

ACHTTECK

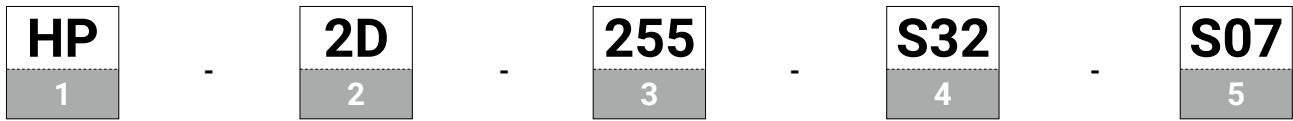
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THE EXPERT OF DIFFICULT MACHINING



Drilling Holder

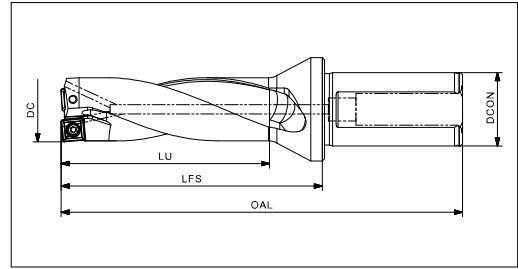
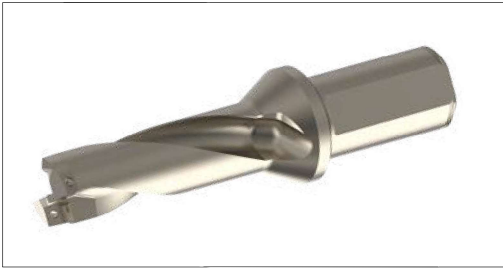
Drilling Holder Denomination System



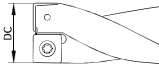


1	HP	Product series	HP: High productivity drilling body series			
2	2D	Length-diameter ratio	2D, 3D, 4D,			
3	255	Tool diameter	255--25.5mm, 500--50mm			
4	S32	Shank diameter	S20=20mm	S25=25mm	S32=32mm	S40=40mm
5	S07	Insert shape and edge length	The insert shape is "S", the cutting edge length is 7mm			

HP Series Drilling Holder

Length-diameter ratio: 2D

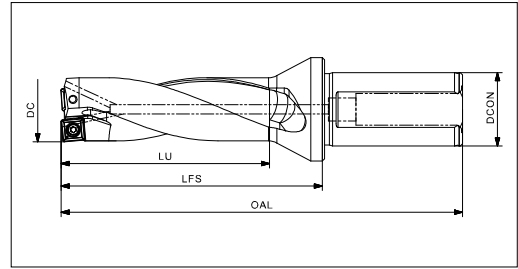
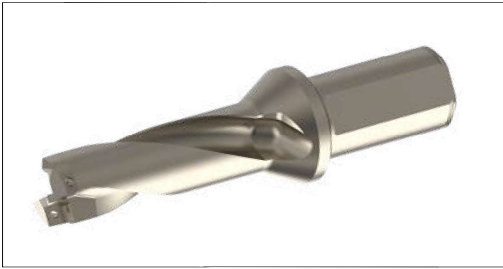


Product code	Dimension (mm)					Inserts
	DC	LU	OAL	DCON	LFS	
HP-2D130-S20-S05	13.0	29	99	20	49	SPMT 050204E-DP
HP-2D135-S20-S05	13.5	30	100	20	50	
HP-2D140-S20-S05	14.0	31	101	20	51	
HP-2D145-S20-S05	14.5	32	102	20	52	
HP-2D150-S20-S05	15.0	33	103	20	53	
HP-2D155-S25-S06	15.5	34	115	25	59	SPMT 060204E-DP
HP-2D160-S25-S06	16.0	35	116	25	60	
HP-2D165-S25-S06	16.5	36	117	25	61	
HP-2D170-S25-S06	17.0	37	118	25	62	
HP-2D175-S25-S06	17.5	38	119	25	63	
HP-2D180-S25-S06	18.0	39	120	25	64	
HP-2D185-S25-S06	18.5	40	121	25	65	
HP-2D190-S25-S06	19.0	41	122	25	66	
HP-2D195-S25-S06	19.5	42	123	25	67	
HP-2D200-S25-S06	20.0	43	124	25	68	
HP-2D205-S25-S06	20.5	44	125	25	69	
HP-2D210-S25-S06	21.0	45	126	25	70	
HP-2D215-S25-S06	21.5	46	127	25	71	
HP-2D220-S32-S07	22.0	47	137	32	77	SPMT 07T308E-DP
HP-2D225-S32-S07	22.5	48	138	32	78	
HP-2D230-S32-S07	23.0	49	139	32	79	
HP-2D235-S32-S07	23.5	50	140	32	80	
HP-2D240-S32-S07	24.0	51	141	32	81	
HP-2D245-S32-S07	24.5	52	142	32	82	
HP-2D250-S32-S07	25.0	53	143	32	83	
HP-2D255-S32-S07	25.5	54	144	32	84	
HP-2D260-S32-S07	26.0	55	145	32	85	
HP-2D265-S32-S07	26.5	56	146	32	86	
HP-2D270-S32-S07	27.0	57	147	32	87	
HP-2D275-S32-S07	27.5	58	148	32	88	

Dimension (mm)	Spare parts	
Holder diameter	Screw	Wrench
		
13-15	ST020043	FT-T06
15.5-21.5	ST022055	FT-T06
22-27.5	ST025065	FT-T08

HP Series Drilling Holder

Length-diameter ratio: 2D



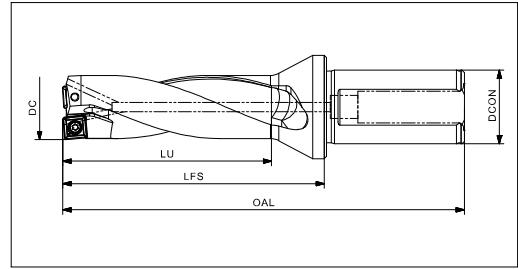
Product code	Dimension (mm)					Inserts
	DC	LU	OAL	DCON	LFS	
HP-2D280-S32-S09	28.0	59	149	32	89	SPMT 090408E-DP
HP-2D285-S32-S09	28.5	60	150	32	90	
HP-2D290-S32-S09	29.0	61	151	32	91	
HP-2D295-S32-S09	29.5	63	153	32	93	
HP-2D300-S32-S09	30.0	65	155	32	95	
HP-2D310-S32-S09	31.0	67	157	32	97	
HP-2D320-S32-S09	32.0	69	159	32	99	
HP-2D330-S32-S09	33.0	71	161	32	101	
HP-2D340-S40-S11	34.0	73	178	40	108	SPMT 110408E-DP
HP-2D350-S40-S11	35.0	75	180	40	110	
HP-2D360-S40-S11	36.0	77	182	40	112	
HP-2D370-S40-S11	37.0	79	184	40	114	
HP-2D380-S40-S11	38.0	81	186	40	116	
HP-2D390-S40-S11	39.0	83	188	40	118	
HP-2D400-S40-S11	40.0	85	190	40	120	
HP-2D410-S40-S11	41.0	87	192	40	122	
HP-2D420-S40-S14	42.0	89	194	40	124	SPMT 140512E-DP
HP-2D430-S40-S14	43.0	91	196	40	126	
HP-2D440-S40-S14	44.0	93	198	40	128	
HP-2D450-S40-S14	45.0	95	200	40	130	
HP-2D460-S40-S14	46.0	97	202	40	132	
HP-2D470-S40-S14	47.0	99	204	40	134	
HP-2D480-S40-S14	48.0	101	206	40	136	
HP-2D490-S40-S14	49.0	103	208	40	138	
HP-2D500-S40-S14	50.0	105	210	40	140	

Drilling holder




Dimension (mm)	Spare parts	
Holder diameter	Screw	Wrench
 28-33	 ST035084X	 FT-T15
34-41	ST040100H	FT-T15
42-50	ST050126	FT-T20

HP Series Drilling Holder

Length-diameter ratio: 3D

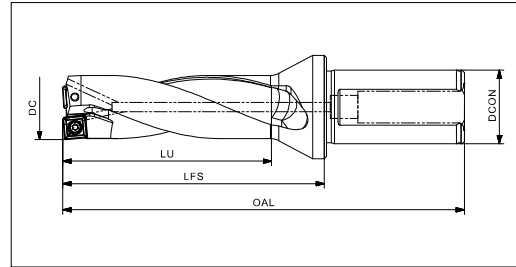


Product code	Dimension (mm)					Inserts
	DC	LU	OAL	DCON	LFS	
HP-3D130-S20-S05	13.0	42	112	20	62	SPMT 050204E-DP
HP-3D135-S20-S05	13.5	44	114	20	64	
HP-3D140-S20-S05	14.0	45	115	20	65	
HP-3D145-S20-S05	14.5	47	117	20	67	
HP-3D150-S20-S05	15.0	48	118	20	68	
HP-3D155-S25-S06	15.5	50	131	25	75	SPMT 060204E-DP
HP-3D160-S25-S06	16.0	51	132	25	76	
HP-3D165-S25-S06	16.5	53	134	25	78	
HP-3D170-S25-S06	17.0	54	135	25	79	
HP-3D175-S25-S06	17.5	56	137	25	81	
HP-3D180-S25-S06	18.0	57	138	25	82	
HP-3D185-S25-S06	18.5	59	140	25	84	
HP-3D190-S25-S06	19.0	60	141	25	85	
HP-3D195-S25-S06	19.5	62	143	25	87	
HP-3D200-S25-S06	20.0	63	144	25	88	
HP-3D205-S25-S06	20.5	65	146	25	90	
HP-3D210-S25-S06	21.0	66	147	25	91	
HP-3D215-S25-S06	21.5	68	149	25	93	
HP-3D220-S32-S07	22.0	69	159	32	99	SPMT 07T308E-DP
HP-3D225-S32-S07	22.5	71	161	32	101	
HP-3D230-S32-S07	23.0	72	162	32	102	
HP-3D235-S32-S07	23.5	74	164	32	104	
HP-3D240-S32-S07	24.0	75	165	32	105	
HP-3D245-S32-S07	24.5	77	167	32	107	
HP-3D250-S32-S07	25.0	78	168	32	108	
HP-3D255-S32-S07	25.5	80	170	32	110	
HP-3D260-S32-S07	26.0	81	171	32	111	
HP-3D265-S32-S07	26.5	83	173	32	113	
HP-3D270-S32-S07	27.0	84	174	32	114	
HP-3D275-S32-S07	27.5	86	176	32	116	

Dimension (mm)	Spare parts	
Holder diameter	Screw	Wrench
		
13-15	ST020043	FT-T06
15.5-21.5	ST022055	FT-T06
22-27.5	ST025065	FT-T08

HP Series Drilling Holder

Length-diameter ratio: 3D



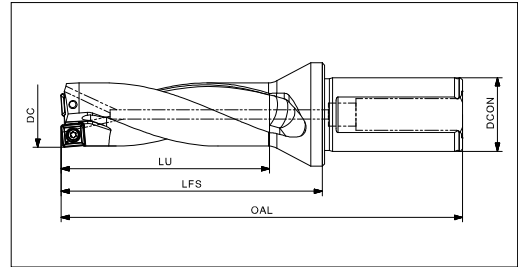
Product code	Dimension (mm)					Inserts
	DC	LU	OAL	DCON	LFS	
HP-3D280-S32-S09	28.0	87	177	32	117	SPMT 090408E-DP
HP-3D285-S32-S09	28.5	89	179	32	119	
HP-3D290-S32-S09	29.0	90	180	32	120	
HP-3D295-S32-S09	29.5	93	183	32	123	
HP-3D300-S32-S09	30.0	95	185	32	125	
HP-3D310-S32-S09	31.0	98	188	32	128	
HP-3D320-S32-S09	32.0	101	191	32	131	
HP-3D330-S32-S09	33.0	104	194	32	134	
HP-3D340-S40-S11	34.0	107	212	40	142	SPMT 110408E-DP
HP-3D350-S40-S11	35.0	110	215	40	145	
HP-3D360-S40-S11	36.0	113	218	40	148	
HP-3D370-S40-S11	37.0	116	221	40	151	
HP-3D380-S40-S11	38.0	119	224	40	154	
HP-3D390-S40-S11	39.0	122	227	40	157	
HP-3D400-S40-S11	40.0	125	230	40	160	
HP-3D410-S40-S11	41.0	128	233	40	163	
HP-3D420-S40-S14	42.0	131	236	40	166	SPMT 140512E-DP
HP-3D430-S40-S14	43.0	134	239	40	169	
HP-3D440-S40-S14	44.0	137	242	40	172	
HP-3D450-S40-S14	45.0	140	245	40	175	
HP-3D460-S40-S14	46.0	143	248	40	178	
HP-3D470-S40-S14	47.0	146	251	40	181	
HP-3D480-S40-S14	48.0	149	254	40	184	
HP-3D490-S40-S14	49.0	152	257	40	187	
HP-3D500-S40-S14	50.0	155	260	40	190	

Drilling holder

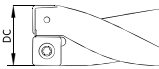


Dimension (mm)	Spare parts	
Holder diameter	Screw	Wrench
 28-33	 ST035084X	 FT-T15
34-41	ST040100H	FT-T15
42-50	ST050126	FT-T20

HP Series Drilling Holder

Length-diameter ratio: 4D

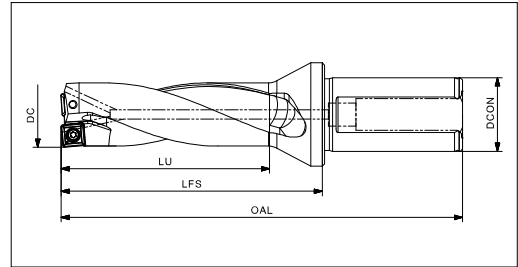


Product code	Dimension (mm)					Inserts
	DC	LU	OAL	DCON	LFS	
HP-4D130-S20-S05	13.0	55	125	20	75	SPMT 050204E-DP
HP-4D135-S20-S05	13.5	57	127	20	77	
HP-4D140-S20-S05	14.0	59	129	20	79	
HP-4D145-S20-S05	14.5	61	131	20	81	
HP-4D150-S20-S05	15.0	63	133	20	83	
HP-4D155-S25-S06	15.5	65	146	25	90	SPMT 060204E-DP
HP-4D160-S25-S06	16.0	67	148	25	92	
HP-4D165-S25-S06	16.5	69	150	25	94	
HP-4D170-S25-S06	17.0	71	152	25	96	
HP-4D175-S25-S06	17.5	73	154	25	98	
HP-4D180-S25-S06	18.0	75	156	25	100	
HP-4D185-S25-S06	18.5	77	158	25	102	
HP-4D190-S25-S06	19.0	79	160	25	104	
HP-4D195-S25-S06	19.5	81	162	25	106	
HP-4D200-S25-S06	20.0	83	164	25	108	
HP-4D205-S25-S06	20.5	85	166	25	110	
HP-4D210-S25-S06	21.0	87	168	25	112	
HP-4D215-S25-S06	21.5	89	170	25	114	
HP-4D220-S32-S07	22.0	91	181	32	121	SPMT 07T308E-DP
HP-4D225-S32-S07	22.5	93	183	32	123	
HP-4D230-S32-S07	23.0	95	185	32	125	
HP-4D235-S32-S07	23.5	97	187	32	127	
HP-4D240-S32-S07	24.0	99	189	32	129	
HP-4D245-S32-S07	24.5	101	191	32	131	
HP-4D250-S32-S07	25.0	103	193	32	133	
HP-4D255-S32-S07	25.5	105	195	32	135	
HP-4D260-S32-S07	26.0	107	197	32	137	
HP-4D265-S32-S07	26.5	109	199	32	139	
HP-4D270-S32-S07	27.0	111	201	32	141	
HP-4D275-S32-S07	27.5	113	203	32	143	

Dimension (mm)	Spare parts	
Holder diameter	Screw	Wrench
 13-15	 ST020043	 FT-T06
15.5-21.5	ST022055	FT-T06
22-27.5	ST025065	FT-T08

HP Series Drilling Holder

Length-diameter ratio: 4D



Product code	Dimension (mm)					Inserts
	DC	LU	OAL	DCON	LFS	
HP-4D280-S32-S09	28.0	115	205	32	145	SPMT 090408E-DP
HP-4D285-S32-S09	28.5	117	207	32	147	
HP-4D290-S32-S09	29.0	120	210	32	150	
HP-4D295-S32-S09	29.5	123	213	32	153	
HP-4D300-S32-S09	30.0	125	215	32	155	
HP-4D310-S32-S09	31.0	129	219	32	159	
HP-4D320-S32-S09	32.0	133	223	32	163	
HP-4D330-S32-S09	33.0	137	227	32	167	
HP-4D340-S40-S11	34.0	141	246	40	176	SPMT 110408E-DP
HP-4D350-S40-S11	35.0	145	250	40	180	
HP-4D360-S40-S11	36.0	149	254	40	184	
HP-4D370-S40-S11	37.0	153	258	40	188	
HP-4D380-S40-S11	38.0	157	262	40	192	
HP-4D390-S40-S11	39.0	161	266	40	196	
HP-4D400-S40-S11	40.0	165	270	40	200	
HP-4D410-S40-S11	41.0	169	274	40	204	
HP-4D420-S40-S14	42.0	173	278	40	208	SPMT 140512E-DP
HP-4D430-S40-S14	43.0	177	282	40	212	
HP-4D440-S40-S14	44.0	181	286	40	216	
HP-4D450-S40-S14	45.0	185	290	40	220	
HP-4D460-S40-S14	46.0	189	294	40	224	
HP-4D470-S40-S14	47.0	193	298	40	228	
HP-4D480-S40-S14	48.0	197	302	40	232	
HP-4D490-S40-S14	49.0	201	306	40	236	
HP-4D500-S40-S14	50.0	205	310	40	240	

Drilling holder

Dimension (mm)	Spare parts	
Holder diameter	Screw	Wrench
 28-33	 ST035084X	 FT-T15
34-41	ST040100H	FT-T15
42-50	ST050126	FT-T20

Drilling Insert Denomination System

S
1


P
2

M
3


T
4

1- Shape/Code










S



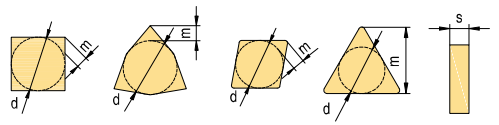
W



2- Clearance Angle

A	B	C	D	E
				
F	G	N	P	O
				Other clearance angle

3- Tolerance

















Class	Unit	In.Circle dimension d	Nose height m	Thickness
A	mm	± 0,025	± 0,005	± 0,025
C	mm	± 0,025	± 0,013	± 0,025
E	mm	± 0,025	± 0,025	± 0,025
F	mm	± 0,013	± 0,005	± 0,025
G	mm	± 0,025	± 0,025	± 0,13
H	mm	± 0,013	± 0,013	± 0,025
J	mm	*	± 0,005	± 0,025
K	mm	*	± 0,013	± 0,025
L	mm	*	± 0,025	± 0,025
M	mm	*	*	± 0,127
U	mm	*	*	± 0,127
N	mm	*	*	± 0,025

* For details refer to right and below tables



IC	Shape: C, E, H, M, O, P, S, T, R, W			
	d		m	
	J,K,L,M,N	U	M, N	U
4.76	± 0,05	± 0,08	± 0,08	± 0,13
5.56	± 0,05	± 0,08	± 0,08	± 0,13
6	± 0,05	± 0,08	± 0,08	± 0,13
6.35	± 0,05	± 0,08	± 0,08	± 0,13
7.94	± 0,05	± 0,08	± 0,08	± 0,13
8	± 0,05	± 0,08	± 0,08	± 0,13
9.525	± 0,05	± 0,08	± 0,08	± 0,13
10	± 0,05	± 0,08	± 0,08	± 0,13
12	± 0,08	± 0,13	± 0,13	± 0,2
12.7	± 0,08	± 0,13	± 0,13	± 0,2
15.875	± 0,1	± 0,18	± 0,15	± 0,27
16	± 0,1	± 0,18	± 0,15	± 0,27
19.05	± 0,1	± 0,18	± 0,15	± 0,27
20	± 0,1	± 0,18	± 0,15	± 0,27
25	± 0,13	± 0,25	± 0,18	± 0,38
25.4	± 0,13	± 0,25	± 0,18	± 0,38
31.75	± 0,15	± 0,25	± 0,2	± 0,38
32	± 0,15	± 0,25	± 0,2	± 0,38

M&N shape	D shape		V shape	
	d	m	d	m
5.56	± 0,05	± 0,11		
6.35	± 0,05	± 0,11	± 0,05	± 0,16
7.94	± 0,05	± 0,11	± 0,05	± 0,16
9.525	± 0,05	± 0,11	± 0,05	± 0,16
12.7	± 0,08	± 0,15	± 0,08	± 0,2
15.875	± 0,10	± 0,18	± 0,10	± 0,27
19.05	± 0,10	± 0,18	± 0,10	± 0,27

4- Clamping Type

A	B	C	F	G
				
H	J	M	N	Q
				
R	T	U	W	Z
				Special

06	02	04	E	-	DP
5	6	7	8	-	9

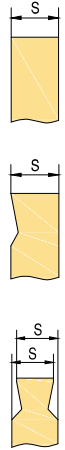
5- Cutting Edge Length				
In.Circle Dimension (mm)	S Code	 Length	W Code	 Length
5.56			03	3.8
6.35	06	6.35	04	4.3
7.94			05	5.4
8.0	08	8.0		
9.525	09	9.525	06	6.5
12.7	12	12.7	08	8.7



7- Corner Radius		
Example		
04	=	0.4
08	=	0.8
12	=	1.2

8- Cutting Edge Shape	
Example	Description
E	Honed cutting edge
F	Sharp cutting edge
T	Negative land

6- Insert Thickness		
Thickness description	Thickness mark	Example
		00 = 0.79
		T0 = 0.99
		01 = 1.59
		T1 = 1.98
		02 = 2.38
		T2 = 2.58
		03 = 3.18
		T3 = 3.97
		04 = 4.76
		T4 = 4.96
		05 = 5.56
		T5 = 5.95
		06 = 6.35
		07 = 7.94
		09 = 9.53
		11 = 11.11
		12 = 12.70
		14 = 14.29
		15 = 15.88

Insert thickness "S" refers to the distance between cutting edge nose and bottom



9- Geometry Code	
<p>DP</p> <ol style="list-style-type: none"> DP geometry has high efficiency. Suitable for short hole high speed drilling. Strong square insert with reinforced geometry offers excellent hole straightness. Drilling holder with helical flute provides excellent chip evacuation and high hole precision. 	
<p>DU/DG</p> <ol style="list-style-type: none"> Suitable cutting angle makes perfect balance for the cutting force. General purpose geometry combined with two grades are suitable for P, M, K, S materials, especially good for the chip control in soft materials. Obtains good surface finish. Good versatility. It's suitable for rotating and non-rotating machining. 	

Drilling holder

Drilling Grade Application Guide

Drilling insert grade ISO group													
Material Group	Materials	ISO	Coated										Uncoated
			PVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD	CVD	
P	Unalloy steels / Alloyed steels	P01											
		P05											
		P10											
		P15											
		P20	AP301U										
		P25		AP351M									
		P30			AP351U								
		P35											
		P40											
		P45											
		P50											
M	Stainless steels	M01											
		M05											
		M10											
		M15											
		M20											
		M25	AP351M										
		M30		AP351U									
		M35											
		M40											
		M45											
K	Cast iron	K01											
		K05											
		K10											
		K15											
		K20											
		K25											
		K30											
		K35											
		K40											
		K45											
		K50											
N	Aluminum/ Aluminum alloys	N01											
		N05											
		N10											
		N15											
		N20											
		N25											
		N30											
S	Heat resistant alloys	S01											
		S05											
		S10											
		S15											
		S20											
		S25	AP351M										
		S30		AP351U									
		S35											
		S40											
		S45											

Drilling Grade Description

P

Steel, cast steel, ferritic / martensitic stainless steel, malleable cast iron

Basic grade

AP301U(P15-P35)

Recommended grade for steel drilling.

High strength and wear resistance ultra fine carbide substrate with nanostructured PVD coating in controllable layers, high coating adhesion, wear-resistance and strength.

AP351M(P25-P40)

Recommended grade for drilling steel parts under unstable working conditions.

Good toughness and wear resistance ultrafine crystalline substrate combined with nanostructure PVD coating.
Good thermal cracking resistance, wear resistance and coating strength.

AP351U(P30-P45)

Recommended grade for drilling steel parts under complex working conditions. Very tough substrate with nanostructured PVD coating.
Good wear resistance and impact resistance.

M

Austenitic stainless steel, cast steel, manganese steel, alloyed cast iron, malleable cast iron, easy to cut steel

Basic grade

AP351M(M25-M40)

Recommended grade for stainless steel drilling.

Very tough and good wear resistance ultrafine crystalline substrate with nanostructured PVD coating.
Good thermal cracking resistance, wear resistance and coating strength.

S

Heat resistant alloy

Basic grade

AP351M(S25-S40)

Recommended grade for heat resistant alloy drilling.

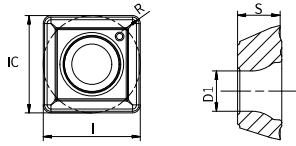
Good toughness and wear resistance ultrafine crystalline substrate combined with nanostructure PVD coating,
good resistance to thermal cracking resistance, wear resistance and coating strength.

AP351U(S30-S45)

Recommended grade for heat resistant alloy drilling under unstable working conditions and low speed.

Very tough substrate with nanostructured PVD coating, good wear resistance and impact resistance.

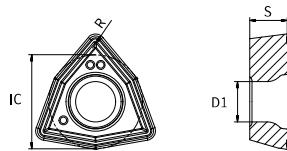
SPMT-DP Drilling Insert



Inserts	Product code	Dimensions					Machining conditions					
		I	IC	S	R	D1	● Good condition ✦ Bad condition			● General condition		
							P	M	K	N		
							AP301U	AP351U	AC301P	AP351M	AP301U	AW100K
	SPMT 050204E-DP	5	5	2.38	0.4	2.25	●	●	●	●	●	
	SPMT 060204E-DP	6	6	2.38	0.4	2.61	●	●	●	●	●	
	SPMT 07T308E-DP	7.94	7.94	3.97	0.8	2.85	●	●	●	●	●	
	SPMT 090408E-DP	9.8	9.8	4.3	0.8	4.05	●	●	●	●	●	
	SPMT 110408E-DP	11.5	11.5	4.8	0.8	4.45	●	●	●	●	●	
	SPMT 140512E-DP	14.3	14.3	5.2	1.2	5.75	●	●	●	●	●	

● Stocked ○ Unstocked ▲ Stopped in the near future

WCMT-DU Drilling Insert

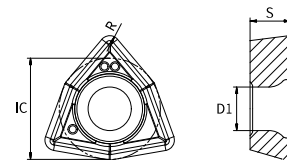


Inserts	Product code	Dimensions					Machining conditions					
		I	IC	S	R	D1	● Good condition ✦ Bad condition			● General condition		
							P	M	K	N		
							AP301U	AP351U	AC301P	AP351M	AP301U	AW100K
	WCMT 030208E-DU	3.8	5.56	2.38	0.8	2.8	●	●				
	WCMT 040208E-DU	4.3	6.35	2.38	0.8	3.0	●	●				
	WCMT 050308E-DU	5.4	7.94	3.18	0.8	3.4	●	●				
	WCMT 06T308E-DU	6.5	9.53	3.97	0.8	3.9	●	●				
	WCMT 080412E-DU	8.7	12.7	4.76	1.2	4.4	●	●				

Remark: DU series are universal inserts, no toolholder is provided.

● Stocked ○ Unstocked ▲ Stopped in the near future

WCMT-DG Drilling Insert



Inserts	Product code	Dimensions					Machining conditions					
		I	IC	S	R	D1	● Good condition ✦ Bad condition			● General condition		
							P	M	K	N		
							AP301U	AP351U	AC301P	AP351M	AP301U	AW100K
	WCMT 030204E-DG	3.8	5.56	2.38	0.4	2.5	▲	▲				
	WCMT 040204E-DG	4.3	6.35	2.38	0.4	2.8	▲	▲				
	WCMT 050308E-DG	5.4	7.94	3.18	0.8	3.4	▲	▲				
	WCMT 06T308E-DG	6.5	9.53	3.97	0.8	4.45	▲	▲				
	WCMT 080408E-DG	8.7	12.7	4.76	0.8	5.5	▲	▲				

● Stocked ○ Unstocked ▲ Stopped in the near future

Cutting Parameter Recommendation

Materials		SP drilling insert series grade application range & cutting parameter recommendation																		
ISO	Material classification	Tensile strength (N/mm ²)	Hardness (HB)	Grade												Feed (mm/rev)				
				AP301U			AP351U			AP351M			AC301P							
				Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
				Cutting speed (m/min)												Feed (mm/rev)				
				260	240	224	220	185	150	240	220	200	175	150	0.05-0.08	0.06-0.10	0.07-0.13	0.08-0.15	0.08-0.16	0.08-0.16
P	Unalloyed steel	<600	<180	260	240	224	220	185	150	240	220	200	175	150	0.05-0.08	0.06-0.10	0.07-0.13	0.08-0.15	0.08-0.16	0.08-0.16
		<950	<280	250	210	200	170	200	170	140	230	190	162.5	135	0.06-0.12	0.08-0.15	0.12-0.22	0.12-0.24	0.13-0.25	0.13-0.25
M	Alloyed steel	700-950	200-280	240	200	160	190	160	130	220	180	150	120	100	0.06-0.10	0.08-0.14	0.12-0.22	0.12-0.23	0.13-0.24	0.13-0.24
		950-1200	280-355	210	170	130	170	130	90	190	150	110	160	130	0.06-0.12	0.08-0.15	0.12-0.22	0.12-0.24	0.13-0.25	0.13-0.25
		1200-1400	355-415	170	140	110	160	120	80	150	120	90	140	110	0.06-0.10	0.08-0.14	0.12-0.22	0.12-0.23	0.13-0.24	0.13-0.24
K	Duplex stainless steel	778	230	260	200	140	180	135	90	240	180	120	-	-	0.05-0.10	0.06-0.12	0.09-0.16	0.10-0.17	0.11-0.18	0.11-0.18
	Austenitic stainless steel	675	200	220	170	120	120	65	60	200	150	100	-	-	0.05-0.10	0.06-0.12	0.09-0.16	0.10-0.17	0.11-0.18	0.11-0.18
	Precipitation-hardening stainless steel	1013	300	180	140	100	90	65	40	160	120	80	-	-	-	-	-	-	-	-
	Grey cast iron	700	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	Nodular cast iron	880	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malleable cast iron	800	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aluminum	260	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	Aluminum alloy	447	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fe-based alloy	943	280	-	-	-	40	30	20	45	35	25	-	-	-	-	-	-	-	-
	Co-based alloy	1076	320	-	-	-	35	25	15	40	30	20	-	-	-	-	-	-	-	-
	Ni-based alloy	1177	350	-	-	-	35	25	15	40	30	20	-	-	-	-	-	-	-	-
	Ti-alloy	1262	370	-	-	-	40	30	20	45	35	25	-	-	0.05-0.10	0.06-0.14	0.10-0.22	0.14-0.23	0.15-0.24	0.15-0.24
H	Hardened steel	-	50-60HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolant.



Cutting Parameter Recommendation

Materials		WC drilling insert series grade application range & cutting parameter recommendation																											
ISO	Material classification	Tensile strength (N/mm ²)	Hardness (HB)	Grade						Feed (mm/rev)																			
				AP301U	AP351U	AC301P	PVD Coated	PVD Coated	CVD Coated	P30-45	M30-45	P25-40	M15-35	S30-45	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min			
				Cutting speed (m/min)																									
				Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min		
P	Unalloyed steel	<600	<180	260	240	224	220	185	150	200	175	150	200	175	150	0.04-0.065	0.07-0.09	0.07-0.10	0.08-0.11	0.08-0.11	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	
		<950	<280	250	210	170	200	170	200	170	140	162.5	135	190	162.5	135	0.05-0.07	0.09-0.09	0.07-0.10	0.08-0.11	0.08-0.11	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13
		700-950	200-280	240	200	160	190	160	190	160	130	150	120	180	150	120	0.05-0.09	0.065-0.14	0.08-0.16	0.10-0.18	0.10-0.18	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
		950-1200	280-355	210	170	130	170	130	170	130	90	130	100	160	130	100	0.04-0.07	0.065-0.11	0.07-0.14	0.09-0.15	0.09-0.15	0.10-0.18	0.10-0.18	0.10-0.18	0.10-0.18	0.10-0.18	0.10-0.18	0.10-0.18	0.10-0.18
M	Duplex stainless steel	778	230	260	200	140	180	135	90	-	-	-	-	-	0.04-0.07	0.065-0.11	0.08-0.14	0.08-0.11	0.08-0.11	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13	0.09-0.13		
	Austenitic stainless steel	675	200	220	170	120	120	65	60	-	-	-	-	-	0.04-0.065	0.065-0.10	0.08-0.12	0.08-0.10	0.08-0.10	0.08-0.11	0.08-0.11	0.08-0.11	0.08-0.11	0.08-0.11	0.08-0.11	0.08-0.11	0.08-0.11		
	Precipitation-hardening stainless steel	1013	300	180	140	100	90	65	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
K	Grey cast iron	700	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Nodular cast iron	880	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Malleable cast iron	800	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
N	Aluminum	260	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Aluminum alloy	447	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Fe-based alloy	943	280	-	-	-	40	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
S	Co-based alloy	1076	320	-	-	-	35	25	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Ni-based alloy	1177	350	-	-	-	35	25	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Ti-alloy	1262	370	-	-	-	40	30	20	-	-	-	-	-	0.05-0.10	0.06-0.11	0.07-0.12	0.08-0.13	0.08-0.13	0.08-0.14	0.08-0.14	0.08-0.14	0.08-0.14	0.08-0.14	0.08-0.14	0.08-0.14			
H	Hardened steel	-	50-60HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Chilled cast iron	-	55HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolant.

Deep-hole Drilling Product Introduction

Achteck has general-purpose deep-hole drilling inserts, which offer high productivity for many industries: energy, engineering machinery, injection molding, aircraft, shipbuilding, military, etc. It can achieve good hole straightness in deep hole drilling and good surface finish. Existing geometries and grades cover steel, stainless steel and heat resistant alloy drilling.

Product application and features

- The inserts can be mounted on the deep-hole drilling head.
- AP301U(N) is the first choice for drilling steel and stainless steel
- All geometries offer good chip-breaking result
- Increased efficiency due to high feed rate
- Reduces the cost per hole




Grade	Coating	Workpiece material					
		P	M	K	N	S	H
AP301U(N)	PVD	●	●			○	

● Marked: 1st Choice ○ Marked: Supplemental application

ISO P : (P15-P35) General-purpose PVD coating with excellent wear-resistance and toughness.

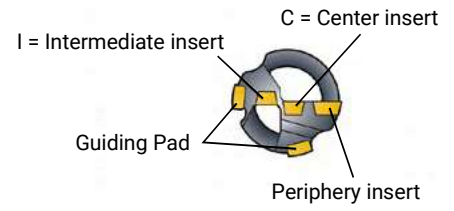
ISO M :(M15-M35) General-purpose grade for ISO-M applications, PVD coating with excellent toughness and resistance to built-up edges.

Geometry Types and Features

Geometry	Edge shape	Application
DH		<ul style="list-style-type: none"> • For general purpose. • Suitable for high cutting speed and feed. • Good chip control in most of materials.
DL		<ul style="list-style-type: none"> • Suitable for long chip materials (such as low carbon alloyed steel and duplex stainless steel). • Obtain a reliable production process in drilling materials where chip jamming can be a problem.
LH		<ul style="list-style-type: none"> • With open geometry; • Suitable for high cutting speed and feed.

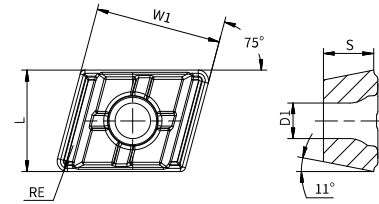
Drilling holder


Ejector Drill Matching Table



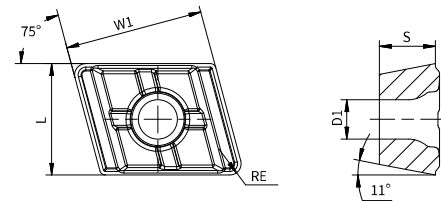
Hole diameter range (mm)	Center insert	Hole diameter range (mm)	Intermediate insert	Hole diameter range (mm)	Periphery insert	Hole diameter range (mm)	Guiding pad
26.00-28.70	EPMT 050308C	26.00-31.00	EPMT 050308I	26.00-31.00	APHT 060308P	26.00-31.00	GPAD-06A
28.71-33.99	EPMT 06T308C	31.01-34.99	EPMT 06T308I	31.01-38.99	APHT 08T308P	31.01-39.60	GPAD-07A
34.00-43.00	EPMT 08T308C	35.00-54.99	EPMT 08T308I	39.00-49.99	APHT 09T308P	39.61-47.00	GPAD-08A
43.01-47.00	EPMT 10T308C	55.00-65.00	EPMT 12T308I	50.00-65.00	APHT 11T308P	47.01-54.99	GPAD-10A
47.01-49.99	EPMT 12T308C	-	-	-	-	55.00-65.00	GPAD-12A
50.00-57.99	EPMT 10T308C	-	-	-	-	-	-
58.00-65.00	EPMT 12T308C	-	-	-	-	-	-

Deep-Hole Drilling Inserts
DH geometry



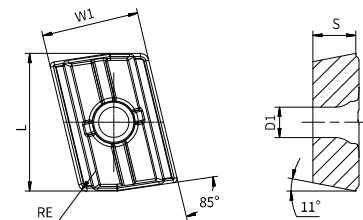
Center insert	Product code	L	W1	S	RE	D1	Competitor's description	Stock
	EPMT 050308C-DH AP301U(N)	5.56	8	3.18	0.8	2.5	800-050308M-C-G 1025	●
	EPMT 06T308C-DH AP301U(N)	6.35	9.87	3.97	0.8	2.8	800-06T308M-C-G 1025	●
	EPMT 08T308C-DH AP301U(N)	7.94	9.87	3.97	0.8	2.8	800-08T308M-C-G 1025	●
	EPMT 10T308C-DH AP301U(N)	9.53	9.87	3.97	0.8	2.8	800-10T308M-C-G 1025	●
	EPMT 12T308C-DH AP301U(N)	12.7	9.87	3.97	0.8	2.8	800-12T308M-C-G 1025	●


● Stock available



Intermediate insert	Product code	L	W1	S	RE	D1	Competitor's description	Stock
	EPMT 050308I-DH AP301U(N)	5.56	8	3.18	0.8	2.5	800-050308M-I-G 1025	●
	EPMT 06T308I-DH AP301U(N)	6.35	9.87	3.97	0.8	2.8	800-06T308M-I-G 1025	●
	EPMT 08T308I-DH AP301U(N)	7.94	9.87	3.97	0.8	2.8	800-08T308M-I-G 1025	●
	EPMT 12T308I-DH AP301U(N)	12.7	9.87	3.97	0.8	2.8	800-12T308M-I-G 1025	●

● Stock available

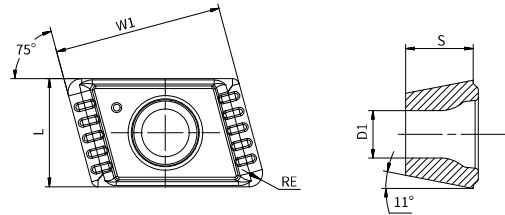



Periphery insert	Product code	L	W1	S	RE	D1	Competitor's description	Stock
	APHT 060308P-DH AP301U(N)	6.5	8	3.18	0.8	2.5	800-060308H-P-G 1025	●
	APHT 08T308P-DH AP301U(N)	8.5	9	3.97	0.8	2.8	800-08T308H-P-G 1025	●
	APHT 09T308P-DH AP301U(N)	9.66	9	3.97	0.8	2.8	800-09T308H-P-G 1025	●
	APHT 11T308P-DH AP301U(N)	12.75	9	3.97	0.8	2.8	800-11T308H-P-G 1025	●

● Stock available

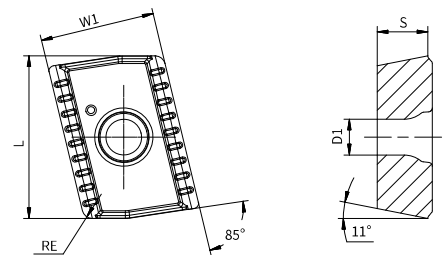
Drilling holder


Deep-Hole Drilling Inserts
DL geometry



Intermediate insert	Product code	L	W1	S	RE	D1	Competitor's description	Stock
	EPMT 050308I-DL AP301U(N)	5.56	8	3.18	0.8	2.5	800-050308M-I-L 1025	●
	EPMT 06T308I-DL AP301U(N)	6.35	9.87	3.97	0.8	2.8	800-06T308M-I-L 1025	●
	EPMT 08T308I-DL AP301U(N)	7.94	9.87	3.97	0.8	2.8	800-08T308M-I-L 1025	●
	EPMT 12T308I-DL AP301U(N)	12.7	9.87	3.97	0.8	2.8	800-12T308M-I-L 1025	●

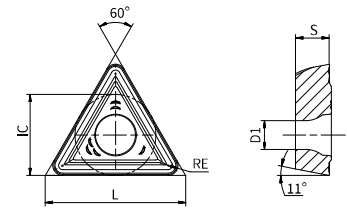
● Stock available




Periphery insert	Product code	L	W1	S	RE	D1	Competitor's description	Stock
	APHT 060308P-DL AP301U(N)	6.5	8	3.18	0.8	2.5	800-060308H-P-L 1025	●
	APHT 08T308P-DL AP301U(N)	8.5	9	3.97	0.8	2.8	800-08T308H-P-L 1025	●
	APHT 09T308P-DL AP301U(N)	9.66	9	3.97	0.8	2.8	800-09T308H-P-L 1025	●
	APHT 11T308P-DL AP301U(N)	12.75	9	3.97	0.8	2.8	800-11T308H-P-L 1025	●

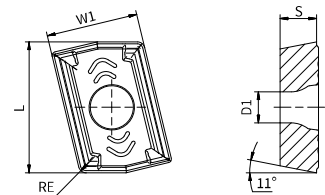
● Stock available


Deep-Hole Drilling Inserts
DH geometry



Center/Intermediate insert	Product code	L	IC	S	RE	D1	Competitor's description	Stock
	TPMT 16T312R-DH AP301U(N)	16.5	9.53	3.97	1.2	3.4	TPMT 16T312R-23 1025	●
	TPMT 220612R-DH AP301U(N)	22	12.7	6.35	1.2	4.4	TPMT 220612R-23 1025	●

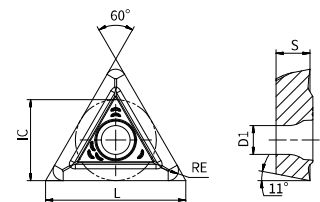
● Stock available




Periphery insert	Product code	L	W1	S	RE	D1	Competitor's description	Stock
	APMT 13T308-DH AP301U(N)	14.6	10	3.97	0.8	3.4	R424.9-13T308-23 1025	●
	APMT 180608-DH AP301U(N)	20.6	11.5	6.35	0.8	4.4	R424.9-180608-23 1025	●

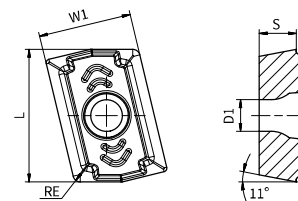
● Stock available

Deep-Hole Drilling Inserts
LH geometry



Center/Intermediate insert	Product code	L	IC	S	RE	D1	Competitor's description	Stock
	TPMT 16T312R-LH AP301U(N)	16.5	9.525	3.97	1.2	3.4	TPMT 16T312R-22 1025	●
	TPMT 220612R-LH AP301U(N)	22	12.7	6.35	1.2	4.4	TPMT 220612R-22 1025	●

● Stock available



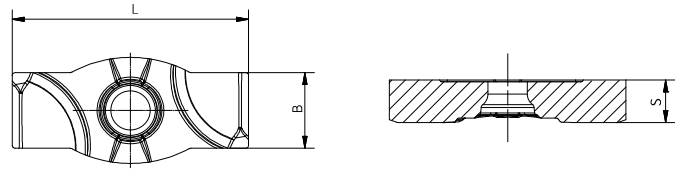
Periphery insert	Product code	L	W1	S	RE	D1	Competitor's description	Stock
	APMT 13T308-LH AP301U(N)	14.6	10	3.97	0.8	3.4	R424.9-13T308-22 1025	●
	APMT 180608-LH AP301U(N)	20.6	11.5	6.35	0.8	4.4	R424.9-180608-22 1025	●


● Stock available

Drilling holder

Deep-Hole Drilling Inserts

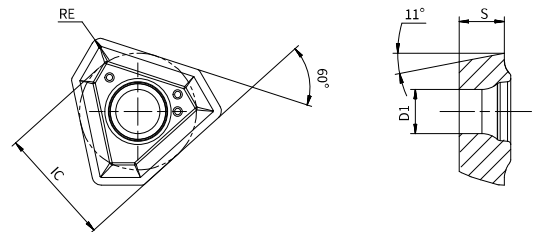
Guiding pad




Guiding pad	Product code	B	L	S	Competitor's description	Stock
	GPAD-06A AC301K	6.00	18.00	3.00	800-06A PM1	●
	GPAD-07A AC301K	7.00	20.00	3.50	800-07A PM1	●
	GPAD-08A AC301K	8.00	25.00	4.50	800-08A PM1	●
	GPAD-10A AC301K	10.00	30.00	4.50	800-10A PM1	●
	GPAD-12A AC301K	12.00	35.00	5.50	800-12A PM1	●

● Stock available

TPMX Series



Sharp	Product code	S	IC	RE	D1	Competitor's description	Stock
	TPMX 1403R-DH AP301U(N)	3.50	8.45	0.80	2.87	TPMX 1403RG TT9030	●
	TPMX 1704R-DH AP301U(N)	4.00	10.30	0.80	3.90	TPMX 1704RG TT9030	●
	TPMX 2405R-DH AP301U(N)	5.50	14.20	1.20	4.40	TPMX 2405RG TT9030	●
	TPMX 2405L-DH AP301U(N)	5.50	14.20	1.20	4.40	TPMX 2405LG TT9030	●
	TPMX 2807R-DH AP301U(N)	7.50	17.00	1.60	5.50	TPMX 2807RG TT9030	●

● Stock available

Recommended Cutting Speed for Materials(Dia 25.00-65.00mm)

	Workpiece material		Brinell hardness (HB)	Grade			Cutting speed Vc m/min	Feed fn mm/r		
				Insert				Drilling dia mm		
				P	I	C		25.00-43.00	43.01-65.00	
P	Unalloyed steel	C=0.05-0.10%	125	AP301U(N)			70-130	0.11-0.41	0.14-0.45	
		C=0.10-0.25%	125				70-130	0.11-0.41	0.14-0.45	
		C=0.25-0.55%	150				70-130	0.11-0.41	0.14-0.45	
		C=0.55-0.80%	170				70-130	0.11-0.41	0.14-0.45	
	High carbon steel	Carbon tool steel	210	AP301U(N)			70-120	0.11-0.41	0.20-0.45	
	Low-alloyed steel	Non-Hardened		180	AP301U(N)			55-110	0.11-0.41	0.20-0.45
		Tempered		275				70-120	0.11-0.41	0.20-0.45
		Tempered		350				70-120	0.11-0.41	0.20-0.45
	High-alloyed steel	Annealed		200	AP301U(N)			55-110	0.11-0.38	0.20-0.40
		Hardened tool steel		325				55-110	0.20-0.38	0.20-0.40
Cast steel	Non-alloyed steel		180	AP301U(N)			55-110	0.11-0.41	0.20-0.45	
	Low-alloy (alloy<5%)		200				55-110	0.11-0.41	0.20-0.45	
M	Stainless steel	Non-Hardened/Ferritic/martensitic		200	AP301U(N)			40-110	0.11-0.41	0.20-0.45
		Austenitic		200				40-110	0.11-0.41	0.20-0.45
		Austenitic, precipitation hardened (PH)		300				40-110	0.11-0.33	0.20-0.35
		Austenitic/ferritic, duplex		230				40-80	0.11-0.33	0.20-0.35
K	Malleable cast iron	Ferritic		200	AP301U(N)			80-120	0.11-0.38	0.24-0.41
		Pearlitic		260				80-120	0.11-0.38	0.24-0.41
	Grey cast iron	Low tensile strength		180	AP301U(N)			60-110	0.11-0.38	0.24-0.41
		High tensile strength		245				60-110	0.11-0.38	0.24-0.41
	Nodular cast iron	Ferritic		160	AP301U(N)			50-110	0.11-0.38	0.24-0.41
		Pearlitic		250				50-110	0.11-0.38	0.24-0.41
GGV (CGI)				230						
N	Wrought aluminium alloys	non-aging		30	AP301U(N)			65-150	0.09-0.33	0.20-0.33
		aged		100				65-150	0.09-0.33	0.20-0.33
	Cast aluminium alloys	≤ 12% Si, non-aging		75	AP301U(N)			65-150	0.09-0.33	0.20-0.33
		≤ 12% Si, aged		90				65-150	0.09-0.33	0.20-0.33
		> 12% Si, non-aging		130				65-150	0.09-0.33	0.20-0.33
	Magnesium alloy			70						
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper		100	AP301U(N)			65-150	0.09-0.33	0.20-0.33
		Brass, bronze, red brass		90	AP301U(N)			65-150	0.09-0.33	0.20-0.33
Cu alloys, short-chip		110	65-150	0.09-0.33				0.20-0.33		
High tensile, Ampco alloy		300	65-150	0.09-0.33				0.20-0.33		
S	Heat-resistant alloys	Fe-based annealed		200	AP301U(N)			10-55	0.09-0.30	0.20-0.33
		Fe-based hardened		280				10-55	0.09-0.30	0.20-0.33
		Ni or Co-based annealed		250				10-55	0.09-0.30	0.20-0.33
		Ni or Co-based hardened		350				10-55	0.09-0.30	0.20-0.33
		Ni or Co-based cast		320				10-55	0.09-0.30	0.20-0.33
	Titanium alloys	Pure titanium		200	AP301U(N)			30-60	0.09-0.30	0.20-0.33
		α alloys		375				30-60	0.09-0.30	0.20-0.33
		α and β alloys		375				30-60	0.09-0.30	0.20-0.33
				410				30-60	0.09-0.30	0.20-0.33
H	Hardened steel	Hardened and tempered		43-47 HRC						
	Chilled cast iron			47-60 HRC						

*) Insert position-P, I, C
P=peripheral insert, I=intermediate insert, C=center insert

Drilling holder

Recommended Cutting Speed for Materials(Dia ≥63.50mm)

Workpiece material			Brinell hardness (HB)	Grade			Cutting speed Vc m/min	Feed fn mm/r	
				Insert				Drilling dia mm	
				P	I	C		≥63.50	
P	Unalloyed steel	C=0.05-0.10%	125	AP301U(N)			80-100	0.18-0.35	
		C=0.10-0.25%	125				80-100	0.18-0.35	
		C=0.25-0.55%	150				80-100	0.18-0.35	
		C=0.55-0.80%	170				80-100	0.18-0.35	
	High carbon steel	Carbon tool steel	210	AP301U(N)			70-100	0.18-0.35	
	Low-alloyed steel	Non-Hardened		180	AP301U(N)			60-100	0.16-0.35
		Tempered		275				70-100	0.18-0.30
		Tempered		350				70-100	0.18-0.30
	High-alloyed steel	Annealed		200	AP301U(N)			60-100	0.16-0.30
		Hardened tool steel		325				60-100	0.16-0.30
Cast steel	Non-alloyed steel		180	AP301U(N)			50-100	0.15-0.30	
	Low-alloy (alloy<5%)		200				50-100	0.15-0.30	
M	Stainless steel	Non-Hardened/Ferritic/martensitic		200	AP301U(N)			50-90	0.16-0.35
		Austenitic		200				50-90	0.16-0.35
		Austenitic, precipitation hardened (PH)		300					
		Austenitic/ferritic, duplex		230					
K	Malleable cast iron	Ferritic		200	AP301U(N)				
		Pearlitic		260					
	Grey cast iron	Low tensile strength		180	AP301U(N)				
		High tensile strength		245					
	Nodular cast iron	Ferritic		160	AP301U(N)				
		Pearlitic		250					
GGV (CGI)				230					
N	Wrought aluminium alloys	non-aging		30	AP301U(N)			65-130	0.10-0.30
		aged		100				65-130	0.10-0.30
	Cast aluminium alloys	≤ 12% Si, non-aging		75	AP301U(N)			65-130	0.10-0.30
		≤ 12% Si, aged		90				65-130	0.10-0.30
		> 12% Si, non-aging		130				65-130	0.10-0.30
	Magnesium alloy			70					
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper		100	AP301U(N)			65-130	0.10-0.30
		Brass, bronze, red brass		90				65-130	0.10-0.30
Cu alloys, short-chip		110	65-130	0.10-0.30					
High tensile, Ampco alloy		300	65-130	0.10-0.30					
S	Heat-resistant alloys	Fe-based annealed		200	AP301U(N)			20-65	0.15-0.30
		Fe-based hardened		280				20-65	0.15-0.30
		Ni or Co-based annealed		250				20-65	0.15-0.30
		Ni or Co-based hardened		350				20-65	0.15-0.30
		Ni or Co-based cast		320					
	Titanium alloys	Pure titanium		200	AP301U(N)			30-100	0.15-0.30
		α alloys		375				30-100	0.15-0.30
α and β alloys		375	30-100	0.15-0.30					
		β alloys		410				30-100	0.15-0.30
H	Hardened steel	Hardened and tempered		43-47 HRC					
	Chilled cast iron			47-60 HRC					

*) Insert position-P, I, C
P=peripheral insert, I=intermediate insert, C=center insert