



shaping your dreams

**HELIIX**  
TOOL COMPANY LIMITED

Coolant-through WDO carbide drill series for stainless steel

# WDO-SUS

WDO-SUS-3D WDO-SUS-5D



Less 25%



Finally, the answer you've been looking for is here...

- 1 Sharp cutting edge
- 2 New flute geometry
- 3 Special margin shape
- 4 New coolant hole shape
- 5 WXL® Coating

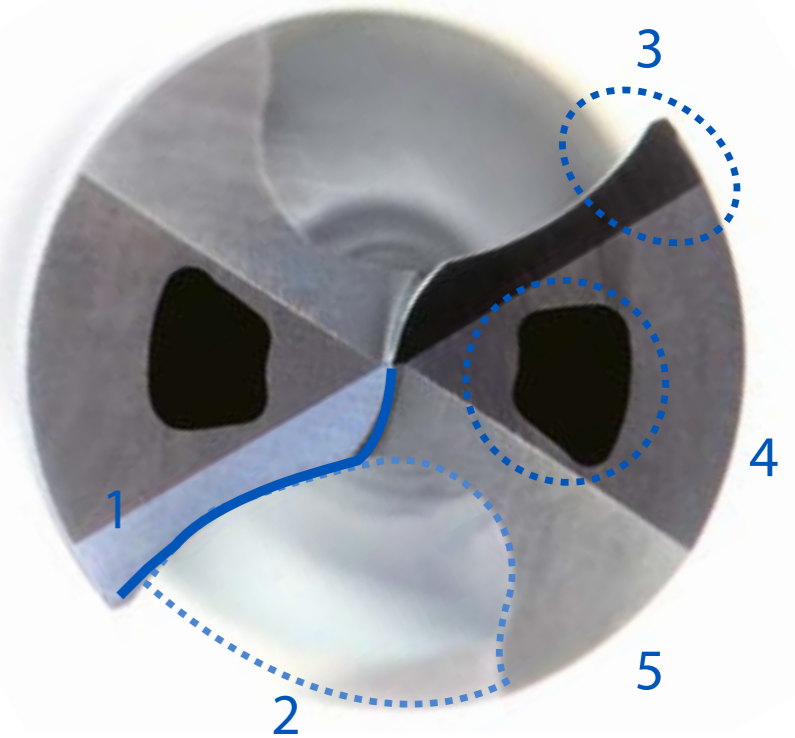


## WDO-SUS Drill for Stainless Steels & Various Materials

OSG's next generation of carbide drills is an almighty one. Focused on the reduction of thrust and aimed at machining Stainless Steel, WDO-SUS-3D/5D is the perfect drill to use for your machine. The flute design produces optimal chip shape, thereby realizing smooth chip evacuation. The margin form is designed to realize low resistance and low cutting temperature.

Common machining problems associated with these materials :

- Work hardening tendency
- Elongation of chips
- Low thermal conductivity
- Welding on cutting tool

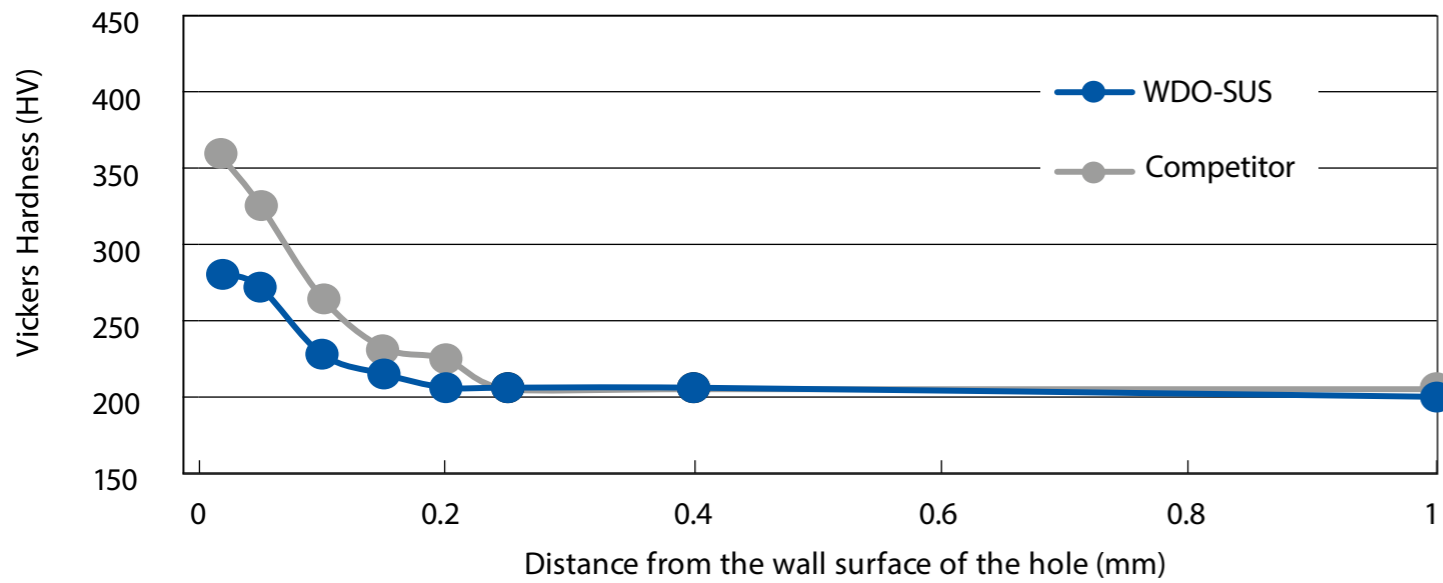


# Key features & Benefits WDO-SUS-3D/5D

## 1 Solution for work hardening - Sharp cutting edge

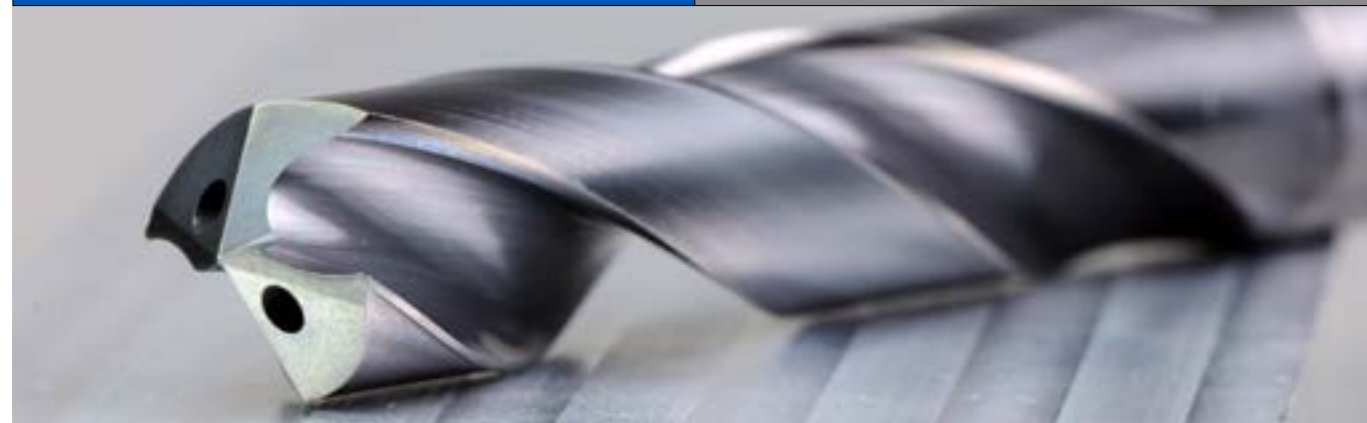
Reduces work hardening, which leads to longer tool life during tapping and reaming

Tool	WDO-SUS-5D φ10	Speed	70m/min (2,229min <sup>-1</sup> )	Coolant	1.5MPa Water Soluble Internal
Work Material	SUS3040C	Feed Rate	446mm/min(0.2mm/rev)	Machine	Horizontal Machining Center



## 2 Solution for elongation of chips - New flute geometry

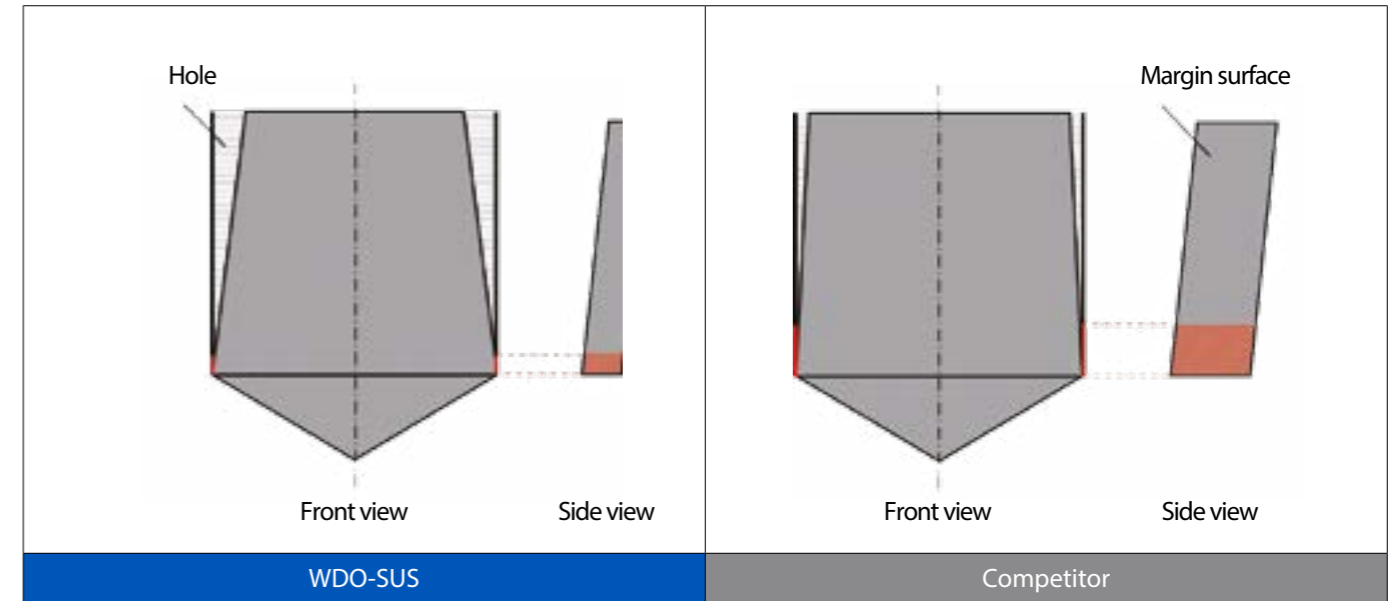
Enables the creation of compact cutting chips



# Key features & Benefits WDO-SUS-3D/5D

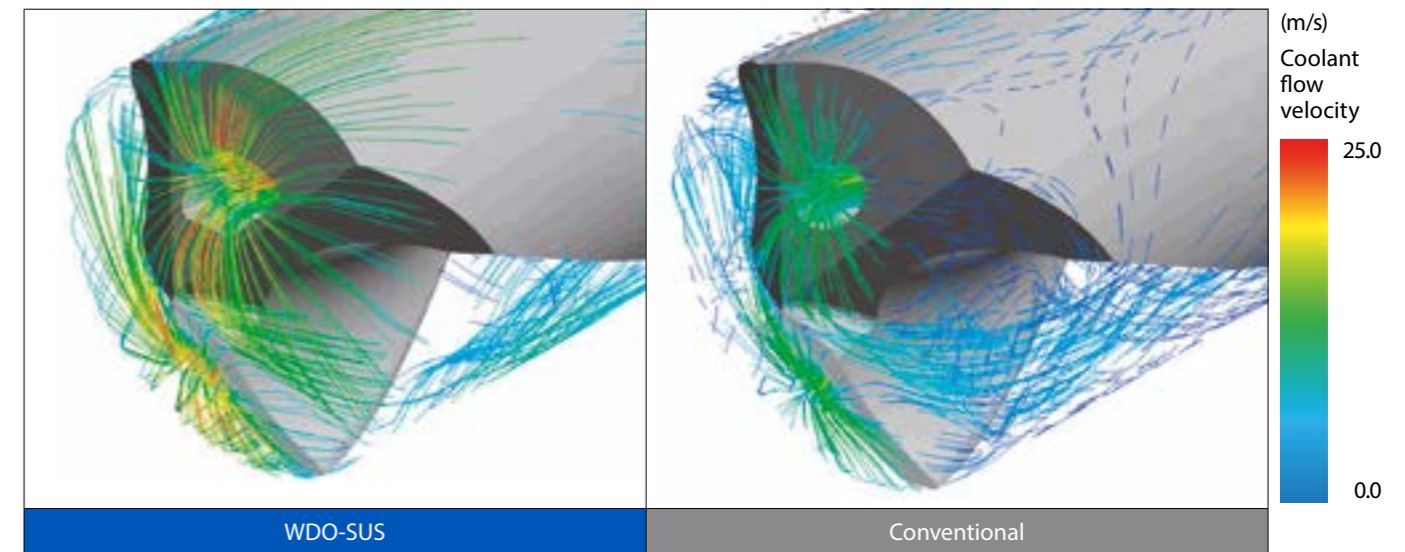
## 3 Solution for high machining heat - Special margin shape

Reduces friction and heat generation



## 4 Solution for high machining heat - New coolant hole shape

Improves coolant flow, chip evacuation and cutting heat generation



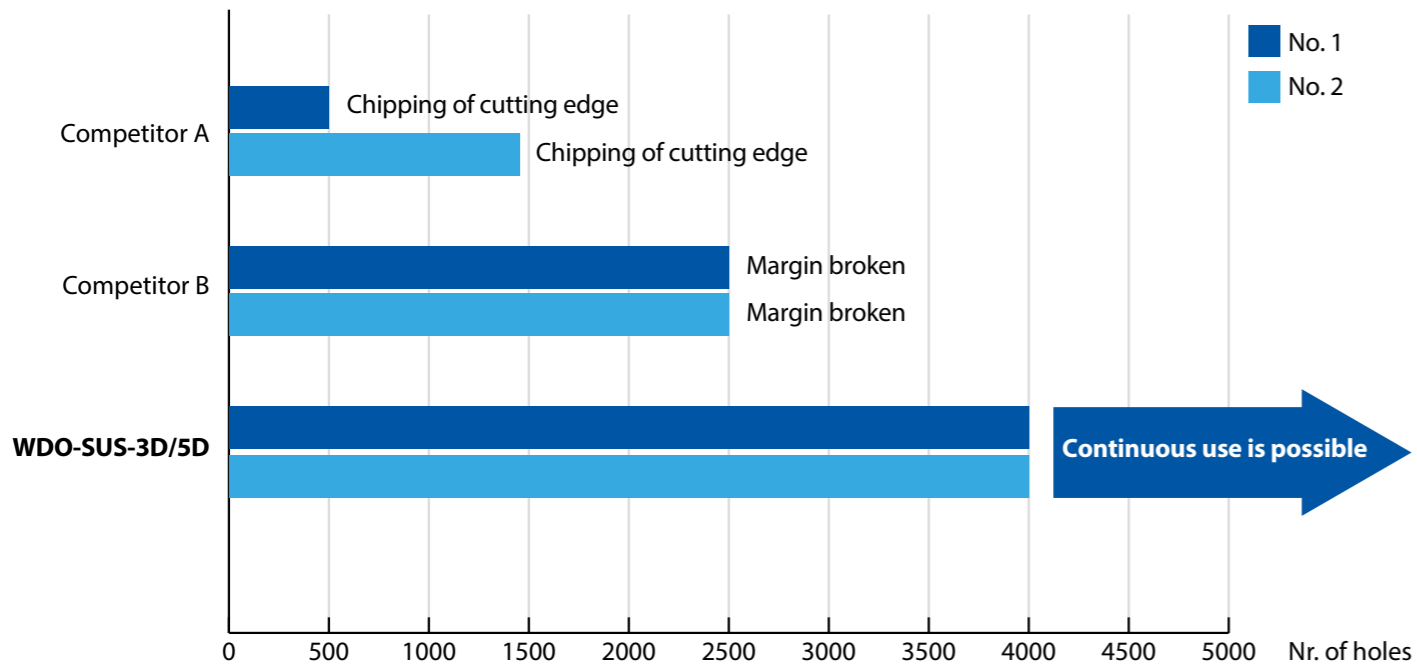
Analysis of coolant flow with spindle speed of 2,200min<sup>-1</sup>

## 5 Solution for welding - heatWXL® coating

High adhesion strength, which minimizes the possibility of chipping

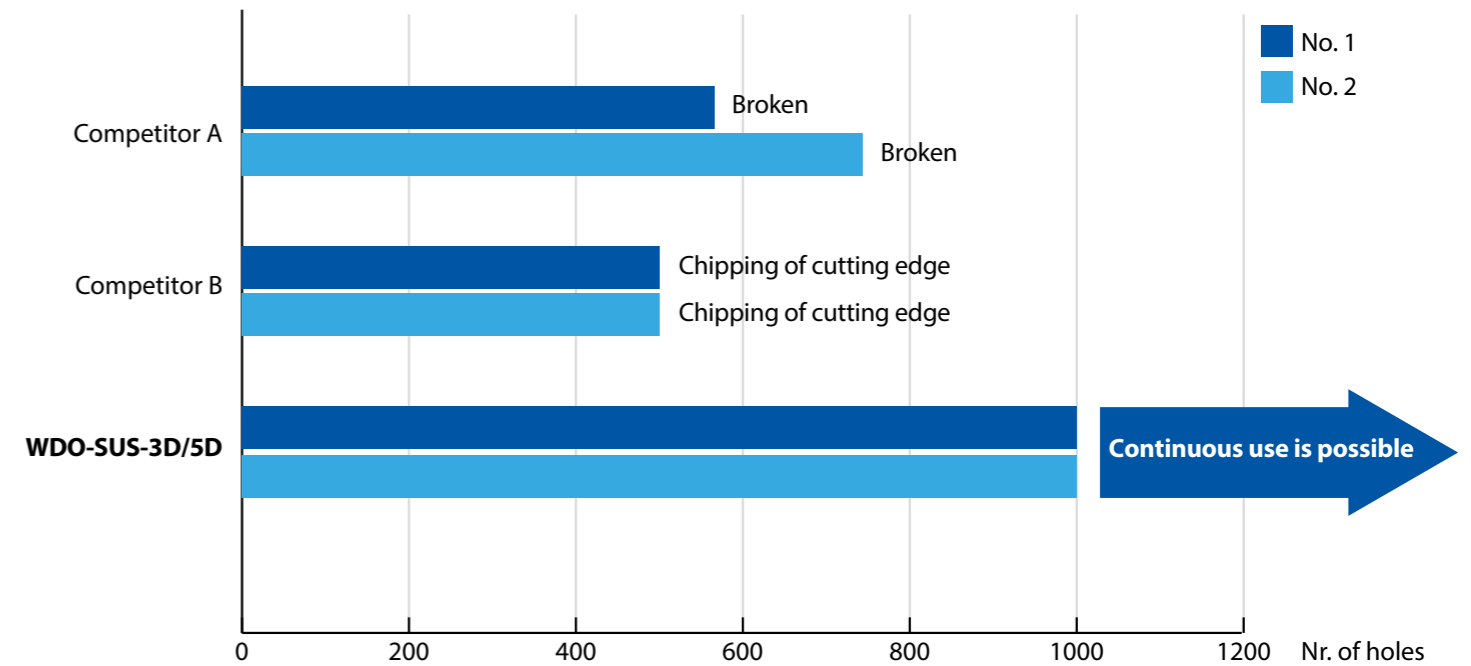
# Performance WDO-SUS-3D/5D versus Conventional type on Work Material SUS304

Cutting Dia	Ø6	Speed	80m/min	Depth of Hole	25mm (Through hole)
Material	SUS304	Feed Rate	0,18mm/rev (3% x D)	Coolant	Internal - Emulsion - 1,5Mpa

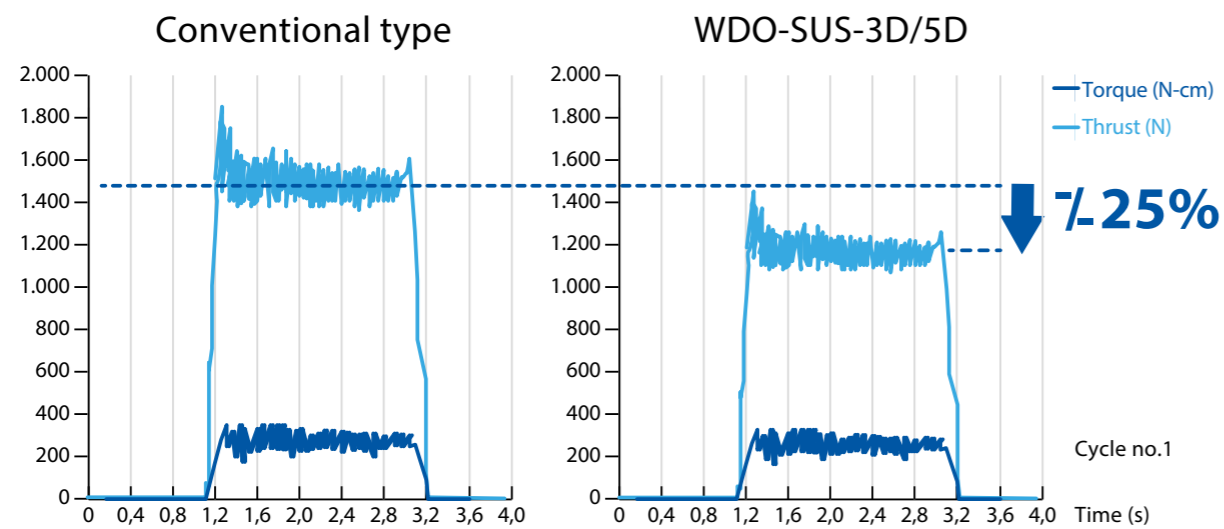


# Performance WDO-SUS-3D/5D versus Conventional type on Work Material S50C

Cutting Dia	Ø10	Speed	100m/min	Depth of Hole	50mm (Through hole)
Material	S50C	Feed Rate	0,30mm/rev (3% x D)	Coolant	Internal - Emulsion - 1,5Mpa



# Conventional type versus WDO-SUS-3D/5D


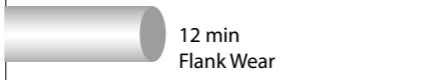


# Conditions

Vc	Carbon Steel S50C 80 ~ 120 m/min		Alloy Steel SCM440 80 ~ 120 m/min		Alloy Steel SCM440 - 30HRC 60 ~ 90 m/min		Stainless Steel SUS304 - SUS316 60 ~ 100 m/min		Super Duplex SUS630 - 17-4PH - 15-5PH 30 ~ 60 m/min		Ti Alloy 20 ~ 50 m/min	
	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)
3	10.600	0,06~0,12	10.600	0,06~0,12	7.400	0,06~0,12	8.500	0,06~0,12	4.800	0,06~0,09	3.700	0,05~0,09
4	8.000	0,08~0,16	8.000	0,08~0,16	5.600	0,08~0,16	6.400	0,08~0,16	3.600	0,08~0,12	2.800	0,06~0,12
5	6.400	0,10~0,20	6.400	0,10~0,20	4.500	0,10~0,20	5.100	0,10~0,20	2.900	0,10~0,15	2.200	0,08~0,15
6	5.300	0,12~0,24	5.300	0,12~0,24	3.700	0,12~0,24	4.200	0,12~0,24	2.400	0,12~0,18	1.900	0,09~0,18
7	4.500	0,14~0,26	4.500	0,14~0,26	3.200	0,14~0,26	3.600	0,14~0,26	2.000	0,14~0,21	1.600	0,11~0,21
8	4.000	0,16~0,28	4.000	0,16~0,28	2.800	0,16~0,28	3.200	0,16~0,28	1.800	0,16~0,24	1.400	0,12~0,24
9	3.500	0,18~0,30	3.500	0,18~0,30	2.500	0,18~0,30	2.800	0,18~0,30	1.600	0,18~0,27	1.200	0,14~0,27
10	3.200	0,20~0,30	3.200	0,20~0,30	2.200	0,20~0,30	2.500	0,20~0,30	1.400	0,20~0,30	1.100	0,15~0,30
11	2.900	0,20~0,30	2.900	0,20~0,30	2.000	0,20~0,30	2.300	0,20~0,30	1.300	0,20~0,30	1.000	0,15~0,30
12	2.700	0,21~0,30	2.700	0,21~0,30	1.900	0,21~0,30	2.100	0,21~0,30	1.200	0,21~0,30	900	0,16~0,30
13	2.400	0,21~0,33	2.400	0,21~0,33	1.700	0,21~0,33	2.000	0,21~0,33	1.100	0,21~0,33	900	0,18~0,33
14	2.300	0,22~0,35	2.300	0,22~0,35	1.600	0,22~0,35	1.800	0,22~0,35	1.000	0,22~0,35	800	0,19~0,35
16	2.000	0,25~0,36	2.000	0,25~0,36	1.400	0,25~0,36	1.600	0,25~0,36	900	0,25~0,36	700	0,22~0,36
18	1.800	0,28~0,38	1.800	0,28~0,38	1.200	0,28~0,38	1.400	0,28~0,38	800	0,28~0,38	600	0,24~0,38
20	1.600	0,30~0,40	1.600	0,30~0,40	1.100	0,30~0,40	1.300	0,30~0,40	700	0,30~0,40	600	0,27~0,40




# Machining Data of Stainless Steel

## Machining Precipitation Stainless Steel

Tool	WDO-SUS-5D	Competitor	Drilling Time (min) 10 20 30
Size	Ø 6,7		
Work Material	15-5 PH		WDO-SUS-5D 
Cutting Speed	50m/min (2.377 min <sup>-1</sup> )		
Feed Rate	357 mm/min (0,15 mm/rev)		Competitor 
Depth of Hole	45 mm (Blind)		
Coolant	Water Soluble (Internal)		
Machine	Horizontal Machining Center		

# Machining data of Titanium Alloy


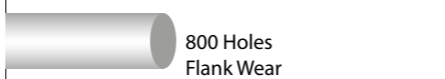
## WDO-SUS-3D in Titanium Alloy

Tool	WDO-SUS-3D Ø 5,1	Number of Holes 500 1.000 1.500 2.000 2.500
Work Material	Ti-6Al-4V (34~36 HRC) (After aging treatment)	
Cutting Speed	40m/min (2.498 min <sup>-1</sup> )	WDO-SUS-5D 
Feed Rate	300 mm/min (0,12 mm/rev)	
Depth of Hole	17 mm (Through)	Competitor 
Coolant	Water Soluble (Internal)	
Machine	Horizontal Machining Center	Conventional 



Cutting chips



## Machining Duplex Stainless Steel

Tool	WDO-SUS-5D	Competitor	Number of Holes 500 1.000 1.500 2.000
Size	Ø 10,3		
Work Material	SUS329J3L		WDO-SUS-5D 
Cutting Speed	65m/min (2.010 min <sup>-1</sup> )		
Feed Rate	462 mm/min (0,23 mm/rev)		Competitor 
Depth of Hole	48 mm (Through)		
Coolant	Water Soluble (Internal)		
Machine	Multifunction Lathe		

## WDO-SUS-5D in Titanium Alloy

Tool	WDO-SUS-5D Ø 10,5	Number of Holes 100 200 300 400
Work Material	Ti-6Al-4V	
Cutting Speed	45m/min (1.365 min <sup>-1</sup> )	WDO-SUS-5D 
Feed Rate	177,5 mm/min (0,13 mm/rev)	
Depth of Hole	29 mm (Blind)	Competitor 
Coolant	Water Soluble (Internal)	
Machine	Horizontal Machining Center	





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Tool specifications subject to change without notice



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