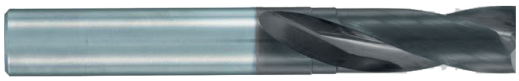
TIZ IMPLEMENTS

WDPN SOLID CARBIDE DRILLS

flat bottom

for holes on various angled surface

180 degree point angle enables drilling of flat, inclined and curved surface

MODEL		DESCRIPTION	SIZE	
			MIN	MAX
	2XD	CARBIDE, WDPN DRILLS, FLAT BOTTOM	D3.0	D20.0

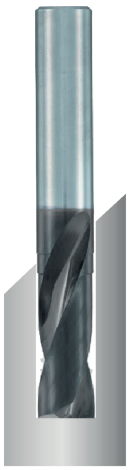
For angled surface, two operations are required by traditional usage

1st oparation (end mill) — Counter boring to make flat surface and guide hole

2nd operation (Drill) — Drilling to required depht of hole

For angled surface, only one operation can be drilled by WDPN Drill

One operation (WDPN Drills) — One drill does it all without using both an end mill and a drill



P				M	K	N	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardned Steels	Stainless Steels	Cast iron	Aluminium	Copper
-HRc20	HRc20-30	HRc30-40	HRc40-50				
excellent	*excellent*	*excellent*	*good*	*good*	*excellent*	*good*	*good*

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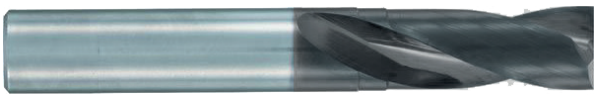
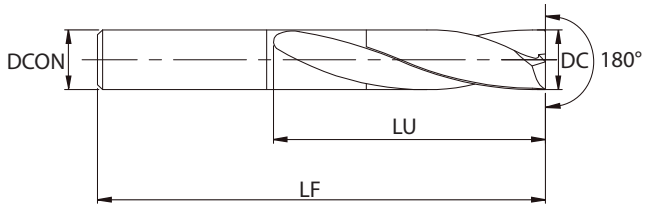
- Optymalized flute shape for excellent chip evacuation.
- High strenght cutting edge to improve tool life and versatility drilling.
- For through holes, minimized burrs at entrance and exit when drilling thin plate.





EDP No.	Drill Diameter	Shank Diameter	Flute Lenght	Overall Lenght
	DC	DCON	LU	LF
WDPN00300016060A	3	6	16	50
WDPN00310016060A	3,1	6	16	50
WDPN00320016060A	3,2	6	16	50
WDPN00330016060A	3,3	6	16	50
WDPN00340018060A	3,4	6	18	50
WDPN00350018060A	3,5	6	18	50
WDPN00360018060A	3,6	6	18	50
WDPN00370018060A	3,7	6	18	50
WDPN00380018060A	3,8	6	18	50
WDPN00390018060A	3,9	6	18	50
WDPN00400018060A	4	6	18	50
WDPN00410020060A	4,1	6	20	60
WDPN00420020060A	4,2	6	20	60
WDPN00430020060A	4,3	6	20	60
WDPN00440020060A	4,4	6	20	60
WDPN00450022060A	4,5	6	22	60
WDPN00460022060A	4,6	6	22	60
WDPN00470022060A	4,7	6	22	60
WDPN00480022060A	4,8	6	22	60
WDPN00490022060A	4,9	6	22	60
WDPN00500022060A	5	6	22	60
WDPN00510024060A	5,1	6	24	60
WDPN00520024060A	5,2	6	24	60
WDPN00530024060A	5,3	6	24	60
WDPN00540024060A	5,4	6	24	60
WDPN00550024060A	5,5	6	24	60

EDP No.	Drill Diameter	Shank Diameter	Flute Lenght	Overall Lenght
	DC	DCON	LU	LF
WDPN00560024060A	5,6	6	24	60
WDPN00570026060A	5,7	6	26	60
WDPN00580026060A	5,8	6	26	60
WDPN00590026060A	5,9	6	26	60
WDPN00600026060A	6	6	26	60
WDPN00610028080A	6,1	8	28	70
WDPN00620028080A	6,2	8	28	70
WDPN00630028080A	6,3	8	28	70
WDPN00640030080A	6,4	8	30	70
WDPN00650030080A	6,5	8	30	70
WDPN00660030080A	6,6	8	30	70
WDPN00670030080A	6,7	8	30	70
WDPN00680030080A	6,8	8	30	70
WDPN00690030080A	6,9	8	30	70
WDPN00700030080A	7	8	30	70
WDPN00710034080A	7,1	8	34	70
WDPN00720034080A	7,2	8	34	70
WDPN00730034080A	7,3	8	34	70
WDPN00740034080A	7,4	8	34	70
WDPN00750034080A	7,5	8	34	70
WDPN00760034080A	7,6	8	34	70
WDPN00770034080A	7,7	8	34	70
WDPN00780034080A	7,8	8	34	70
WDPN00790034080A	7,9	8	34	70
WDPN00800034080A	8	8	34	70
WDPN00810038100A	8,1	10	38	80

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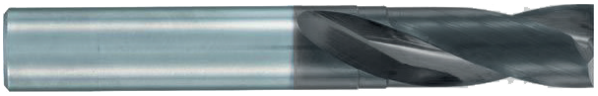

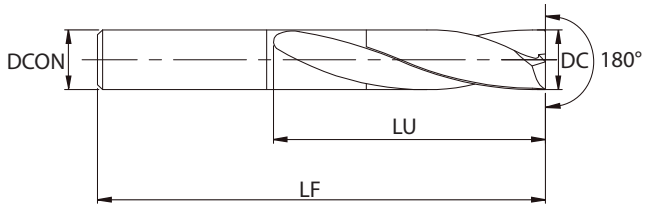

EDP No.	Drill Diameter	Shank Diameter	Flute Lenght	Overall Lenght
	DC	DCON	LU	LF
WDPN00820038100A	8,2	10	38	80
WDPN00830038100A	8,3	10	38	80
WDPN00840038100A	8,4	10	38	80
WDPN00850038100A	8,5	10	38	80
WDPN00860038100A	8,6	10	38	80
WDPN00870040100A	8,7	10	40	80
WDPN00880040100A	8,8	10	40	80
WDPN00890040100A	8,9	10	40	80
WDPN00900040100A	9	10	40	80
WDPN00910042100A	9,1	10	42	80
WDPN00920042100A	9,2	10	42	80
WDPN00930042100A	9,3	10	42	80
WDPN00940042100A	9,4	10	42	80
WDPN00950042100A	9,5	10	42	80
WDPN00960042100A	9,6	10	42	80
WDPN00970045100A	9,7	10	45	80
WDPN00980045100A	9,8	10	45	80
WDPN00990045100A	9,9	10	45	80
WDPN01000045100A	10	10	45	80
WDPN01010046120A	10,1	12	46	90
WDPN01020046120A	10,2	12	46	90
WDPN01030046120A	10,3	12	46	90
WDPN01040048120A	10,4	12	48	90
WDPN01050048120A	10,5	12	48	90
WDPN01060048120A	10,6	12	48	90
WDPN01070048120A	10,7	12	48	90

EDP No.	Drill Diameter	Shank Diameter	Flute Lenght	Overall Lenght
	DC	DCON	LU	LF
WDPN01080048120A	10,8	12	48	90
WDPN01090048120A	10,9	12	48	90
WDPN01100048120A	11	12	48	90
WDPN01110050120A	11,1	12	50	90
WDPN01120050120A	11,2	12	50	90
WDPN01130050120A	11,3	12	50	90
WDPN01140050120A	11,4	12	50	90
WDPN01150050120A	11,5	12	50	90
WDPN01160050120A	11,6	12	50	90
WDPN01170052120A	11,7	12	52	90
WDPN01180052120A	11,8	12	52	90
WDPN01190052120A	11,9	12	52	90
WDPN01200052120A	12	12	52	90
WDPN01210054140A	12,1	14	54	100
WDPN01220054140A	12,2	14	54	100
WDPN01230054140A	12,3	14	54	100
WDPN01240054140A	12,4	14	54	100
WDPN01250054140A	12,5	14	54	100
WDPN01260054140A	12,6	14	54	100
WDPN01270056140A	12,7	14	56	100
WDPN01280056140A	12,8	14	56	100
WDPN01290056140A	12,9	14	56	100
WDPN01300056140A	13	14	56	100
WDPN01310058140A	13,1	14	58	100
WDPN01320058140A	13,2	14	58	100
WDPN01330058140A	13,3	14	58	100

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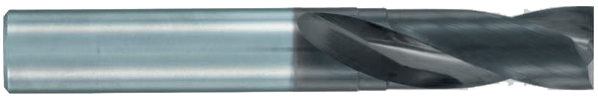
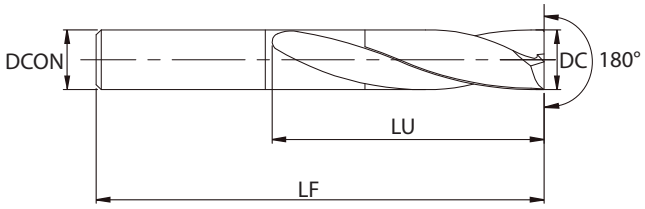




EDP No.	Drill Diameter	Shank Diameter	Flute Lenght	Overall Lenght
	DC	DCON	LU	LF
WDPN01340058140A	13,4	14	58	100
WDPN01350058140A	13,5	14	58	100
WDPN01360058140A	13,6	14	58	100
WDPN01370058140A	13,7	14	58	100
WDPN01380058140A	13,8	14	58	100
WDPN01390058140A	13,9	14	58	100
WDPN01400058140A	14	14	58	100
WDPN01410062160A	14,1	16	62	105
WDPN01420062160A	14,2	16	62	105
WDPN01430062160A	14,3	16	62	105
WDPN01440062160A	14,4	16	62	105
WDPN01450062160A	14,5	16	62	105
WDPN01460062160A	14,6	16	62	105
WDPN01470062160A	14,7	16	62	105
WDPN01480062160A	14,8	16	62	105
WDPN01490062160A	14,9	16	62	105
WDPN01500062160A	15	16	62	105
WDPN01510064160A	15,1	16	64	115
WDPN01520064160A	15,2	16	64	115
WDPN01530064160A	15,3	16	64	115
WDPN01540064160A	15,4	16	64	115
WDPN01550064160A	15,5	16	64	115
WDPN01560064160A	15,6	16	64	115
WDPN01570064160A	15,7	16	64	115
WDPN01580064160A	15,8	16	64	115
WDPN01590064160A	15,9	16	64	115

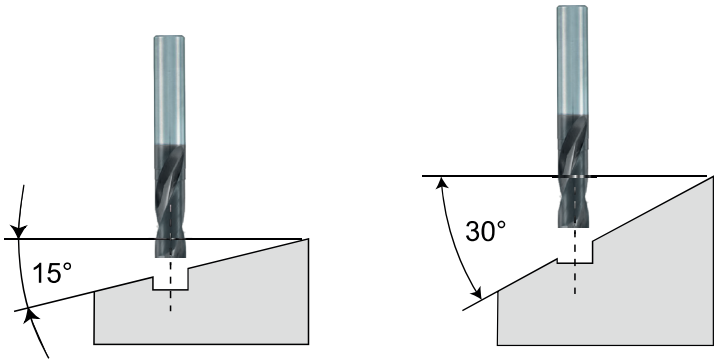
EDP No.	Drill Diameter	Shank Diameter	Flute Lenght	Overall Lenght
	DC	DCON	LU	LF
WDPN01600064160A	16	16	64	115
WDPN01650070180A	16,5	18	70	125
WDPN01700070180A	17	18	70	125
WDPN01750070180A	17,5	18	70	125
WDPN01800070180A	18	18	70	125
WDPN01850075200A	18,5	20	75	135
WDPN01900075200A	19	20	75	135
WDPN01950075200A	19,5	20	75	145
WDPN02000075200A	20	20	75	145

TIZ IMPLEMENTS

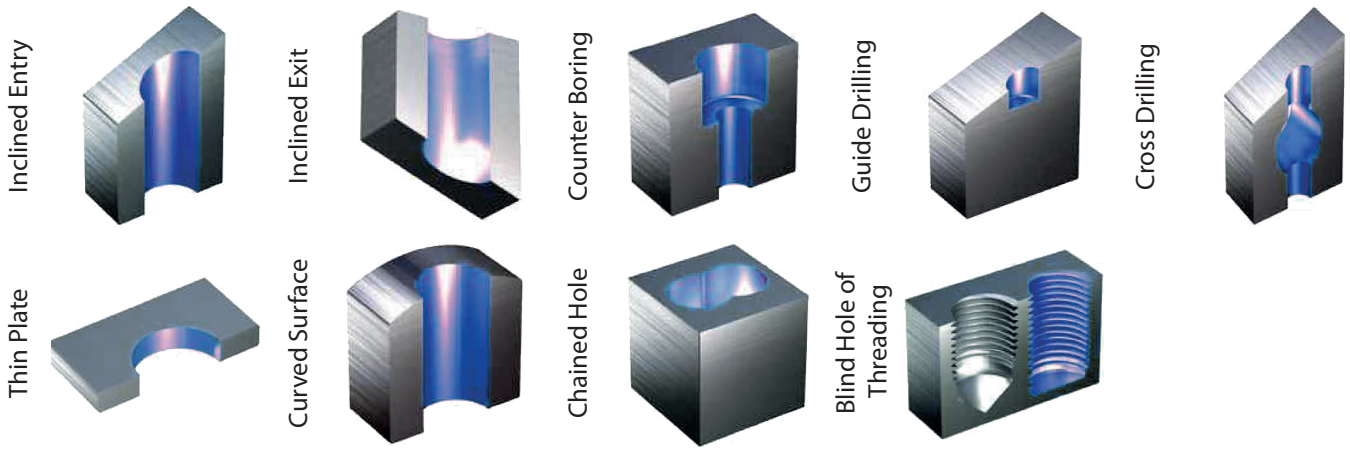
Recommended cutting conditions

- The cutting conditions are for 2xD.
- The rigid and precise machine and holder are required.
- The recommended depth of hole is measured from the highest point of the hole on drilling in inclined and angled surfaces. The recommended cutting conditions are those for drilling on flat and horizontal surfaces.
- Please adjust feed rate according to the above surface angle when drilling on an inclined surface.
  - The recommended feed rate 50% or lower, in case of 15°-30° of the incline angle.
  - The recommended feed rate 30% or lower and RPM 70%, in case of 30° - of the incline angle. Please decrease cutting speed as material hardness increases.
- Only use drilling tool. Side milling, traversing, helical milling are not usable.

Surface angle	Cutting conditions	
	RMP	FEED
0°-15°	100%	100%
15°-30°	100%	50%
30°-	70%	30%



Variety of drilling



Work material	P								M		K		N	
	Structual steels		Carbon steels Alloy steels		Prehardnened stells		Hardend steels		Stainless steels		Cast iron		Aluminum	
Hardness			<HB225		Hrc30-40		HRc40-50		200 HB					
Drilling speed	80 m/min		70 m/min		38m/min		25 m/min		30 m/min		68 m/min		165 m/min	
DC	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	8350	0,05	7250	0,05	3890	0,05	2790	0,03	3180	0,02	7250	0,04	17850	0,06
4	6250	0,07	5410	0,07	2940	0,06	2100	0,04	2380	0,03	5410	0,06	13130	0,08
5	5040	0,08	4360	0,07	2310	0,08	1680	0,05	1910	0,04	4360	0,07	10500	0,1
6	4200	0,1	3630	0,1	1890	0,09	1370	0,05	1590	0,05	3630	0,09	8930	0,12
8	3150	0,14	2730	0,13	1470	0,12	1050	0,08	1190	0,06	2730	0,12	6670	0,16
10	2520	0,17	2160	0,17	1160	0,15	840	0,1	955	0,08	2160	0,15	5360	0,2
12	2100	0,21	1790	0,21	1000	0,18	690	0,12	796	0,1	1790	0,18	4470	0,24
16	1580	0,28	1370	0,28	740	0,24	530	0,16	597	0,12	1370	0,24	3360	0,32
20	1260	0,35	1110	0,34	580	0,31	420	0,2	477	0,15	1110	0,3	2680	0,4

RMP=rev/min
FEED= mm/rev