edge surface, ensuring good threading machining quality and high dimensional accuracy.

It is apply for high efficiency through-hole and blind-hole machining of high tensility material such as soft steel, stainless steel, Al alloys and cast Al alloy, etc.

Application case

Work piece: auto engine shell
 Work piece material: Al alloy (HB90~120)
 Tool type: 4222ACS-M10×1.25-6H
 Cutting parameters: n=1300r/min
 F=1625mm/min
 h=29mm, through hole or blind hole machining
 Machining tool: horizontal machining center
 Cooling style: emulsified liquid cooling

Comparison of hole number

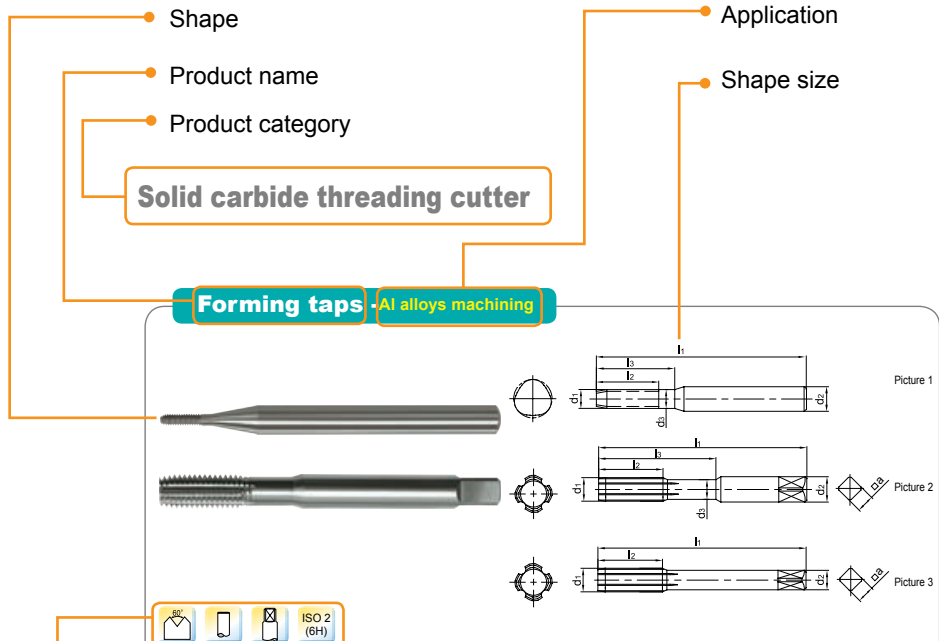


ZCC•CT: 120000 holes (still usable)
 Company A: 100000 holes (failure)



How to choose the right solid carbide threading tools

How to choose the right solid carbide threading tools



Type	Cooling mode	Basic dimension(mm)											Grade		Pre-hole diameter			
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry	Number of teeth	KTG402		YK40F	d	
4122M-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5					60°	Picture 1	4	●	○	0.9
4122MS-M1*0.25-6H		2P	M1	0.25	3		40	5					60°	Picture 1	4	●	○	0.9
4122M-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5					60°	Picture 1	4	●	○	1.1
4122MS-M1.2*0.25-6H		2P	M1.2	0.25	3		40	5					60°	Picture 1	4	●	○	1.1
4122M-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11				60°	Picture 1	4	●	○	1.47
4122MS-M1.6*0.35-6H		2P	M1.6	0.35	3	1.1	40	5	11				60°	Picture 1	4	●	○	1.47
4122M-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12				60°	Picture 1	4	●	○	1.85
4122MS-M2*0.4-6H		2P	M2	0.4	3	1.5	45	6	12				60°	Picture 1	4	●	○	1.85
4122M-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14				60°	Picture 1	4	●	○	2.33
4122MS-M2.5*0.45-6H		2P	M2.5	0.45	3	1.9	50	6	14				60°	Picture 1	4	●	○	2.33
4222M-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7			60°	Picture 2	4	●	○	2.8
4222MS-M3*0.5-6H		2P	M3	0.5	3.5	2.3	56	6	18	2.7			60°	Picture 2	4	●	○	2.8
4222M-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4			60°	Picture 2	4	●	○	3.8
4222MS-M4*0.5-6H		2P	M4	0.5	4.5	3.1	63	8	21	3.4			60°	Picture 2	4	●	○	3.8
4222M-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4			60°	Picture 2	4	●	○	3.7
4222MS-M4*0.7-6H		2P	M4	0.7	4.5	3.1	63	8	21	3.4			60°	Picture 2	4	●	○	3.7
4222M-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9			60°	Picture 2	4	●	○	4.8
4222MS-M5*0.5-6H		2P	M5	0.5	6	4.3	70	10	25	4.9			60°	Picture 2	4	●	○	4.8

● Stock available ○ Make-to-order

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
			~40HRC	~50HRC	~60HRC					
KTG402	○					○				
YK40F	○					○		○		



Applicable workpiece material range
Thread profile angle, shank type, precision class

Specification
Type, basic dimensions, number of tooth and grade.

Code key, cutting parameter, technical information, Non-standard customization



BORING TOOL



Threading tools

Solid carbide threading tools overview ● C160

**Icons information of solid carbide
threading tools** ● C160

Code key of solid carbide threading tools ● C161

**Detail information of solid carbide
threading tools** ● C162-C175

Solid carbide threading cutters C162-C173

Solid carbide threading end mills C174-C175

**Recommended cutting parameters of solid
carbide threading tools** ● C176








**Technical information of solid carbide
threading tools** ● C177-C182

**Non-standard customization for
threading tools** ● C183-C184





Threading tools overview

Name	Type	Shape	Diameter range	Workpiece material						Page		
				P	M	K	N	S	H	Specification	Cutting parameters	
				Mild steel	Common steel	Stainless steel	Cast iron	Aluminum alloy	Heat resistant alloy			High hardness steel
Forming tap	4122A		M1~M2.5					○			C162	C176
	4222A		M3~M16					○			C163	C176
	4122M		M1~M2.5	○		○		○			C164	C176
	4222M		M3~M16	○		○		○			C165	C176
Helical-flute cutting taps	4201C		M3~M16					○			C166-C167	C176
	4201A							○			C170-C171	C176
Straight-flute cutting tap	4202C		M3~M16					○			C168-C169	C176
	4202A							○			C172-C173	C176
Threading end mills	4111		M3~M20	○	○		○	○			C175	C176

○ Very suitable ○ Suitable

Icons information

Shank type



Straight shank



Square straight shank as per DIN10

Thread profile angle of tap



60° shown

Precision class of screw thread



Precision class of screw thread



Precision class of screw thread

Drilling tools

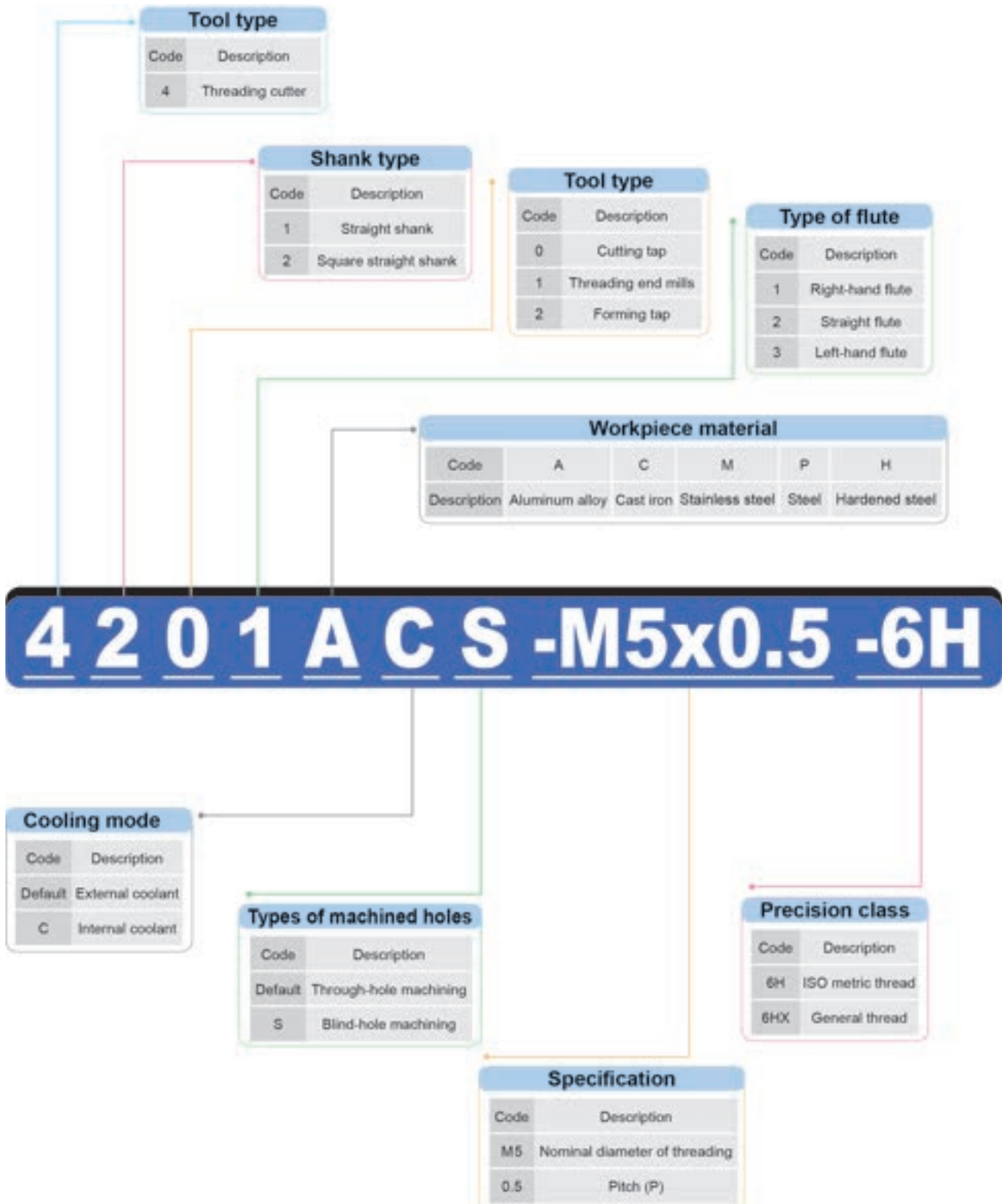
Reaming Tools

Threading Cutter

Threading tools overview & icons information



Threading tools code key



Drilling tools

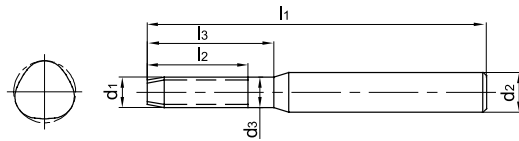
Reaming Tools

Threading Cutter

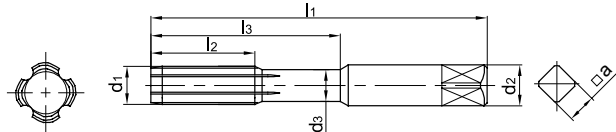
Threading cutter code key



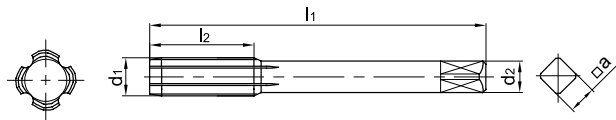
Forming taps -Al alloys machining



Picture 1



Picture 2



Picture 3



Type	Cooling mode	Basic dimension(mm)											Grade	Pre-hole diameter				
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry			Number of teeth	YK40F	d	
4122A-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5							Picture 1	3	●	0.9
4122AS-M1*0.25-6H		1.5P	M1	0.25	3		40	5								3	●	0.9
4122A-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5							Picture 1	3	●	1.1
4122AS-M1.2*0.25-6H		1.5P	M1.2	0.25	3		40	5								3	●	1.1
4122A-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11						Picture 1	3	●	1.47
4122AS-M1.6*0.35-6H		1.5P	M1.6	0.35	3	1.1	40	5	11							3	●	1.47
4122A-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12						Picture 1	3	●	1.85
4122AS-M2*0.4-6H		1.5P	M2	0.4	3	1.5	45	6	12							3	●	1.85
4122A-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14						Picture 1	3	●	2.33
4122AS-M2.5*0.45-6H		1.5P	M2.5	0.45	3	1.9	50	6	14							3	●	2.33
4222A-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7					Picture 2	4	●	2.8
4222AS-M3*0.5-6H		1.5P	M3	0.5	3.5	2.3	56	6	18	2.7						4	●	2.8
4222A-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4					Picture 2	4	●	3.8
4222AS-M4*0.5-6H		1.5P	M4	0.5	4.5	3.1	63	8	21	3.4						4	●	3.8
4222A-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4					Picture 2	4	●	3.7
4222AS-M4*0.7-6H		1.5P	M4	0.7	4.5	3.1	63	8	21	3.4						4	●	3.7
4222A-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9					Picture 2	4	●	4.8
4222AS-M5*0.5-6H		1.5P	M5	0.5	6	4.3	70	10	25	4.9						4	●	4.8
4222A-M5*0.8-6H		3P	M5	0.8	6	4	70	10	25	4.9					Picture 2	4	●	4.65
4222AS-M5*0.8-6H		1.5P	M5	0.8	6	4	70	10	25	4.9						4	●	4.65
4222A-M6*0.75-6H		3P	M6	0.75	6	5	80	12	30	4.9					Picture 2	4	●	5.7
4222AS-M6*0.75-6H		1.5P	M6	0.75	6	5	80	12	30	4.9						4	●	5.7
4222A-M6*1-6H		3P	M6	1	6	4.7	80	12	30	4.9					Picture 2	4	●	5.6
4222AS-M6*1-6H		1.5P	M6	1	6	4.7	80	12	30	4.9						4	●	5.6
4222A-M7*1-6H		3P	M7	1	7	5.7	80	14	30	5.5					Picture 2	4	●	6.6
4222AS-M7*1-6H		1.5P	M7	1	7	5.7	80	14	30	5.5						4	●	6.6

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Forming taps-Al alloys machining



Type	Cooling mode	Basic dimension(mm)											Grade	Pre-hole diameter				
		Length of Forming taper	d1	P	d2	d3	l1	l2	l3	a × a	Thread profile	Geometry	Number of teeth	YK40F	d			
4222A-M8*1-6H	External coolant	3P	M8	1	8	6.7	90	16	35	6.2	60°	Picture 2	4	●	7.6			
4222AS-M8*1-6H		1.5P																
4222A-M8*1.25-6H		3P	M8	1.25	8	6.4	90	16	35	6.2		Picture 2	4	●	7.45			
4222AS-M8*1.25-6H		1.5P																
4222A-M10*1-6H		3P	M10	1	10	8.7	100	20	39	8		Picture 2	5	●	9.6			
4222AS-M10*1-6H		1.5P																
4222A-M10*1.25-6H		3P	M10	1.25	10	8.4	100	20	39	8		Picture 2	5	●	9.45			
4222AS-M10*1.25-6H		1.5P																
4222A-M10*1.5-6H		3P	M10	1.5	10	8.1	100	20	39	8		Picture 2	5	●	9.35			
4222AS-M10*1.5-6H		1.5P																
4222AC-M10*1.5-6H		3P																
4222ACS-M10*1.5-6H		1.5P																
4222A-M12*1.25-6H		External coolant	3P	M12	1.25	9		110	24			7	60°	Picture 3	5	●	11.45	
4222AS-M12*1.25-6H			1.5P															
4222A-M12*1.5-6H			3P	M12	1.5	9		110	24			7		Picture 3	5	●	11.35	
4222AS-M12*1.5-6H			1.5P															
4222A-M12*1.75-6H			3P	M12	1.75	9		110	24			7		Picture 3	5	●	11.25	
4222AS-M12*1.75-6H			1.5P															
4222AC-M12*1.75-6H			3P															
4222ACS-M12*1.75-6H			1.5P															
4222A-M14*1.5-6H	External coolant		3P	M14	1.5	11		110	26		9	60°		Picture 3	6	●	13.35	
4222AS-M14*1.5-6H			1.5P															
4222A-M14*2-6H			3P	M14	2	11		110	26		9			Picture 3	6	●	13.1	
4222AS-M14*2-6H			1.5P															
4222A-M16*1.5-6H			3P	M16	1.5	12		110	27		9			Picture 3	6	●	15.35	
4222AS-M16*1.5-6H			1.5P															
4222A-M16*2-6H			3P															
4222AS-M16*2-6H			1.5P															
4222AC-M16*2-6H			Internal coolant	3P	M16	2	12		110	27				9	Picture 3	6	●	15.1
4222ACS-M16*2-6H				1.5P														

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

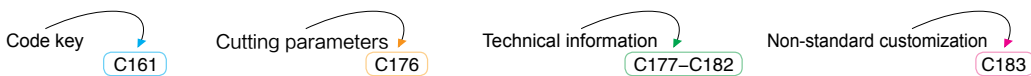
Threading Cutter

Forming taps-Al alloys machining

➤ Applicable material table

○ Very suitable ○ Suitable

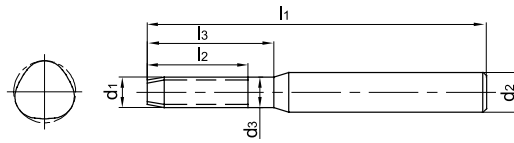
Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC				○	



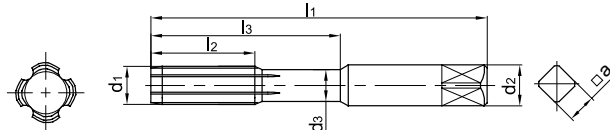


Forming taps -stainless steel machining

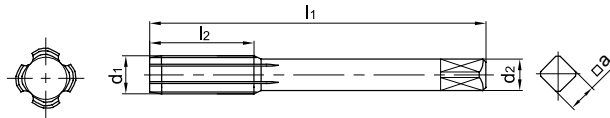
Forming taps -stainless steel machining



Picture 1



Picture 2



Picture 3



Type	Cooling mode	Basic dimension(mm)											Grade		Pre-hole diameter				
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry	Number of teeth	KTG402		YK40F	d		
4122M-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5						Picture 1	4	●	○	0.9	
4122MS-M1*0.25-6H		2P	M1	0.25	3		40	5						Picture 1	4	●	○	0.9	
4122M-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5						Picture 1	4	●	○	1.1	
4122MS-M1.2*0.25-6H		2P	M1.2	0.25	3		40	5						Picture 1	4	●	○	1.1	
4122M-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11					Picture 1	4	●	○	1.47	
4122MS-M1.6*0.35-6H		2P	M1.6	0.35	3	1.1	40	5	11					Picture 1	4	●	○	1.47	
4122M-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12					Picture 1	4	●	○	1.85	
4122MS-M2*0.4-6H		2P	M2	0.4	3	1.5	45	6	12					Picture 1	4	●	○	1.85	
4122M-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14					Picture 1	4	●	○	2.33	
4122MS-M2.5*0.45-6H		2P	M2.5	0.45	3	1.9	50	6	14					Picture 1	4	●	○	2.33	
4222M-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7	60°				Picture 2	4	●	○	2.8
4222MS-M3*0.5-6H		2P													Picture 2	4	●	○	2.8
4222M-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4					Picture 2	4	●	○	3.8
4222MS-M4*0.5-6H		2P													Picture 2	4	●	○	3.8
4222M-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4					Picture 2	4	●	○	3.7
4222MS-M4*0.7-6H		2P													Picture 2	4	●	○	3.7
4222M-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9					Picture 2	4	●	○	4.8
4222MS-M5*0.5-6H		2P													Picture 2	4	●	○	4.8
4222M-M5*0.8-6H		3P	M5	0.8	6	4	70	10	25	4.9					Picture 2	4	●	○	4.65
4222MS-M5*0.8-6H		2P													Picture 2	4	●	○	4.65
4222M-M6*0.75-6H	3P	M6	0.75	6	5	80	12	30	4.9	Picture 2					4	●	○	5.7	
4222MS-M6*0.75-6H	2P									Picture 2					4	●	○	5.7	
4222M-M6*1-6H	3P	M6	1	6	4.7	80	12	30	4.9	Picture 2					4	●	○	5.6	
4222MS-M6*1-6H	2P									Picture 2					4	●	○	5.6	
4222M-M7*1-6H	3P	M7	1	7	5.7	80	14	30	5.5	Picture 2					4	●	○	6.6	
4222MS-M7*1-6H	2P									Picture 2					4	●	○	6.6	

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Forming taps-stainless steel machining



Forming taps -stainless steel machining

Type	Cooling mode	Basic dimension(mm)											Grade		Pre-hole diameter			
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry	Number of teeth	KTG402		YK40F	d	
4222M-M8*1-6H	External coolant	3P	M8	1	8	6.7	90	16	35	6.2		Picture 2	4	●	○	7.6		
4222MS-M8*1-6H		2P																
4222M-M8*1.25-6H		3P	M8	1.25	8	6.4	90	16	35	6.2		Picture 2	4	●	○	7.45		
4222MS-M8*1.25-6H		2P																
4222M-M10*1-6H		3P	M10	1	10	8.7	100	20	39	8		Picture 2	5	●	○	9.6		
4222MS-M10*1-6H		2P																
4222M-M10*1.25-6H		3P	M10	1.25	10	8.4	100	20	39	8		Picture 2	5	●	○	9.45		
4222MS-M10*1.25-6H		2P																
4222M-M10*1.5-6H		3P	M10	1.5	10	8.1	100	20	39	8		Picture 2	5	●	○	9.35		
4222MS-M10*1.5-6H		2P																
4222MC-M10*1.5-6H		Internal coolant	3P	M10	1.5	10	8.1	100	20	39	8		Picture 2	5	●	○	9.35	
4222MCS-M10*1.5-6H		2P																
4222M-M12*1.25-6H		External coolant	3P	M12	1.25	9		110	24		7		Picture 3	5	●	○	11.45	
4222MS-M12*1.25-6H			2P															
4222M-M12*1.5-6H			3P	M12	1.5	9		110	24		7	60°	Picture 3	5	●	○	11.35	
4222MS-M12*1.5-6H			2P															
4222M-M12*1.75-6H			3P	M12	1.75	9		110	24		7		Picture 3	5	●	○	11.25	
4222MS-M12*1.75-6H			2P															
4222MC-M12*1.75-6H			Internal coolant	3P	M12	1.75	9		110	24		7		Picture 3	5	●	○	11.25
4222MCS-M12*1.75-6H			2P															
4222M-M14*1.5-6H	External coolant		3P	M14	1.5	11		110	26		9		Picture 3	6	●	○	13.35	
4222MS-M14*1.5-6H			2P															
4222M-M14*2-6H			3P	M14	2	11		110	26		9		Picture 3	6	●	○	13.1	
4222MS-M14*2-6H			2P															
4222M-M16*1.5-6H			3P	M16	1.5	12		110	27		9		Picture 3	6	●	○	15.35	
4222MS-M16*1.5-6H			2P															
4222M-M16*2-6H			3P	M16	2	12		110	27		9		Picture 3	6	●	○	15.1	
4222MS-M16*2-6H			2P															
4222MC-M16*2-6H			Internal coolant	3P	M16	2	12		110	27	9		Picture 3	6	●	○	15.1	
4222MCS-M16*2-6H			2P															

● Stock available ○ Make-to-order

➤ Applicable material table

⊙ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
			~40HRC	~50HRC	~60HRC					
KTG402	⊙					⊙				
YK40F	○					○		○		

Code key
C161

Cutting parameters
C176

Technical information
C177-C182

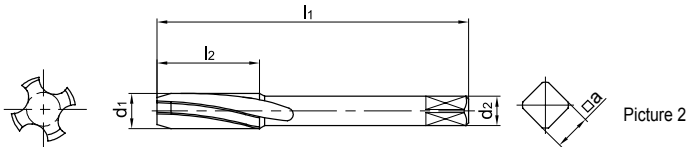
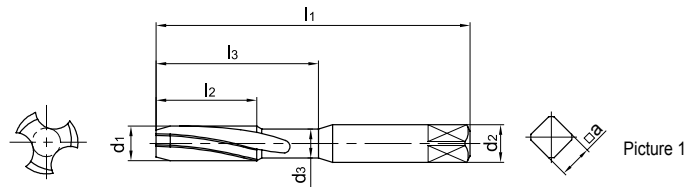
Non-standard customization
C183

Drilling tools
Reaming Tools
Threading Cutter

Forming taps-stainless steel machining



Helical-flute cutting taps - cast iron machining



Type	Basic dimension(mm)											Grade	Pre-hole diameter	
	Length of Cutting tap	d1	P	d2	d3	l1	l2	l3	a × a	Thread profile	Geometry			Number of teeth
4201C-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4201C-M3*0.5-6HX	3P													
4201CS-M3*0.5-6H	1.5P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4201CS-M3*0.5-6HX	1.5P													
4201C-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4201C-M4*0.7-6HX	3P													
4201CS-M4*0.7-6H	1.5P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4201CS-M4*0.7-6HX	1.5P													
4201C-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4201C-M5*0.8-6HX	3P													
4201CS-M5*0.8-6H	1.5P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4201CS-M5*0.8-6HX	1.5P													
4201C-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4201C-M6*0.75-6HX	3P													
4201CS-M6*0.75-6H	1.5P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4201CS-M6*0.75-6HX	1.5P													
4201C-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201CC-M6*1-6H	3P													
4201C-M6*1-6HX	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201CS-M6*1-6H	1.5P													
4201CCS-M6*1-6H	1.5P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201CS-M6*1-6HX	1.5P													
4201C-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	60°	Picture 1	3	●	6
4201CS-M7*1-6H	1.5P													
4201C-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	60°	Picture 1	3	●	7
4201CS-M8*1-6H	1.5P													
4201C-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4201CC-M8*1.25-6H	3P													
4201C-M8*1.25-6HX	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4201CS-M8*1.25-6H	1.5P													
4201CCS-M8*1.25-6H	1.5P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4201CS-M8*1.25-6HX	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Helical-flute cutting taps-cast iron machining



Helical-flute cutting taps - cast iron machining

Type	Basic dimension(mm)												Grade	Pre-hole diameter						
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry	Number of teeth	YK40F	d						
4201C-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9						
4201CS-M10*1-6H	1.5P																			
4201C-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8		60°	Picture 1	4	●	8.75					
4201CS-M10*1.25-6H	1.5P																			
4201C-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8			60°	Picture 1	4	●	8.5				
4201CC-M10*1.5-6H	3P																			
4201C-M10*1.5-6HX	3P																			
4201CS-M10*1.5-6H	1.5P																			
4201CCS-M10*1.5-6H	1.5P																			
4201CS-M10*1.5-6HX	1.5P																			
4201C-M12*1.25-6H	3P	M12	1.25	9		110	29		7				60°	Picture 2	4	●	10.75			
4201CS-M12*1.25-6H	1.5P																			
4201C-M12*1.5-6H	3P	M12	1.5	9		110	29		7					60°		4	●	10.5		
4201CS-M12*1.5-6H	1.5P																			
4201C-M12*1.75-6H	3P	M12	1.75	9		110	29		7						60°	Picture 2	4	●	10.25	
4201CC-M12*1.75-6H	3P																			
4201C-M12*1.75-6HX	3P																			
4201CS-M12*1.75-6H	1.5P																			
4201CCS-M12*1.75-6H	1.5P																			
4201CS-M12*1.75-6HX	1.5P																			
4201C-M14*1.5-6H	3P	M14	1.5	11		110	30		9	60°						Picture 2	4	●	12.5	
4201CS-M14*1.5-6H	1.5P																			
4201C-M14*2-6H	3P	M14	2	11		110	30		9		60°					Picture 2	4	●	12	
4201CS-M14*2-6H	1.5P																			
4201C-M16*1.5-6H	3P	M16	1.5	12		110	32		9			60°				Picture 2	4	●	14.5	
4201CS-M16*1.5-6H	1.5P																			
4201C-M16*2-6H	3P	M16	2	12		110	32		9							60°	Picture 2	4	●	14
4201C-M16*2-6HX	3P																			
4201CS-M16*2-6H	1.5P																			
4201CS-M16*2-6HX	1.5P																			

● Stock available ○ Make-to-order

Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC		○	○		

Code key
C161

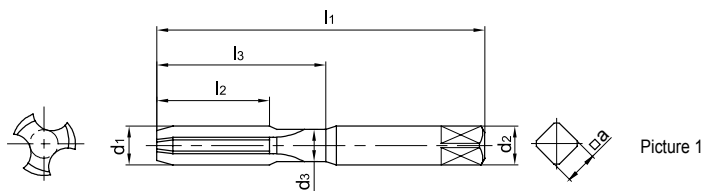
Cutting parameters
C176

Technical information
C177-C182

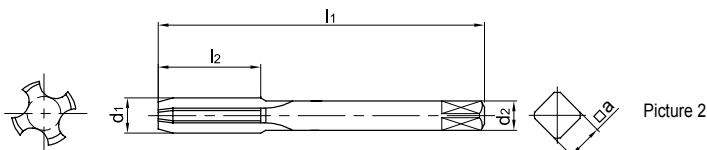
Non-standard customization
C183



Straight-flute cutting taps - cast iron machining



Picture 1



Picture 2



Type	Basic dimension(mm)											Grade	Pre-hole diameter	
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry			Number of teeth
4202C-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4202C-M3*0.5-6HX	3P													
4202CS-M3*0.5-6H	1.5P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4202CS-M3*0.5-6HX	1.5P													
4202C-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4202C-M4*0.7-6HX	3P													
4202CS-M4*0.7-6H	1.5P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4202CS-M4*0.7-6HX	1.5P													
4202C-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4202C-M5*0.8-6HX	3P													
4202CS-M5*0.8-6H	1.5P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4202CS-M5*0.8-6HX	1.5P													
4202C-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4202C-M6*0.75-6HX	3P													
4202CS-M6*0.75-6H	1.5P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4202CS-M6*0.75-6HX	1.5P													
4202C-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4202CC-M6*1-6H	3P													
4202C-M6*1-6HX	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4202CS-M6*1-6H	1.5P													
4202CCS-M6*1-6H	1.5P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4202CS-M6*1-6HX	1.5P													
4202C-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	60°	Picture 1	3	●	6
4202CS-M7*1-6H	1.5P													
4202C-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	60°	Picture 1	3	●	7
4202CS-M8*1-6H	1.5P													
4202C-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4202CC-M8*1.25-6H	3P													
4202C-M8*1.25-6HX	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4202CS-M8*1.25-6H	1.5P													
4202CCS-M8*1.25-6H	1.5P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4202CS-M8*1.25-6HX	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Straight-flute cutting tap-cast iron machining



Straight-flute cutting taps - cast iron machining

Type	Basic dimension(mm)												Grade	Pre-hole diameter						
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth	YK40F	d						
4202C-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9						
4202CS-M10*1-6H	1.5P																			
4202C-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8		60°	Picture 1	4	●	8.75					
4202CS-M10*1.25-6H	1.5P																			
4202C-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8			60°	Picture 1	4	●	8.5				
4202CC-M10*1.5-6H	3P																			
4202C-M10*1.5-6HX	3P																			
4202CS-M10*1.5-6H	1.5P																			
4202CCS-M10*1.5-6H	1.5P																			
4202CS-M10*1.5-6HX	1.5P																			
4202C-M12*1.25-6H	3P	M12	1.25	9		110	29		7				60°	Picture 2	4	●	10.75			
4202CS-M12*1.25-6H	1.5P																			
4202C-M12*1.5-6H	3P	M12	1.5	9		110	29		7					60°		4	●	10.5		
4202CS-M12*1.5-6H	1.5P																			
4202C-M12*1.75-6H	3P	M12	1.75	9		110	29		7						60°	Picture 2	4	●	10.25	
4202CC-M12*1.75-6H	3P																			
4202C-M12*1.75-6HX	3P																			
4202CS-M12*1.75-6H	1.5P																			
4202CCS-M12*1.75-6H	1.5P																			
4202CS-M12*1.75-6HX	1.5P																			
4202C-M14*1.5-6H	3P	M14	1.5	11		110	30		9	60°						Picture 2	4	●	12.5	
4202CS-M14*1.5-6H	1.5P																			
4202C-M14*2-6H	3P	M14	2	11		110	30		9		60°					Picture 2	4	●	12	
4202CS-M14*2-6H	1.5P																			
4202C-M16*1.5-6H	3P	M16	1.5	12		110	32		9			60°				Picture 2	4	●	14.5	
4202CS-M16*1.5-6H	1.5P																			
4202C-M16*2-6H	3P	M16	2	12		110	32		9							60°	Picture 2	4	●	14
4202C-M16*2-6HX	3P																			
4202CS-M16*2-6H	1.5P																			
4202CS-M16*2-6HX	1.5P																			

● Stock available ○ Make-to-order

▶▶ Applicable material table

⊙ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC							
YK40F							⊙	⊙			

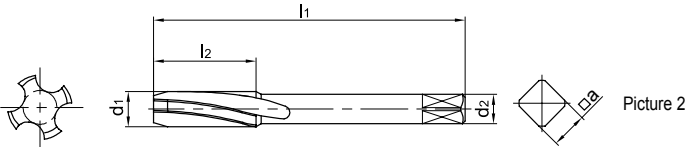
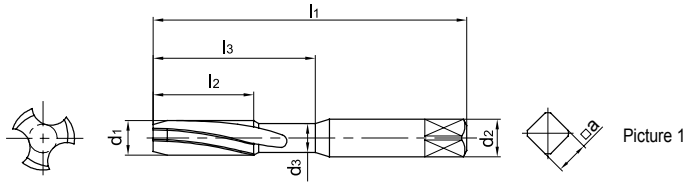


Drilling tools
Reaming Tools
Threading Cutter

Straight-flute cutting tap-cast iron machining



Helical-flute cutting taps - Al alloys machining



Type	Basic dimension(mm)												Grade	Pre-hole diameter
	Length of Cutting tap	d1	P	d2	d3	l1	l2	l3	a × a	Thread profile	Geometry	Number of teeth	YK40F	d
4201A-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4201A-M3*0.5-6HX	3P													
4201AS-M3*0.5-6H	1.5P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4201AS-M3*0.5-6HX	1.5P													
4201A-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4201A-M4*0.7-6HX	3P													
4201AS-M4*0.7-6H	1.5P	M4	0.7	4.5	3.1	63	13	21	3.4	60°	Picture 1	3	●	3.3
4201AS-M4*0.7-6HX	1.5P													
4201A-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4201A-M5*0.8-6HX	3P													
4201AS-M5*0.8-6H	1.5P	M5	0.8	6	4	70	16	25	4.9	60°	Picture 1	3	●	4.2
4201AS-M5*0.8-6HX	1.5P													
4201A-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4201A-M6*0.75-6HX	3P													
4201AS-M6*0.75-6H	1.5P	M6	0.75	6	5	80	19	30	4.9	60°	Picture 1	3	●	5.25
4201AS-M6*0.75-6HX	1.5P													
4201A-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201AC-M6*1-6H	3P													
4201A-M6*1-6HX	3P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201AS-M6*1-6H	1.5P													
4201ACS-M6*1-6H	1.5P	M6	1	6	4.7	80	19	30	4.9	60°	Picture 1	3	●	5
4201AS-M6*1-6HX	1.5P													
4201A-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	60°	Picture 1	3	●	6
4201AS-M7*1-6H	1.5P													
4201A-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	60°	Picture 1	3	●	7
4201AS-M8*1-6H	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Helical-flute cutting taps --Al alloys machining



Helical-flute cutting taps - Al alloys machining

Type	Basic dimension(mm)											Grade	Pre-hole diameter		
	Length of Cutting tap	d1	P	d2	d3	l1	l2	l3	a×a	Thread profile	Geometry	Number of teeth	YK40F	d	
4201A-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75	
4201AC-M8*1.25-6H	3P														
4201A-M8*1.25-6HX	3P														
4201AS-M8*1.25-6H	1.5P														
4201ACS-M8*1.25-6H	1.5P														
4201AS-M8*1.25-6HX	1.5P														
4201A-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8		Picture 1	4	●	9	
4201AS-M10*1-6H	1.5P														
4201A-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8			Picture 1	4	●	8.75
4201AS-M10*1.25-6H	1.5P														
4201A-M10*1.5-6H	3P														
4201AC-M10*1.5-6H	3P														
4201A-M10*1.5-6HX	3P														
4201AS-M10*1.5-6H	1.5P														
4201ACS-M10*1.5-6H	1.5P														
4201AS-M10*1.5-6HX	1.5P														
4201A-M12*1.25-6H	3P	M12	1.25	9		110	29		7		Picture 2	4	●	10.75	
4201AS-M12*1.25-6H	1.5P														
4201A-M12*1.5-6H	3P	M12	1.5	9		110	29		7			Picture 2	4	●	10.5
4201AS-M12*1.5-6H	1.5P														
4201A-M12*1.75-6H	3P														
4201AC-M12*1.75-6H	3P														
4201A-M12*1.75-6HX	3P														
4201AS-M12*1.75-6H	1.5P														
4201ACS-M12*1.75-6H	1.5P														
4201AS-M12*1.75-6HX	1.5P														
4201A-M14*1.5-6H	3P	M14	1.5	11		110	30		9	Picture 2	4	●	12.5		
4201AS-M14*1.5-6H	1.5P														
4201A-M14*2-6H	3P	M14	2	11		110	30		9		Picture 2	4	●	12	
4201AS-M14*2-6H	1.5P														
4201A-M16*1.5-6H	3P														
4201AS-M16*1.5-6H	1.5P														
4201A-M16*2-6H	3P														
4201A-M16*2-6HX	3P														
4201AS-M16*2-6H	1.5P														
4201AS-M16*2-6HX	1.5P														
4201A-M16*2-6H	3P	M16	2	12		110	32		9	Picture 2	4	●	14.5		
4201AS-M16*1.5-6H	1.5P														
4201A-M16*2-6H	3P														
4201A-M16*2-6HX	3P														
4201AS-M16*2-6H	1.5P														
4201AS-M16*2-6HX	1.5P														

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC				◎	



Code key

C161

Cutting parameters

C176

Technical information

C177-C182

Non-standard customization

C183

Helical-flute cutting taps --Al alloys machining

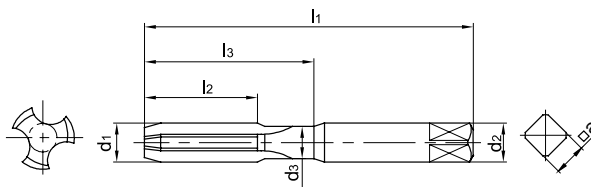
Drilling tools

Reaming Tools

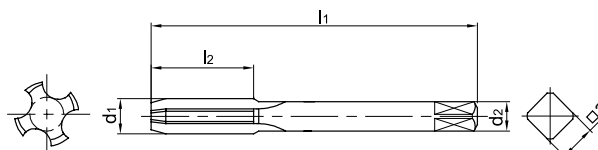
Threading Cutter



Straight-flute cutting taps - Al alloys machining



Picture 1



Picture 2



Type	Basic dimension(mm)												Grade	Pre-hole diameter
	Length of Cutting tap	d1	P	d2	d3	l1	l2	l3	a×a	Thread profile	Geometry	Number of teeth	YK40F	d
4202A-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4202A-M3*0.5-6HX	3P													
4202AS-M3*0.5-6H	1.5P													
4202AS-M3*0.5-6HX	1.5P	M4	0.7	4.5	3.1	63	13	21	3.4		Picture 1	3	●	3.3
4202A-M4*0.7-6H	3P													
4202A-M4*0.7-6HX	3P													
4202AS-M4*0.7-6H	1.5P	M5	0.8	6	4	70	16	25	4.9		Picture 1	3	●	4.2
4202AS-M4*0.7-6HX	1.5P													
4202A-M5*0.8-6H	3P													
4202A-M5*0.8-6HX	3P	M6	0.75	6	5	80	19	30	4.9		Picture 1	3	●	5.25
4202AS-M5*0.8-6H	1.5P													
4202AS-M5*0.8-6HX	1.5P													
4202A-M6*0.75-6H	3P	M6	1	6	4.7	80	19	30	4.9	Picture 1	3	●	5	
4202A-M6*0.75-6HX	3P													
4202AS-M6*0.75-6H	1.5P													
4202AS-M6*0.75-6HX	1.5P	M7	1	7	5.7	80	19	30	5.5	Picture 1	3	●	6	
4202A-M6*1-6H	3P													
4202AC-M6*1-6H	3P													
4202A-M6*1-6HX	3P	M8	1	8	6.7	90	20	35	6.2	Picture 1	3	●	7	
4202AS-M6*1-6H	1.5P													
4202ACS-M6*1-6H	1.5P													
4202AS-M6*1-6HX	1.5P	M7	1	7	5.7	80	19	30	5.5	Picture 1	3	●	6	
4202A-M7*1-6H	3P													
4202AS-M7*1-6H	1.5P													
4202A-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	Picture 1	3	●	7	
4202AS-M8*1-6H	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Helical-flute cutting taps --Al alloys machining



Straight-flute cutting taps - Al alloys machining

Type	Basic dimension(mm)											Grade	Pre-hole diameter					
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth	YK40F	d				
4202A-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75				
4202AC-M8*1.25-6H	3P																	
4202A-M8*1.25-6HX	3P																	
4202AS-M8*1.25-6H	1.5P																	
4202ACS-M8*1.25-6H	1.5P																	
4202AS-M8*1.25-6HX	1.5P																	
4202A-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8		Picture 1	4	●	9				
4202AS-M10*1-6H	1.5P																	
4202A-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8						Picture 1	4	●	8.75
4202AS-M10*1.25-6H	1.5P																	
4202A-M10*1.5-6H	3P																	
4202AC-M10*1.5-6H	3P																	
4202A-M10*1.5-6HX	3P																	
4202AS-M10*1.5-6H	1.5P																	
4202ACS-M10*1.5-6H	1.5P																	
4202AS-M10*1.5-6HX	1.5P																	
4202A-M12*1.25-6H	3P	M12	1.25	9		110	29		7		Picture 2	4	●	10.75				
4202AS-M12*1.25-6H	1.5P																	
4202A-M12*1.5-6H	3P	M12	1.5	9		110	29		7						Picture 2	4	●	10.5
4202AS-M12*1.5-6H	1.5P																	
4202A-M12*1.75-6H	3P																	
4202AC-M12*1.75-6H	3P																	
4202A-M12*1.75-6HX	3P																	
4202AS-M12*1.75-6H	1.5P																	
4202ACS-M12*1.75-6H	1.5P																	
4202AS-M12*1.75-6HX	1.5P																	
4202A-M14*1.5-6H	3P	M14	1.5	11		110	30		9	Picture 2	4	●	12.5					
4202AS-M14*1.5-6H	1.5P																	
4202A-M14*2-6H	3P	M14	2	11		110	30		9					Picture 2	4	●	12	
4202AS-M14*2-6H	1.5P																	
4202A-M16*1.5-6H	3P																	
4202AS-M16*1.5-6H	1.5P																	
4202A-M16*2-6H	3P																	
4202A-M16*2-6HX	3P																	
4202AS-M16*2-6H	1.5P																	
4202AS-M16*2-6HX	1.5P																	

● Stock available ○ Make-to-order

Applicable material table

◎ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC				◎	



Code key

C161

Cutting parameters

C176

Technical information

C177-C182

Non-standard customization

C183

Drilling tools

Reaming Tools

Threading Cutter

Helical-flute cutting taps --Al alloys machining

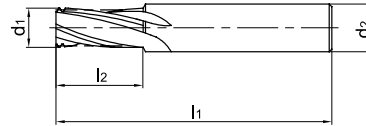


Newly upgraded!

Solid carbide
Thread mills



Thread mills



Type	Basic dimension(mm)							Recommended grade		Pre-hole diameter
	D	d ₁	P	d ₂	l ₁	l ₂	Number of teeth	KTG4015	YK40F	d
4111-M3*0.5	M3	2.35	0.5	4	50	6	3	●	○	2.5
4111-M4*0.7	M4	3.15	0.7	4	50	8	3	●	○	3.3
4111-M5*0.5	M5	4.3	0.5	6	50	10	3	●	○	4.5
4111-M5*0.8	M5	4	0.8	6	50	10	3	●	○	4.2
4111-M6*0.75	M6	5	0.75	6	60	12	4	●	○	5.25
4111-M6*1	M6	4.75	1	6	60	12	4	●	○	5
4111-M8*1	M8	6.65	1	8	60	16	4	●	○	7
4111-M8*1.25	M8	6.45	1.25	8	60	16	4	●	○	6.75
4111-M10*1	M10	8.55	1	10	75	20	4	●	○	9
4111-M10*1.5	M10	8.1	1.5	10	75	20	4	●	○	8.5
4111-M12*1.25	M12	10.25	1.25	12	75	24	4	●	○	10.75
4111-M12*1.75	M12	9.75	1.75	12	75	24	4	●	○	10.25
4111-M14*1	M14	12.35	1	14	75	20	4	●	○	13
4111-M14*1.5	M14	11.9	1.5	14	75	28	4	●	○	12.5
4111-M14*2	M14	11.4	2	14	75	28	4	●	○	12
4111-M16*2	M16	13.3	2	16	90	32	6	●	○	14
4111-M18*1	M18	16.15	1	18	90	20	6	●	○	17
4111-M18*2.5	M18	14.75	2.5	18	90	36	6	●	○	15.5
4111-M20*2	M20	17.1	2	18	100	40	6	●	○	18
4111-M20*2.5	M20	16.65	2.5	18	100	40	6	●	○	17.5

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Thread milling cutter

➤ **Applicable material table**

● Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
			~40HRC	~50HRC	~60HRC					
KTG4015	○	●	○				○	○		
YK40F							○	○	○	

Code key
C161

Cutting parameters
C176

Technical information
C177-C182

Non-standard customization
C184



Forming tap

Workpiece material	Cutting speed (m/min)
Stainless steel / Mild steel	5~20
Aluminium alloy	20~50
Cast aluminium alloy(Si<10%)	15~40

Cutting tap

Workpiece material	Cutting speed (m/min)
Grey cast iron	15~30
Nodular cast iron	10~20
Aluminium alloy	20~50
Cast aluminium alloy (Si < 10%)	20~45
Cast aluminium alloy (Si ≥ 10%)	15~40

Thread mills

Workpiece material	Cutting speed (m/min)		Feed rate (mm/z)	
	Uncoated	Coated	D≤8	D>8
Alloy steel、Common steel	20~60	40~120	0.02~0.05	0.04~0.12
Aluminium alloy	100~250	---	0.05~0.2	

Note:

The tool entering feed is less than 70% of threading feed. It is in direct proportion to the diameter of the tap. The above cut parameters are suitable for thread cutters with helical flute. Please reduce feed rate and cutting speed by 20% ~ 40% if it is straight-flute tools.

Drilling tools

Reaming Tools

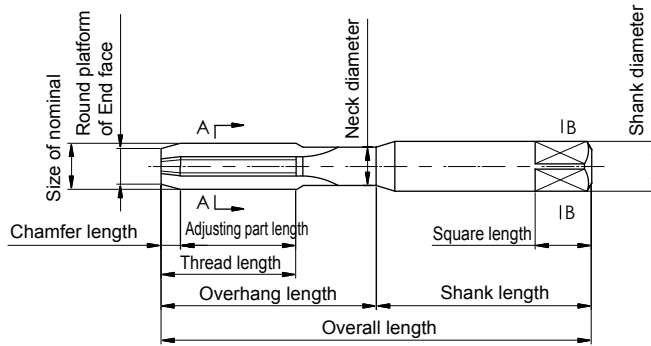
Threading Cutter

Recommended cutting parameters

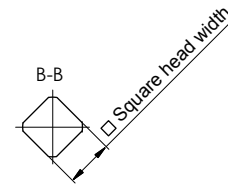
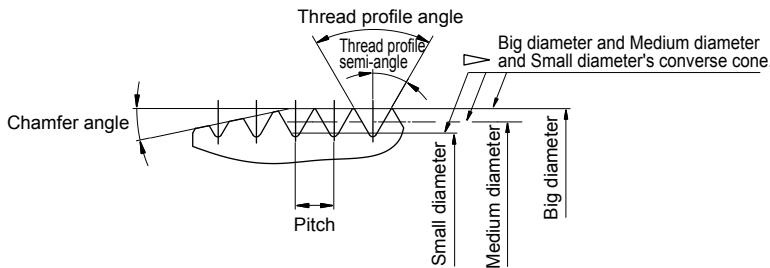
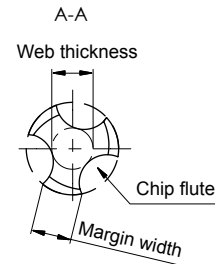


Tap

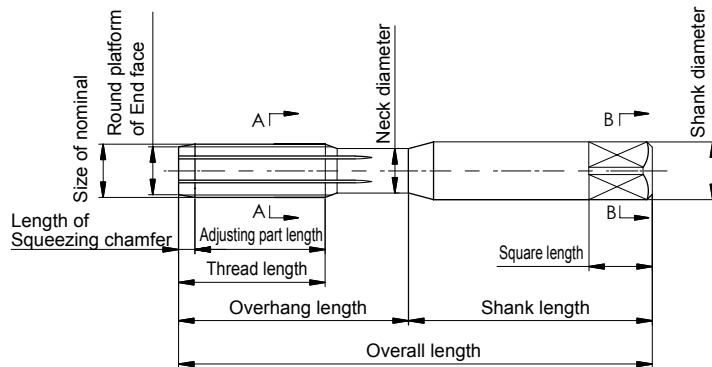
Parts terminology of cutting taps



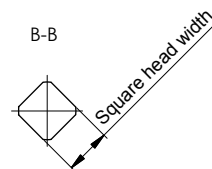
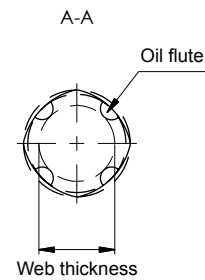
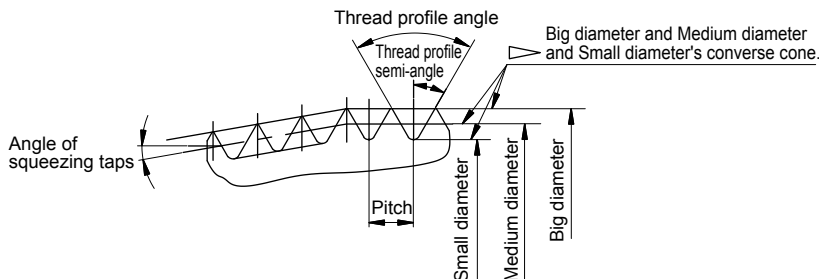
Magnifying fig of chamfer and thread profile



Parts terminology of forming taps



Magnifying fig of squeezing chamfer and guided threads



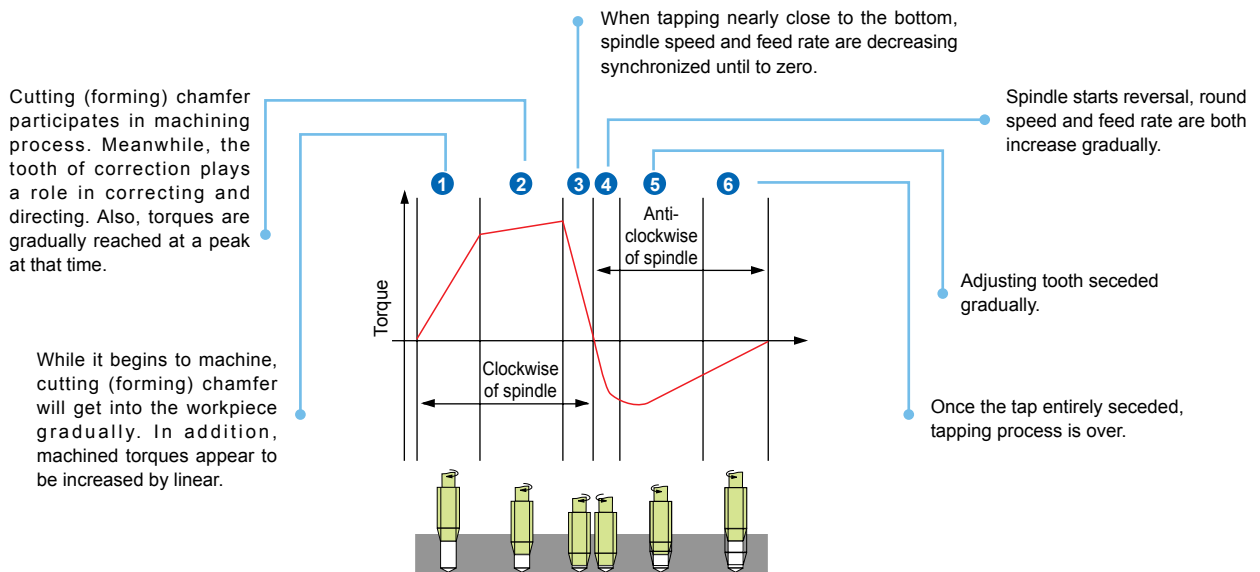
Drilling tools

Reaming Tools

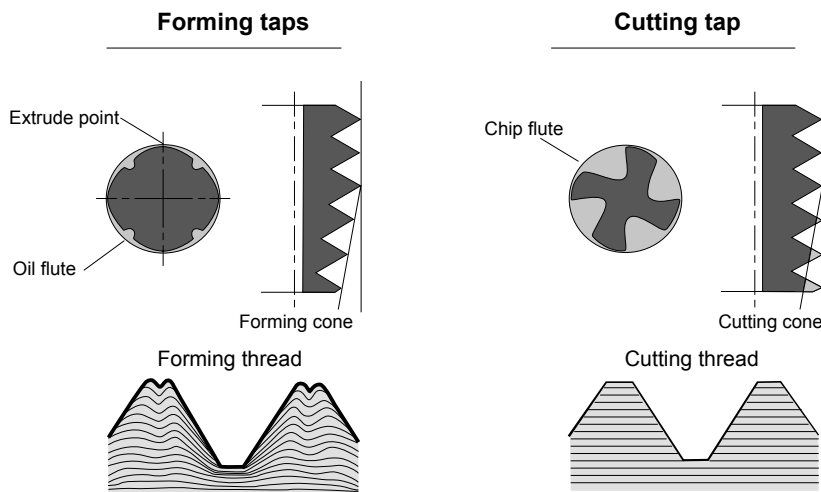
Threading Cutter

Technical information

Process of tapping and tapping torques



Comparison of forming taps and cutting taps



Tapping types of cutting taps

Due to different machines, tapping types of cutting taps can be broadly divided into flexible tapping and rigid tapping. Due to different pre-hole, it can also be divided into through-hole tapping and blind-hole tapping.

Rigid tapping: Machine tool has good precision, the spindle feed rate is consistent with the tap pitch. Used general chunks.




Flexible tapping: Machine tool has poor precision, the spindle feed rate cannot be strictly in accordance with the pitch. Compensating floating chucks should be used to compensate the error between the tapping feed and the tap pitch, so that the tap can feed in accordance with the pitch.

Through-hole tapping: chip removal along the direction of tapping feed, so that the chip clogging and scratching and squeezing on the machined surface caused by chips can be reduced and the accuracy of thread processing can be improved.

Bind-hole tapping: chips removal along the direction of tap shank. Increase of cutting force, which is caused by chips blocked in the groove, can be prevented.



Features and applications of tap flute

Classification	Advantages	Disadvantages	Recommend applications
<p>Straight-flute taps</p> 	<ul style="list-style-type: none"> ● general performance is good ● high cutting edge strength ● easy to regrind 	<ul style="list-style-type: none"> ● large cutting torque by machining ● bad chip-breaking and chip removal ability ● cannot tapping to the bottom of blind holes 	<ul style="list-style-type: none"> ● for machining of high hardness material ● material generating powdered chips ● material easy to cause abrasion ● tap shot through and blind hole
<p>Helical-flute taps</p> 	<ul style="list-style-type: none"> ● small cutting torque by machining ● better chip-breaking and chip removal ability ● available for tapping to the bottom of blind holes ● penetrate to pre-hole easily 	<ul style="list-style-type: none"> ● bad cutting edge strength ● easily fall in tooth when seceding 	<ul style="list-style-type: none"> ● tap long through and blind hole ● material generating long curling chips ● the hole with axial slot on inner wall
<p>Forming taps</p> 	<ul style="list-style-type: none"> ● no chips ● high precision of internal thread ● high tool strength ● available for tapping to the bottom of blind holes 	<ul style="list-style-type: none"> ● only for machining of specific material ● high requirement of pre-hole ● high requirement of lubrication liquid 	<ul style="list-style-type: none"> ● for soft materials with good toughness and ductility ● tap through and blind hole

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The common problems in tapping

Common problems	Reasons	Solutions
Too large Internal thread	Wrong tap type selection	Selecting right tap according to work materials and requirement
	Pre-hole is too large	Select appropriate prehole drills
	Pre-hole is off center	Improve prehole quality
		Change to floated tapping method
	Axial feed not equable	Mechanical feed
		Use flexible tapping
	Build-up edge	Regrinding in time or change taps
		Adopt coated taps
		Fully lubricated
Extremely high cutting speed	Lower cutting speed	
Insufficient lubrication or cooling	Check lubricating oil density	
	Increase cooling liquid pressure and volume	
Wrong selection of tap tolerance level	Select taps with right tolerance	
Too small internal thread	Wrong selection of tap tolerance level	Select taps with right tolerance
	Wrong tapping	Avoid taps bear higher axial stress in the process of tapping
	The rigidity of machine tool spindle is too well	Adopt axial floated chuck
Thread disorderly buckle	When starts tapping, force too much press on right helical taps	Decrease pressure when starts tapping
	When starts tapping, force too small press on left helical taps	increase pressure when starts tapping
	Unmatched of machine tool feed and thread pitch	Change to floated tapping
Unsmooth on internal thread surface	Wrong selection of taps	Selecting right tap according to work materials and requirement
	Too high Cutting speed	Lower cutting speed
	Insufficient cooling	Use right cooling liquid and enough volume or select taps with inner coolant
	Obstructed chip removal	Select helical flute taps
	Too small pre-hole diameter	Adjust pre-hole drill
	Build-up edge	Adopt coated taps
Fully lubricated		
Tap breakage	Too small pre-hole	Adjust pre-hole drill
	Torque is too large when tapping	Increase length of cutting chamfer
		Increase cutting edge
	Tap touch hole bottom	Check the depth of pre-hole
		Adopt floated tapping
	Pre-hole chamfer is too small, pre-hole location or angle error	Check pre-hole
		adopt floated tapping
Cutting speed is too high	Lower cutting speed	
	Select helical flute taps	

Drilling tools

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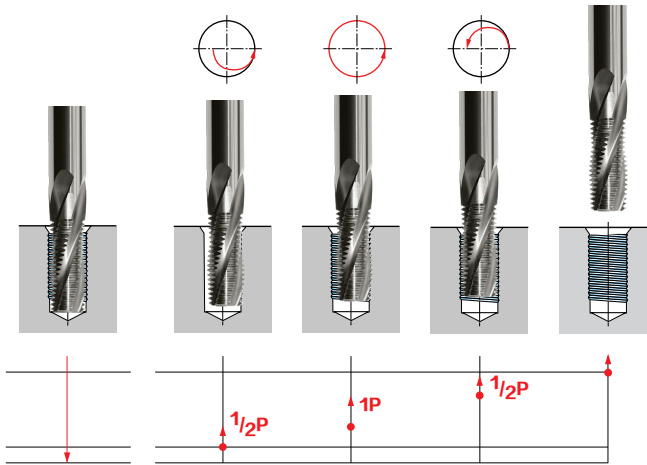
Threading Cutter

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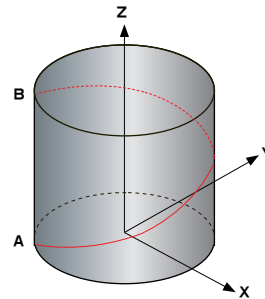


Thread mills

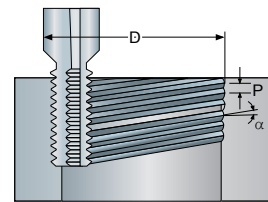
Thread mills (graphic demonstration)



Thread milling is composed of tool rotation and helical interpolate mill of machine tool. In a circle interpolation process, required threads are machined by using the geometry shape of tool and moving axially with a pitch.



Picture A



α: helical angle
D: large-diameter
p: pitch

Picture B

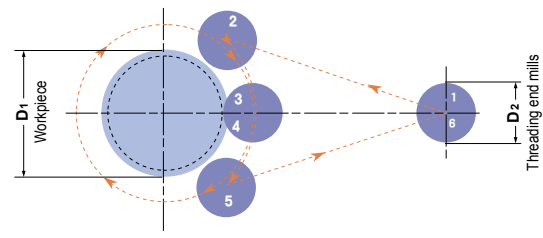
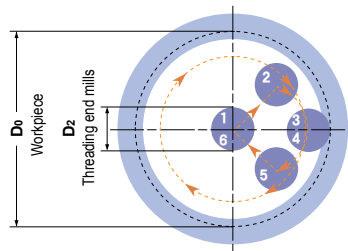
Arc entering method

Internal thread

External thread

Thread milling can use arc entering method and radial entering method.

Arc entering: placidly entering and out leads to almost no cutting traces or vibration, so that it is particularly suitable for materials difficult to be machined and precise threading.



1-2 rapid positioning
2-3 entering by arc feed and interpolating along the Z axis at the same time
3-4 360° full circle cutting interpolation and axial moving of one pitch

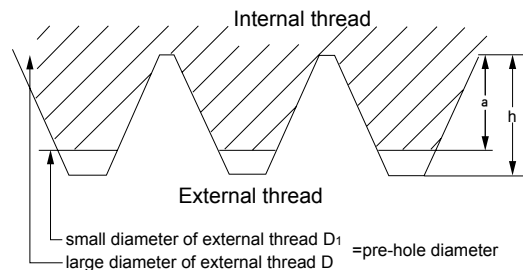
4-5 cutting-out by arc feed and interpolating along the Z axis at the same time
5-6 quick return

Thread overlap ratio

The thread overlap ratio is the ratio of effective chimeric height of external thread and internal thread and the height of standard tooth. It must be considered before machining of internal thread pre-hole.

$$\text{Thread overlap ratio} = \frac{\text{Reference dimension of large diameter of external thread} - \text{pre-hole diameter}}{2 \times (\text{height of standard tooth type})} \times 100\%$$

while external thread appears to be standardized tooth



$a = 1/2 \times (D - D_1)$
h = height of standard tooth of external thread
chimerism ratio = $a/h \times 100\%$

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The solutions of common problems in thread milling

	Common problems	reasons	solutions
Thread milling cutter	Roughness on internal thread milling cutter surface	Too long overhang	Decrease the length of overhang
		Select wrong type	Select appropriate tool(e.g. tool with helix flute)
		Poor chip removal	Select helix flute tap
			Adopt inner cooling
		Too large cutting force	Decrease cutting force
	Unreasonable cutting parameter	Adjust cutting parameter	
	Severe tool wear	Unreasonable cutting parameter	Lower cutting speed
			Increase the feed rate per tooth
		Unreasonable machining mode	Adopt down milling
			Adopt Arc cut-in milling.
		Uncoated tools/inappropriate coated	Adopt Coated tool/ instead coat
	Too large overhang	Decrease length of overhang	
	Falling on cutting edge	Unreasonable cutting parameter	Decrease the feed rate per tooth
		Unreasonable machining mode	Adopt down milling
			Adopt Arc cut-in milling
		Uncoated tools/inappropriate coated	Adopt Coated tool/instead coat
Thread is taper	Too large overhang	Decrease length of overhang	
	Unreasonable cutting parameter	Decrease the feed rate per tooth	
	Unreasonable machining mode	Adopt up milling	
	Too large cutting force	Decrease cutting force	

Drilling tools

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Threading Cutter

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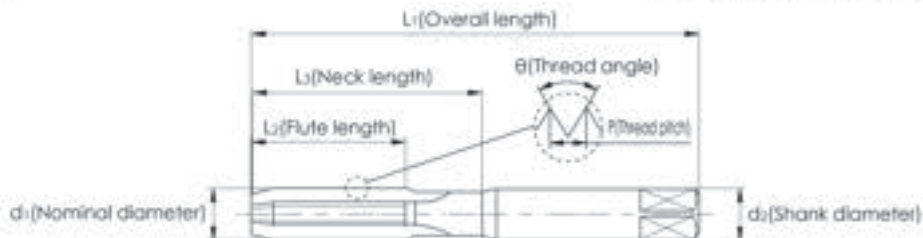
Non-standard customization for special application (Taps)

Company name;	
Fax;	Huanghe Southern Road, Tianyuan Zone, Zhuzhou, Hunan province
Tel;	Fax: 0731-22882721 22885420 22887878
E-MAIL;	Zip code: 412007 E-mail: zccct@zccct.com

Workpiece materials		Hole Form	
Grey cast iron		 Through hole	 Blind hole
Ductile iron			
Aluminum alloy			
Silicon Aluminum Alloy(Si< 10%)		Bottom hole diameter	
Silicon Aluminum Alloy(Si> 10%)		Bottom hole depth	
Stainless Steel		Thread form	
Soft steel		Threading precision	
Other materials	Workpiece material grade	Tapping depth	
		Threading rotation speed	
		Tapping form	
Hardened steel (HRC48-63)	Hardness	Rigid tapping	Flexible tapping
Tool Information (attachment)			
Shank form		Chip pocket form	
Square shank		Straight flute	
Round shank		Right handed flute	Left handed flute
Coolant form		Coating	
External coolant		Coated	
Internal coolant		Non-Coated	

Unit: mm ;

Check mark for copy to fill the form: ✓



Applying tools: Cutting tap _____ Thread forming tap _____

Nominal diameter d1= _____ Shank diameter d2= _____ Thread pitch P= _____ Thread angle θ= _____

Overall length l1= _____ Flute length l2= _____ Neck length l3= _____

Note:

Order Quantity: _____ PCS Expected delivery date: _____

Quotation: _____ Confirmation: _____

Date: _____

Drilling tools

Reaming Tools

Threading Cutter

Non-standard customization for special application (Taps)



Company name;

Fax;

Tel;


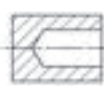
E-MAIL;



Huanghe Southern Road, Tianyuan Zone,
Zhuzhou, Hunan province

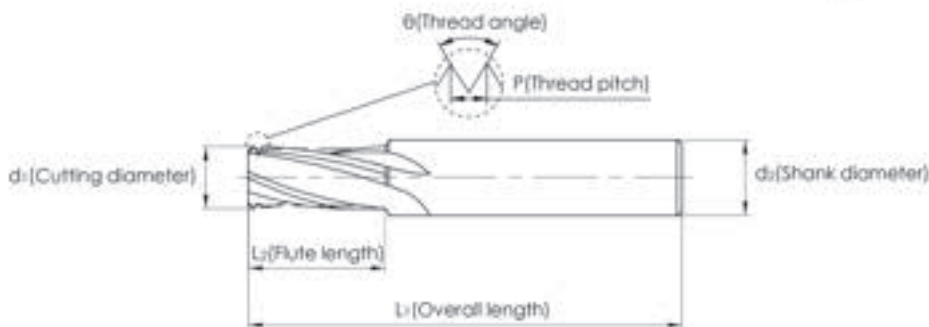
Fax: 0731-22882721 22885420 22887878

Zip code: 412007 E-mail: zccct@zccct.com

Workpiece materials		Hole Form	
Grey cast iron		 Through hole	 Blind hole
Ductile iron			
Aluminum alloy			
Silicon Aluminum Alloy(Si<10%)		Bottom hole diameter	
Silicon Aluminum Alloy(Si>10%)		Bottom hole depth	
Stainless Steel		Thread form	
Soft steel		Threading precision	
Ordinary steel		Tapping depth	
Other materials	Workpiece material grade	Threading rotation speed	
	Hardness	Thread form	
		External threading	Internal threading
Tool Information (attachment)			
Chip pocket	Right handed flute	Left handed flute	Straight flute
Coating	Coated	Non-Coated	
Coolant type	External coolant	Internal coolant	

Unit: mm ;

Check mark for copy to fill the form: ✓



Thread specification= _____ Cutting diameter d_1 = _____ Shank diameter d_2 = _____ Thread angle θ = _____

Overall length L_2 = _____ Flute length L_1 = _____ Thread pitch P = _____

Note:

Order Quantity: _____ PCS Expected delivery date: _____

Quotation: _____ Confirmation: _____

Date: _____

Drilling tools

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Non-standard customization for special application (Taps)