



Size $\phi 2 \sim \phi 12$

UTDF



Patented in Japan

Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

Work Material																		
Structural Steels SS400	Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels					Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
				~ 50HRC	~ 55HRC	~ 60HRC	~ 65HRC	~ 70HRC										
●	●	●	○						●	●								

$\phi 3$ mm Shank V Series

UDC-PCD Series

CBN Series

Square
Long Neck Square

Radius
Long Neck Radius

Taper Neck Radius

Ball / Long Shank Ball
Long Neck Ball
Taper Neck Ball

Taper

Barrel

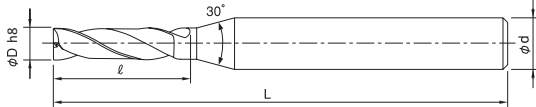
Spiral V Cutter

Drill

Technical Data

Features

Available to a wide variety of applications by the 180° point angle.
 The helix angle of 30° offers excellent chip evacuation, stable and highly efficient pilot hole drilling.
 New web-thinning design for improved chip evacuation and sharpness.
 Double-margin will guide the tool into inner wall and achieve high-straightness drilling to non-planar surface.
 Size M4 - M12 for drilling pilot holes before tapping.



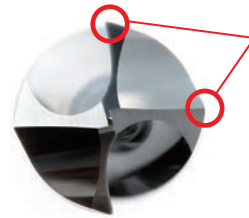
Outside Diameter	Diameter Tolerance(h8)
$\phi D \leq 3$	0/-0.014
$3 < \phi D \leq 6$	0/-0.018
$6 < \phi D \leq 10$	0/-0.022
$10 < \phi D \leq 12$	0/-0.027

Feature1 : Helix angle 30°



Excellent chip evacuation with 30° helix angle

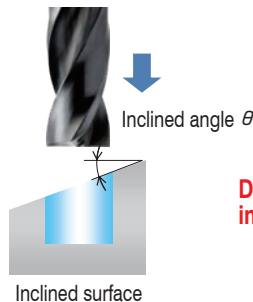
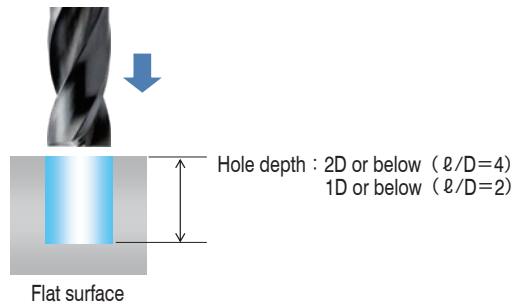
Feature2 : Double-margin



Double-margin

High-straightness drilling

Feature3 : A wide variety of applications



Designed for drilling on flat, inclined or curved surfaces.

Total 21 models

Unit (mm)

Model Number	Diameter ϕ D	Flute Length ℓ	Overall Length L	Shank Diameter ϕ d	Suggested Retail Price ¥
UTDF 2200-080	2	8	50	4	6,500
UTDF 2250-100	2.5	10	50	4	6,500
UTDF 2300-120	3	12	60	6	6,500
UTDF 2330-132	3.3	13.2	60	6	7,000
UTDF 2400-160	4	16	60	6	7,200
UTDF 2420-168	4.2	16.8	60	6	7,500
UTDF 2500-200	5	20	60	6	7,800
UTDF 2510-204	5.1	20.4	60	6	7,800
UTDF 2600-240	6	24	60	6	8,000
UTDF 2650-130	6.5	13	70	8	9,700
UTDF 2680-272	6.8	27.2	70	8	9,700
UTDF 2700-280	7	28	80	8	9,700
UTDF 2800-320	8	32	80	8	10,500
UTDF 2850-340	8.5	34	80	10	11,500
UTDF 2860-344	8.6	34.4	80	10	11,500
UTDF 2900-360	9	36	80	10	13,500
UTDF 2950-190	9.5	19	90	10	13,500
UTDF 21000-400	10	40	90	10	13,500
UTDF 21030-412	10.3	41.2	90	12	14,000
UTDF 21100-220	11	22	100	12	15,500
UTDF 21200-480	12	48	100	12	15,500

*Contact our sales for the custom size tool.

ϕ 3mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square

Long Neck
Square

Radius

Long Neck
Radius

Taper Neck
Radius

Ball / Long
Shank Ball

Long Neck
Ball

Taper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data

Drilling Conditions for UTDF

Flat Surface

WORK MATERIAL			CARBON STEELS STRUCTURAL STEELS GRAY CAST IRON S50C / SS400 / FC250	ALLOY STEELS SCM415	PREHARDENED STEELS NAK80	DUCTILE IRON FCD	ALUMINUM ALLOYS A5052 / A7075	ALUMINUM CAST ADC12							
Model Number	Diameter ϕD (mm)	Flute Length l_f (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	
□3mm Shank V Series	2200-080	2	8	15,000	900	12,900	740	6,000	160	12,900	660	25,200	2,070	18,900	1,340
	2250-100	2.5	10	12,000	880	10,320	730	4,800	160	10,320	660	20,160	2,070	15,120	1,340
UDC-PCD Series	2300-120	3	12	10,000	860	8,600	710	4,000	150	8,600	630	16,800	1,970	12,600	1,280
	2330-132	3.3	13.2	9,090	860	7,820	710	3,640	150	7,820	630	15,280	1,970	11,460	1,280
CBN Series	2400-160	4	16	7,500	830	6,450	690	3,000	150	6,450	610	12,600	1,900	9,450	1,230
	2420-168	4.2	16.8	7,150	830	6,150	690	2,860	150	6,150	610	12,000	1,900	9,000	1,230
Square	2500-200	5	20	6,000	800	5,160	660	2,400	140	5,160	590	10,080	1,840	7,560	1,190
	2510-204	5.1	20.4	5,880	800	5,060	660	2,350	140	5,060	590	9,880	1,840	7,400	1,190
Long Neck Square	2600-240	6	24	5,000	770	4,300	640	2,000	140	4,300	560	8,400	1,770	6,300	1,140
	2650-130	6.5	13	4,620	770	3,970	640	1,850	140	3,970	560	7,750	1,770	5,820	1,140
Radius	2680-272	6.8	27.2	4,420	770	3,800	640	1,770	140	3,800	560	7,420	1,770	5,560	1,140
	2700-280	7	28	4,290	760	3,680	630	1,710	140	3,680	560	7,200	1,770	5,400	1,140
Long Neck Radius	2800-320	8	32	3,750	730	3,230	600	1,500	130	3,230	540	6,300	1,670	4,730	1,080
	2850-340	8.5	34	3,530	730	3,040	600	1,420	130	3,040	540	5,930	1,670	4,450	1,080
Taper Neck Radius	2860-344	8.6	34.4	3,490	720	3,000	600	1,400	130	3,000	540	5,860	1,670	4,400	1,080
	2900-360	9	36	3,330	720	2,870	590	1,330	120	2,870	530	5,600	1,670	4,200	1,080
Ball / Long Shank Ball	2950-190	9.5	19	3,160	700	2,720	580	1,260	120	2,720	520	5,300	1,620	3,980	1,050
	21000-400	10	40	3,000	690	2,580	570	1,200	120	2,580	510	5,040	1,580	3,780	1,020
Long Neck Ball	21030-412	10.3	41.2	2,920	690	2,510	570	1,170	120	2,510	510	4,900	1,580	3,670	1,020
	21100-220	11	22	2,730	670	2,350	550	1,090	110	2,350	500	4,580	1,540	3,440	1,000
Taper Neck Ball	21200-480	12	48	2,500	650	2,150	540	1,000	110	2,150	480	4,200	1,490	3,150	960

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Long Neck Ball
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Taper

Barrel

Spiral V Cutter

Drill

Technical Data

Drilling Conditions for UTDF

Inclined Surface ($\theta \leq 30^\circ$)

WORK MATERIAL			CARBON STEELS STRUCTURAL STEELS GRAY CAST IRON S50C / SS400 / FC250		ALLOY STEELS SCM415		PREHARDENED STEELS NAK80		DUCTILE IRON FCD		ALUMINUM ALLOYS A5052 / A7075		ALUMINUM CAST ADC12	
Model Number	Diameter ϕD (mm)	Flute Length l (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
2200-080	2	8	15,000	270	12,900	220	6,000	48	12,900	190	25,200	620	18,900	400
2250-100	2.5	10	12,000	260	10,320	220	4,800	48	10,320	190	20,160	620	15,120	400
2300-120	3	12	10,000	250	8,600	210	4,000	45	8,600	180	16,800	590	12,600	380
2330-132	3.3	13.2	9,090	250	7,820	210	3,640	45	7,820	180	15,280	590	11,460	380
2400-160	4	16	7,500	240	6,450	200	3,000	45	6,450	180	12,600	570	9,450	360
2420-168	4.2	16.8	7,150	240	6,150	200	2,860	45	6,150	180	12,000	570	9,000	360
2500-200	5	20	6,000	240	5,160	190	2,400	42	5,160	170	10,080	550	7,560	350
2510-204	5.1	20.4	5,880	230	5,060	190	2,350	42	5,060	170	9,880	550	7,400	350
2600-240	6	24	5,000	230	4,300	190	2,000	42	4,300	160	8,400	530	6,300	340
2650-130	6.5	13	4,620	230	3,970	190	1,850	42	3,970	160	7,750	530	5,820	340
2680-272	6.8	27.2	4,420	230	3,800	190	1,770	42	3,800	160	7,420	530	5,560	340
2700-280	7	28	4,290	230	3,680	190	1,710	42	3,680	160	7,200	530	5,400	340
2800-320	8	32	3,750	210	3,230	180	1,500	39	3,230	160	6,300	500	4,730	320
2850-340	8.5	34	3,530	210	3,040	180	1,420	39	3,040	160	5,930	500	4,450	320
2860-344	8.6	34.4	3,490	210	3,000	180	1,400	39	3,000	160	5,860	500	4,400	320
2900-360	9	36	3,330	210	2,870	180	1,330	38	2,870	160	5,600	500	4,200	320
2950-190	9.5	19	3,160	210	2,720	170	1,260	36	2,720	150	5,300	490	3,980	310
21000-400	10	40	3,000	200	2,580	170	1,200	36	2,580	150	5,040	470	3,780	300
21030-412	10.3	41.2	2,920	200	2,510	170	1,170	36	2,510	150	4,900	470	3,670	300
21100-220	11	22	2,730	200	2,350	160	1,090	34	2,350	140	4,580	460	3,440	290
21200-480	12	48	2,500	190	2,150	160	1,000	33	2,150	140	4,200	440	3,150	280

$\phi 3\text{mm}$ Shank
V Series

UDC-PCD
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CBN
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Square

Long Neck
Square

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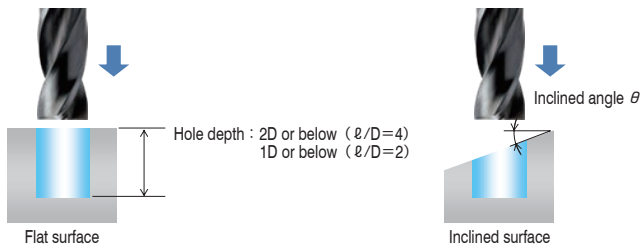
Drill

Technical Data

Drilling Conditions for UTDF

Inclined Surface ($\theta > 30^\circ$)

WORK MATERIAL			CARBON STEELS STRUCTURAL STEELS GRAY CAST IRON S50C / SS400 / FC250	ALLOY STEELS SCM415	PREHARDENED STEELS NAK80	DUCTILE IRON FCD	ALUMINUM ALLOYS A5052 / A7075	ALUMINUM CAST ADC12						
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2200-080	2	8	10,500	90	9,030	74	4,200	16	9,030	66	17,640	200	13,230	130
2250-100	2.5	10	8,400	90	7,220	74	3,360	16	7,220	66	14,110	200	10,580	130
2300-120	3	12	7,000	86	6,020	71	2,800	15	6,020	63	11,760	190	8,820	120
2330-132	3.3	13.2	6,370	86	5,480	71	2,550	15	5,480	63	10,700	190	8,030	120
2400-160	4	16	5,250	83	4,520	69	2,100	15	4,520	61	8,820	190	6,620	120
2420-168	4.2	16.8	5,010	83	4,310	69	2,010	15	4,310	61	8,400	190	6,300	120
2500-200	5	20	4,200	80	3,620	66	1,680	14	3,620	59	7,060	180	5,300	110
2510-204	5.1	20.4	4,120	80	3,540	66	1,650	14	3,540	59	6,920	180	5,190	110
2600-240	6	24	3,500	77	3,010	64	1,400	14	3,010	56	5,880	170	4,410	110
2650-130	6.5	13	3,230	77	2,780	64	1,290	14	2,780	56	5,430	170	4,070	110
2680-272	6.8	27.2	3,100	77	2,660	64	1,240	14	2,660	56	5,200	170	3,900	110
2700-280	7	28	3,000	77	2,580	64	1,200	14	2,580	56	5,040	170	3,780	110
2800-320	8	32	2,630	73	2,270	60	1,050	13	2,270	54	4,410	160	3,320	100
2850-340	8.5	34	2,480	73	2,130	60	1,000	13	2,130	54	4,160	160	3,120	100
2860-344	8.6	34.4	2,440	73	2,100	60	980	13	2,100	54	4,100	160	3,080	100
2900-360	9	36	2,330	73	2,010	60	930	13	2,010	54	3,920	160	2,940	100
2950-190	9.5	19	2,210	71	1,900	58	880	12	1,900	53	3,710	150	2,790	100
21000-400	10	40	2,100	69	1,810	57	840	12	1,810	51	3,530	150	2,650	100
21030-412	10.3	41.2	2,050	69	1,760	57	820	12	1,760	51	3,430	150	2,570	100
21100-220	11	22	1,910	67	1,640	55	760	11	1,640	49	3,210	140	2,400	90
21200-480	12	48	1,750	65	1,510	54	700	11	1,510	48	2,940	140	2,210	90



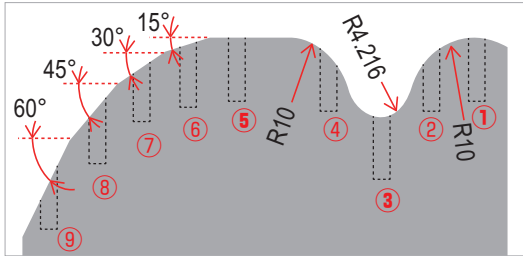
Note:

- These milling parameters are for reference only.
- Adjust the parameters in accordance with the machine rigidity, workpiece clamping condition and shape.
- Recommend water soluble or oil coolant.
- Step milling is recommended in case of clogging.

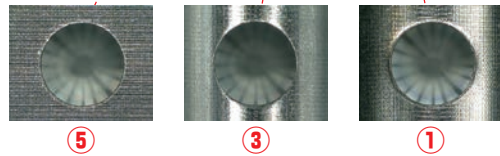
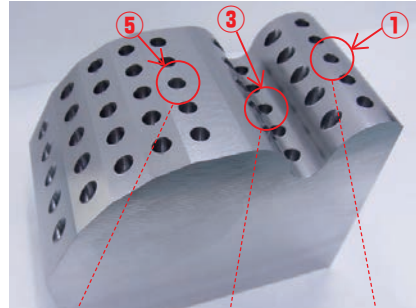
UTDF Inclined Surface Drilling Example $\phi 3.5 \times$ Flute Length 14 mm (Prototype)

SS400

Work Shape



Coolant : Water Soluble (Nozzle)
 Work Size : $40 \times 75 \times 60$ mm



Each hole after drilling

Excellent drilling performance with less burrs.

UTDF
 Inclined Surface
 Drilling Video



Drilling spot	Surface	Spindle Speed (min ⁻¹)	Feed Rate (min/min)	Drilling Depth (The Deepest spot) (mm)
1	凸 Curved surface (Top)	7,000	450	7
2	Curved surface (45°)		270	
3	凹 Curved surface (Top)		450	
4	Curved surface (45°)		270	
5	Flat Surface		450	
6	Inclined Surface (15°)		320	
7	Inclined Surface (30°)		320	
8	Inclined Surface (45°)		270	
9	Inclined Surface (60°)		225	

*Contact our sales for the custom size tool.

Tool After Drilling $\phi 2 \times$ Flute Length 8 mm

A5052

Surface	Spindle Speed	Feed Rate	Drilling Depth	Number of Holes	Coolant
Flat Surface	23,100 min ⁻¹	830 mm/min	4 mm	100 holes	Water Soluble (Nozzle)

Comparison of Tip Damage after 100 hits

UTDF



Competitor



More tool-life left without adhesion after drilling 100 holes.

Chip adhesion

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