

**Drilling Insert Denomination System**

**S**  
1


**P**  
2

**M**  
3


**T**  
4

**1- Shape/Code**










**S**



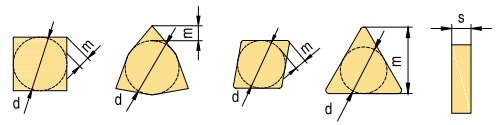
**W**



**2- Clearance Angle**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
				
<b>F</b>	<b>G</b>	<b>N</b>	<b>P</b>	<b>O</b>
				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**

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

<b>06</b>	<b>02</b>	<b>04</b>	<b>E</b>	<b>-</b>	<b>DP</b>
5	6	7	8	-	9

5- Cutting Edge Length				
In.Circle Dimension (mm)	S Code	S Length	W Code	W 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><b>DP</b></p> <ol style="list-style-type: none"> <li>1. DP geometry has high efficiency. Suitable for short hole high speed drilling.</li> <li>2. Strong square insert with reinforced geometry offers excellent hole straightness.</li> <li>3. Drilling holder with helical flute provides excellent chip evacuation and high hole precision.</li> </ol>	
<p><b>DU/DG</b></p> <ol style="list-style-type: none"> <li>1. Suitable cutting angle makes perfect balance for the cutting force.</li> <li>2. General purpose geometry combined with two grades are suitable for P, M, K, S materials, especially good for the chip control in soft materials.</li> <li>3. Obtains good surface finish.</li> <li>4. Good versatility. It's suitable for rotating and non-rotating machining.</li> </ol>	

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	
<b>P</b>	Unalloy steels / Alloyed steels	P01											
		P05											
		P10											
		P15											
		P20	AP301U										
		P25		AP351M									
		P30			AP351U								
		P35											
		P40											
		P45											
		P50											
<b>M</b>	Stainless steels	M01											
		M05											
		M10											
		M15											
		M20											
		M25	AP351M										
		M30		AP351U									
		M35											
		M40											
		M45											
<b>K</b>	Cast iron	K01											
		K05											
		K10											
		K15											
		K20											
		K25											
		K30											
		K35											
		K40											
		K45											
		K50											
<b>N</b>	Aluminum/ Aluminum alloys	N01											
		N05											
		N10											
		N15											
		N20											
		N25											
		N30											
<b>S</b>	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.

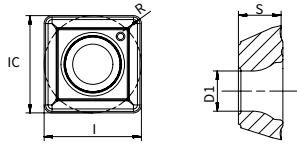
Good toughness and wear resistance ultrafine crystalline substrate combined with nanostructure PVD coating,  
good resistance to thermal cracking resistance, wear resistance and coating strength.

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.

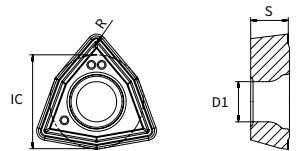
**SPMT-DP Drilling Insert**



Inserts	Product code	Dimensions					Machining conditions					
		I	IC	S	R	D1	Good condition			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**

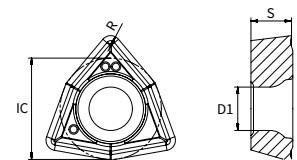


Inserts	Product code	Dimensions					Machining conditions					
		I	IC	S	R	D1	Good condition			General condition		
							●	✱	✱	●	●	●
							P			M	K	N
							AP301U	AP351U	AC301P	AP351M	AP301U	AW100K
	WCMT 030208E-DU	3.8	5.56	2.38	0.8	2.8	●	●				
	WCMT 040208E-DU	4.3	6.35	2.38	0.8	3.0	●	●				
	WCMT 050308E-DU	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			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		WC drilling insert series grade application range & cutting parameter recommendation																
ISO	Material classification	Tensile strength (N/mm <sup>2</sup> )	Hardness (HB)	Grade						Feed (mm/rev)								
				AP301U	AP351U	AC301P	PVD Coated	P30-45	M30-45	CVD Coated	P25-40	-	-	S 30-45	-	-	-	
				Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min
				Cutting speed (m/min)														
				Ø 16mm ~ Ø20 mm						Ø 20.5mm ~ Ø25mm		Ø 25.5mm ~ Ø30 mm		Ø 31mm ~ Ø41 mm		Ø 41mm ~ Ø58 mm		
				WCMT 030204E-DU/DG						WCMT 040204E-DU/DG		WCMT 050308E-DU/DG		WCMT 06T308E-DU/DG		WCMT 080408E-DU/DG		
P	Unalloyed steel	<600	<180	260	240	224	220	185	150	200	175	150	0.04-0.065	0.07-0.09	0.07-0.10	0.08-0.11	0.09-0.13	
		<950	<280	250	210	170	200	170	140	190	162.5	135	0.05-0.07	0.09-0.09	0.07-0.10	0.08-0.11	0.09-0.13	
	Alloyed steel	700-950	200-280	240	200	160	190	160	130	180	150	120	0.05-0.09	0.065-0.14	0.08-0.16	0.10-0.18	0.10-0.20	
		950-1200	280-355	210	170	130	170	130	90	160	130	100	0.04-0.07	0.065-0.11	0.07-0.14	0.09-0.15	0.10-0.18	
M	Duplex stainless steel	1200-1400	355-415	170	140	110	160	120	80	140	110	80	0.04-0.065	0.05-0.9	0.07-0.10	0.08-0.12	0.09-0.13	
	Austenitic 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	0.09-0.13	
		675	200	220	170	120	120	120	65	60	-	-	0.04-0.065	0.065-0.10	0.08-0.12	0.08-0.10	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Aluminum	260	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	Aluminum alloy	447	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fe-based alloy	943	280	-	-	-	40	30	20	-	-	-	-	-	-	-	-	-
		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	0.08-0.14	
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.