WORLDIA
SHAPING YOUR WORLD
WITH DIAMOND

BEIJING WORLDIA DIAMOND TOOLS CO., LTD.

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WORLDIA

Carbide Cutting Tools

Company Introduction

Beijing Worldia Diamond Tools Co., Ltd. was founded in 2006 in Beijing Zhongguancun Science and Technology Park;

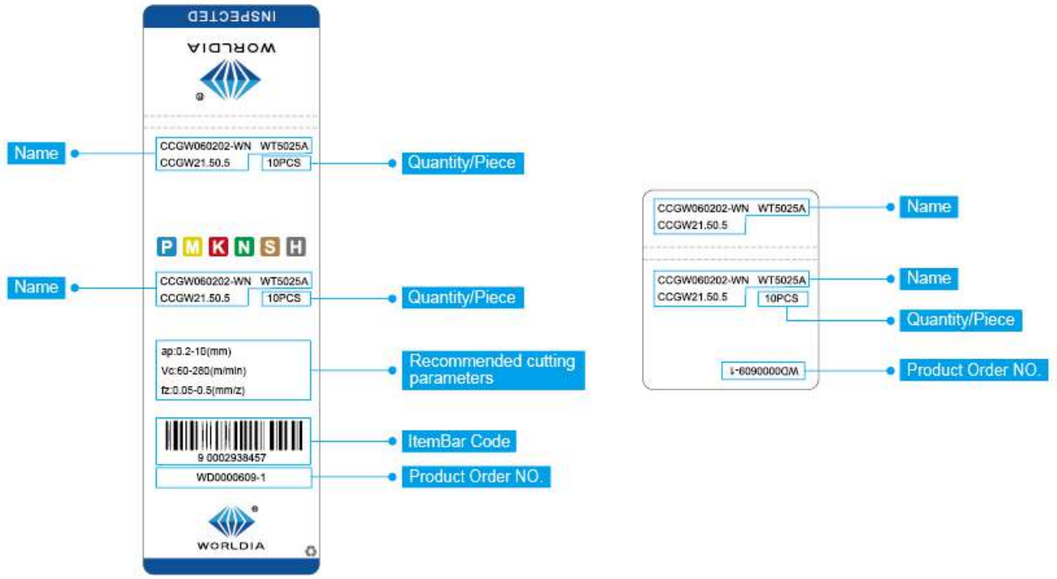
The Worldia Group currently has one branch and several wholly-owned subsidiaries. Among them, the two largest subsidiaries are Jiaxing Worldia Diamond Tools Co., Ltd. and Langfang Supower Diamond Technology Co., Ltd.;

The company is a high-tech enterprise mainly engaged in the research and development, production and sales of superhard cutting tools and superhard material products;

The products are involved in many well-known enterprises in the fields of optoelectronic display industry, photovoltaic, wind power, semiconductor, electronic equipment manufacturing at home and abroad, and have formed long-term and stable cooperative relations;

On July 22, 2019, worldia was officially listed on the STAR Market in Shanghai Stock Exchange. (Stock Code: 688028)

Product Packing Introduction



Face Milling Tools NEW

SN..12Series

Product Introduction

- Double sided negative insert with 8 cutting edges
- Two classes tolerance type(M class and G class)
- Three-dimensional chipbreaker (JL/JM/JR) available in various applications
- 45°, 75°and 88°entering angle line

Face Milling Tools NEW

HN..09Series

Product Introduction

- Double sided negative insert with 12 cutting edges for economical machning
- Two classes tolerance type(M class and G class)
- Two-dimensional chipbreaker (JM/JR) available in various applications
- JR geometrie and CVD coated enable high speed and rough milling cast iron

Turning Tools NEW

High temperature alloys, Turnning

Grade

WT5015:Recommended for continus cutting of stainless steel
General machining of heat resitant alloy
Machining of hardened steels

Chip Breaker

FS:Finishing of exotic materials
MS:Semi-fishing of exotic materials, stainless steel
ES:Medium machining of stainless steel, heat resitant alloys, mild steel

Parting & Grooving NEW

CMGDN Series

Chip Breaker

J:Recommended for parting and grooving of stainless steel, and low carbon steel
C:Recommended for parting and grooving of alloy steel, carbon steel, cast iron, stainless steel and other materials

Drilling Tools

SP..-UD

Square drilling insert

WC..-PD

Trigon drilling insert

CARBIDE CUTTING TOOLS

CONTENTS

WORLDIA®

MILLING TOOLS

CONTENTS

Milling Inserts

Milling Cutters

Milling Insert Designation System

A	P	K	T	Space
1	2	3	4	

1 - Shape

A	C	H	L	O
85°	80°	120°	90°	135°

P	R	S	T	W
108°	360°	90°	60°	80°

Z

others

2 - Insert clearance angle

A	B	C	D
3°	5°	7°	15°

E	F	G	N
20°	25°	30°	0°

P	O
11°	others

3 - Tolerance

Grade	Unit	d	m	s
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	± 0.130
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

* See table at right and below

Shape: C, E, H, M, O, P, S, T, R, W

IC	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	± 0.20
12.7	± 0.08	± 0.13	± 0.13	± 0.20
15.875	± 0.10	± 0.18	± 0.15	± 0.27
16	± 0.10	± 0.18	± 0.15	± 0.27
19.05	± 0.10	± 0.18	± 0.15	± 0.27
20	± 0.10	± 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	± 0.20	± 0.38
32	± 0.15	± 0.25	± 0.20	± 0.38

M&N grade	D shape		V shape	
IC	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	± 0.20
15.875	± 0.10	± 0.18	± 0.10	± 0.27
19.05	± 0.10	± 0.18	± 0.10	± 0.27

4 - Chipformer and clamp type

A	G	H	M	N
Q	T	U	W	X
	40°-60°	40°-60°	40°-60°	others

16	04	PD	E	R
5	6	7	8	9

5 - Cutting edge length

Diameter of internal tangent circle (mm)	Insert shape A	C	H	R	O	S	T
3.180							5
3.970							6
5.000				5			
5.560							9
6.000				6			
6.350		6					11
7.940							13
8.000				8			
9.525		9		9		9	16
10.000				10			
12.000				12			
12.700		12	5		5	12	22
13.400						13	
15.875		16		15		15	27
16.500			9				
16.000				16	6		
19.050		19		19		19	33
20.000				20			
20.200					8		
25.000				25			
25.400		25		25		25	44
31.750				31			
32.000				32			

6 - Thinkness

Add 0 or T before rounding down

A, B, C, N, O, W,

H, M, R, T,

F, G, J, U,

Example:
01 = 1.59
T1 = 1.98
02 = 2.38
03 = 3.18
T3 = 3.97
04 = 4.76
05 = 5.56
06 = 6.35
07 = 7.94
09 = 9.52
11 = 11.11
12 = 12.70
14 = 14.29
15 = 15.88

7 - Cutting edge corner

Corner radius

MO = round insert (metric)

00 = Sharp	24 = 2.4
01 = 0.1	28 = 2.8
02 = 0.2	31 = 3.1
04 = 0.4	40 = 4.0
08 = 0.8	48 = 4.8
12 = 1.2	56 = 5.6
16 = 1.6	64 = 6.4
20 = 2.0	X = Others

Wiper corner

Entering angle(kr)	Relief angle(αn)
A = 45°	A = 3°
D = 60°	B = 5°
E = 75°	C = 7°
F = 85°	D = 15°
G = 87°	E = 20°
P = 90°	F = 25°
Z = Others	G = 30°
	N = 0°
	P = 11°
	Z = Others

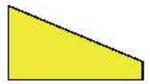
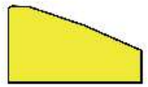
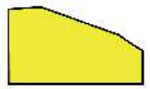
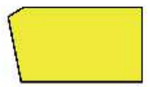
8 - Cutting edge design

Names	Photo	Clarification
F		Sharp cutting edge
E		Rounded cutting edges
T		Negative chamfer cutting edge
S		Negative chamfering and filleting of cutting edges

9 - Hand of tool

R L N

Chipbreaker Introduction

Application	Chip breaker		Applications and features
Light machining	JL		• For stainless steel, steel, and exotic materials machining • Sharp cutting edge, low cutting force
General machining	JM		• For stainless steel, steel, cast iron and exotic materials machining • Sharp cutting edge, low cutting force
Stable machining	JR		• For roughing applications • For cast iron and steel machining
Stable machining	TM		• For roughing or interrupted machining applications • Strong cutting edge credit to large land angle

Chipbreaker Application

Materials				Chip breaker application			
				JL	JM	JR	TM
ISO	Material	Tensile strength (N/mm²)	Hardness (HB)	Low cutting forces	General machining	Roughing	Roughing
P	Non-alloy	≤600	≤180	◭	▲	▲	-
		≤950	≤280	◭	▲	▲	-
	Alloy steel	700-950	200-280	◭	▲	▲	-
		950-1200	280-355	◭	▲	▲	-
		1200-1400	355-415	◭	▲	▲	-
M	Austenitic stainless steel	675	200	◭	▲	-	-
	Duplex stainless steel	778	230	◭	▲	-	-
	Precipitation hardening stainless steel	1013	300	◭	▲	-	-
K	Gray cast iron	700	220	-	◭	▲	▲
	Nodular cast iron	880	260	-	◭	▲	▲
S	Ferrous alloys	943	280	◭	◭	-	-
	Nickel-based alloys	1076	320	◭	◭	-	-
	Cobalt-based alloys	1177	350	◭	◭	-	-
	Titanium alloy	1262	370	◭	◭	-	-
N	Pure aluminum	260	75	-	-	-	-
	Aluminum alloy	447	130	-	-	-	-
H	Hardened steel	-	50-60HRC	-	◭	-	-
	Chilled cast iron	-	55HRC	-	◭	-	-

▲ Indicates first recommendation ◭ Indicates second recommendation - Indicates not recommendation

▲ Indicates first recommendation ◭ Indicates second recommendation - Indicates not recommendation

ISO Application Range

ISO application rang of Milling insert grades

Material Group	Materials	ISO	PVD coated							CVD coated
			WT5025	WT5030	WT5035	WT7020	WT3330	WT3020	WT3010	WT4020
P	Unalloyed steel, alloyed steel	P01								
		P05								
		P10								
		P15	WT5025	WT5030				WT3020	WT3010	
		P20								
		P25			WT5035					
		P30								
		P35								
		P40								
		P45								
		P50								
M	Stainless steel	M01								
		M05								
		M10								
		M15	WT5025	WT5030			WT3330			
		M20								
		M25			WT5035					
		M30								
		M35								
		M40								
		M45								
K	Cast iron	K01								
		K05								
		K10								
		K15				WT7020				WT4020
		K20								
		K25								
		K30								
		K35								
		K40								
		K45								
S	High temperature alloy	S01								
		S05								
		S10								
		S15	WT5025	WT5030			WT3330			
		S20								
		S25								
		S30								
		S35								
		S40								
		S45								
N	Non-ferrous alloy	N01								
		N05								
		N10								
		N15								
		N20								
		N25								
		N30								
H	Hardened steel, cold cast iron	H01								
		H05								
		H10						WT3020	WT3010	
		H15								
		H20								
		H25								
		H30								

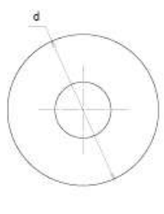
PVD Coated Carbide Grades

Grade	Appearance	ISO range	Characteristics & applications
WT5025	Black brown	P15-P35 M15-M35 S15-S35	• Submicron substrate and good wear resistance • For general machining of steel,stainless steel and heat resistant alloy
WT5030	Golden yellow	P15-P40 M15-M40 S15-S40	• Submicron substrate and goo wear resistantce • For general machining of steel, stainless steel and heat resistant alloy • Suitable for wet cutting condition
WT5035	Grey black	M25-M45 P25-P45	• Tough substrate with good fracture toughness • For interrupted roughing of stainless steel and stell
WT7020	Black brown	K10-K30	• Tough substrate for machining of cast iron • General machining of gray cast iron,nodular cast iron and alloy cast iron
WT3330	Bronze	M15-M35 S15-S35	• Submicron substrate and good wear resistance • General miachining of stainless steel and heat resistant alloy
WT3020	Grey black	H15-H25 P10-P25	• Submicron substrate and good wear resistance • For general or finish machining of hardened steel and steel
WT3010	Grey black	H05-H15 P05-P15	• Hard substrate with excellent wear resistance • For finishing fo hardened steel and high speed machining of steel

CVD Coated Carbide Grades

Grade	Appearance	ISO Range	Characteristics & applications
WT4020	Two-coloured	K15-K35	• Tough substrate for machining of cast iron • For high speed machining gray cast iron, nodular cast iron and alloy cast iron • Suitable for dry cutting condition

RPMW/RPMT Inserts

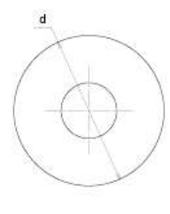


Insert	Designation		Dimension		Cutting parameter		Grade							
			d mm	S mm	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT1020	WT4020	WT3010	WT3020
	RPMW	1003M0	10.0	3.18	0.20-0.70	0.20-5.00	▲	▲					▲	▲
		10T3M0	10.0	3.97	0.20-0.70	0.20-5.00	▲	△	△		△		△	▲
		1204M0	12.0	4.76	0.30-0.85	0.20-6.00	▲	△	△		△		△	▲
	RPMT	08T2M0-MM	8.0	2.78	0.10-0.60	0.20-4.00	▲	△		▲				
		10T3M0-MM	10.0	3.97	0.20-0.70	0.20-5.00	▲	△		▲			▲	△
		1204M0-MM	12.0	4.76	0.30-0.85	0.20-6.00	▲	△		▲			▲	△
	RPMT	10T3M0-MP	10.0	3.97	0.20-0.70	0.20-5.00	▲	△	▲	△	△		▲	▲
		1204M0-MP	12.0	4.76	0.30-0.85	0.20-6.00	▲	△	▲	△	△		▲	▲

Processing materials		Processing conditions												
P	Steel	● Stable cutting	●	●	✖							●	●
M	Stainless steel	◐ General cutting	●	●	✖	●							
K	Cast iron	✖ Unstable cutting					●						
N	Non-ferrous alloys												
S	High temperature alloys		●	●		●							
H	Hardened steel						●					●	●

△ General stock ▲ Regular srock

RDMW/RDMT Inserts

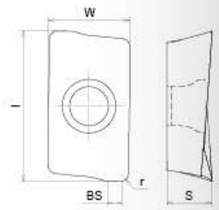


Insert	Designation		Dimension		Cutting parameter		Grade							
			d mm	S mm	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT1020	WT4020	WT3010	WT3020
	RDMW	0501M0	5.0	1.59	0.20-0.50	0.15-2.00	▲							
		0702M0	7.0	2.38	0.20-0.60	0.20-3.00	▲	▲						▲
		10T3M0T	10.0	3.97	0.20-0.70	0.20-5.00	△		△		▲		▲	▲
		1204M0T	12.0	4.76	0.25-0.80	0.25-6.00	△		△		▲		△	▲
	RDMT	10T3M0-TM	10.0	3.97	0.20-0.70	0.20-5.00	▲						△	▲
		1204M0-TM	12.0	4.76	0.25-0.80	0.25-6.00	▲						△	▲
		1605M0-TM	16.0	5.56	0.30-1.10	0.30-8.00	▲							

Processing materials		Processing conditions												
P	Steel	● Stable cutting	●	●	✖							●	●
M	Stainless steel	◐ General cutting	●	●	✖		●						
K	Cast iron	✖ Unstable cutting											
N	Non-ferrous alloys												
S	High temperature alloys		●	●									
H	Hardened steel						●					●	●

△ General stock ▲ Regular srock

APMT Inserts

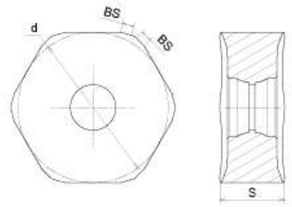


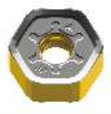
Insert	Designation		Dimension					Cutting parameter		Grade							
			W mm	l mm	S mm	r	BS	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	APMT	1135PDER-MP	6.27	11.3	3.5	0.8	1.3	0.05-0.50	0.20-9.50	▲	△	△		▲		▲	▲
	APMT	1604PDER-MP	9.37	16.4	4.76	0.8	1.6	0.06-1.00	0.20-14.50	▲	△	▲		▲		△	▲
	APMT	1135PDER-JM	6.21	11.0	3.5	0.8	1.2	0.05-0.50	0.20-9.00	▲	△	△		△		▲	▲
	APMT	1604PDER-JM	9.27	16.5	4.76	0.8	1.4	0.06-1.00	0.20-14.50	▲	△	△		△		△	▲
	APMT	1135PDER-JH	6.21	11.0	3.5	0.8	1.5	0.06-0.60	0.20-9.00	▲	△	▲		▲		▲	▲
	APMT	1604PDER-JH	9.27	16.5	4.76	0.8	1.7	0.08-1.20	0.20-14.50	▲	△	▲		▲		△	▲

Processing materials		Processing conditions											
P	Steel	● Stable cutting	◖	◖	✕						●	●
M	Stainless steel	◖ General cutting	◖	◖	✕							
K	Cast iron	✕ Unstable cutting					◖					
N	Non-ferrous alloys											
S	High temperature alloys		◖	◖								
H	Hardened steel										●	●

△ General stock ▲ Regular srock

HNMU/HNGU Inserts

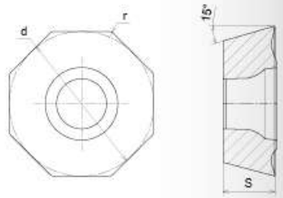


Insert	Designation		Dimension			Cutting parameter		Grade								
			d	S	BS	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	HNMU	0906ANSN-JM	16.5	6.35	1.2	0.10-0.30	0.20-6.00	▲		△		▲	△	△	△
	HNGU	0906ANSN-JM	16.5	6.35	1.2	0.10-0.30	0.20-6.00	▲		▲	△	▲	△		
	HNMU	0906ANSN-JR	16.5	6.35	1.2	0.20-0.50	0.20-6.00	▲				▲	△	△	△
	HNGU	0906ANSN-JR	16.5	6.35	1.2	0.20-0.50	0.20-6.00	▲		▲		▲	△		

Processing materials		Processing conditions											
P	Steel	● Stable cutting	◖	◖	✕						●	●
M	Stainless steel	◖ General cutting	◖	◖	✕	●						
K	Cast iron	✕ Unstable cutting					◖	◖				
N	Non-ferrous alloys											
S	High temperature alloys		◖	◖		●						
H	Hardened steel										●	●

△ General stock ▲ Regular srock

ODMT Inserts



Insert	Designation		Dimension				Cutting parameter		Grade							
			d	S	BS	r	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	ODMT	060508TN-JM	16.0	5.56		0.8	0.12-0.35	0.20-4.50	▲	△		△	▲	△		

Processing materials		
P	Steel	
M	Stainless steel	
K	Cast Iron	
N	Non-ferrous alloys	
S	High temperature alloys	
H	Hardened steel	

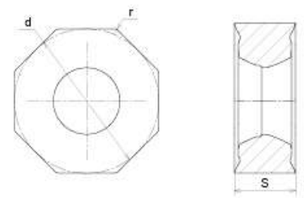
Processing conditions

- ● Stable cutting
- ◕ General cutting
- ✠ Unstable cutting

◕	◕							
◕	◕		◕					
				●	●			
	✠		✠					

△ General stock ▲ Regular srock

ONMU/ONHU Inserts



Insert	Designation		Dimension				Cutting parameter		Grade							
			d	S	BS	r	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	ONMU	050505TN-JR	13.0	5.5		0.5	0.15-0.35	0.20-3.50	▲	△			▲			
	ONHU	050505TN-JR	13.0	5.5		0.5	0.15-0.35	0.20-3.50	▲	△			▲			

Processing materials		
P	Steel	
M	Stainless steel	
K	Cast Iron	
N	Non-ferrous alloys	
S	High temperature alloys	
H	Hardened steel	

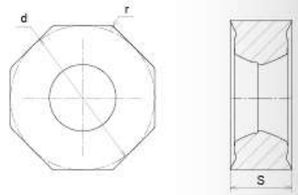
Processing conditions

- ● Stable cutting
- ◕ General cutting
- ✠ Unstable cutting

◕	◕					●	●	
◕	◕							
				◕				
◕	◕					●	●	

△ General stock ▲ Regular srock

ONMU/ONHU Inserts

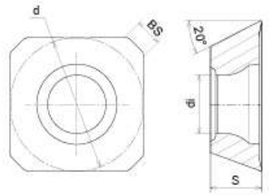


Insert	Designation		Dimension				Cutting parameter		Grade							
			d	S	BS	r	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT1020	WT4020	WT3010	WT3020
	ONMU	080608ANN-JL	20.2	6.0	2.0	0.8	0.10-0.30	0.20-5.00	▲	△			△			
	ONHU	080608ANN-JL	20.2	6.0	2.0	0.8	0.12-0.30	0.20-5.00	▲	△			△			
	ONMU	080608-JM	20.2	6.0		0.8	0.12-0.30	0.20-5.00	▲		△		▲			
	ONHU	080608-JM	20.2	6.0		0.8	0.12-0.30	0.20-5.00	▲		△		▲			
	ONMU	080608-JR	20.2	6.0		0.8	0.20-0.30	0.20-5.00	▲		▲		▲	▲		
	ONHU	080608-JR	20.2	6.0		0.8	0.20-0.30	0.20-5.00	▲		▲		▲	▲		

Processing materials		Processing conditions	WT5025	WT5030	WT5035	WT3330	WT1020	WT4020	WT3010	WT3020
P	Steel	● Stable cutting	◖	◖	✠				●	●
M	Stainless steel	◖ General cutting	◖	◖						
K	Cast iron	✠ Unstable cutting			✠		◖	◖		
N	Non-ferrous alloys									
S	High temperature alloys		◖	◖						
H	Hardened steel								●	●

△ General stock ▲ Regular srock

SEKT/SEMT Inserts

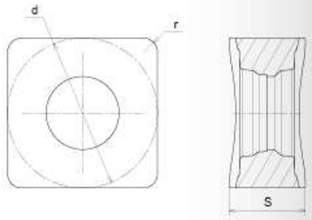


Insert	Designation		Dimension				Cutting parameter		Grade							
			d mm	S mm	di	BS	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT1020	WT4020	WT3010	WT3020
	SEKT	1204AFTN-JM	12.7	4.76	5.5	1.7	0.20-0.70	0.50-6.50	▲	△		▲	▲			
	SEMT	13T3AGSN-JM	13.4	3.97	4.4	2.0	0.20-0.70	0.50-6.50	▲	△		▲				

Processing materials		Processing conditions	WT5025	WT5030	WT5035	WT3330	WT1020	WT4020	WT3010	WT3020
P	Steel	● Stable cutting	◖	◖						
M	Stainless steel	◖ General cutting	◖	◖		◖				
K	Cast iron	✠ Unstable cutting					◖			
N	Non-ferrous alloys									
S	High temperature alloys		◖	◖		◖				
H	Hardened steel						◖			

△ General stock ▲ Regular srock

SNMX/SNGX Inserts

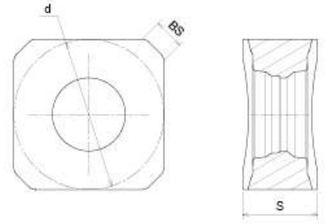


Insert	Designation		Dimension				Cutting parameter		Grade							
			d	S	BS	r	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	SNMX	120512-JL	12.7	6.35		1.2	0.12-0.35	0.20-10.00	▲		△	▲	△			
	SNMX	120512-JM	12.7	6.35		1.2	0.12-0.38	0.20-10.00	▲	△	△		▲	△		
		120520-JM	12.7	6.35		2.0	0.12-0.38	0.20-10.00	▲		▲		▲	▲		
	SNMX	120512-JR	12.7	6.35		1.2	0.12-0.40	0.20-10.00	▲	△	△		▲			
		120520-JR	12.7	6.35		2.0	0.12-0.40	0.20-10.00	▲		▲		△	▲		
	SNGX	120512-JM	12.7	6.35		1.2	0.12-0.38	0.20-10.00	▲	△	▲	▲	▲	△		

Processing materials		Processing conditions	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
P	Steel	● Stable cutting	●	●	✱					
M	Stainless steel	◐ General cutting	◐	◐	✱	◐				
K	Cast iron	✱ Unstable cutting					◐	◐		
N	Non-ferrous alloys									
S	High temperature alloys		◐	◐		◐				
H	Hardened steel									

△ General stock ▲ Regular srock

SNMX/SNGX-ANN Inserts

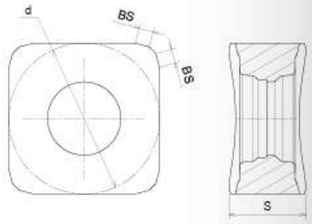


Insert	Designation		Dimension				Cutting parameter		Grade							
			d	S	BS	r	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	SNMX	1205ANN-JL	12.7	6.35	1.6		0.15-0.35	0.20-6.50	▲	△			▲			
	SNGX	1205ANN-JL	12.7	6.35	1.6		0.15-0.35	0.20-6.50	▲			▲	▲			
	SNMX	1205ANN-JM	12.7	6.35	1.6		0.15-0.38	0.20-6.50	▲	△	▲		▲	△		
	SNGX	1205ANN-JM	12.7	6.35	1.6		0.15-0.38	0.20-6.50	▲	△		▲	▲	▲		
	SNMX	1205ANN-JR	12.7	6.35	1.6		0.15-0.40	0.20-6.50	▲		▲		△	▲		
	SNGX	1205ANN-JR	12.7	6.35	1.6		0.15-0.40	0.20-6.50	▲		△		△			

Processing materials		Processing conditions	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
P	Steel	● Stable cutting	●	●	✱					
M	Stainless steel	◐ General cutting	◐	◐	✱	◐				
K	Cast iron	✱ Unstable cutting					◐	◐		
N	Non-ferrous alloys									
S	High temperature alloys		◐	◐	✱	◐				
H	Hardened steel									

△ General stock ▲ Regular srock

SNGX-ENN Inserts

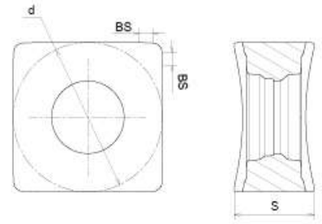


Insert	Designation		Dimension				Cutting parameter		Grade							
			d	S	BS	r	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	SNGX	1205ENN-JL	12.7	6.35	1.2		0.10-0.27	0.20-8.00	▲	△		△	▲	▲		
	SNGX	1205ENN-JM	12.7	6.35	1.2		0.12-0.30	0.20-8.00	▲	△	▲		▲	▲		
	SNGX	1205ENN-JR	12.7	6.35	1.2		0.12-0.33	0.20-8.00	▲	△	▲		▲	▲		

Processing materials		Processing conditions	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
P	Steel	● Stable cutting	●	●						
M	Stainless steel	● General cutting	●	●	✖	●				
K	Cast iron	✖ Unstable cutting						●		
N	Non-ferrous alloys									
S	High temperature alloys		●	●	✖					
H	Hardened steel									

△ General stock ▲ Regular srock

SNMX/SNGX-ZNN Inserts



Insert	Designation		Dimension				Cutting parameter		Grade							
			d	S	BS	r	fz (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
	SNMX	1205ZNN-JM	12.7	6.35	1.2		0.12-0.27	0.20-10.0	▲		▲		▲			
	SNGX	1205ZNN-JL	12.7	6.35	1.2		0.10-0.24	0.20-10.0	▲				▲	▲		
	SNGX	1205ZNN-JM	12.7	6.35	1.2		0.12-0.27	0.20-10.0	▲		▲		▲	▲		
	SNGX	1205ZNN-JR	12.7	6.35	1.2		0.12-0.30	0.20-10.0	▲		▲		▲	▲		

Processing materials		Processing conditions	WT5025	WT5030	WT5035	WT3330	WT7020	WT4020	WT3010	WT3020
P	Steel	● Stable cutting	●	●	✖					
M	Stainless steel	● General cutting	●	●	✖					
K	Cast iron	✖ Unstable cutting						●		
N	Non-ferrous alloys									
S	High temperature alloys		●	●						
H	Hardened steel									

△ General stock ▲ Regular srock

Milling cutter

Face Milling Cutter Designation System

J	FM	75		-	6	80	-	27	R	-	SE12	-	C
1	2	3	4	-	5	6	-	7	8	-	9	-	10

1 - Brand

WORLDIA

2 - Milling type

FM: Face milling
SM: Square shoulder milling
DM: Groove side and face machining
TM: Thread milling

3 - Entering angle

90=90°
45=45°
60=60°
75=75°
R: Round shape insert

4 - Clamping method

Unmarked: Screw clamp
W: Wedge clamp
S: Tool holder

5 - Teeth number

6=6teeth
8=8teeth

6 - Diameter

40=40mm
160=160mm

7 - Connection method

numerical: arbor
value: side retaining
W
C value: cylindrical handle
M value: screw connection

8 - Feed direction

R: Right
L: Left

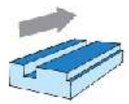
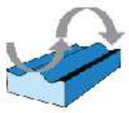
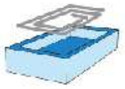
9 - Insert information

SE12: SE12 insert

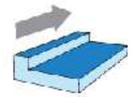
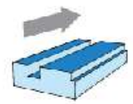
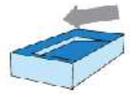
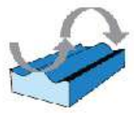
10 - Remarks

C: Internal cooling
Unmarked: No internal cooling

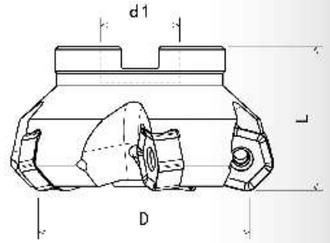
Face Mills Selecton Guide

Series			JFM45-HN09	JFM42-OD06	JFM45-ON05	JFM45-ON08
Page			M24	M25	M26	M27
Approach angle			45°	42°	45°	45°
Maximum cutting depth(mm)			6	4.5	3.5	5.5
Diameter range(mm)			D63-200	D50-160	D50-160	D63-160
Insert			HN..09	OD..0605	ON..05	ON..08
Application	Face milling		●	●	●	●
	Shoulder milling					
	Slot milling					
	Straight ramping			●		
	Helical in ramping			●		
	Profile milling					
	Chamfer milling			●		
	Step down			●		

Face Mills Selection Guide

Series			JFM45-SN12	JFM75-SN12	JFM88-SN12
Page			M28	M29	M30
Approach angle			45°	75°	88°
Maximum cutting depth(mm)			6.5	8.0	10.0
Diameter range(mm)			D50-160	D50-160	D50-160
Insert			SN_X 1205ANN SN_X 1205…	SN_X 1205ENN SN_X 1205…	SN_X 1205ZNN SN_X 1205…
Application	Face milling		●	●	●
	Shoulder milling				
	Slot milling				
	Straight ramping				
	Helical in ramping				
	Profile milling				
	Chamfer milling				
	Step down				

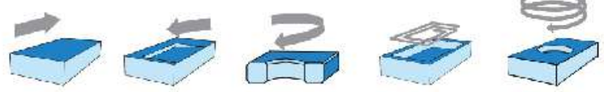
JFM45-HN09

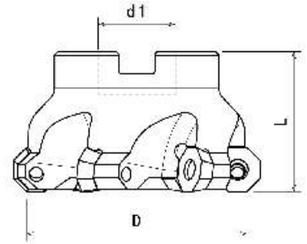


Designation	D	d1	L	ap(max)	Z	Insert
JFM45-450-22R-HN09	50	22	40	6	4	HN...09
JFM45-663-22R-HN09	63	22	40	6	6	
JFM45-680-27R-HN09	80	27	50	6	6	
JFM45-880-27R-HN09	80	27	50	6	8	
JFM45-6100-32R-HN09	100	32	50	6	6	
JFM45-8100-32R-HN09	100	32	50	6	8	
JFM45-10100-32R-HN09	100	32	50	6	10	
JFM45-8125-40R-HN09	125	40	63	6	8	
JFM45-10125-40R-HN09	125	40	63	6	10	
JFM45-12125-40R-HN09	125	40	63	6	12	
JFM45-8160-40R-HN09	160	40	63	6	8	
JFM45-12160-40R-HN09	160	40	63	6	12	
JFM45-14160-40R-HN09	160	40	63	6	14	
JFM45-10200-60R-HN09	200	60	63	6	10	
JFM45-12200-60R-HN09	200	60	63	6	12	
JFM45-14200-60R-HN09	200	60	63	6	14	

Dimension	Components		
Diameter	Screw type	Spanner type	Torsion
D63-200			5.0 Nm
	JS045120	T20	

JFM42-OD06

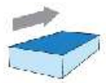


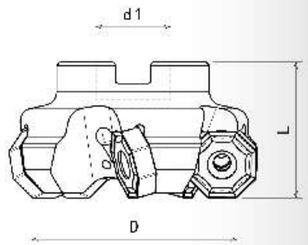


Designation	D	d1	L	ap(max)	Z	Insert
JFM42-450-22R-OD06	50	22	40	4.5	4	OD..0605
JFM42-563-22R-OD06	63	22	40	4.5	5	
JFM42-580-27R-OD06	80	27	50	4.5	5	
JFM42-680-27R-OD06	80	27	50	4.5	6	
JFM42-6100-32R-OD06	100	32	50	4.5	6	
JFM42-7100-32R-OD06	100	32	50	4.5	7	
JFM42-7125-40R-OD06	125	40	63	4.5	7	
JFM42-8125-40R-OD06	125	40	63	4.5	8	
JFM42-10160-40R-OD06	160	40	63	4.5	10	

Dimension	Components		
Diameter	Screw type	Spanner type	Torsion
D50-160			5.0 Nm
	JS050120	T20	

JFM45-ON05

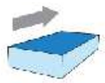


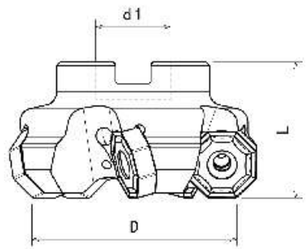


Designation	D	d1	L	ap(max)	Z	Insert
JFM45-450-22R-ON05	50	22	40	3.5	4	
JFM45-650-22R-ON05	50	22	40	3.5	6	
JFM45-463-22R-ON05	63	22	40	3.5	4	
JFM45-663-22R-ON05	63	22	40	3.5	6	
JFM45-863-22R-ON05	63	22	40	3.5	8	
JFM45-780-27R-ON05	80	27	50	3.5	7	
JFM45-1080-27R-ON05	80	27	50	3.5	10	ON..05
JFM45-8100-32R-ON05	100	32	50	3.5	8	
JFM45-12100-32R-ON05	100	32	50	3.5	12	
JFM45-6125-40R-ON05	125	40	63	3.5	6	
JFM45-10125-40R-ON05	125	40	63	3.5	10	
JFM45-16125-40R-ON05	125	40	63	3.5	16	
JFM45-12160-40R-ON05	160	40	63	3.5	12	

Dimension	Components		
Diameter	Screw type	Spanner type	Torsion
D50-160			3.5Nm
	JS040090	T15	

JFM45-ON08

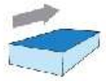


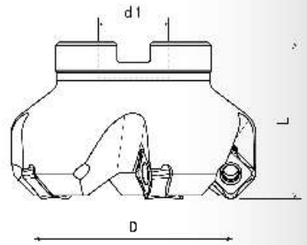


Designation	D	d1	L	ap(max)	Z	Insert
JFM45-563-27R-ON08	63	22	40	5.5	5	
JFM45-680-27R-ON08	80	27	50	5.5	6	
JFM45-880-27R-ON08	80	27	50	5.5	8	
JFM45-7100-32R-ON08	100	32	50	5.5	7	
JFM45-10100-32R-ON08	100	32	50	5.5	10	ON..08
JFM45-8125-40R-ON08	125	40	63	5.5	8	
JFM45-12125-40R-ON08	125	40	63	5.5	12	
JFM45-10160-40R-ON08	160	40	63	5.5	10	
JFM45-15160-40R-ON08	160	40	63	5.5	15	

Dimension	Components		
Diameter	Screw type	Spanner type	Torsion
D63-160			5.0Nm
	JS050120	T20	

JFM45-SN12

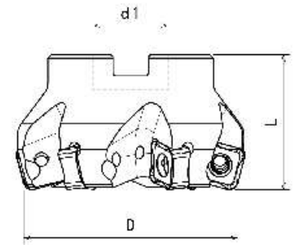




Designation	D	d1	L	ap(max)	Z	Insert
JFM45-450-22R-SN12	50	22	40	6.5	4	
JFM45-463-22R-SN12	63	22	40	6.5	4	
JFM45-663-22R-SN12	63	22	40	6.5	6	
JFM45-580-27R-SN12	80	22	50	6.5	5	
JFM45-780-27R-SN12	80	27	50	6.5	7	SN_X 1205ANN
JFM45-6100-32R-SN12	100	27	50	6.5	6	SN_X 1205…
JFM45-8100-32R-SN12	100	32	50	6.5	8	
JFM45-8125-40R-SN12	125	32	63	6.5	8	
JFM45-10125-40R-SN12	125	40	63	6.5	10	
JFM45-10160-40R-SN12	160	40	63	6.5	10	

Dimension	Components		
Diameter	Screw type	Spanner type	Torsion
D50-160			5.0Nm
	JS050120	T20	

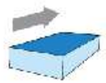
JFM75-SN12

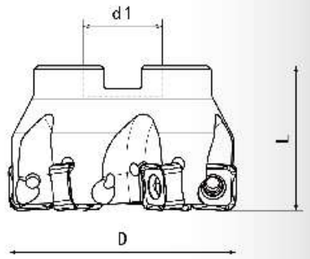


Designation	D	d1	L	ap(max)	Z	Insert
JFM75-450-22R-SN12	50	22	40	8.0	4	
JFM75-563-22R-SN12	63	22	40	8.0	5	
JFM75-780-27R-SN12	80	27	50	8.0	7	SN_X 1205ENN
JFM75-8100-32R-SN12	100	32	50	8.0	8	SN_X 1205…
JFM75-10125-40R-SN12	125	40	63	8.0	10	
JFM75-10160-40R-SN12	160	40	63	8.0	10	

Dimension	Components		
Diameter	Screw type	Spanner type	Torsion
D50-160			5.0Nm
	JS050120	T20	

JFM88-SN12

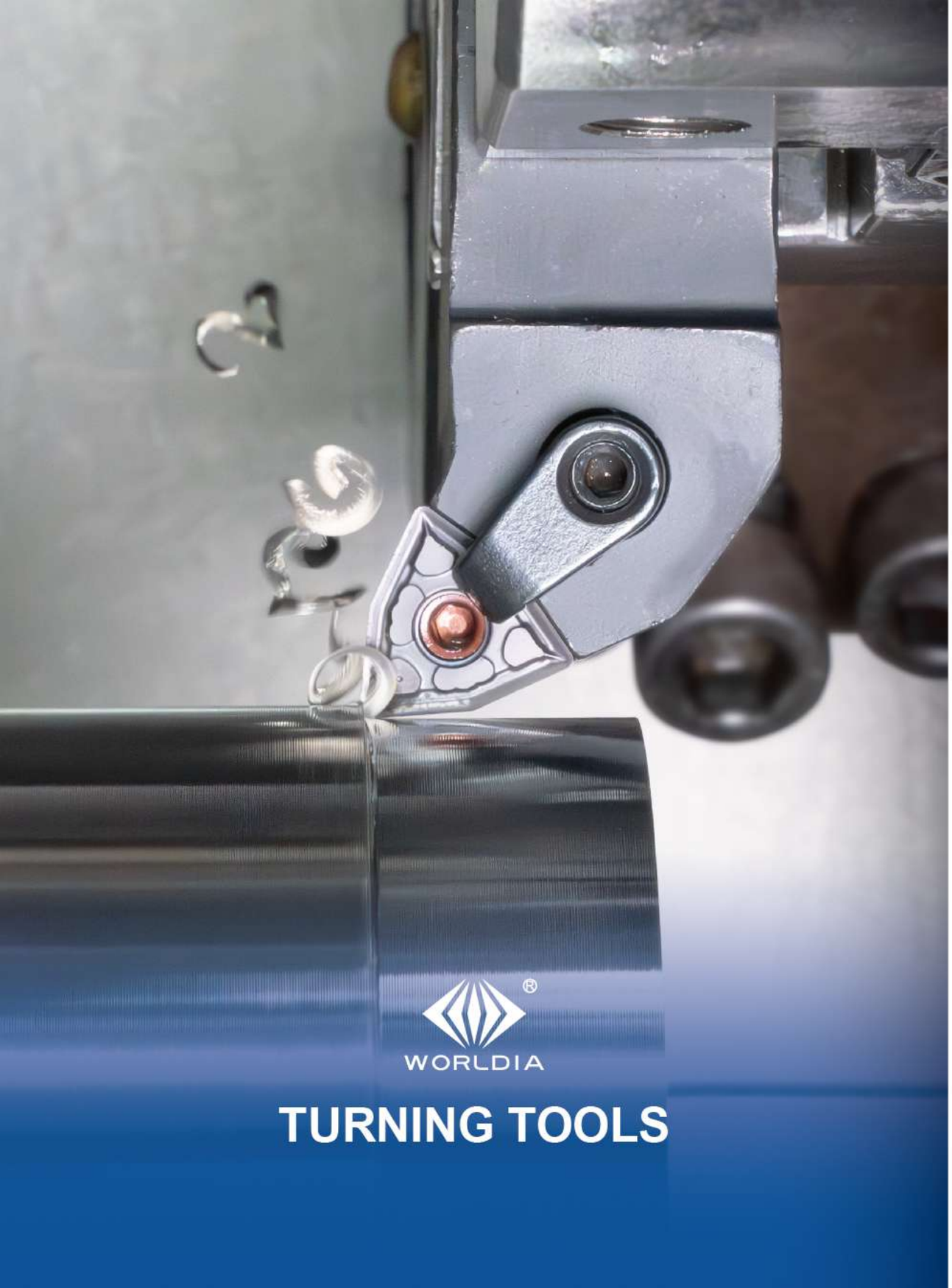




Designation	D	d1	L	ap(max)	Z	Insert
JFM88-450-22R-SN12	50	22	40	10.0	4	SN_X 1205ZNN SN_X 1205…
JFM88-463-22R-SN12	63	22	40	10.0	4	
JFM88-663-22R-SN12	63	22	40	10.0	6	
JFM88-580-27R-SN12	80	27	50	10.0	5	
JFM88-780-27R-SN12	80	27	50	10.0	7	
JFM88-8100-32R-SN12	100	32	50	10.0	8	
JFM88-10100-32R-SN12	100	32	50	10.0	10	
JFM88-10125-40R-SN12	125	40	63	10.0	10	
JFM88-13125-40R-SN12	125	40	63	10.0	13	
JFM88-12160-40R-SN12	160	40	63	10.0	12	

Dimension	Components		
Diameter	Screw type	Spanner type	Torsion
D50-160			5.0Nm
	JS050120	T20	

WORLDIA®



TURNING TOOLS

CONTENTS

Turning Inserts

Turning Insert Designation System

C	N	M	G	
1	2	3	4	Space

1 - Shape

A	B	C	D	E
85°	82°	80°	55°	75°
H	**K**	**L**	**M**	**O**
120°	55°	90°	86°	135°
P	**R**	**S**	**T**	**V**
108°	360°	90°	60°	35°
W	**Z**			
80°	others			

2 - Insert clearance angle

A	B	C	D
3°	5°	7°	15°
E	**F**	**G**	**N**
20°	25°	30°	0°
P	**O**		
11°	others		

3 - Tolerance

Grade	Unit	d	m	s
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	± 0.130
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

* See table at right and below

Shape: C, E, H, M, O, P, S, T, R, W

IC	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	± 0.20
12.7	± 0.08	± 0.13	± 0.13	± 0.20
15.875	± 0.10	± 0.18	± 0.15	± 0.27
16	± 0.10	± 0.18	± 0.15	± 0.27
19.05	± 0.10	± 0.18	± 0.15	± 0.27
20	± 0.10	± 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	± 0.20	± 0.38
32	± 0.15	± 0.25	± 0.20	± 0.38

M&N grade	D shape		V shape	
IC	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	± 0.20
15.875	± 0.10	± 0.18	± 0.10	± 0.27
19.05	± 0.10	± 0.18	± 0.10	± 0.27

4 - Type

A	G	H	M	N
Q	**T**	**U**	**W**	**X**
	40°-60°	40°-60°	40°-60°	others

12	04	08		-	FS
5	6	7	8	-	9

5 - Cutting edge length

Diameter of internal tangent circle (mm)	Insert shape							
	C	D	R	S	T	V	W	K
3.97					06			
5.0			05					
5.56					09			
6.0			06					
6.35	06	07			11	11		
8.0			08					
9.525	09	11	09	09	16	16	06	16
10.0			10					
12.0			12					
12.7	12	15		12	22	22	08	
15.875	16		15	15	27			
16.0			16					
19.05	19		19	19	33			
20.0			20					
25.0			25					
25.4	25		25	25				
31.75								
32.0			32					

6 - Thinkness

Add 0 or T before rounding down

A, B, C, N, O, W,

H, M, R, T,

F, G, J, U,

Example :
01 = 1.59mm
T1 = 1.98mm
02 = 2.38mm
03 = 3.18mm
T3 = 3.97mm
04 = 4.76mm
05 = 5.56mm
06 = 6.35mm
07 = 7.94mm
09 = 9.52mm
11 = 11.11mm
12 = 12.70mm
14 = 14.29mm
15 = 15.88mm

7 - Cutting edge corner

Corner radius

MO = round insert (metric)

00 = Sharp	24 = 2.4
01 = 0.1	28 = 2.8
02 = 0.2	31 = 3.1
04 = 0.4	40 = 4.0
08 = 0.8	48 = 4.8
12 = 1.2	56 = 5.6
16 = 1.6	64 = 6.4
20 = 2.0	X = Others

Wiper corner

Entering angle(kr)	Relief angle(αn)
A = 45°	A = 3°
D = 60°	B = 5°
E = 75°	C = 7°
F = 85°	D = 15°
G = 87°	E = 20°
P = 90°	F = 25°
Z = Others	G = 30°
	N = 0°
	P = 11°
	Z = Others

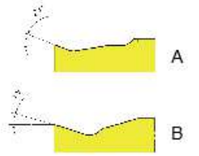
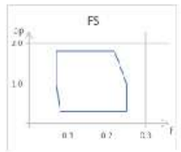
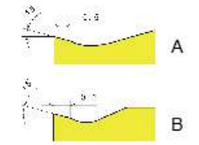
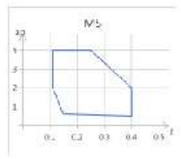
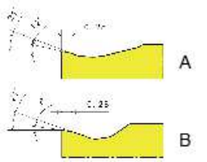
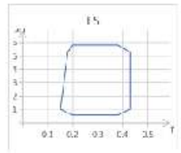
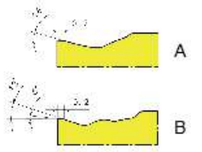
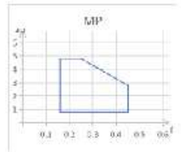
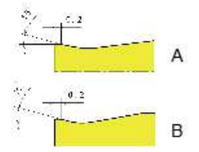
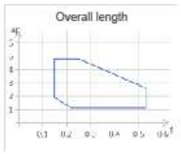
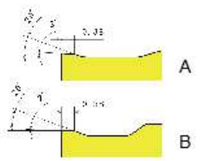
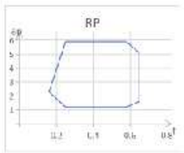
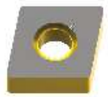
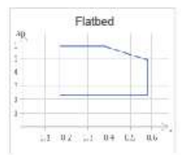
8 - Cutting edge design

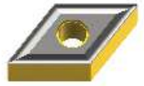
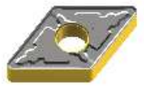
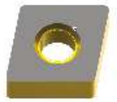
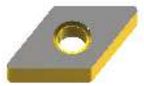
Names	Photo	Clarification
F		Sharp cutting edge
E		Rounded cutting edges
T		Negative chamfer
S		Negative chamfering and filleting of cutting edges

9 - Information about chip breakers

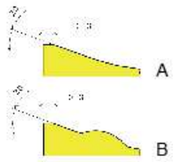
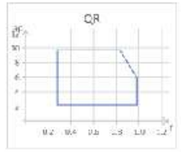
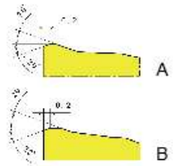
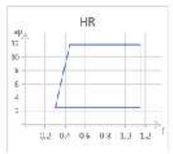
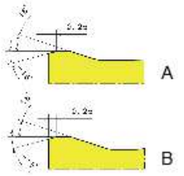
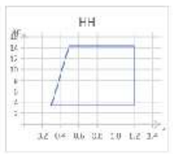
Refer to page T04-T06

Chipbareaker Of Negative Inserts

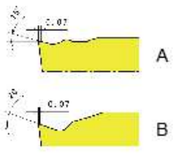
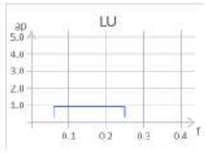
Application	Chip breaker		Geometric angle	Cutting range	Application and features
Finishing	FS				• Finishing of exotic materials • Positive rake geometry to minimize cutting force • Excellent chip control and excellent surface roughness after machining
Semi-finishing	MS				• Semi-finishing of exotic materials, stainless steel • Double rake geometry,sharp cutting edge and low cutting force
Medium processing	ES				• Medium machining stainless steel, high temperature alloys, mild steel • For general machining, low cutting force
	MP				• Medium machining of steel • Excellent chip control and evacuation due to the specially designed chip breaker geometry • Double rake geometry and low cutting force
	Overall length				• Medium machining of cast iron, carbon steel and alloy steel • Strong cutting edge
Roughing	RP				• Roughing of steel • Excellent chip control due to the specially designed chipbreaker geometry for small depth machining • Strong cutting, stable rough machining
	Flatbed				• Roughing of cast iron • For interrupt and unstable machining applications

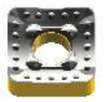
CNMG-FS	DNMG-FS	SNMG-FS	TNMG-FS	VNMG-FS	WNMG-FS
					
T10	T13	T15	T18	T19	T20
CNMG-MS	DNMG-MS	SNMG-MS	TNMG-MS	VNMG-MS	WNMG-MS
					
T10	T13	T15	T18	T19	T20
CNMG-ES	DNMG-ES	SNMG-ES	TNMG-ES	VNMG-ES	WNMG-ES
					
T10	T13	T15	T18	T19	T20
CNMG-MP	DNMG-MP	SNMG-MP	TNMG-MP	VNMG-MP	WNMG-MP
					
T10	T13	T15	T18	T19	T20
CNMG-	DNMG-	SNMG-	TNMG-	VNMG-	WNMG-
					
T10	T14	T15	T18	T19	T20
CNMG-RP	DNMG-RP	SNMG-RP			WNMG-RP
					
T11	T14	T16			T20
CNMA	DNMA	SNMA	TNMA		WNMA
					
T11	T14	T16	T18		T20

Chipbareaker Of Negative Inserts

Application	Chip breaker		Geometric angle	Cutting range	Application and features
Heavy roughing	QR		 A B		• Heavy roughing of steel, stainless steel and cast iron • Positive rake geometry credit to low cutting force • For low horse power machines and slender workpiece machining
	HR		 A B		• Heavy roughing of steel • Wide groove and several dimples for high feed • Low cutting force and excellent chip control due to wave cutting edge
	HH		 A B		• Heavy roughing of steel • Large land angle and straight cutting edge • For large depth of cut and high feed machining of big dimension ring workpiece

Chipbareaker Of Positive Inserts

Application	Chip breaker		Geometric angle	Cutting range	Application features
Finishing	LU		 A B		• For finishing semi-finishing of high temperature alloys, stainless steel, steel • Low cutting force, good chip control

CNMM-QR  T11		SNMM-QR  T16			
CNMM-HR  T12		SNMM-HR  T16			
CNMM-HH  T12		SNMM-HH  T17			

CCMT-LU  T21	DCMT-LU  T22	SCMT-LU  T23	TCMT-LU  T24	VCMT-LU  T25	

ISO Application Range

ISO application range of Turning insert grades

Material Group	Materials	ISO	PVD coated						CVD coated				
			WT5015	WT5025	WT5030	WT5035	WT3310	WT3330	WT8010	WT8020	WT8030	WT4015	WT4020
P	Unalloyed steel, alloyed steel	P01											
		P05	WT5015						WT8010				
		P10	WT5015						WT8010	WT8020			
		P15	WT5015						WT8010	WT8020	WT8030		
		P20	WT5015						WT8010	WT8020	WT8030		
		P25				WT5035				WT8020	WT8030		
		P30				WT5035				WT8020	WT8030		
		P35				WT5035				WT8020	WT8030		
		P40				WT5035					WT8030		
		P45				WT5035					WT8030		
		P50				WT5035					WT8030		
M	Stainless steel	M01											
		M05	WT5015				WT3310						
		M10	WT5015				WT3310						
		M15	WT5015	WT5025	WT5030		WT3310	WT3330					
		M20	WT5015	WT5025	WT5030		WT3310	WT3330					
		M25		WT5025	WT5030	WT5035	WT3310	WT3330					
		M30		WT5025	WT5030	WT5035	WT3310	WT3330					
		M35		WT5025	WT5030	WT5035	WT3310	WT3330					
		M40		WT5025	WT5030	WT5035	WT3310	WT3330					
		M45		WT5025	WT5030	WT5035	WT3310	WT3330					
K	Cast iron	K01											
		K05											
		K10										WT4015	WT4020
		K15										WT4015	WT4020
		K20										WT4015	WT4020
		K25										WT4015	WT4020
		K30										WT4015	WT4020
		K35										WT4015	WT4020
		K40										WT4015	WT4020
		K45										WT4015	WT4020
S	High temperature alloy	S01											
		S05	WT5015				WT3310						
		S10	WT5015				WT3310						
		S15	WT5015	WT5025	WT5030		WT3310	WT3330					
		S20	WT5015	WT5025	WT5030		WT3310	WT3330					
		S25		WT5025	WT5030		WT3310	WT3330					
		S30		WT5025	WT5030		WT3310	WT3330					
		S35		WT5025	WT5030		WT3310	WT3330					
		S40			WT5030								
		S45			WT5030								
N	Non-ferrous alloy	N01											
		N05											
		N10											
		N15											
		N20											
		N25											
		N30											
H	Hardened steel, cold cast iron	H01											
		H05											
		H10											
		H15											
		H20											
		H25											
		H30											

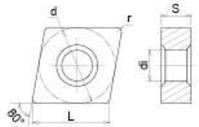
PVD Coated Carbide Grades

Grade	Appearance	Range	Characteristics & applications
WT5015	Black brown	M05-M20 S05-S20 P05-P20	• Submicron substrate • For stable machining of stainless steel • For finishing of high temperature alloy and hardened steel
WT5025	Black brown	M15-M35 S15-S35	• Submicron substrate • For general machining of stainless steel and high temperature alloy
WT5030	Golden yellow	M15-M40 S15-S40	• Submicron substrate • For general stable machining of stainless steel and high temperature alloy
WT5035	Grey black	M25-M45 P25-P45	• Tough carbide substrate and excellent toughness • For roughing of stainless steel and steel
WT3310	Bronze	S05-S20 M05-M20	• Submicron substrate and excellent wear resistance • For finishing of high temperature alloy and stainless steel
WT3330	Bronze	S15-S35 M15-M35	• Submicron substrate and good wear resistance • For general machining of high temperature alloy and stainless steel

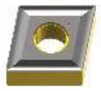
CVD Coated Carbide Grades

Grade	Appearance	Range	Characteristics & applications
WT8010	Two-coloured	P05-P15	• Tough substrate for steel machining • For high speed and continuous cutting application
WT8020	Two-coloured	P10-P25	• Tough substrate for steel machining • For light interrupted cutting application
WT8030	Two-coloured	P15-P35	• Tough substrate for steel machining • For general machining application
WT4015	Two-coloured	K10-K30	• Tough carbide substrate for cast iron machining • For high speed turning of gray cast iron
WT4020	Two-coloured	K15-K35	• Tough carbide substrate for gray & ductile cast iron and alloy cast iron • For general machining application

Negative 80°Rhombic Inserts



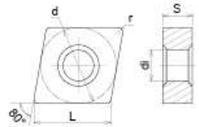
Dimension(mm)				
Type	d	L	S	di
CN_1204_	12.7	12.9	4.76	5.16
CN_1606_	15.87	16.1	6.35	6.35
CN_1906_	19.05	19.3	6.35	7.94

Insert		Designation		Cutting parameter		Grade										
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		CNMG	120404-FS	0.05-0.15	0.50-1.50				▲		△				▲	▲
			120408-FS	0.10-0.30	0.70-1.50				▲	▲	△				▲	▲
Semi-finishing		CNMG	120404-MS	0.10-0.25	0.80-3.50				▲	▲	△				△	△
			120408-MS	0.10-0.30	1.00-3.50				▲	▲	△	△			△	△
			120412-MS	0.15-0.30	1.30-3.50				▲	▲	△	△			△	△
Medium processing		CNMG	120404-ES	0.08-0.20	0.40-4.50				▲	▲	△	△			▲	▲
			120408-ES	0.15-0.40	0.80-4.50				▲	▲	△	△			▲	▲
			120412-ES	0.20-0.50	1.20-4.50				▲	▲	△	△			▲	▲
			160612-ES	0.20-0.50	1.20-5.50					▲		△				
			160616-ES	0.30-0.60	1.60-5.50					▲		△				
			190612-ES	0.20-0.50	1.20-6.50					▲						
			190616-ES	0.30-0.60	1.60-5.50											
		CNMG	120404-MP	0.08-0.20	0.40-4.50	▲		▲								
			120408-MP	0.15-0.40	0.80-4.50	▲	▲	▲								
			120412-MP	0.20-0.50	1.20-4.50	▲	▲	▲								
			160608-MP	0.15-0.40	0.80-5.50	▲		▲								
			160612-MP	0.20-0.50	1.20-5.50	▲		▲								
			190608-MP	0.15-0.40	0.80-6.50	▲		▲								
		CNMG	120404	0.08-0.20	0.40-4.50								▲	▲		
			120408	0.15-0.40	0.80-4.50								▲	▲		
			120412	0.20-0.50	1.20-4.50								▲	▲		
			160612	0.20-0.50	1.20-5.50								▲	△		
			160616	0.30-0.60	1.60-5.50								▲	△		
			190612	0.20-0.50	0.80-6.50								▲	△		

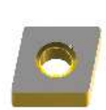
Processing materials			Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
	P	Steel	● Stable cutting	●	●	◐								
	M	Stainless steel	◐ General cutting				●	◐	◐	✠			●	◐
	K	Cast iron	✠ Unstable cutting								●	◐		
	N	Non-ferrous alloys												
	S	High temperature alloys												
	H	Hardened steel												

△ General stock ▲ Regular srock

Negative 80°Rhombic Inserts



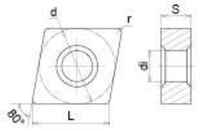
Dimension(mm)				
Type	d	L	S	di
CN_1204_	12.7	12.9	4.76	5.16
CN_1606_	15.87	16.1	6.35	6.35
CN_1906_	19.05	19.3	6.35	7.94
CN_2507_	25.4	25.8	7.94	9.12
CN_2509_	25.4	25.8	9.53	9.12

Insert		Designation		Cutting parameter		Grade										
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Roughing		CNMG	120408-RP	0.20-0.60	1.20-6.00	▲	△	▲								
			120412-RP	0.30-0.70	1.80-6.00	▲	△	▲								
			160612-RP	0.30-0.70	1.80-7.00	▲		▲								
			160616-RP	0.40-0.85	2.40-7.00	▲		▲								
			160624-RP	0.60-1.00	3.60-7.00	▲		▲								
			190612-RP	0.30-0.70	1.80-9.00	▲	△	▲								
			190616-RP	0.40-0.85	2.40-9.00	▲	△	▲								
		CNMA	120404	0.10-0.30	0.60-6.00								▲			
			120408	0.20-0.60	1.20-6.00								▲	△		
			120412	0.30-0.70	1.80-6.00								▲	△		
			120416	0.40-0.85	2.40-6.00								▲			
			160608	0.20-0.60	1.20-7.00								▲			
			160612	0.30-0.70	1.80-7.00								▲			
			160616	0.40-0.85	2.40-7.00								▲			
			160620	0.50-0.95	3.00-7.00								▲			
			190608	0.20-0.60	1.20-9.00								▲			
			190612	0.30-0.70	1.80-9.00								▲			
			190616	0.40-0.85	2.40-9.00								▲			
Heavy roughing		CNMM	190612-QR	0.25-0.50	2.20-7.70	▲		△								
			190616-QR	0.30-0.60	3.00-7.70	▲	△	▲								
			190624-QR	0.50-1.00	4.50-7.70	△	△	▲								
			250724-QR	0.50-1.00	5.00-10.50			△								
			250924-QR	0.50-1.00	5.00-10.50	△	△	▲								

Processing materials			Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
	P	Steel	● Stable cutting	●	●	◐								
	M	Stainless steel	◐ General cutting											
	K	Cast iron	✠ Unstable cutting								●	◐		
	N	Non-ferrous alloys												
	S	High temperature alloys												
	H	Hardened steel												

△ General stock ▲ Regular srock

Negative 80°Rhombic Inserts



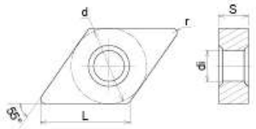
Dimension(mm)				
Type	d	L	S	di
CN_1906_	19.05	19.3	6.35	7.94
CN_2507_	25.4	25.8	7.94	9.12
CN_2509_	25.4	25.8	9.53	9.12

Insert		Designation		Cutting parameter		Grade								
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Heavy roughing		CNMM	190612-HR	0.25-0.50	2.50-9.00	▲		△								
			190616-HR	0.30-0.60	3.50-9.00	▲	△	▲								
			190624-HR	0.50-1.00	4.50-9.00	△	△	▲								
			250724-HR	0.50-1.00	4.50-12.00			△								
			250924-HR	0.50-1.00	4.50-12.00	△	△	▲								
		CNMM	190616-HH	0.30-0.60	3.50-12.00	△		▲								
			190624-HH	0.50-1.00	4.50-12.00	▲		▲								
			250724-HH	0.50-1.00	5.00-15.00			▲								
			250924-HH	0.50-1.00	5.00-15.00	▲		▲								

Processing materials		Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
P	Steel	● Stable cutting	●	●	◕								
M	Stainless steel	◕ General cutting											
K	Cast Iron	✠ Unstable cutting											
N	Non-ferrous alloys												
S	High temperature alloys												
H	Hardened steel												

△ General stock ▲ Regular srock

Negative 55°Rhombic Inserts



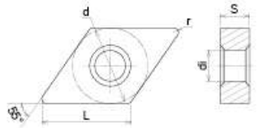
Dimension(mm)				
Type	d	L	S	di
DN_1104_	9.52	11.62	4.76	3.81
DN_1504_	12.7	15.5	4.76	5.16
DN_1506_	12.7	15.5	6.35	5.16

Insert		Designation		Cutting parameter		Grade								
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		DNMG	150404-FS	0.05-0.15	0.30-2.50				▲						▲	
			150408-FS	0.10-0.30	0.50-2.50				▲	▲					▲	△
			150604-FS	0.05-0.15	0.30-2.50				▲						▲	
			150608-FS	0.10-0.30	0.50-2.50				▲	▲					▲	△
Semi-finishing		DNMG	110408-MS	0.13-0.35	0.30-2.50				▲	▲	△				▲	▲
			150404-MS	0.06-0.18	0.60-3.00				▲	▲						▲
			150408-MS	0.13-0.35	0.80-3.00				▲	▲	△				▲	▲
			150412-MS	0.20-0.40	1.00-3.00					▲						▲
			150604-MS	0.06-0.18	0.60-3.00				▲	▲						▲
			150608-MS	0.13-0.35	0.80-3.00				▲	▲	△				▲	▲
			150612-MS	0.20-0.40	1.00-3.00					▲						▲
Medium processing		DNMG	150404-ES	0.08-0.20	0.40-4.00				▲		△	△			▲	▲
			150408-ES	0.15-0.40	0.80-4.00				▲	▲	△	△			▲	▲
			150412-ES	0.25-0.50	1.20-4.00				▲	▲	△	△				
			150604-ES	0.08-0.20	0.40-4.00				▲						▲	▲
			150608-ES	0.15-0.40	0.80-4.00				▲	▲	△	△			▲	▲
			150612-ES	0.25-0.50	1.20-4.00				▲	▲	△	△				
		DNMG	110404-MP	0.08-0.20	0.40-3.00	△		▲								
			110408-MP	0.15-0.40	0.80-3.00	△	▲	▲								
			150404-MP	0.08-0.20	0.40-4.00	▲		▲								
			150408-MP	0.15-0.40	0.80-4.00	▲	▲	▲								
			150412-MP	0.25-0.50	1.20-4.00	△		▲								
			150604-MP	0.08-0.20	0.40-4.00	△		▲								
			150608-MP	0.15-0.40	0.80-4.00	▲	▲	▲								
			150612-MP	0.25-0.50	1.20-4.00	△										

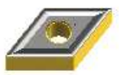
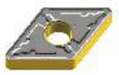
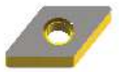
Processing materials		Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
P	Steel	● Stable cutting	●	●	◕								
M	Stainless steel	◕ General cutting				●	◕	◕	✠			●	◕
K	Cast Iron	✠ Unstable cutting											
N	Non-ferrous alloys												
S	High temperature alloys												
H	Hardened steel												

△ General stock ▲ Regular srock

Negative 55°Rhombic Inserts



Dimension(mm)				
Type	d	L	S	di
DN_1504_	12.7	15.5	4.76	5.16
DN_1506_	12.7	15.5	6.35	5.16

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Medium processing		DNMG	150404	0.08-0.20	0.40-4.00								△	▲		
			150408	0.15-0.40	0.80-4.00								▲	▲		
			150412	0.25-0.50	1.20-4.00								▲	△		
			150604	0.08-0.20	0.40-4.00								△	▲		
			150608	0.15-0.40	0.80-4.00								▲	▲		
			150612	0.25-0.50	1.20-4.00								▲	△		
Roughing		DNMG	150408-RP	0.20-0.60	1.20-4.00	▲	△	▲								
			150412-RP	0.30-0.90	1.80-4.00	▲	△	▲								
			150416-RP	0.40-1.20	2.40-4.00	△		▲								
			150608-RP	0.20-0.60	1.20-4.00	▲	△	▲								
			150612-RP	0.30-0.90	1.80-4.00	▲	△	▲								
			150616-RP	0.40-1.20	2.40-4.50	△		▲								
		DNMA	150404	0.10-0.30	0.60-5.50								△			
			150408	0.20-0.60	1.20-5.50								▲	△		
			150412	0.30-0.90	1.80-5.50								▲			
			150604	0.10-0.30	0.60-5.50								△			
			150608	0.20-0.60	1.20-5.50								▲	△		
			150612	0.30-0.90	1.80-5.50								▲			

Processing materials		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous alloys	
S	High temperature alloys	
H	Hardened steel	

Processing conditions

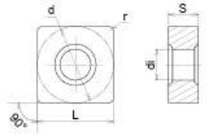
● Stable cutting

◕ General cutting

✠ Unstable cutting

△ General stock ▲ Regular srock

Negative Square Inserts



Dimension(mm)				
Type	d	L	S	di
SN_1204_	12.7	12.7	4.76	5.16
SN_1506_	15.87	15.87	6.35	6.35
SN_1906_	19.05	19.05	6.35	7.94

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		SNMG	120404-FS	0.05-0.15	0.25-2.50				▲						▲	
			120408-FS	0.10-0.30	0.50-2.50				▲	△					▲	▲
Semi-finishing		SNMG	120404-MS	0.06-0.20	0.50-3.50				▲	▲					▲	▲
			120408-MS	0.10-0.35	0.60-3.50				▲	▲	△				▲	▲
			120412-MS	0.12-0.40	0.80-3.50				▲	▲	△				▲	▲
			120416-MS	0.15-0.45	1.00-3.50					△						
			150612-MS	0.12-0.40	0.60-4.00				△	▲						▲
			150616-MS	0.15-0.45	0.80-4.00				△	▲						▲
			190616-MS	0.15-0.45	1.00-4.00				△	▲						▲
Medium processing		SNMG	120408-ES	0.13-0.40	0.80-4.50						▲	△			▲	▲
			120412-ES	0.15-0.55	1.20-4.50					▲	▲	△			▲	▲
			150612-ES	0.15-0.55	1.20-5.50					▲	▲					
			150616-ES	0.20-0.60	1.60-5.50						▲					
			190612-ES	0.15-0.55	1.20-6.50					▲	▲					
		SNMG	120404-MP	0.08-0.25	0.40-4.00	△		▲								
			120408-MP	0.13-0.40	0.80-4.00	△	△	▲								
			120412-MP	0.15-0.55	1.20-4.00	▲	△	▲								
			150608-MP	0.13-0.40	1.20-5.50	▲		▲								
		SNMG	120404	0.08-0.25	0.40-4.50									▲		
			120408	0.13-0.40	0.80-4.50								▲	▲		
			120412	0.15-0.55	1.20-4.50								▲	▲		

Processing materials		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous alloys	
S	High temperature alloys	
H	Hardened steel	

Processing conditions

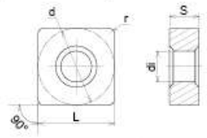
● Stable cutting

◕ General cutting

✠ Unstable cutting

△ General stock ▲ Regular srock

Negative Square Inserts

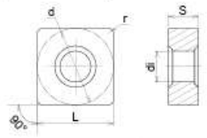


Dimension(mm)				
Type	d	L	S	di
SN_1204_	12.7	12.7	4.76	5.16
SN_1506_	15.87	15.88	6.35	6.35
SN_1906_	19.05	19.05	6.35	7.94
SN_2507_	25.4	25.4	7.94	9.12
SN_2509_	25.4	25.4	9.52	9.12

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Roughing		SNMG	150608-RP	0.20-0.60	1.20-6.50	△		▲								
			150612-RP	0.30-0.70	1.80-6.50	△		▲								
			150616-RP	0.40-0.80	2.40-6.50	△		▲								
			190612-RP	0.30-0.70	1.80-8.00	▲	△	▲								
			190616-RP	0.40-0.80	2.40-8.00	▲	△	▲								
		SNMA	120408	0.20-0.60	1.20-6.00								▲	△		
			120412	0.30-0.70	1.80-6.00								▲	△		
			120416	0.40-0.80	2.40-6.00								▲			
			150612	0.30-0.70	1.80-7.00								△			
			150616	0.40-0.80	2.40-7.00								△			
			190612	0.40-0.80	1.80-8.50								△			
			190616	0.40-1.20	2.40-8.50								△			
Heavy roughing		SNMM	150612-QR	0.25-0.65	2.20-6.50	△		▲								
			150616-QR	0.35-0.75	3.00-6.50	△		▲								
			190612-QR	0.25-0.65	2.20-8.50	△		▲								
			190616-QR	0.35-0.75	3.00-8.50	▲	△	▲								
			190624-QR	0.50-0.85	3.50-8.50	▲	△	▲								
			250724-QR	0.50-0.85	4.50-10.00			▲								
			250924-QR	0.50-0.85	4.50-10.00	▲	△	▲								
		SNMM	190612-HR	0.26-0.60	2.50-8.50	△		▲								
			190616-HR	0.35-0.80	3.50-8.50	△		▲								
			190624-HR	0.50-1.20	4.00-8.50	▲	△	▲								
			250724-HR	0.50-1.20	4.50-10.50			▲								
			250924-HR	0.50-1.20	4.50-10.50	▲	△	▲								
Processing materials	P	Steel	Processing conditions			●	●	◐								
	M	Stainless steel														
	K	Cast iron	● Stable cutting										●	◐		
	N	Non-ferrous alloys	◐ General cutting													
	S	High temperature alloys	✠ Unstable cutting													
	H	Hardened steel														

△ General stock ▲ Regular srock

Negative Square Inserts

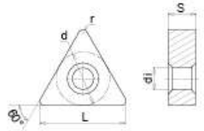


Dimension(mm)				
Type	d	L	S	di
SN_1906_	19.05	19.05	6.35	7.94
SN_2507_	25.4	25.4	7.94	9.12
SN_2509_	25.4	25.4	9.52	9.12

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Heavy roughing		SNMM	190616-HH	0.35-0.80	3.50-9.50			▲								
			190624-HH	0.50-1.20	4.00-9.50	▲	△	▲								
			250724-HH	0.50-1.20	4.50-12.50			▲								
			250924-HH	0.50-1.20	4.50-12.50	▲	△	▲								
Processing materials	P	Steel	Processing conditions			●	●	◐								
	M	Stainless steel														
	K	Cast iron	● Stable cutting													
	N	Non-ferrous alloys	◐ General cutting													
	S	High temperature alloys	✠ Unstable cutting													
	H	Hardened steel														

△ General stock ▲ Regular srock

Negative Triangular Inserts

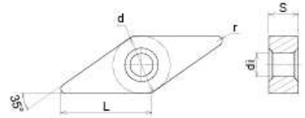


Dimension(mm)				
Type	d	L	S	di
TN_1604_	9.52	16.5	4.76	3.81
TN_2204_	12.7	22.0	4.76	5.16

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		TNMG	160404-FS	0.05-0.15	0.25-1.20				▲						▲	▲
			160408-FS	0.10-0.30	0.50-1.50				▲	▲					▲	▲
Semi-finishing		TNMG	160404-MS	0.06-0.20	0.30-3.00				▲	▲					▲	▲
			160408-MS	0.12-0.35	0.60-3.00				▲	▲	△				▲	▲
			160412-MS	0.18-0.40	0.90-3.00				▲	▲	△				▲	▲
			220408-MS	0.12-0.35	0.60-3.50				▲	▲						▲
			220412-MS	0.18-0.40	0.90-3.50				▲	▲						▲
Medium processing		TNMG	160404-ES	0.08-0.25	0.40-3.50				▲						▲	
			160408-ES	0.15-0.45	0.80-3.50				▲	▲					▲	▲
			160412-ES	0.20-0.50	1.20-3.50				▲						▲	
		TNMG	160404-MP	0.08-0.25	0.40-3.50	▲		▲								
			160408-MP	0.15-0.45	0.80-3.50	▲	△	▲								
			160412-MP	0.20-0.50	1.20-3.50	▲		▲								
		TNMG	160404	0.08-0.25	0.40-3.50								▲	▲		
			160408	0.15-0.45	0.80-3.50								▲	▲		
			160412	0.20-0.50	1.20-3.50								▲	▲		
			220412	0.20-0.50	1.20-4.50								▲			
			220416	0.25-0.55	1.80-4.50								▲			
Roughing		TNMA	160404	0.10-0.30	0.60-4.00								▲	△		
			160408	0.15-0.45	1.00-4.00								▲	▲		
			160412	0.20-0.50	1.20-4.00								▲			
			160416	0.25-0.55	1.50-4.00								▲			
			220408	0.15-0.45	1.20-5.00								▲			
			220412	0.20-0.50	1.50-5.00								▲			
			220416	0.25-0.55	1.80-5.00								▲			
Processing materials	P	Steel		Processing conditions		●	●	◕								
	M	Stainless steel							●	◕	◕				●	◕
	K	Cast Iron		● Stable cutting												
	N	Non-ferrous alloys		◕ General cutting									●	◕		
	S	High temperature alloys		✠ Unstable cutting												
	H	Hardened steel														

△ General stock ▲ Regular srock

Negative 35°Rhombic Inserts

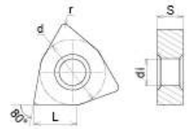


Dimension(mm)				
Type	d	L	S	di
VN_1604_	9.52	16.5	4.76	3.81

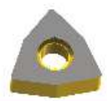
Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		VNMG	160404-FS	0.05-0.15	0.20-2.00				▲						▲	▲
			160408-FS	0.10-0.30	0.30-2.00				▲	△					▲	▲
Semi-finishing		VNMG	160404-MS	0.06-0.20	0.30-2.50				▲	▲					▲	
			160408-MS	0.12-0.35	0.50-2.50				▲	▲	△				▲	▲
Medium processing		VNMG	160404-ES	0.08-0.25	0.40-3.00				▲	▲					▲	
			160408-ES	0.15-0.35	0.80-3.00				▲	▲	△				▲	▲
			160412-ES	0.20-0.40	1.20-3.00				▲						▲	
		VNMG	160404-MP	0.08-0.25	0.40-3.00	▲	△	▲								
			160408-MP	0.15-0.35	0.60-3.00	▲	△	▲								
			160412-MP	0.20-0.40	1.00-3.00	△		▲								
		VNMG	160404	0.08-0.30	0.40-3.00									▲		
			160408	0.15-0.40	0.80-3.00								▲	▲		
			160412	0.20-0.45	1.20-3.00								▲	▲		
Processing materials	P	Steel		Processing conditions		●	●	◕								
	M	Stainless steel							●	◕	◕				●	◕
	K	Cast Iron		● Stable cutting												
	N	Non-ferrous alloys		◕ General cutting									●	◕		
	S	High temperature alloys		✠ Unstable cutting												
	H	Hardened steel														

△ General stock ▲ Regular srock

Negative 80°Trigon Inserts



Dimension(mm)				
Type	d	L	S	di
WN_0604_	9.52	6.52	4.76	3.81
WN_0804_	12.7	8.70	4.76	5.16

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		WNMG	080404-FS	0.05-0.15	0.20-2.00				▲	▲					▲	▲
			080408-FS	0.10-0.30	0.50-2.00				▲	▲					▲	▲
Semi-finishing		WNMG	060404-MS	0.06-0.25	0.40-2.00				▲							▲
			060408-MS	0.10-0.35	0.60-2.00				▲							▲
			080404-MS	0.06-0.25	0.40-2.50				▲	▲					▲	▲
			080408-MS	0.10-0.35	0.60-2.50				▲	▲	△	△			▲	▲
			080412-MS	0.15-0.40	0.80-2.50				▲	▲		△			▲	▲
Medium processing		WNMG	080404-ES	0.08-0.30	0.40-3.00				▲						▲	▲
			080408-ES	0.15-0.35	0.80-3.00				▲	▲					▲	▲
			080412-ES	0.20-0.40	1.20-3.00				▲						▲	▲
		WNMG	060408-MP	0.15-0.40	0.60-2.50	▲		▲								
			080404-MP	0.08-0.30	0.40-3.00	▲	△	▲								
			080408-MP	0.15-0.40	0.80-3.00	▲	△	▲								
			080412-MP	0.20-0.45	1.20-3.00	▲	△	▲								
		WNMG	080404	0.08-0.30	0.40-3.00									▲	▲	
			080408	0.15-0.40	0.80-3.00									▲	▲	
			080412	0.20-0.45	1.20-3.00									▲	▲	
Roughing		WNMG	080408-RP	0.15-0.60	1.20-3.50	▲	△	▲								
			080412-RP	0.20-0.65	1.80-3.50	▲	△	▲								
		WNMA	080404	0.10-0.35	0.60-4.00									▲		
			080408	0.15-0.60	1.20-4.00									▲	△	
			080412	0.20-0.70	1.80-4.00									▲	△	
			080416	0.25-0.75	2.00-4.00									▲		

Processing materials		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous alloys	
S	High temperature alloys	
H	Hardened steel	

Processing conditions

● Stable cutting

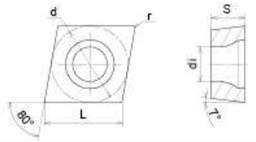
◕ General cutting

✠ Unstable cutting

●	●	◕											●	◕
			●	◕	◕	✠							●	◕
											●	◕		

△ General stock ▲ Regular srock

Positive 80°Rhombic Inserts



Dimension(mm)				
Type	d	L	S	di
CC_0602_	6.35	6.45	2.38	2.80
CC_09T3_	9.52	9.67	3.97	4.40

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		CCMT	060202-LU	0.02-0.07	0.10-1.00		▲		▲	▲					▲	▲
			060204-LU	0.04-0.10	0.15-1.00	▲	▲	△	▲	▲					▲	▲
			060208-LU	0.06-0.15	0.20-1.00		▲	△		▲						▲
			09T302-LU	0.02-0.07	0.10-1.50		▲			▲						▲
			09T304-LU	0.04-0.15	0.15-1.50	▲	▲	△	▲	▲					▲	▲
			09T308-LU	0.06-0.20	0.20-1.50		▲	△		▲						▲

Processing materials		
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Non-ferrous alloys	
S	High temperature alloys	
H	Hardened steel	

Processing conditions

● Stable cutting

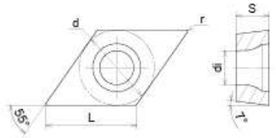
◕ General cutting

✠ Unstable cutting

●	●	◕											●	◕
			●	◕									●	◕

△ General stock ▲ Regular srock

Positive 55°Rhombic Inserts



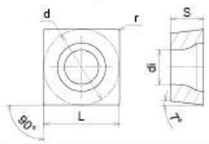
Dimension(mm)				
Type	d	L	S	di
DC_0702_	6.35	7.75	2.38	2.80
DC_11T3_	9.52	11.62	3.97	4.40

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		DCMT	070202-LU	0.02-0.10	0.10-1.30		▲			▲					▲	▲
			070204-LU	0.04-0.15	0.20-1.30	▲	▲	△	▲	▲					▲	▲
			11T302-LU	0.02-0.10	0.10-1.80		▲			▲					▲	▲
			11T304-LU	0.04-0.15	0.20-1.80	▲	▲	△	▲	▲					▲	▲
			11T308-LU	0.06-0.20	0.30-1.80		▲	△		▲						▲

Processing materials			Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
	P	Steel	● Stable cutting	●	●	◐								
	M	Stainless steel	◐ General cutting				●	◐					●	◐
	K	Cast iron	✱ Unstable cutting											
	N	Non-ferrous alloys												
	S	High temperature alloys												
	H	Hardened steel												

△ General stock ▲ Regular srock

Positive Square Inserts



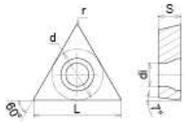
Dimension(mm)				
Type	d	L	S	di
SC_09T3_	9.52	9.52	3.97	4.40
SC_1204_	12.7	12.7	4.76	5.50

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		SCMT	09T304-LU	0.04-0.15	0.30-1.50	▲	▲	△	▲	▲						▲
			09T308-LU	0.06-0.20	0.60-1.50		▲		▲	▲						
			120404-LU	0.04-0.15	0.30-2.00	▲	▲	△	▲	▲						▲

Processing materials			Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
	P	Steel	● Stable cutting	●	●	◐								
	M	Stainless steel	◐ General cutting				●	◐						◐
	K	Cast iron	✱ Unstable cutting											
	N	Non-ferrous alloys												
	S	High temperature alloys												
	H	Hardened steel												

△ General stock ▲ Regular srock

Positive Triangular Inserts



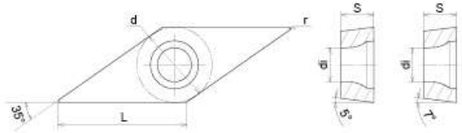
Dimension(mm)				
Type	d	L	S	di
TC_0902_	5.56	9.63	2.38	2.50
TC_1102_	6.35	11.0	2.38	2.80
TC_16T3_	9.52	16.5	3.97	4.40

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		TCMT	090204-LU	0.04-0.15	0.30-1.50	▲	▲	▲	▲	▲						△
			090208-LU	0.06-0.20	0.60-1.50		▲	▲		▲						△
			110204-LU	0.05-0.15	0.40-1.50	▲	▲	▲	▲	▲						△
			110208-LU	0.06-0.20	0.60-1.50		▲	▲		▲						△
			16T304-LU	0.05-0.15	0.30-2.00	▲	▲	▲	▲	▲						△
			16T308-LU	0.06-0.20	0.60-2.00	▲	▲	▲	▲	▲						△
			16T312-LU	0.09-0.25	0.80-2.00		▲	△		▲						

Processing materials			Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
	P	Steel	● Stable cutting	●	●	◕								
	M	Stainless steel	◕ General cutting				●	◕						◕
	K	Cast iron	✠ Unstable cutting											
	N	Non-ferrous alloys												
	S	High temperature alloys												
	H	Hardened steel												

△ General stock ▲ Regular srock

Positive 35°Rhombic Inserts



Dimension(mm)				
Type	d	L	S	di
VB_1103_	6.35	11.07	3.18	2.80
VB_1604_	9.52	16.61	4.76	4.40
VC_1604_	9.52	16.61	4.76	4.40

Insert		Designation		Cutting parameter		Grade									
				f (mm/rev)	ap (mm)	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
Finishing		VBMT	110302-LU	0.02-0.10	0.10-1.00	▲	▲			▲						▲
			110304-LU	0.04-0.15	0.15-1.00	▲	▲	△	▲	▲						▲
			110308-LU	0.06-0.20	0.20-1.00		▲	▲		▲						
			160402-LU	0.02-0.10	0.10-1.50	▲	▲			▲						▲
			160404-LU	0.04-0.15	0.15-1.50	▲	▲	△	▲	▲						▲
			160408-LU	0.06-0.20	0.20-1.50		▲	△		▲						
		VCMT	160404-LU	0.04-0.15	0.15-1.50		▲		▲	▲						▲
			160408-LU	0.06-0.20	0.20-1.50		▲		▲	▲						▲

Processing materials			Processing conditions	WT8010	WT8020	WT8030	WT5015	WT5025	WT5030	WT5035	WT4015	WT4020	WT3310	WT3330
	P	Steel	● Stable cutting	●	●	◕								
	M	Stainless steel	◕ General cutting				●	◕						◕
	K	Cast iron	✠ Unstable cutting											
	N	Non-ferrous alloys												
	S	High temperature alloys												
	H	Hardened steel												

△ General stock ▲ Regular srock

PARTING & GROOVING

CONTENTS

Parting & Grooving Insert

Parting & Grooving Holder

Parting & Grooving Insert

Insert Designation System

CM	G	D	N		200	020	-	J	-	6R
1	2	3	4	Space	5	6	-	7	-	8

1 - Company product series

WORLDIA "CM" Grooving Series

2 - Cutting type

G: Grooving/Parting

T: Grooving/Turning

3 - Insert type

S: Single

D: Double

4 - Hand of Insert


N: Neutral


L: Left hand


R: Right hand

5 - Insert width W

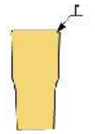
200=2.0mm

300=3.0mm

400=4.0mm

500=5.0mm

6 - Corner radius r



020=0.2mm

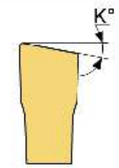
030=0.3mm

7 - Chipbreaker


C


J

8 - Cutting edge angle K



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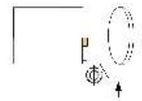
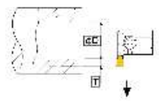
15

Chipbreaker Introduction

Application	Chip breaker		Application and features
Medium feed	C		• For parting and grooving application • Suitable for grooving and parting of alloy steel, carbon steel, stainless steel, cast iron
Medium low feed	J		• For machining of stainless steel,mild steel and thin-wall workpiece • Suitable for grooving and parting of stainless steel, low carbon alloy steel, low carbon steel

Insert Selection Guide

Application \ Insert			CMGDN	
			C	J
				
Page			G08	G08
External	Grooving		●	●
	Parting		●	●
Internal	Grooving		●	●

ISO Application Range

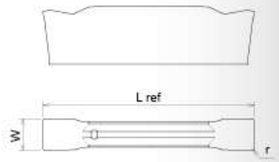
ISO range of insert grade

Material Group	Material	ISO	PVD Coated					
			WT5015	WT5025	WT5030	WT5035	WT7020	WT3310
P	Unalloyed steel, alloyed steel	P01						
		P05	WT5015					
		P10		WT5025				
		P15			WT5030			
		P20						
		P25				WT5035		
		P30						
		P35						
		P40						
		P45						
		P50						
M	Stainless steel	M01						
		M05	WT5015					WT3310
		M10		WT5025				
		M15			WT5030			
		M20						
		M25				WT5035		
		M30						
		M35						
		M40						
		M45						
K	Cast iron	K01						
		K05						
		K10					WT7020	
		K15						
		K20						
		K25						
		K30						
		K35						
		K40						
		K45						
S	High temperature alloy	S01						
		S05	WT5015					WT3310
		S10						
		S15			WT5030			
		S20						
		S25						
		S30						
		S35						
		S40						
		S45						
N	Non-ferrous alloy	N01						
		N05						
		N10						
		N15						
		N20						
		N25						
		N30						
H	Hardened steel, cold cast iron	H01						
		H05						
		H10						
		H15						
		H20						
		H25						
		H30						

PVD Coated Garbide Grades

Grade	Appearance	ISO	Characteristics & Applications
WT5015	Black brown	P05-P20 M05-M20 S05-S20	• Submircon substrate, excellent wear resistance • For stable machining of steel, stainless steel, high temperature alloy and hardened steel
WT5025	Black brown	P10-P30 M10-M30	• Submircon substrate, good wear resistance • For machining of steel and stainless steel
WT5030	Golden yellow	P15-P40 M15-M40 S15-S40	• Submircon substrate, good wear resistance • For machining of steel,stainless steel and high temperature alloy
WT5035	Grey black	P25-P45 M25-M45	• Tough carbide substrate, good fracture toughness • For rough machining of steel and stainless steel
WT7020	Black brown	K10-K30	• Tough carbide substrate • For machining of gray cast iron, ductile cast iron nad alloy cast iron
WT3310	Bronze	S05-S20 M05-M20	• Submircon substrate, excellent wear resistance • For machining of high temperature alloy and stainless steel

CMMN-J/C type
CMGDN-J/C type



Insert	Designation		Cutting parameter f (mm/rev)	Cutting parameter Tmax	Geometric dimensions W	Geometric dimensions r	Geometric dimensions L	Grade WT5015	Grade WT5025	Grade WT5030	Grade WT5035	Grade WT7020	Grade WT3310
	CMMN	150015-C	0.05-0.20	15.0	1.50	0.15	16.0		▲			△	
		200020-C	0.06-0.20	15.0	2.00	0.2	16.0		▲		▲	△	
		250020-C	0.06-0.20	17.0	2.50	0.2	18.0		▲				
		300040-C	0.07-0.22	20.0	3.00	0.4	21.0		▲		▲	▲	
		400040-C	0.08-0.25	20.0	4.00	0.4	21.0		▲		▲	▲	
		500080-C	0.09-0.30	25.0	5.00	0.8	26.0		▲		△	▲	
		600080-C	0.11-0.35	25.0	6.00	0.8	26.0		▲		△	△	
	CMMN	150015-J	0.04-0.15	15.0	1.50	0.15	16.0		▲				
		200020-J	0.04-0.15	15.0	2.00	0.2	16.0		▲				▲
		250020-J	0.04-0.18	17.0	2.50	0.2	18.0		▲				
		300040-J	0.05-0.20	20.0	3.00	0.4	21.0		▲				▲
		400040-J	0.06-0.20	20.0	4.00	0.4	21.0		▲				▲
		500080-J	0.07-0.22	25.0	5.00	0.8	26.0		▲				▲
		600080-J	0.07-0.22	25.0	6.00	0.8	26.0		▲				△
	CMGDN	200020-C	0.05-0.20	19.0	2.00	0.2	20.0		▲		▲	△	
		300020-C	0.06-0.22	19.0	3.00	0.2	20.0		▲		▲	▲	
		400030-C	0.07-0.25	18.0	4.00	0.3	19.0		▲		▲	▲	
		500030-C	0.08-0.30	18.0	5.00	0.3	19.0		▲		▲	▲	
	CMGDN	200020-J	0.04-0.12	19.0	2.00	0.2	20.0		▲				▲
		300020-J	0.04-0.15	19.0	3.00	0.2	20.0		▲				▲
		400030-J	0.05-0.16	18.0	4.00	0.3	19.0		▲				▲
		500030-J	0.05-0.18	18.0	5.00	0.3	19.0		▲				△

Processing materials		Processing conditions	WT5015	WT5025	WT5030	WT5035	WT7020	WT3310
P	Steel			◐		✱		●
M	Stainless steel			◐		✱		●
K	Cast iron	● Stable cutting					◐	
N	Non-ferrous alloys	◐ General cutting						
S	High temperature alloys	✱ Unstable cutting		◐		✱		●
H	Hardened steel							

△ General stock ▲ Regular srock

Holder Designation System

J	G	I	H	R		25	25	-	3	T14	-	40	-	60	-	RN	-	C
1	2	3	4	5	Space	6	7	-	8	9	-	10	-	11	-	12	-	13

1 - Brand
WORLDIA

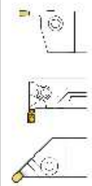
2 - Application type
G:Grooving/Parting

T:Turning/Grooving

3 - Machining type
E: External

I: Internal

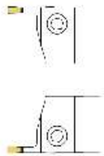
F: Facing

4 - Shape of holder head


H: Linear 0°

V: Vertical 90°

U: Under cut 45°

5 - Hand of tool


L: Left hand

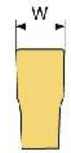
R: Right hand

6 - Holder diameter d/height H


16=16.0mm
20=20.0mm
25=25.0mm
32=32.0mm

7 - Holder width B


16=16.0mm
20=20.0mm
25=25.0mm
32=32.0mm

8 - Insert width W


2=2.0mm
3=3.0mm
4=4.0mm
5=5.0mm

9 - Ap max

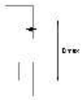

T14=Max14mm

T16=Max16mm

T20=Max20mm

10 - Minimum cutting diameter


40=40.0mm

11 - Maximum cutting diameter


60=60.0mm

12 - Special code
RN: Outside bulge holders

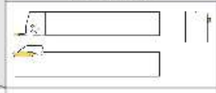
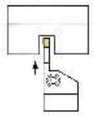
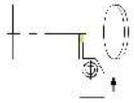
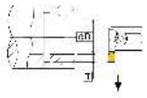
D: Reinforced holders

SW: For swiss machine

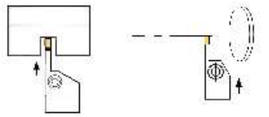
13 - Cooling type
C: Inner-cooling

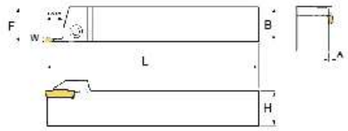
External cooling
is not indicated

Holder Selection Guide

Application \ Holder			External		Internal
			JGEHR/L	JGEHR/L-SW	JGIVR/L
					
Page			G11	G12	G13
External	Grooving		●	●	
	Parting		●	●	
Internal	Grooving				●

External Parting Holder

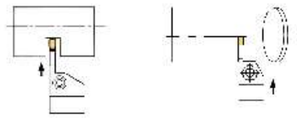


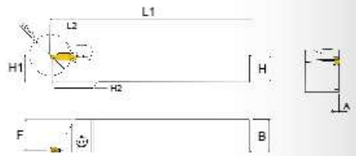


Designation		Dimension(mm)							Insert
		H	B	L	A	T-max	W	F	
JGEHR/L	1616-2T14	16	16	125	1.8	14	2	16	CMGDN
	1616-3T16	16	16	125	2.4	16	3	16	
	2020-2T14	20	20	125	1.8	14	2	20	
	2020-3T20	20	20	125	2.4	20	3	20	
	2020-4T20	20	20	125	3.0	20	4	20	
	2525-2T14	25	25	150	1.8	14	2	25	
	2525-3T20	25	25	150	2.4	20	3	25	
	2525-4T20	25	25	150	3.0	20	4	25	
	2525-5T25	25	25	150	3.9	25	5	25	

Screw	Wrench	Applicable holder
		
JSH050200	L04	JGEHR/L 1616-2
JSH060250	L05	JGEHR/L 2020-2
JSH060250	L05	JGEHR/L 2525-2
JSH050200	L04	JGEHR/L 1616-3
JSH060250	L05	JGEHR/L 2020-3/4
JSH060250	L05	JGEHR/L 2525-3/4/5

SW External Holder

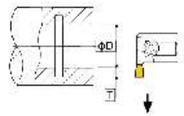


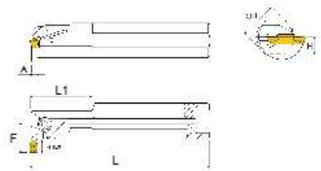


Designation		Dimension(mm)									Insert
		H	B	H1	H2	A	L1	L2	F	Dmax	
JGEHR/L-SW	1010-2D20-SW	10	10	10	2	1.8	125	20	9.1	20	CMGDN
	1212-2D24-SW	12	12	12	2	1.8	125	20	11.1	24	
	1414-2D24-SW	14	14	14	0	1.8	125	20	13.1	24	
	1616-2D32-SW	16	16	16	0	1.8	125	25	15.1	32	
	1212-3D24-SW	12	12	12	2	2.4	125	20	10.8	24	
	1616-3D32-SW	16	16	16	0	2.4	125	25	14.8	32	
	1616-3D38-SW	16	16	16	0	2.4	125	27	14.8	38	
	2020-3D45-SW	20	20	20	0	2.4	125	24	18.8	45	

Screw	Wrench	Applicable holder
		
JSR040125	T15	JGEHR/L-SW 1010-2
JSR040125	T15	JGEHR/L-SW 1212-2/3
JSR040125	T15	JGEHR/L-SW 1414-2
JSR040125	T15	JGEHR/L-SW 1616-2/3
JSR040125	T15	JGEHR/L-SW 2020-3

Internal Grooving Holder





Designation		Dimension(mm)							Insert
		Φd	L	L1	F	H	A	T-max	Dmin	
JGIVR/L	20-2T6.0-C	20	160	40	15.8	9.0	1.6	6.0	25	CMGDN
	25-2T5.0-C	25	200	40	17.5	11.5	1.6	5.0	25	
	20-3T6.0-C	20	160	40	15.8	9.0	2.1	6.0	25	
	25-3T5.1-C	25	200	40	17.5	11.5	2.1	5.1	25	
	32-3T4.7-C	32	250	60	19.8	14.0	2.1	4.7	31	
	20-4T6.0-C	20	160	40	15.8	9.0	2.9	6.0	25	
	25-4T5.2-C	25	200	40	17.5	11.5	2.9	5.2	25	
	32-4T4.7-C	32	250	60	20.8	14.0	2.9	4.7	31	
	25-5T5.2-C	25	200	40	17.3	11.5	3.9	5.2	31	
	32-5T4.7-C	32	250	60	20.8	14.0	3.9	4.7	31	

Screw	Wrench	Applicable holder
		
JSH050120	L04	JGIVR/L 20-2/3/4
JSH050160	L04	JGIVR/L 25-2/3/4
JSH050160	L04	JGIVR/L 32-3/4
JSH060160	L05	JGIVR/L 25-5
JSH060160	L05	JGIVR/L 32-5

DRILLING TOOLS

CONTENTS

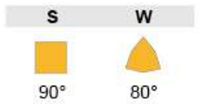
Drilling Insert

Drilling Holder

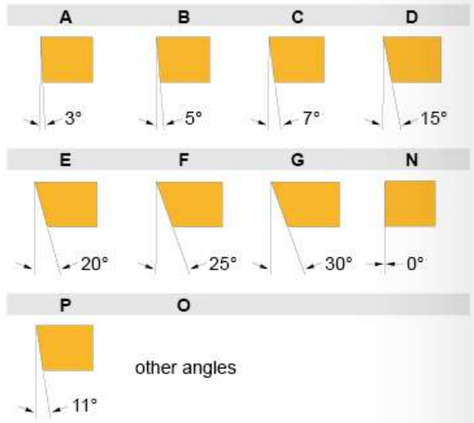
Insert Designation System

S	P	M	G	
1	2	3	4	Space

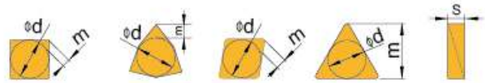
1 - Shape



2 - Clearance angle



3 - Tolerance



Class	Unit	d	m	s
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

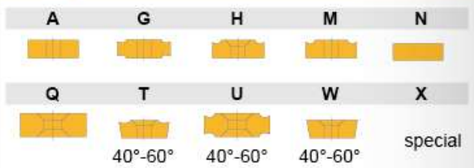
* For details refer to right and below tables

Shape: C, E, H, M, O, P, S, T, R, W

IC	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 Class	D shape		V shape	
IC	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 - Type



06	02	04	-	UD
5	6	7	-	8

5 - Cutting edge length

In. Circle Dimension	S		W	
	Code	Edge	Code	Edge
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

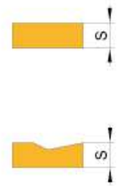
12=1.2

6 - Thickness

Thickness description

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

Thickness mark



Example

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

8 - Chip breaker

UD

PD

ISO Application Range

ISO range of Drilling insert grade

Material Group	Material	ISO	PVD Coated		
			WT5025	WT5035	WT3330
P	Unalloyed steel, alloyed steel	P01			
		P05			
		P10			
		P15	WT5025		WT3330
		P20			
		P25		WT5035	
		P30			
		P35			
		P40			
		P45			
		P50			
M	Stainless steel	M01			
		M05			
		M10			
		M15	WT5025		WT3330
		M20			
		M25		WT5035	
		M30			
		M35			
		M40			
		M45			
K	Cast iron	K01			
		K05			
		K10			
		K15			
		K20			
		K25			
		K30			
		K35			
		K40			
		K45			
S	High temperature alloy	S01			
		S05			
		S10			
		S15	WT5025		WT3330
		S20			
		S25		WT5035	
		S30			
		S35			
		S40			
		S45			
N	Non-ferrous alloy	N01			
		N05			
		N10			
		N15			
		N20			
		N25			
		N30			
H	Hardened steel, cold cast iron	H01			
		H05			
		H10			
		H15			
		H20			
		H25			
		H30			

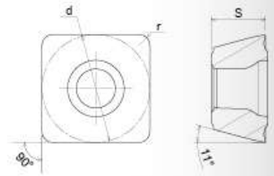
PVD Coated Carbide Grade

Grade	Appearance	Range	Characteristics & Applications
WT5025	Black brown	P15-P35 M15-M35 S15-S35	• Submircon substrate, good wear resistance • For drilling of steel,stainless steel, heat-resistant alloy and cast iron
WT5035	Grey black	P25-P45 M25-M45 S25-S45	• Tough cabide substrate, good fracture toughness • For unstable machining of steel,stainless steel,heat-resistant alloy and cast iron
WT3330	Bronze	M15-M35 S15-S35 P15-P35	• Submircon substrate,excellent BUE-resistant and stable machinability • For machining of stainless steel,heat-resistant alloy and mild steel

Introduction Of Chipbreaker

Chip breaker		Application and features
UD		• Four cutting edges • Good surface roughness after machining
PD		• Three cutting edges • Higher efficiency machining • Suitable for through hole and lathe machining

SPMG Insert

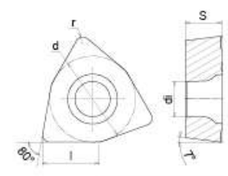


Insert	Designation		Cutting parameter	Geometric dimensions			Grade		
			fz (mm/rev)	d	S	r	WT5025	WT5035	WT3330
	SPMG	050204-UD	0.05-0.11	5.0	2.38	0.4	▲	▲	
		060204-UD	0.06-0.14	6.0	2.38	0.4	▲	▲	
		07T308-UD	0.06-0.18	7.94	3.97	0.8	▲	▲	
		090408-UD	0.07-0.20	9.8	4.3	0.8	▲	▲	
		110408-UD	0.08-0.22	11.5	4.8	0.8	▲	▲	
		140512-UD	0.08-0.24	14.3	5.2	1.2	▲	▲	

Processing materials		Processing conditions	WT5025	WT5035	WT3330
P	Steel		◔	✠	
M	Stainless steel		◔	✠	
K	Cast iron	● Stable cutting	◔		
N	Non-ferrous alloys	◔ General cutting			
S	High temperature alloys	✠ Unstable cutting	◔	✠	
H	Hardened steel				

△ General stock ▲ Regular srock

WCMT Insert



Insert	Designation		Cutting parameter	Geometric dimensions			Grade		
			fz (mm/rev)	d	S	r	WT5025	WT5035	WT3330
	WCMT	030208-PD	0.04-0.10	5.56	2.38	0.8	▲	△	▲
		040208-PD	0.05-0.12	6.35	2.38	0.8	▲	△	▲
		050308-PD	0.07-0.15	7.94	3.18	0.8	▲	△	▲
		06T308-PD	0.08-0.18	9.525	3.97	0.8	▲	△	▲
		080412-PD	0.09-0.20	12.7	4.76	1.2	▲	△	▲

Processing materials		Processing conditions	WT5025	WT5035	WT3330
P	Steel		◔	✠	◔
M	Stainless steel		◔	✠	◔
K	Cast iron	● Stable cutting	◔		
N	Non-ferrous alloys	◔ General cutting			
S	High temperature alloys	✠ Unstable cutting	◔	✠	◔
H	Hardened steel				

△ General stock ▲ Regular srock

Recommended Drilling Conditions

Materials				SPMG insert														
ISO	Material classification	Tensile strength (N/mm²)	Hardness (HB)	Cutting speed(m/min)									Drilling Holder Diameter Grouping					
													Φ13-Φ15	Φ15.5-Φ21.5	Φ22-Φ27.5	Φ28-Φ33.5	Φ34-Φ41	Φ42-Φ50	Φ51-Φ60
				WT5025			WT5035			WT3330			SPMG 050204-UD	SPMG 060204-UD	SPMG 07T308-UD	SPMG 090408-UD	SPMG 110408-UD	SPMG 140512-UD	SPMG 090408-UD
				min	M	max	min	M	max	min	M	max	Feed(mm/rev)						
P	Unalloyed steel	≤600	≤180	80	160	220	70	140	200	-	-	-	0.05-0.08	0.06-0.10	0.06-0.12	0.07-0.13	0.08-0.15	0.08-0.16	0.07-0.13
		≤950	≤280	70	150	220	65	130	180	-	-	-	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.20	0.12-0.22	0.13-0.24	0.12-0.20
	Alloyed steel	700-950	200-280	70	140	200	60	120	160	-	-	-	0.06-0.10	0.08-0.14	0.10-0.18	0.12-0.20	0.12-0.22	0.13-0.24	0.12-0.20
		950-1200	280-355	65	120	180	55	100	160	-	-	-	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.20	0.12-0.22	0.13-0.24	0.12-0.20
		1200-1400	355-415	60	100	160	50	80	150	-	-	-	0.06-0.10	0.08-0.14	0.10-0.18	0.12-0.20	0.12-0.22	0.13-0.24	0.12-0.20
M	Austenitic stainless steel	675	200	60	110	160	45	90	150	-	-	-	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18	0.09-0.16
	Duplex stainless steel	778	230	50	90	140	40	70	130	-	-	-	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18	0.09-0.16
	Precipitation-hardening stainless steel	1013	300	-	-	-	40	60	110	-	-	-	0.05-0.09	0.06-0.10	0.07-0.13	0.08-0.14	0.09-0.15	0.10-0.16	0.08-0.14
K	Grey cast iron	700	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nodular cast iron	880	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	Fe-based alloy	943	280	-	-	-	20	40	60	-	-	-	0.05-0.10	0.06-0.14	0.08-0.16	0.10-0.20	0.12-0.22	0.14-0.24	-
	Co-based alloy	1076	320	-	-	-	15	25	35	-	-	-	0.05-0.10	0.06-0.12	0.07-0.13	0.9-0.15	0.10-0.18	0.11-0.20	-
	Ni-based alloy	1177	350	-	-	-	15	25	35	-	-	-	0.05-0.10	0.06-0.12	0.07-0.13	0.9-0.15	0.10-0.18	0.11-0.20	-
	Ti-alloy	1262	370	-	-	-	20	30	40	-	-	-	0.05-0.10	0.06-0.12	0.07-0.13	0.9-0.15	0.10-0.18	0.11-0.20	-
N	Aluminum	260	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aluminum alloy	447	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	Hardened steel	-	52-62HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chilled cast iron	-	≥55HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*The above only refers to the general recommendation reference, the actual need to consider the machine tool, fixture, tool body rigidity, material changes and cutting fluid adjustment.

Recommended Drilling Conditions

Materials				SPMG insert													
ISO	Material classification	Tensile strength (N/mm²)	Hardness (HB)	Cutting speed(m/min)									Drilling Holder Diameter Grouping				
													Φ16-Φ20.5	Φ21-Φ24.5	Φ25-Φ30.5	Φ31-Φ41	Φ42-Φ60
				WT5025			WT5035			WT3330			WCMT 030208-PD	WCMT 040208-PD	WCMT 050308-PD	WCMT 06T308-PD	WCMT 080412-PD
				min	M	max	min	M	max	min	M	max	Feed(mm/rev)				
P	Unalloyed steel	≤600	≤180	80	160	220	70	140	200	80	160	220	0.04-0.06	0.07-0.09	0.07-0.10	0.08-0.11	0.09-0.13
		≤950	≤280	70	150	220	65	130	180	-	-	-	0.05-0.07	0.07-0.09	0.07-0.10	0.08-0.11	0.09-0.13
	Alloyed steel	700-950	200-280	70	140	200	60	120	160	70	140	200	0.05-0.09	0.07-0.12	0.08-0.14	0.10-0.16	0.10-0.18
		950-1200	280-355	65	120	180	55	100	160	-	-	-	0.04-0.09	0.07-0.11	0.07-0.12	0.09-0.14	0.10-0.16
		1200-1400	355-415	60	100	160	50	80	150	-	-	-	0.04-0.07	0.05-0.09	0.07-0.10	0.08-0.12	0.09-0.13
M	Austenitic stainless steel	675	200	60	110	160	45	90	150	60	120	180	0.04-0.08	0.06-0.11	0.08-0.13	0.08-0.14	0.08-0.15
	Duplex stainless steel	778	230	50	90	140	40	70	130	50	100	160	0.04-0.07	0.06-0.10	0.07-0.11	0.08-0.12	0.09-0.13
	Precipitation-hardening stainless steel	1013	300	-	-	-	40	60	110	45	80	140	0.04-0.07	0.05-0.09	0.07-0.10	0.08-0.12	0.09-0.13
K	Grey cast iron	700	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nodular cast iron	880	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	Fe-based alloy	943	280	-	-	-	20	40	60	30	55	80	0.05-0.09	0.07-0.12	0.08-0.14	0.10-0.16	0.10-0.18
	Co-based alloy	1076	320	-	-	-	15	25	35	20	30	40	0.04-0.07	0.05-0.09	0.07-0.10	0.08-0.12	0.09-0.13
	Ni-based alloy	1177	350	-	-	-	15	25	35	20	30	40	0.04-0.07	0.05-0.09	0.07-0.10	0.08-0.12	0.09-0.13
	Ti-alloy	1262	370	-	-	-	20	30	40	25	40	60	0.04-0.07	0.05-0.09	0.07-0.10	0.08-0.12	0.09-0.13
N	Aluminum	260	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aluminum alloy	447	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	Hardened steel	-	52-62HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chilled cast iron	-	≥55HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*The above only refers to the general recommendation reference, the actual need to consider the machine tool, fixture, tool body rigidity, material changes and cutting fluid adjustment.

Drilling Holder

Holder Designation System

J	3D	-	260	-	W32	-	SP07
1	2	-	3	-	4	-	5

1 - Brand

WORLDIA

2 - Drilling depth

2D; 3D; 4D; 5D

3 - Drill diameter

260=26.0mm

265=26.5mm

4 - Shank diameter

W20=20mm

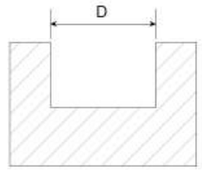
W25=25mm

5 - Insert specification

SP07=SPMG 07T3..

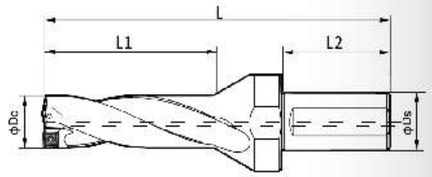
WC06=WCMT 06T3..

Drilling Bore Diameter Tolerance



Bore diameter	2D	3D	4D	5D
D13-D21.5	-0.10~+0.15	-0.10~+0.18	-0.10~+0.20	-0.10~+0.25
D22-D50	-0.10~+0.15	-0.12~+0.20	-0.15~+0.25	-0.15~+0.30
D51-60	-0.15~+0.20	-0.15~+0.25	-0.15~+0.30	-0.15~+0.33

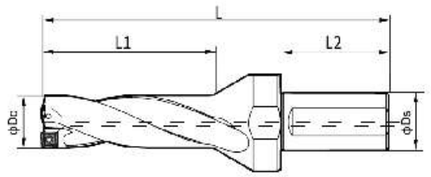
SP Series Drilling Holder
Drilling Depth: 2D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J2D-130-W20-SP05	13.0	29	88	20	44	SPMG 050204
J2D-135-W20-SP05	13.5	30	89	20	44	
J2D-140-W20-SP05	14.0	31	90	20	44	
J2D-145-W20-SP05	14.5	32	91	20	44	
J2D-150-W20-SP05	15.0	33	92	20	44	
J2D-155-W20-SP06	15.5	34	93	20	44	SPMG 060204
J2D-160-W20-SP06	16.0	35	94	20	44	
J2D-165-W20-SP06	16.5	36	95	20	44	
J2D-170-W20-SP06	17.0	37	96	20	44	
J2D-175-W25-SP06	17.5	38	109	25	56	
J2D-180-W25-SP06	18.0	39	110	25	56	
J2D-185-W25-SP06	18.5	40	111	25	56	
J2D-190-W25-SP06	19.0	41	112	25	56	
J2D-195-W25-SP06	19.5	42	113	25	56	
J2D-200-W25-SP06	20.0	43	114	25	56	
J2D-205-W25-SP06	20.5	44	115	25	56	
J2D-210-W25-SP06	21.0	45	116	25	56	
J2D-215-W25-SP06	21.5	46	117	25	56	
J2D-220-W25-SP07	22.0	47	118	25	56	SPMG 07T308
J2D-225-W25-SP07	22.5	48	119	25	56	
J2D-230-W25-SP07	23.0	49	123	25	56	
J2D-235-W25-SP07	23.5	50	124	25	56	
J2D-240-W25-SP07	24.0	51	125	25	56	
J2D-245-W25-SP07	24.5	52	126	25	56	
J2D-250-W25-SP07	25.0	53	127	25	56	
J2D-255-W32-SP07	25.5	54	134	32	60	
J2D-260-W32-SP07	26.0	55	135	32	60	
J2D-265-W32-SP07	26.5	56	136	32	60	

Screw	Wrench	Applicable holder
		
JST020040	T06	J2D-130-W20-SP05~J2D-150-W20-SP05
JST022050	T07	J2D-155-W20-SP06~J2D-170-W20-SP06
JST022050	T07	J2D-175-W25-SP06~J2D-215-W25-SP06
JST025060	T08	J2D-220-W25-SP07~J2D-275-W32-SP07

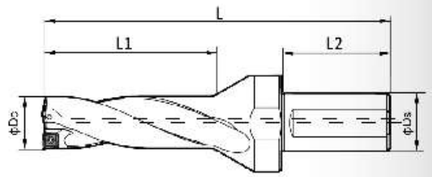
SP Series Drilling Holder
Drilling Depth: 2D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J2D-270-W32-SP07	27.0	57	137	32	60	SPMG 07T308
J2D-275-W32-SP07	27.5	58	138	32	60	
J2D-280-W32-SP09	28.0	59	139	32	60	SPMG 090408
J2D-285-W32-SP09	28.5	60	140	32	60	
J2D-290-W32-SP09	29.0	62	143	32	60	
J2D-295-W32-SP09	29.5	63	144	32	60	
J2D-300-W32-SP09	30.0	64	148	32	60	
J2D-305-W32-SP09	30.5	65	149	32	60	
J2D-310-W32-SP09	31.0	66	150	32	60	
J2D-315-W32-SP09	31.5	67	151	32	60	
J2D-320-W32-SP09	32.0	68	152	32	60	
J2D-325-W32-SP09	32.5	69	153	32	60	
J2D-330-W32-SP09	33.0	70	154	32	60	
J2D-335-W32-SP09	33.5	71	155	32	60	
J2D-340-W40-SP11	34.0	72	156	40	60	SPMG 110408
J2D-345-W40-SP11	34.5	73	157	40	60	
J2D-350-W40-SP11	35.0	74	158	40	60	
J2D-355-W40-SP11	35.5	75	159	40	60	
J2D-360-W40-SP11	36.0	76	160	40	60	
J2D-365-W40-SP11	36.5	77	161	40	60	
J2D-370-W40-SP11	37.0	79	169	40	60	
J2D-375-W40-SP11	37.5	80	170	40	60	
J2D-380-W40-SP11	38.0	81	171	40	60	
J2D-385-W40-SP11	38.5	82	172	40	60	
J2D-390-W40-SP11	39.0	83	173	40	60	
J2D-395-W40-SP11	39.5	84	174	40	60	
J2D-400-W40-SP11	40.0	85	185	40	70	
J2D-410-W40-SP11	41.0	87	187	40	70	

Screw	Wrench	Applicable holder
		
JST025060	T08	J2D-220-W25-SP07~J2D-275-W32-SP07
JST035080	T15	J2D-280-W32-SP09~J2D-335-W32-SP09
JST040100	T15	J2D-340-W40-SP11~J2D-410-W40-SP11

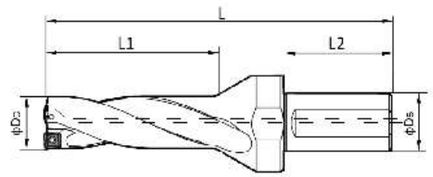
SP Series Drilling Holder
Drilling Depth: 2D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J2D-420-W40-SP14	42.0	89	189	40	70	SPMG 140512
J2D-430-W40-SP14	43.0	91	191	40	70	
J2D-440-W40-SP14	44.0	93	193	40	70	
J2D-450-W40-SP14	45.0	95	195	40	70	
J2D-460-W40-SP14	46.0	97	197	40	70	
J2D-470-W40-SP14	47.0	99	199	40	70	
J2D-480-W40-SP14	48.0	101	201	40	70	
J2D-490-W40-SP14	49.0	103	203	40	70	
J2D-500-W40-SP14	50.0	105	205	40	70	
J2D-510-W40-SP09	51.0	107	207	40	70	SPMG 090408
J2D-520-W40-SP09	52.0	109	209	40	70	
J2D-530-W40-SP09	53.0	111	211	40	70	
J2D-540-W40-SP09	54.0	113	213	40	70	
J2D-550-W40-SP09	55.0	115	215	40	70	
J2D-560-W40-SP09	56.0	120	222	40	70	
J2D-570-W40-SP09	57.0	122	224	40	70	
J2D-580-W40-SP09	58.0	124	226	40	70	
J2D-590-W40-SP09	59.0	126	228	40	70	
J2D-600-W40-SP09	60.0	128	230	40	70	

Screw	Wrench	Applicable holder
		
JST050110	T20	J2D-420-W40-SP14~J2D-500-W40-SP14
JST035080	T15	J2D-510-W40-SP09~J2D-600-W40-SP09

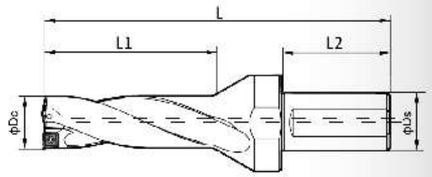
SP Series Drilling Holder
Drilling Depth: 3D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J3D-130-W20-SP05	13.0	42	101	20	44	SPMG 050204
J3D-135-W20-SP05	13.5	44	103	20	44	
J3D-140-W20-SP05	14.0	45	104	20	44	
J3D-145-W20-SP05	14.5	47	106	20	44	
J3D-150-W20-SP05	15.0	48	107	20	44	
J3D-155-W20-SP06	15.5	50	109	20	44	SPMG 060204
J3D-160-W20-SP06	16.0	51	110	20	44	
J3D-165-W20-SP06	16.5	53	112	20	44	
J3D-170-W20-SP06	17.0	54	113	20	44	
J3D-175-W25-SP06	17.5	56	127	25	56	
J3D-180-W25-SP06	18.0	57	128	25	56	
J3D-185-W25-SP06	18.5	59	130	25	56	
J3D-190-W25-SP06	19.0	60	131	25	56	
J3D-195-W25-SP06	19.5	62	133	25	56	
J3D-200-W25-SP06	20.0	63	134	25	56	
J3D-205-W25-SP06	20.5	65	136	25	56	
J3D-210-W25-SP06	21.0	66	137	25	56	
J3D-215-W25-SP06	21.5	68	139	25	56	
J3D-220-W25-SP07	22.0	69	140	25	56	SPMG 07T308
J3D-225-W25-SP07	22.5	71	142	25	56	
J3D-230-W25-SP07	23.0	72	146	25	56	
J3D-235-W25-SP07	23.5	74	148	25	56	
J3D-240-W25-SP07	24.0	75	149	25	56	
J3D-245-W25-SP07	24.5	77	151	25	56	
J3D-250-W25-SP07	25.0	78	152	25	56	
J3D-255-W32-SP07	25.5	80	160	32	60	
J3D-260-W32-SP07	26.0	81	161	32	60	
J3D-265-W32-SP07	26.5	83	163	32	60	

Screw	Wrench	Applicable holder
		
JST020040	T06	J3D-130-W20-SP05~J3D-150-W20-SP05
JST022050	T07	J3D-155-W20-SP06~J3D-170-W20-SP06
JST022050	T07	J3D-175-W25-SP06~J3D-215-W25-SP06
JST025060	T08	J3D-220-W25-SP07~J3D-275-W32-SP07

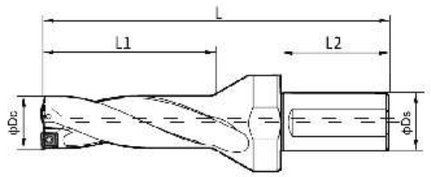
SP Series Drilling Holder
Drilling Depth: 3D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J3D-270-W32-SP07	27.0	84	164	32	60	SPMG 07T308
J3D-275-W32-SP07	27.5	86	166	32	60	
J3D-280-W32-SP09	28.0	87	167	32	60	SPMG 090408
J3D-285-W32-SP09	28.5	89	169	32	60	
J3D-290-W32-SP09	29.0	91	172	32	60	
J3D-295-W32-SP09	29.5	93	174	32	60	
J3D-300-W32-SP09	30.0	94	178	32	60	
J3D-305-W32-SP09	30.5	96	180	32	60	
J3D-310-W32-SP09	31.0	97	181	32	60	
J3D-315-W32-SP09	31.5	99	183	32	60	
J3D-320-W32-SP09	32.0	100	184	32	60	
J3D-325-W32-SP09	32.5	102	186	32	60	
J3D-330-W32-SP09	33.0	103	187	32	60	
J3D-335-W32-SP09	33.5	105	189	32	60	
J3D-340-W40-SP11	34.0	106	190	40	60	SPMG 110408
J3D-345-W40-SP11	34.5	108	192	40	60	
J3D-350-W40-SP11	35.0	109	193	40	60	
J3D-355-W40-SP11	35.5	111	195	40	60	
J3D-360-W40-SP11	36.0	112	196	40	60	
J3D-365-W40-SP11	36.5	114	198	40	60	
J3D-370-W40-SP11	37.0	116	206	40	60	
J3D-375-W40-SP11	37.5	118	208	40	60	
J3D-380-W40-SP11	38.0	119	207	40	60	
J3D-385-W40-SP11	38.5	121	211	40	60	
J3D-390-W40-SP11	39.0	122	212	40	60	
J3D-395-W40-SP11	39.5	124	214	40	60	
J3D-400-W40-SP11	40.0	125	225	40	70	
J3D-410-W40-SP11	41.0	128	228	40	70	

Screw	Wrench	Applicable holder
		
JST025060	T08	J3D-220-W25-SP07~J3D-275-W32-SP07
JST035080	T15	J3D-280-W32-SP09~J3D-335-W32-SP09
JST040100	T15	J3D-340-W40-SP11~J3D-410-W40-SP11

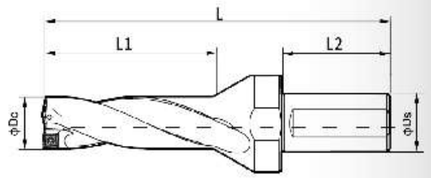
SP Series Drilling Holder
Drilling Depth: 3D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J3D-420-W40-SP14	42.0	131	231	40	70	SPMG 140512
J3D-430-W40-SP14	43.0	134	234	40	70	
J3D-440-W40-SP14	44.0	137	237	40	70	
J3D-450-W40-SP14	45.0	140	240	40	70	
J3D-460-W40-SP14	46.0	143	243	40	70	
J3D-470-W40-SP14	47.0	146	246	40	70	
J3D-480-W40-SP14	48.0	149	249	40	70	
J3D-490-W40-SP14	49.0	152	252	40	70	
J3D-500-W40-SP14	50.0	155	255	40	70	
J3D-510-W40-SP09	51.0	158	258	40	70	SPMG 090408
J3D-520-W40-SP09	52.0	161	261	40	70	
J3D-530-W40-SP09	53.0	164	264	40	70	
J3D-540-W40-SP09	54.0	167	267	40	70	
J3D-550-W40-SP09	55.0	170	270	40	70	
J3D-560-W40-SP09	56.0	176	278	40	70	
J3D-570-W40-SP09	57.0	179	281	40	70	
J3D-580-W40-SP09	58.0	182	284	40	70	
J3D-590-W40-SP09	59.0	185	287	40	70	
J3D-600-W40-SP09	60.0	188	290	40	70	

Screw	Wrench	Applicable holder
		
JST050110	T20	J3D-420-W40-SP14~J3D-500-W40-SP14
JST035080	T15	J3D-510-W40-SPO9~J3D-600-W40-SP09

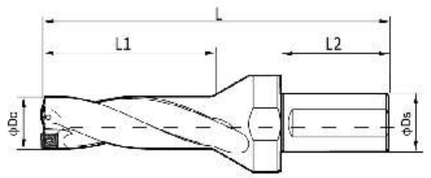
SP Series Drilling Holder
Drilling Depth: 4D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J4D-130-W20-SP05	13.0	55	114	20	44	SPMG 050204
J4D-135-W20-SP05	13.5	57	116	20	44	
J4D-140-W20-SP05	14.0	59	118	20	44	
J4D-145-W20-SP05	14.5	61	120	20	44	
J4D-150-W20-SP05	15.0	63	122	20	44	
J4D-155-W20-SP06	15.5	65	124	20	44	SPMG 060204
J4D-160-W20-SP06	16.0	67	126	20	44	
J4D-165-W20-SP06	16.5	69	128	20	44	
J4D-170-W20-SP06	17.0	71	130	20	44	
J4D-175-W25-SP06	17.5	73	144	25	56	
J4D-180-W25-SP06	18.0	75	146	25	56	
J4D-185-W25-SP06	18.5	77	148	25	56	
J4D-190-W25-SP06	19.0	79	150	25	56	
J4D-195-W25-SP06	19.5	81	152	25	56	
J4D-200-W25-SP06	20.0	83	154	25	56	
J4D-205-W25-SP06	20.5	85	156	25	56	
J4D-210-W25-SP06	21.0	87	158	25	56	
J4D-215-W25-SP06	21.5	89	160	25	56	
J4D-220-W25-SP07	22.0	91	162	25	56	SPMG 07T308
J4D-225-W25-SP07	22.5	93	164	25	56	
J4D-230-W25-SP07	23.0	95	169	25	56	
J4D-235-W25-SP07	23.5	97	171	25	56	
J4D-240-W25-SP07	24.0	99	173	25	56	
J4D-245-W25-SP07	24.5	101	175	25	56	
J4D-250-W25-SP07	25.0	103	177	25	56	
J4D-255-W32-SP07	25.5	105	185	32	60	
J4D-260-W32-SP07	26.0	107	187	32	60	
J4D-265-W32-SP07	26.5	109	189	32	60	

Screw	Wrench	Applicable holder
		
JST020040	T06	J4D-130-W20-SP05~J4D-150-W20-SP05
JST022050	T06	J4D-155-W20-SP06~J4D-170-W20-SP06
JST022050	T06	J4D-175-W25-SP06~J4D-215-W25-SP06
JST025060	T08	J4D-220-W25-SP07~J4D-275-W32-SP07

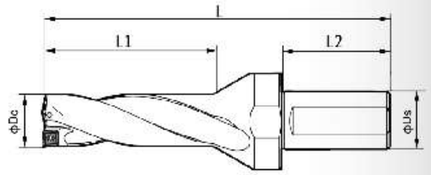
SP Series Drilling Holder
Drilling Depth: 4D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J4D-270-W32-SP07	27.0	111	191	32	60	SPMG 07T308
J4D-275-W32-SP07	27.5	113	193	32	60	
J4D-280-W32-SP09	28.0	115	195	32	60	SPMG 090408
J4D-285-W32-SP09	28.5	117	197	32	60	
J4D-290-W32-SP09	29.0	120	201	32	60	
J4D-295-W32-SP09	29.5	122	203	32	60	
J4D-300-W32-SP09	30.0	124	208	32	60	
J4D-305-W32-SP09	30.5	126	210	32	60	
J4D-310-W32-SP09	31.0	128	212	32	60	
J4D-315-W32-SP09	31.5	130	214	32	60	
J4D-320-W32-SP09	32.0	132	216	32	60	
J4D-325-W32-SP09	32.5	134	218	32	60	
J4D-330-W32-SP09	33.0	136	220	32	60	
J4D-335-W32-SP09	33.5	138	222	32	60	
J4D-340-W40-SP11	34.0	140	224	40	60	SPMG 110408
J4D-345-W40-SP11	34.5	142	226	40	60	
J4D-350-W40-SP11	35.0	144	228	40	60	
J4D-355-W40-SP11	35.5	146	230	40	60	
J4D-360-W40-SP11	36.0	148	232	40	60	
J4D-365-W40-SP11	36.5	150	234	40	60	
J4D-370-W40-SP11	37.0	153	243	40	60	
J4D-375-W40-SP11	37.5	155	245	40	60	
J4D-380-W40-SP11	38.0	157	247	40	60	
J4D-385-W40-SP11	38.5	159	249	40	60	
J4D-390-W40-SP11	39.0	161	251	40	60	
J4D-395-W40-SP11	39.5	163	253	40	60	
J4D-400-W40-SP11	40.0	165	265	40	70	
J4D-410-W40-SP11	41.0	169	269	40	70	

Screw	Wrench	Applicable holder
		
JST025060	T08	J4D-220-W25-SP07~J4D-275-W32-SP07
JST035080	T15	J4D-280-W32-SP09~J4D-335-W32-SP09
JST040100	T15	J4D-340-W40-SP11~J4D-410-W40-SP11

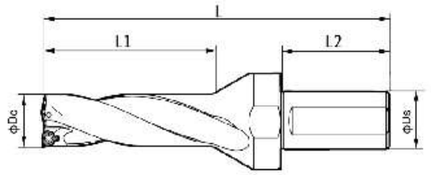
SP Series Drilling Holder
Drilling Depth: 4D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J4D-420-W40-SP14	42.0	173	273	40	70	SPMG 140512
J4D-430-W40-SP14	43.0	177	277	40	70	
J4D-440-W40-SP14	44.0	181	281	40	70	
J4D-450-W40-SP14	45.0	185	285	40	70	
J4D-460-W40-SP14	46.0	189	289	40	70	
J4D-470-W40-SP14	47.0	193	293	40	70	
J4D-480-W40-SP14	48.0	197	297	40	70	
J4D-490-W40-SP14	49.0	201	301	40	70	
J4D-500-W40-SP14	50.0	205	305	40	70	
J4D-510-W40-SP09	51.0	209	309	40	70	SPMG 090408
J4D-520-W40-SP09	52.0	213	313	40	70	
J4D-530-W40-SP09	53.0	217	317	40	70	
J4D-540-W40-SP09	54.0	221	321	40	70	
J4D-550-W40-SP09	55.0	225	325	40	70	
J4D-560-W40-SP09	56.0	232	334	40	70	
J4D-570-W40-SP09	57.0	236	338	40	70	
J4D-580-W40-SP09	58.0	240	342	40	70	
J4D-590-W40-SP09	59.0	244	346	40	70	
J4D-600-W40-SP09	60.0	248	350	40	70	

Screw	Wrench	Applicable holder
JST050110	T20	J4D-420-W40-SP14~J4D-500-W40-SP14
JST035080	T15	J4D-510-W40-SP09~J4D-600-W40-SP09

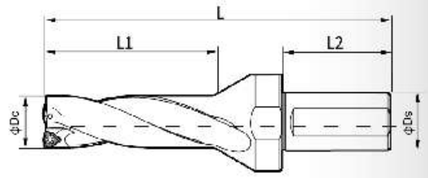
WC Series Drilling Holder
Drilling Depth: 2D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J2D-150-W20-WC03	15.0	33	92	20	44	WCMT 030208
J2D-155-W20-WC03	15.5	34	93	20	44	
J2D-160-W20-WC03	16.0	35	94	20	44	
J2D-165-W20-WC03	16.5	36	95	20	44	
J2D-170-W20-WC03	17.0	37	96	20	44	
J2D-175-W25-WC03	17.5	38	109	25	56	
J2D-180-W25-WC03	18.0	39	110	25	56	
J2D-185-W25-WC03	18.5	40	111	25	56	
J2D-190-W25-WC03	19.0	41	112	25	56	
J2D-195-W25-WC03	19.5	42	113	25	56	
J2D-200-W25-WC03	20.0	43	114	25	56	
J2D-205-W25-WC03	20.5	44	115	25	56	
J2D-210-W25-WC04	21.0	45	116	25	56	WCMT 040208
J2D-215-W25-WC04	21.5	46	117	25	56	
J2D-220-W25-WC04	22.0	47	118	25	56	
J2D-225-W25-WC04	22.5	48	119	25	56	
J2D-230-W25-WC04	23.0	49	123	25	56	
J2D-235-W25-WC04	23.5	50	124	25	56	
J2D-240-W25-WC04	24.0	51	125	25	56	
J2D-245-W25-WC04	24.5	52	126	25	56	
J2D-250-W25-WC05	25.0	53	127	25	56	WCMT 050308
J2D-255-W32-WC05	25.5	54	134	32	60	
J2D-260-W32-WC05	26.0	55	135	32	60	
J2D-265-W32-WC05	26.5	56	136	32	60	
J2D-270-W32-WC05	27.0	57	137	32	60	
J2D-275-W32-WC05	27.5	58	138	32	60	
J2D-280-W32-WC05	28.0	59	139	32	60	
J2D-285-W32-WC05	28.5	60	140	32	60	
J2D-290-W32-WC05	29.0	62	143	32	60	
J2D-295-W32-WC05	29.5	63	144	32	60	

Screw	Wrench	Applicable holder
JST025060	T08	J2D-150-W20-WC03~J2D-205-W25-WC03
JST025060	T08	J2D-210-W25-WC04~J2D-245-W25-WC04
JST030080	T08	J2D-250-W25-WC05~J2D-305-W32-WC05

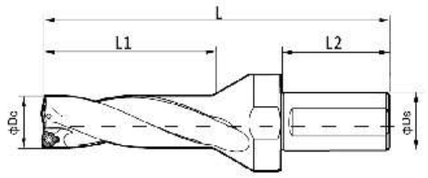
WC Series Drilling Holder
Drilling Depth: 2D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J2D-300-W32-WC05	30.0	64	148	32	60	WCMT 050308
J2D-305-W32-WC05	30.5	65	149	32	60	
J2D-310-W32-WC06	31.0	66	150	32	60	WCMT 06T308
J2D-315-W32-WC06	31.5	67	151	32	60	
J2D-320-W32-WC06	32.0	68	152	32	60	
J2D-325-W32-WC06	32.5	69	153	32	60	
J2D-330-W32-WC06	33.0	70	154	32	60	
J2D-335-W32-WC06	33.5	71	155	32	60	
J2D-340-W32-WC06	34.0	72	156	32	60	WCMT 06T308
J2D-345-W32-WC06	34.5	73	157	32	60	
J2D-350-W32-WC06	35.0	74	158	32	60	
J2D-355-W32-WC06	35.5	75	159	32	60	
J2D-360-W32-WC06	36.0	76	160	32	60	
J2D-365-W32-WC06	36.5	77	161	32	60	
J2D-370-W32-WC06	37.0	79	169	32	60	
J2D-375-W32-WC06	37.5	80	170	32	60	
J2D-380-W32-WC06	38.0	81	171	32	60	
J2D-385-W32-WC06	38.5	82	172	32	60	
J2D-390-W32-WC06	39.0	83	173	32	60	
J2D-395-W32-WC06	39.5	84	174	32	60	
J2D-400-W40-WC06	40.0	85	185	40	70	
J2D-410-W40-WC06	41.0	87	187	40	70	
J2D-420-W40-WC08	42.0	89	189	40	70	WCMT 080412
J2D-430-W40-WC08	43.0	91	191	40	70	
J2D-440-W40-WC08	44.0	93	193	40	70	
J2D-450-W40-WC08	45.0	95	195	40	70	
J2D-460-W40-WC08	46.0	97	197	40	70	
J2D-470-W40-WC08	47.0	99	199	40	70	
J2D-480-W40-WC08	48.0	101	201	40	70	
J2D-490-W40-WC08	49.0	103	203	40	70	

Screw	Wrench	Applicable holder
		
JST030080	T08	J2D-250-W25-WC05~J2D-305-W32-WC05
JST035080	T15	J2D-310-W32-WC06~J2D-410-W40-WC06
JST040100	T15	J2D-420-W40-WC08~J2D-600-W40-WC08

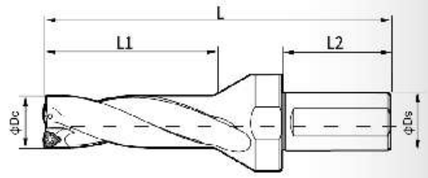
WC Series Drilling Holder
Drilling Depth: 2D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J2D-500-W40-WC08	50.0	105	205	40	70	WCMT 080412
J2D-510-W40-WC08	51.0	107	207	40	70	
J2D-520-W40-WC08	52.0	109	209	40	70	
J2D-530-W40-WC08	53.0	111	211	40	70	
J2D-540-W40-WC08	54.0	113	213	40	70	
J2D-550-W40-WC08	55.0	115	215	40	70	
J2D-560-W40-WC08	56.0	120	222	40	70	
J2D-570-W40-WC08	57.0	122	224	40	70	
J2D-580-W40-WC08	58.0	124	226	40	70	
J2D-590-W40-WC08	59.0	126	228	40	70	
J2D-600-W40-WC08	60.0	128	230	40	70	

Screw	Wrench	Applicable holder
		
JST040100	T15	J2D-420-W40-WC08~J2D-600-W40-WC08

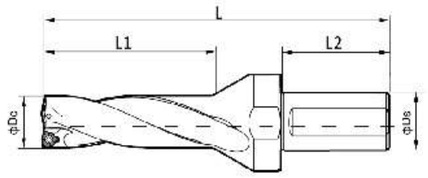
WC Series Drilling Holder
Drilling Depth: 3D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J3D-150-W20-WC03	15.0	48	107	20	44	WCMT 030208
J3D-155-W20-WC03	15.5	50	109	20	44	
J3D-160-W20-WC03	16.0	51	110	20	44	
J3D-165-W20-WC03	16.5	53	112	20	44	
J3D-170-W20-WC03	17.0	54	113	20	44	
J3D-175-W25-WC03	17.5	56	127	25	56	
J3D-180-W25-WC03	18.0	57	128	25	56	
J3D-185-W25-WC03	18.5	59	130	25	56	
J3D-190-W25-WC03	19.0	60	131	25	56	
J3D-195-W25-WC03	19.5	62	133	25	56	
J3D-200-W25-WC03	20.0	63	134	25	56	
J3D-205-W25-WC03	20.5	65	136	25	56	
J3D-210-W25-WC04	21.0	66	137	25	56	WCMT 040208
J3D-215-W25-WC04	21.5	68	139	25	56	
J3D-220-W25-WC04	22.0	69	140	25	56	
J3D-225-W25-WC04	22.5	71	142	25	56	
J3D-230-W25-WC04	23.0	72	146	25	56	
J3D-235-W25-WC04	23.5	74	148	25	56	
J3D-240-W25-WC04	24.0	75	149	25	56	
J3D-245-W25-WC04	24.5	77	151	25	56	
J3D-250-W25-WC05	25.0	78	152	25	56	WCMT 050308
J3D-255-W32-WC05	25.5	80	160	32	60	
J3D-260-W32-WC05	26.0	81	161	32	60	
J3D-265-W32-WC05	26.5	83	163	32	60	
J3D-270-W32-WC05	27.0	84	164	32	60	
J3D-275-W32-WC05	27.5	86	166	32	60	
J3D-280-W32-WC05	28.0	87	167	32	60	
J3D-285-W32-WC05	28.5	89	169	32	60	
J3D-290-W32-WC05	29.0	91	172	32	60	
J3D-295-W32-WC05	29.5	93	174	32	60	

Screw	Wrench	Applicable holder
		
JST025060	T08	J3D-150-W20-WC03~J3D-205-W25-WC03
JST025060	T08	J3D-210-W25-WC04~J3D-245-W25-WC04
JST030080	T08	J3D-250-W25-WC05~J3D-305-W32-WC05

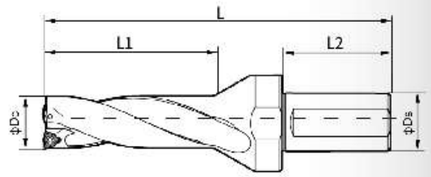
WC Series Drilling Holder
Drilling Depth: 3D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J3D-300-W32-WC05	30.0	94	178	32	60	WCMT 050308
J3D-305-W32-WC05	30.5	96	180	32	60	
J3D-310-W32-WC06	31.0	97	181	32	60	WCMT 06T308
J3D-315-W32-WC06	31.5	99	183	32	60	
J3D-320-W32-WC06	32.0	100	184	32	60	
J3D-325-W32-WC06	32.5	102	186	32	60	
J3D-330-W32-WC06	33.0	103	187	32	60	
J3D-335-W32-WC06	33.5	105	189	32	60	
J3D-340-W32-WC06	34.0	106	190	32	60	WCMT 06T308
J3D-345-W32-WC06	34.5	108	192	32	60	
J3D-350-W32-WC06	35.0	109	193	32	60	
J3D-355-W32-WC06	35.5	111	195	32	60	
J3D-360-W32-WC06	36.0	112	196	32	60	
J3D-365-W32-WC06	36.5	114	198	32	60	
J3D-370-W32-WC06	37.0	116	206	32	60	
J3D-375-W32-WC06	37.5	118	208	32	60	
J3D-380-W32-WC06	38.0	119	209	32	60	
J3D-385-W32-WC06	38.5	121	211	32	60	
J3D-390-W32-WC06	39.0	122	212	32	60	
J3D-395-W32-WC06	39.5	124	214	32	60	
J3D-400-W40-WC06	40.0	125	225	40	70	
J3D-410-W40-WC06	41.0	128	228	40	70	
J3D-420-W40-WC08	42.0	131	231	40	70	WCMT 080412
J3D-430-W40-WC08	43.0	134	234	40	70	
J3D-440-W40-WC08	44.0	137	237	40	70	
J3D-450-W40-WC08	45.0	140	240	40	70	
J3D-460-W40-WC08	46.0	143	243	40	70	
J3D-470-W40-WC08	47.0	146	246	40	70	
J3D-480-W40-WC08	48.0	149	249	40	70	
J3D-490-W40-WC08	49.0	152	252	40	70	

Screw	Wrench	Applicable holder
		
JST030080	T08	J3D-250-W25-WC05~J3D-305-W32-WC05
JST035080	T15	J3D-310-W32-WC06~J3D-410-W40-WC06
JST040100	T15	J3D-420-W40-WC08~J3D-600-W40-WC08

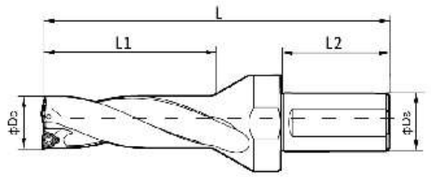
WC Series Drilling Holder
Drilling Depth: 3D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J3D-500-W40-WC08	50.0	155	255	40	70	WCMT 080412
J3D-510-W40-WC08	51.0	158	258	40	70	
J3D-520-W40-WC08	52.0	161	261	40	70	
J3D-530-W40-WC08	53.0	164	264	40	70	
J3D-540-W40-WC08	54.0	167	267	40	70	
J3D-550-W40-WC08	55.0	170	270	40	70	
J3D-560-W40-WC08	56.0	176	278	40	70	
J3D-570-W40-WC08	57.0	179	281	40	70	
J3D-580-W40-WC08	58.0	182	284	40	70	
J3D-590-W40-WC08	59.0	185	287	40	70	
J3D-600-W40-WC08	60.0	188	290	40	70	

Screw	Wrench	Applicable holder
		
JST040100	T15	J3D-420-W40-WC08~J3D-600-W40-WC08

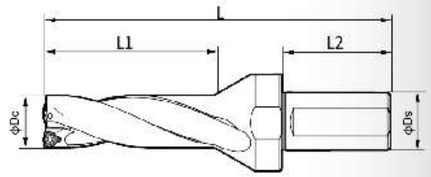
WC Series Drilling Holder
Drilling Depth: 4D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J4D-150-W20-WC03	15.0	63	122	20	44	WCMT 030208
J4D-155-W20-WC03	15.5	65	124	20	44	
J4D-160-W20-WC03	16.0	67	126	20	44	
J4D-165-W20-WC03	16.5	69	128	20	44	
J4D-170-W20-WC03	17.0	71	130	20	44	
J4D-175-W25-WC03	17.5	73	144	25	56	
J4D-180-W25-WC03	18.0	75	146	25	56	
J4D-185-W25-WC03	18.5	77	148	25	56	
J4D-190-W25-WC03	19.0	79	150	25	56	
J4D-195-W25-WC03	19.5	81	152	25	56	
J4D-200-W25-WC03	20.0	83	154	25	56	
J4D-205-W25-WC03	20.5	85	156	25	56	
J4D-210-W25-WC04	21.0	87	158	25	56	WCMT 040208
J4D-215-W25-WC04	21.5	89	160	25	56	
J4D-220-W25-WC04	22.0	91	162	25	56	
J4D-225-W25-WC04	22.5	93	164	25	56	
J4D-230-W25-WC04	23.0	95	169	25	56	
J4D-235-W25-WC04	23.5	97	171	25	56	
J4D-240-W25-WC04	24.0	99	173	25	56	
J4D-245-W25-WC04	24.5	101	175	25	56	
J4D-250-W25-WC05	25.0	103	177	25	56	WCMT 050308
J4D-255-W32-WC05	25.5	105	185	32	60	
J4D-260-W32-WC05	26.0	107	187	32	60	
J4D-265-W32-WC05	26.5	109	189	32	60	
J4D-270-W32-WC05	27.0	111	191	32	60	
J4D-275-W32-WC05	27.5	113	193	32	60	
J4D-280-W32-WC05	28.0	115	195	32	60	
J4D-285-W32-WC05	28.5	117	197	32	60	
J4D-290-W32-WC05	29.0	120	201	32	60	
J4D-295-W32-WC05	29.5	122	203	32	60	

Screw	Wrench	Applicable holder
		
JST025060	T08	J4D-150-W20-WC03~J4D-205-W25-WC03
JST025060	T08	J4D-210-W25-WC04~J4D-245-W25-WC04
JST030080	T08	J4D-250-W25-WC05~J4D-305-W32-WC05

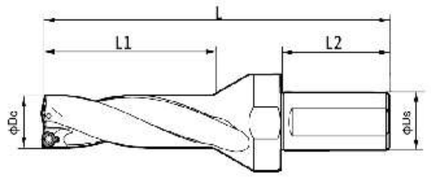
WC Series Drilling Holder
Drilling Depth: 4D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J4D-300-W32-WC05	30.0	124	208	32	60	WCMT 050308
J4D-305-W32-WC05	30.5	126	210	32	60	
J4D-310-W32-WC06	31.0	128	212	32	60	WCMT 06T308
J4D-315-W32-WC06	31.5	130	214	32	60	
J4D-320-W32-WC06	32.0	132	216	32	60	
J4D-325-W32-WC06	32.5	134	218	32	60	
J4D-330-W32-WC06	33.0	136	220	32	60	
J4D-335-W32-WC06	33.5	138	222	32	60	
J4D-340-W32-WC06	34.0	140	224	32	60	WCMT 06T308
J4D-345-W32-WC06	34.5	142	226	32	60	
J4D-350-W32-WC06	35.0	144	228	32	60	
J4D-355-W32-WC06	35.5	146	230	32	60	
J4D-360-W32-WC06	36.0	148	232	32	60	
J4D-365-W32-WC06	36.5	150	236	32	60	
J4D-370-W32-WC06	37.0	153	243	32	60	
J4D-375-W32-WC06	37.5	155	245	32	60	
J4D-380-W32-WC06	38.0	157	247	32	60	
J4D-385-W32-WC06	38.5	159	249	32	60	
J4D-390-W32-WC06	39.0	161	251	32	60	
J4D-395-W32-WC06	39.5	163	253	32	60	
J4D-400-W40-WC06	40.0	165	265	40	70	
J4D-410-W40-WC06	41.0	169	269	40	70	
J4D-420-W40-WC08	42.0	173	273	40	70	WCMT 080412
J4D-430-W40-WC08	43.0	177	277	40	70	
J4D-440-W40-WC08	44.0	181	281	40	70	
J4D-450-W40-WC08	45.0	185	285	40	70	
J4D-460-W40-WC08	46.0	189	289	40	70	
J4D-470-W40-WC08	47.0	193	293	40	70	
J4D-480-W40-WC08	48.0	197	297	40	70	
J4D-490-W40-WC08	49.0	201	301	40	70	

Screw	Wrench	Applicable holder
		
JST030080	T08	J4D-250-W25-WC05~J4D-305-W32-WC05
JST035080	T15	J4D-310-W32-WC06~J4D-410-W40-WC06
JST040100	T15	J4D-420-W40-WC08~J4D-600-W40-WC08

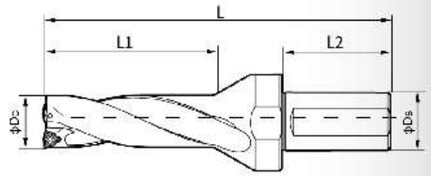
WC Series Drilling Holder
Drilling Depth: 4D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J4D-500-W40-WC08	50.0	205	305	40	70	WCMT 080412
J4D-510-W40-WC08	51.0	209	309	40	70	
J4D-520-W40-WC08	52.0	213	313	40	70	
J4D-530-W40-WC08	53.0	217	317	40	70	
J4D-540-W40-WC08	54.0	221	321	40	70	
J4D-550-W40-WC08	55.0	225	325	40	70	
J4D-560-W40-WC08	56.0	232	334	40	70	
J4D-570-W40-WC08	57.0	236	338	40	70	
J4D-580-W40-WC08	58.0	240	342	40	70	
J4D-590-W40-WC08	59.0	244	346	40	70	
J4D-600-W40-WC08	60.0	248	350	40	70	

Screw	Wrench	Applicable holder
		
JST040100	T15	J4D-420-W40-WC08~J4D-600-W40-WC08

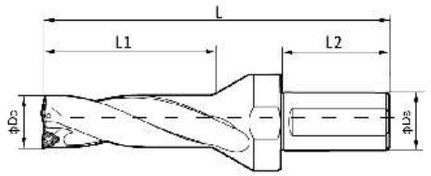
WC Series Drilling Holder
Drilling Depth: 5D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J5D-160-W20-WC03	16.0	83	142	20	44	WCMT 030208
J5D-165-W20-WC03	16.5	86	145	20	44	
J5D-170-W20-WC03	17.0	88	147	20	44	
J5D-175-W25-WC03	17.5	91	150	25	56	
J5D-180-W25-WC03	18.0	93	152	25	56	
J5D-185-W25-WC03	18.5	96	155	25	56	
J5D-190-W25-WC03	19.0	98	157	25	56	
J5D-195-W25-WC03	19.5	101	160	25	56	
J5D-200-W25-WC03	20.0	103	162	25	56	
J5D-205-W25-WC03	20.5	106	165	25	56	
J5D-210-W25-WC04	21.0	108	167	25	56	WCMT 040208
J5D-215-W25-WC04	21.5	111	170	25	56	
J5D-220-W25-WC04	22.0	113	172	25	56	
J5D-225-W25-WC04	22.5	116	175	25	56	
J5D-230-W25-WC04	23.0	118	180	25	56	
J5D-235-W25-WC04	23.5	121	183	25	56	
J5D-240-W25-WC04	24.0	123	185	25	56	
J5D-245-W25-WC04	24.5	126	188	25	56	
J5D-250-W25-WC05	25.0	128	190	25	56	WCMT 050308
J5D-255-W32-WC05	25.5	131	213	32	60	
J5D-260-W32-WC05	26.0	133	216	32	60	
J5D-265-W32-WC05	26.5	136	217	32	60	
J5D-270-W32-WC05	27.0	138	218	32	60	
J5D-275-W32-WC05	27.5	141	221	32	60	
J5D-280-W32-WC05	28.0	143	223	32	60	
J5D-285-W32-WC05	28.5	146	226	32	60	
J5D-290-W32-WC05	29.0	149	230	32	60	
J5D-295-W32-WC05	29.5	151	233	32	60	
J5D-300-W32-WC05	30.0	154	238	32	60	
J5D-305-W32-WC05	30.5	157	241	32	60	

Screw	Wrench	Applicable holder
		
JST025060	T08	J5D-160-W20-WC03~J5D-205-W25-WC03
JST025060	T08	J5D-210-W25-WC04~J5D-245-W25-WC04
JST030080	T08	J5D-250-W25-WC05~J5D-305-W32-WC05

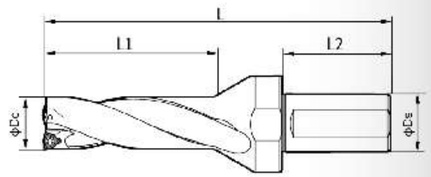
WC Series Drilling Holder
Drilling Depth: 5D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J5D-310-W32-WC06	31.0	159	243	32	60	WCMT 06T308
J5D-315-W32-WC06	31.5	162	245	32	60	
J5D-320-W32-WC06	32.0	164	248	32	60	
J5D-325-W32-WC06	32.5	167	251	32	60	
J5D-330-W32-WC06	33.0	169	253	32	60	
J5D-335-W32-WC06	33.5	172	255	32	60	
J5D-340-W32-WC06	34.0	174	258	32	60	WCMT 06T308
J5D-345-W32-WC06	34.5	177	261	32	60	
J5D-350-W32-WC06	35.0	179	263	32	60	
J5D-355-W32-WC06	35.5	182	265	32	60	
J5D-360-W32-WC06	36.0	184	268	32	60	
J5D-365-W32-WC06	36.5	187	271	32	60	
J5D-370-W32-WC06	37.0	190	280	32	60	
J5D-375-W32-WC06	37.5	193	283	32	60	
J5D-380-W32-WC06	38.0	195	285	32	60	
J5D-385-W32-WC06	38.5	198	288	32	60	
J5D-390-W32-WC06	39.0	200	290	32	60	
J5D-395-W32-WC06	39.5	203	293	32	60	
J5D-400-W40-WC06	40.0	205	305	40	70	
J5D-410-W40-WC06	41.0	210	310	40	70	
J5D-420-W40-WC08	42.0	215	315	40	70	WCMT 080412
J5D-430-W40-WC08	43.0	220	320	40	70	
J5D-440-W40-WC08	44.0	225	325	40	70	
J5D-450-W40-WC08	45.0	230	330	40	70	
J5D-460-W40-WC08	46.0	235	335	40	70	
J5D-470-W40-WC08	47.0	240	340	40	70	
J5D-480-W40-WC08	48.0	245	345	40	70	
J5D-490-W40-WC08	49.0	250	350	40	70	

Screw	Wrench	Applicable holder
		
JST035080	T15	J5D-310-W32-WC06~J5D-410-W40-WC06
JST040100	T15	J5D-420-W40-WC08~J5D-600-W40-WC08

WC Series Drilling Holder
Drilling Depth: 5D



Designation	Dimension(mm)					Inserts
	Dc	L1	L	Ds	L2	
J5D-500-W40-WC08	50.0	255	355	40	70	WCMT 080412
J5D-510-W40-WC08	51.0	260	360	40	70	
J5D-520-W40-WC08	52.0	265	365	40	70	
J5D-530-W40-WC08	53.0	270	370	40	70	
J5D-540-W40-WC08	54.0	275	375	40	70	
J5D-550-W40-WC08	55.0	280	380	40	70	
J5D-560-W40-WC08	56.0	285	385	40	70	
J5D-570-W40-WC08	57.0	295	390	40	70	
J5D-580-W40-WC08	58.0	300	395	40	70	
J5D-590-W40-WC08	59.0	305	400	40	70	
J5D-600-W40-WC08	60.0	310	405	40	70	

Screw	Wrench	Applicable holder
		
JST040100	T15	J5D-420-W40-WC08~J5D-600-W40-WC08

Precautions For Safe Use Of Cutting Tools

Project	Risk	Safeguard Procedures
Common cutting tool	Direct contact with the sharp edge of the cutting tool may cause injury to the human body.	When you install or remove cutting tools on the machine, use protective labor protection such as gloves.
	Improper use of the tool can lead to its breakage, splashes, causing damage.	Read samples and safety standards before use. Please use protective glasses and clothing.
	Excessive wear and severe impact increase the cutting resistance, which may cause the tool to break and splash, causing injury to the operator.	Replace excessively worn tools in time. Please use protective glasses and clothing.
	The chips in the cutting process may cause burns and scratches to people.	Use tools such as pliers to remove chips. Please use protective glasses, clothing and gloves.
	The sparks and hot chips generated during the cutting process pose a risk of fire and explosion.	Remove flammable and explosive materials from the cutting area. Please prepare fire extinguishing equipment.
	The machine tool running at high speed will cause severe vibration due to the poor balance of the fixture and so on, resulting in tool damage.	Before cutting, check the equipment for loose or abnormal sounds. Please use protective glasses and clothing.
	Burrs and other defects on the workpiece are very sharp and can easily scratch the human body.	Please do not touch the burrs on the workpiece. Use protective gloves and clothing.
	Direct machining without clamping the workpiece will cause tool damage and spatter of the workpiece.	The workpiece must be firmly clamped. Please use protective glasses and clothing.
Indexable Cutting Tool	Cutting when the insert or insert attachment is not properly secured, there is a risk that the tool will fall off and fly out causing injury.	Before processing, ensure that the inserts and other accessories are properly fastened with the appropriate tools.
	There is a risk that the insert or knife will break and splash when over-tightened with auxiliary tools such as bolts or platens.	Do not use auxiliary tools such as bushings to tighten them excessively.
	Inserts or accessories may fall off and fly out due to inertial centrifugal force when cutting at high speed.	Use knives within recommended limits. Please use protective glasses and clothing.
Milling and other rotary tools	Because of the sharp edge of the milling tool, there is a risk of scratches if you touch it directly with your hand.	For your safety, wear protective gloves if you have to touch the insert.
	In rotary cutting, clothes, gloves, etc., are easy to be twisted onto high-speed equipment, causing casualties.	When you are performing rotary cutting, please do not wear gloves processing.Always be careful not to let clothes, etc. touch the running machine parts.
	Eccentric rotating or poorly balanced tools will produce shaking vibration during rotating processing, causing damage and flying leading to injury.	Use the tool within the allowable speed range. Check the balance of the machine regularly.
	In high-speed cutting, high-speed flying chips may cause injury.	Use safety cover, protective screen, outer cover, etc. Please use protective glasses, protective clothing and gloves.
Others	Use outside the specified purpose can lead to accelerated damage to machine tools and tools, and cause other hazards.	Use according to the instructions and regulations.
	The use of a tool in a non-stationary state is very dangerous and may cause damage to the tool or machine.	Use the tools as recommended.

CONTENTS

Technical Information

Turning Grade Comparison Table

Classification		WORLDIA	SANDVIK	KENNAMETAL	SECO	WALTER	ISCAR	TAEGUTEC	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	ZCC.CT	Achteck
P	P10	WT8010	GC4415 GC4325	KCP10	TP1501 TP1500	WPP10S WPP10	IC8150	TT8115	MC6015 UE6110	T9215 T9115	CA115P CA5515	AC8015P AC810P	YBC152 YBC151	AC152P
	P20	WT8020	GC4425 GC4225	KCP25 KC9215	TP2501 TP2500	WPP20S WPP20	IC8250	TT8125	MC6025 UE6020	T9125 T9025	CA125P CA5525	AC8025P AC820P	YBC251 YBC252	AC250P
	P30	WT8030	GC4335 GC4235	KCP30	TP3500	WPP30S WPP30	IC8350	TT8135 TT8020*	MC6035	T9135 T9035	CA5535	AC8035P AC830P	YBC351 YBC352	AC350P
M	M10	WT3310* WT5015*	GC1105*	KC5010*	TH1000* CP200*	WSM10* WSM10S*	IC907* IC807*	TT5080*	VP10RT* MP7015*	AH120*	PR1305* PR1310* PR1215*	AC510U*	YBG102* YBG105*	AP100S*
	M20	WT3330* WT5025* WT5030*	GC1115* GC15*	KCU25* KC5525*	CP500*	WSM20* WSM20S*	IC908* IC808*	TT9080* TT9030	VP15TF* MP7025*	AH725* AH130*	PR930* RP1225* PR1325*	AC520U*	YBG202* YBG212* YBG205*	AP200U* AP301M*
	M30	WT5035*	GC1125*	KCM35B KC7030*	CP600*	WSM30S* WSM30	IC830*	TT8020*	MP7035*	AH645*	PR1535*	AC6040* AC530U*		AP351M*
K	K10	WT4015	GC3205 GC3005	KCK05 KCK05B	TK1001 TK1000	WKK10S WAK10	IC5005	TT7005	MC5005 UC5105	T505	CA4505 CA4010	AC405K AC410K	YBD052	AC102K
	K20	WT4020	GC3210 GC3215	KCK15 KC9315	TK2001 TK2000	WKK20S WAK20	IC5010 IC428	TT7310 TT7015	MC5015 UC5115	T5115 T515	CA4515 CA415	AC415K AC700G	YBD152C YBD152	AC202K ACK15A
S	S10	WT3310* WT5015*	GCSO5F GC1105* GC1115*	KCU10* KC5510*	TH1000* TH1500* TS2000*	WSM10*	IC807* IC907*	TT5080*	VP10RT* MP9005*	AH110* AH905* AH8005*	PR1305* PR1310* PR1715*	AC503U* AC510U*	YBG102* YBG105*	AP100S*
	S20	WT3330*	GC15* GC1115*	KCU20* KC5525* KC5025*	CP500*	WSM20*	IC808* IC908*	TT9080*	VP15TF* MP9015*	AH120* AH8015*	PR1425* PR1225* PR1325*	AC520U*	YBG212* YBG202* YBG205*	AP301M*
N	N10		H10	K68 K313	KX	WK1	IC20	K10	HTI10	TH10	KW10	H1	YD101	AW100K

"*"Indicates the grade of PVD coating. The brand information of each manufacturer comes from public information.
The data is for reference only and subject to the actual product information.

Turning Chip breaker Comparison Table

Classification	Application	WORLDIA	SANDVIK	KENNAMETAL	SECO	WALTER	ISCAR	TAEGUTEC	MITSUBISHI	TUNGALOY	SUMITOMO	KYOCERA	KORLOY	ZCC.CT	Achteck
P	Finishing		QF	FF, FS	FF1	FP5	SF	FA, FS FX	FH	TF,ZF	FA,FL	DP, GP PP	HU, VL	WGF	PB1
				FP, LF FN	FF2 MF2	NF3	NF	FG,FM	LP, SH FY	TS,TSF	SU,SE	XF, XP HQ	VG, VF VQ	SF,NF DF	
	Semi-finishing		PF, XF			NS6		FC, FT	SA		LU	CQ, PQ CJ	VB, VC HC	NM	PB3
	Medium processing	MP	PM, XM	FM	MF3 M3	MP5 NM4	M3P	PC	MP, MV MA	TM	GE,GU	PG,PS	VM, HS GS	PM	PC3
			HM XMR	MP, RP RM		NM6	GN	MT			UX, UG	HS,CS	HM, GM	DM	PD3
	Roughing	RP	PR	RN M6	M5, MR7 RP5	NR4	NR, R3P	RT	GH, RP	TH	MU, MX	PT, GT	HR, GR	DR	PD5
	Heavy roughing		PR	RM		NRF		RX	HZ			PX			PC8
		QR	QR	MR,MP	R5, R6	NR6	R3P NM	RH	HZ	TRS,57	MP,HG	HX	GH		PD8
		HR	HR, 31	RH	R8,R7	NRR		HT, HD	HCS,HX	65,TU	HF,HU		VT	ER,HDR	PC9
		HH			RR9			HY, HZ	HV, HDS		HW		VH		PD9
M	Finishing	FS	MF	FP	MF1	NF4	SF, F3M	EA,SF	FS, LM	SF	SU	MQ	HA, VP2	EF	MB2
	Semi-finishing	MS	SM	MS	MF2	MS3	PP	ML	MS	28	UP	TK	HA		SL3
	Medium processing	ES	MM	MP,UP	MF4	NMS	M3M	EM	MS, GM MA	SS, S	EX, GU	MS, MU	GS, HS	EM	MC3 SC3
K	Medium processing	MG-		RP	M5	NM5 RK5	MG-	MG-	MG-, GK	MG-		C		MG-	PC4
	Roughing	Flatbed	KR	UN	MR7	RK7		RT	GX, RK	CH	GZ	ZS, GC	GR	DR	KC4 KD5
S	Finishing	FS	SF	FS	MF1	NF4	SF	EA, SF	FS,LS	TF	SU	MQ	VP1	EF	SC1 MB2
	Semi-finishing	MS		MS	MF2	MS3	PP	ML	MS	28	UP	TK	HA		SL3
	Medium processing	ES	SM,SMC	UP	MR3	NMS NMT	TF	MP, SU MK	MS	HMM SA	EG,EX	MS, MU	VP3	NM	SC3

The brand information of each manufacturer comes from public information.
The data is for reference only and subject to the actual product information.

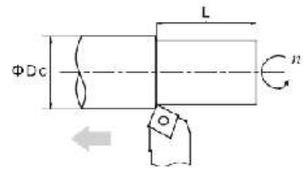
Turning Chip breaker Comparison Table

Classification	Application	WORLDIA	SANDVIK	KENNAMETAL	SECO	WALTER	ISCAR	TAEGUTEC	DURACARB	TUNGALOY	KYOCERA	MITSUBISHI	SUMITOMO	KORLOY	ZCC.CT	Achteck
P M K	Finishing	LU	PF,UF	UF, 11 GM	FF1	PF4 PF5	38, PF	FA,FX		01, PF PSF	XP, GK GP, VF	FV	LU, FP	VL, VF HFP	SF, HF	PB1
	Semi-finishing		PM	MP				PC FM	41	PSS PS	HQ				EF EM	PC2
	Medium processing		XM, PR UR, XR	MF	F2	PM5 E47, MT-	14, 17 19, MT-	MT	52	PM	MT-	MQ, MV MT-, G	SF, MU	C25	HR	KC2
N	Semi-finishing		AL	HP	AL	PM2	AF, AS	FL	AU	AL	AH	AZ	AW,AG	AK, AR	LH	NC2

The brand information of each manufacturer comes from public information.
The data is for reference only and subject to the actual product information.

Turning General Formula

▶ Cutting speed



$$Vc=\frac{\pi*Dc*n}{1000}\ (m/min)$$

Vc:Cutting speed(m/min) π≈3.14
Dc:Workpiece diameter(mm) n:Spindle speed(rev/min)

▶ Feed speed

$$Vf=f*n(mm/min)$$

Vf:Feed speed(mm/min) f:Feed rate(mm/rev)
n:Spindle speed(rev/min)

▶ Chip thickness

$$h=f*sinkr(mm)$$

h:Chip thickness(mm) f:Feed rate(mm/rev)
kr:Tool cutting edge angle

▶ Chip width

$$b=\frac{ap}{sinkr}\ (m/min)$$

b:Chip width(mm) ap:Axial depth of cut(mm)
kr:Tool cutting edge angle

▶ Chip area

$$A=h*b=ap*f(mm^2)$$

A:Chip area(mm^2) ap:Axial depth of cut(mm)
f:Feed rate(mm/rev)

▶ Cutting force

$$Fc=Kc*ap*f(N)$$

Fc:Cutting force(N) Kc:Unit cutting force(N/mm^2)
ap:Axial depth of cut(mm) f:Feed rate(mm/rev)

▶ Cutting power

$$Pmot=\frac{Kc*Vc*ap*f}{6000*\eta}\ (KW)$$

Pmot:Cutting power(KW) Kc:Unit cutting force(N/mm^2)
Vc:Cutting speed(m/min) ap:Axial depth of cut(mm)
f:Feed rate(mm/rev) η:Mechanical efficiency

▶ Chip removal

$$Q=ap*f*Vc(cm^3/min)$$

Q:Chip removal(cm^3/min) ap:Axial depth of cut(mm)
f:Feed rate(mm/rev) Vc:Cutting speed(m/min)

▶ Theoretic surface roughness

$$Rmax=\frac{f^2}{8*r}*1000(um)$$

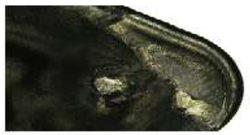
Rmax:Theoretic surface roughness(mm)
f:Feed rate(mm/rev) r:Corner radius(mm)

▶ Work time

$$Tc=\frac{L}{F*n}\ (min)$$

Tc:Work time f:Feed rate(mm/rev)
n:Spindle speed (rev/min) L:Working length (mm)

Turning Insert Common Troubleshooting

Failtures	Picture	Analysis	Solution
Flank wear		• Tool material is too soft • Excessive cutting speed • Too small clearance angle • Too low feed rate • Insufficient cooling	• Choose high wear-resistant insert grade • Reduce cutting speed • Enlarge clearance angle • Increase feed rate
Crater wear		• Tool material is too soft • Excessive cutting speed • Excessive feed rate	• Choose high wear-resistant insert grade • Reduce cutting speed • Reduce feed rate • Increase the flow of coolant
Fracture		• Tool material is too hard • Too low cutting edge strength	• Choose tougher grade • Enhance cutting edge strength
Plastic deformation		• Tool material is too soft • Too fast cutting speed • Excessive cutting depth & feed rate • Insufficient cooling	• Choose high wear-resistant insert grade • Reduce cutting speed • Reduce cutting depth & feed rate • Choose good thermal conductivity grade • Increase the flow of coolant
Bulit up edge		• Too low cutting speed • Cutting edge not sharp • Unsuitable grade • Insufficient cooling	• Increase cutting speed • Choose sharp geometry • Choose less adhesion grade • Increase the flow of coolant
Mechanical wear		• Excessive feed rate and cutting depth • Vibration	• Choose tougher grade • Choose a smaller approach angle • Choose bigger corner radius • Change to high rigidity holder
Cracks(thermal)		• Excessive cutting heat change on edge	• Choose dry cutting oradequate cooling • Choose tougher grade

Milling Grade Comparison Table

Application		WORLDIA	SANDVIK	KENNAMETAL	SECO	WALTER	ISCAR	TAEGUTEC	MITSUBISHI	TUNGALOY	SUMITOMO	KYOCERA	KORLOY	ZCC.CT	Achteck
P	P10	WT3010* WT3020*	GC1025* GC1010*	KC715M*		WXM15*			F7010		ACP100*	PR1225*	PC3525*	YBG202* YBG205*	
	P20	WT5025* WT5030*	GC1130* GC1030* GC4220 GC4020 GC4030	KC522M* KC525M* KCPM20	MP1500* T250M T25M T20M	WKP25S	IC330* IC250* IC950* IC520N	TT7080* TT7030*	MC7020 MP6120* MV1020 UP20M* F7030	T313W AH725*	ACP200* ACP2500*	PR1525* PR1225* PR1230*	PC3535* PC3500*	YBC301 YBC302 YBM251 YBG205* YBG252*	AP251U*
	P30	WT5025* WT5030*	GC1130* GC4040 GC4230 GC4330	KC994M* KC725M* KC792M* KC530M	MP2500 T250M T25M F25M F30M	WSM35S* WKP35S WKP35G	IC330* IC328* IC830* IC908*	TT9080* TT9030* TT7080*	MP6130* VP15TF* VP3ORT* F7030	T3130 GH330 AH120* AH330* AH730*	AC230* ACP300*	PR1230* PR1535*	PC5300* PC9530* PC3600*	YBM351 YBM251 YBM301 YBG302*	AP351U* AP351M* AC301P
	P40	WT5035*	GC4040 GC4240 GC4340	KC735M*	MP300 T350M T60M T25M	WKP45S WSP46*	IC635 IC928* IC4050	TT9030*	VP30RT*	AH140*	AC230* ACZ330* ACZ350*		PC9530*	YBC302 YBG302* YBG351*	AP403M*
M	M10		GC1025* GC1030*	KC522M*				TT9300*	F7010	T6120 T6020	ACM100* ACM200*	PR1225*	NC5330	YBG202*	
	M20			KC730M* KC525M*	MS2050 MP2500 T250M T25M F20M	WXM15*	IC380* IC908* IC928*	TT9300*	MC7020 VP15TF* VP20RT* MP7030* MP7130*	T6130	ACM200* ACP200* ACU2500*	PR1525* PR1225*	PC5300* PC3545* PC9530*	YBM251 YBM253 YBC302 YBG205* YBG252*	AP251U*
	M30	WT5035* WT3330*	GC1040* GC2040* S40T	KC994M* KC725M* KCPK30*	T350M T250M F40M	WSM35S* WSM36*	IC380* IC328* IC330*	T9080* TT8020*	F7030 VP3ORT* MP7140*		ACM300* ACP300* ACZ350*	CA6535 PR1535*	PC3545* PC5300*	YBC302 YBG351* YBG302*	AP351U* AP351M*
	M40				MM4500	WKP45S WSP46*	IC830*	TT8080* TT8020* TT9300*	VP3ORT*		ACZ350*		PC9530*	YBG302*	AP403M*
K	K01				MH1000		IC5100 IC4100			T505 T5105	ACK100*		PC215K		
	K10	WT7020* WT4020	GC1010* GC3220 K15W	KCK15* KC915M*	MK1500 T150M F15M	WXM15* WAK15 WSN10	IC5100 IC4010 IC910* IC810*	K10	MP8010* MC5020 MV1020 VP10RT*	T515 T5115 T5125	ACK200* AC211*	PR1500* PR1210* PR905*	PC6510* PC5300*	YBD152 YBG102* YBG252*	
	K20	WT7020* WT4020	GC1020* GC3020 GC3330 GC3334	KCC520M* KC920M* KC925M*	MP1500* MK2000* MK2050*	WKP25S WKK25S*	IC810* IC910* IC928*	TT6080* TT7515	VP15TF* VP2ORT*	AH120* AH725* T1215	EH20Z* ACZ310* ACK300*	CA420M PR1210* CA415D PR905*		YBD152 YBD252 YBG152*	AP251K* AP351K* AC301K
	K30		GC3040 GC4040	KC930M*	MK3000 T250M	WKP35S	IC928*	TT7515		GH130*				YBD252 YBG152*	
S	S10		GC1030* GC1025* GC1010*	KC510M*	MS2050*		IC903* IC807* IC808* IC908*	K10	MP9120* VP15TF*		ACM100* ACM200*	CA6535 PR1535* PR1210*		YBG202* YBS203*	
	S20	WT5025* WT5030* WT3330*	GC1030* GC2030* GC1130*	KC525M*	MP2050*	WSM35S* WSM36*	IC903* IC807* IC808* IC908* IC830*	TT9080* TT9030* TT5525*	MP9120* VP15TF* MP9130* MP9030*		ACU2500* ACM200*	CA6535 PR1535* PR1210*		YBS203* YBS303*	
	S30	WT5035* WT3330*	GC2040* S40T	KC725M* KCPM40*	F40M*	WSP45S* WSP46* WSM42X* WMP45G	IC328 IC330	TT8080* TT8020* TT9300*	MP9140*		ACM300*	PR1535*		YBS303*	AP403S*

"*"Indicates the grade of PVD coating. The brand information of each manufacturer comes from public information.
The data is for reference only and subject to the actual product information.

Milling General Formula

▶ Cutting speed

$$Vc=\frac{\pi*Dc*n}{1000}\ (m/min)$$

Vc:Cutting speed(m/min) π≈3.14
Dc:Cutter diameter(mm) n:Spindle speed(rev/min)

▶ Spindle speed

$$n=\frac{1000*Vc}{\pi*Dc}\ (rev/min)$$

Vc:Cutting speed(m/min) π≈3.14
Dc:Cutter diameter(mm) n:Spindle speed(rev/min)

▶ Feed speed

$$Vf=fz*n*Z(mm/min)$$

Vf:Feed speed(mm/min) fz:Feed rate per rev.(mm/z)
n:Spindle speed(rev/min) Z:Number of teeth

▶ Feed rate per rev.

$$fz=\frac{Vf}{n*Z}\ (mm/z)$$

fz:Feed rate per rev.(mm/z) Vf:Feed speed(mm/min)
n:Spindle speed(rev/min) Z:Number of teeth

▶ Feed rate per teeth

$$f=\frac{vf}{n}\ (mm/rev)$$

f:Feed rate per rev.(mm/rev) Vf:Feed speed(mm/min)
n:Spindle speed (rev/min)

▶ Work time

$$Tc=\frac{L}{Vf}\ (min)$$

Tc:Work time(min) L:Length of feed(mm)
Vf:Feed speed(mm/min)

▶ Horse power

$$Hp=\frac{Pmot}{0.75}$$

▶ Power demand

$$Pmot=\frac{ap*ae*Vf*Kc}{6*10^7*\eta}\ (KW)$$

Pmot:Cutting power(KW) ap:Chip depth ae:Cutting width
Kc:Unit cutting force(N/mm²)
η:Machine efficiency coefficient(0.7-0.95)

▶ Average chip thickness

$$hm=\frac{114.7*fz*sink*(ae/Dc)}{\Psi s}\ (KW)$$

hm:Average chip thickness fz:Feed rate per rev.(mm/z)
ae:Cutting width Dc:Cutter diameter(mm)
Ψs:Pressure angle

▶ Feed force

Cutter in the center site

$$\Psi s=2*\arcsin(\frac{ae}{Dc})\ [^\circ]$$

Cutter in excentric site

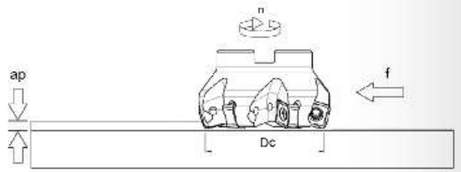
$$\Psi s=90^\circ+\arcsin\frac{ae-(Dc/2)}{(Dc/2)}\ [^\circ]$$

Ψs:Pressure angle ae:Cutting width
Dc:Cutter diameter(mm)

▶ Chip removal

$$hm=\frac{114.7*fz*sink*(ae/Dc)}{\Psi s}\ (KW)$$

Q:Chip removal (cm³/min) ap:Chip depth
ae:Cutting width Dc:Cutter diameter(mm)
fz:Feed rate per rev.(mm/z) Ψs:Pressure angle



Drilling General Formula

▶ Cutting speed

$$Vc=\frac{\pi*Dc*n}{1000}\ (m/min)$$

Vc:Cutting speed(m/min) π≈3.14
Dc:Drill diameter(mm) n:Spindle speed(rev/min)

▶ Spindle speed

$$n=\frac{1000*Vc}{\pi*Dc}\ (rev/min)$$

Vc:Cutting speed(m/min) π≈3.14
Dc:Drill diameter(mm) n:Spindle speed(rev/min)

▶ Feed speed

$$Vf=fz*n*Z(mm/min)$$

Vf:Feed speed(mm/min) fz:Feed rate per rev.(mm/z)
n:Spindle speed(rev/min) Z:Number of teeth

▶ Feed rate per rev.

$$fz=\frac{Vf}{n*Z}\ (mm/z)$$

fz:Feed rate per rev.(mm/z) Vf:Feed speed(mm/min)
n:Spindle speed(rev/min) Z:Number of teeth

▶ Chip removal

$$Q=\frac{Vf*\pi*Dc^2}{4*1000}\ (cm^3/min)$$

Q:Chip removal(cm³/min) Vf:Feed speed(mm/min)
π≈3.14 Dc:Drill diameter(mm)

▶ Horse power

$$Hp=\frac{Pmot}{0.75}$$

Hp:Horse power Pmot:Cutting power(KW)

▶ Power demand

$$Pmot=\frac{Q*Kc}{60000*\eta}\ (KW)$$

Pmot:Cutting power(KW) Q:Chip removal(cm³/min)
Kc:Unit cutting force(N/mm²)
η:Machine efficiency coefficient(0.7-0.95)

▶ Torque

$$Mc=\frac{Dc^2*Kc*f}{8000}\ (N*m)$$

Mc:Torque Dc:Drill diameter(mm)
Kc:Unit cutting force(N/mm²) f:Feed rate per rev.(mm/rev)

▶ Feed force

$$Ff=0.63*\frac{f*Dc*Kc}{2}\ (N)$$

Ff:Feed force f:Feed rate per rev.(mm/rev)
Dc:Drill diameter(mm) Kc:Unit cutting force(N/mm²)

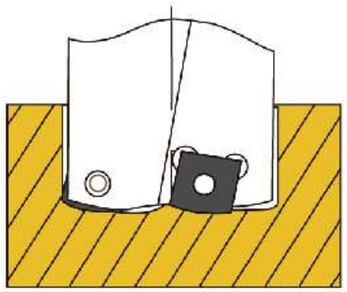
▶ Chip thickness

$$h=fz*sink(mm)$$

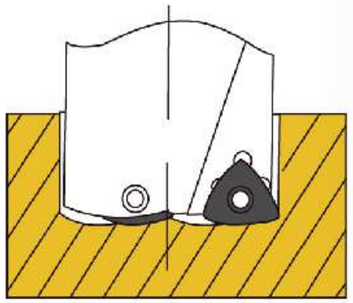
h:Chip thickness(mm) fz:Feed rate(mm/rev)

Shallow hole drilling machining blind hole size description

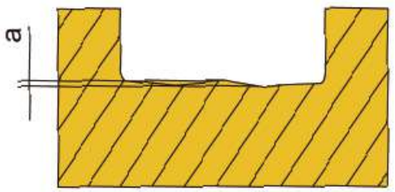
SP Insert Shallow hole



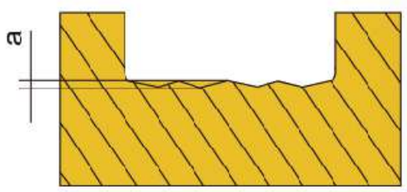
WC Insert Shallow hole drill



SP Insert



WC Insert



Insert Type	Waveform Height a(mm)
SPMG 050204	0.30
SPMG 060204	0.40
SPMG 07T308	0.50
SPMG 090408	0.70
SPMG 110408	0.80
SPMG 140512	0.90

Insert Type	Waveform Height a(mm)
WCMT 030208	0.50
WCMT 040208	0.60
WCMT 050308	0.80
WCMT 06T308	0.95
WCMT 080412	1.25

Hardness Conversion Table

Hardness				Tensile Strength N/mm²
Rockwell		Vickers	Brinell	
HRC	HRA	HV	HB	
70	86.6	1037	-	-
69.5	86.3	1017	-	-
69	86.1	997	-	-
68.5	85.8	978	-	-
68	85.5	959	-	-
67.5	85.2	941	-	-
67	85	923	-	-
66.5	84.7	906	-	-
66	84.4	889	-	-
65.5	84.1	872	-	-
65	83.9.	856	-	-
64.5	83.6	840	-	-
64	83.3	825	-	-
63.5	83.1	810	-	-
63	82.8	795	-	-
62.5	82.5	780	-	-
62	82.2	766	-	-
61.5	82	752	-	-
61.0	81.7	739	-	-
60.5	81.4	726	-	
60	81.2	713	-	2555
59.5	80.9	700	-	2500
59	80.6	688	-	2450
58.5	80.3	676	-	2395
58	80.1	664	-	2345
57. 5	79.8	653	-	2295
57	79.5	642	-	2250
56.5	79.3	631	-	2205
56	79	620	-	2160
55.5	78.7	609	-	2115
55	78.5	599	-	2075
54.5	78.2	589	-	2035
54	77.9	579	-	1995
53.5	77.7	570	-	1955
53	77.4	561	-	1920
52.5	77.1	551	-	1885
52	76.9	543	-	1850
51.5	76.6	534	-	1815
51	76.3	525	501	1780
50.5	76.1	517	494	1750
50	75.8	509	488	1720
49.5	75.5	501	481	1690
49	75.3	493	474	1660
48.5	75	485	468	1630
48	74.7	478	461	1605
47.5	74.5	470	455	1575
47	74.2	463	449	1550
46.5	73.9	456	442	1525
46	73.7	449	436	1500
45.5	73.4	443	430	1475
45	73.2	436	424	1450
44.5	72.9	429	418	1430
44	72.6	423	413	1405
43.5	72.4	417	407	1385
43	72.1	411	401	1360

Hardness				Tensile Strength N/mm²
Rockwell		Vickers	Brinell	
HRC	HRA	HV	HB	
42.5	71.8	405	396	1340
42	71.6	399	391	1320
41.5	71.3	393	385	1300
41	71.1	388	380	1280
40.5	70.8	382	375	1260
40	70.5	377	370	1245
39.5	70.3	372	365	1225
39	70	367	360	1210
38.5	-	362	355	1190
38	-	357	350	1175
37.5	-	352	345	1160
37	-	347	341	1140
36.5	-	342	336	1125
36	-	338	332	1110
35.5	-	333	327	1095
35	-	329	323	1080
34.5	-	324	318	1065
34	-	320	314	1050
33.5	-	316	310	1035
33	-	312	306	1020
32.5	-	308	302	1010
32	-	304	298	995
31.5	-	300	294	980
31	-	296	291	970
30.5	-	292	287	960
30	-	289	283	950
29.5	-	285	280	935
29	-	281	276	920
28.5	-	278	273	910
28	-	274	269	900
27.5	-	271	266	890
27	-	268	263	880
26.5	-	264	260	870
26	-	261	257	860
25.5	-	258	254	850
25	-	255	251	835
24.5	-	252	248	830
24	-	249	245	820
23.5	-	246	242	810
23	-	243	240	800
22.5	-	240	237	790
22	-	237	234	785
21.5	-	234	232	775
21	-	231	229	765
20.5	-	229	227	760
20	-	226	225	750
19.5	-	223	222	745
19	-	221	220	735
18.5	-	218	218	730
18	-	216	216	725
17.5	-	214	214	715
17	-	211	211	710

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Material Conversion Table

ISO	China	U.S.A	Germany		U.K.		Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
	Structural steel										
P	15	1015	1.0401	C15	080M15	-	1350	CC12	C15C16	F.111	-
	20	1020	1.0402	C22	050A20	2C	1450	CC20	C20C21	F.112	-
	35	1035	1.0501	C35	060A35	-	1550	CC35	C35	F.113	-
	45	1045	1.0503	C45	080M40	-	1650	CC45	C45	F.114	-
	55	1055	1.0535	C55	070M55	-	1655	-	C55	-	-
	60	1060	1.0601	C60	080A62	43D	-	CC55	C60	-	-
	Y15	1213	1.7015	9SMn28	230M07	-	1912	S250	CF9SMn28	11SMn28	SUM22
	-	12L13	1.0718	9SMnPb28	-	-	1914	S250Pb	CF9MnPb28	11SMnPb28	SUM22L
	-	-	1.0722	10SPb20	-	-	-	10PbF2	CF10Pb20	10SPb20	-
	-	1140	1.0726	35S20	212M36	8M	1957	35MF4	-	F210G	-
	Y13	1215	1.0736	9SMn36	240M07	1B	-	S300	CF9SMn36	12SMn35	-
	-	12L14	1.0737	9SMnPb36	-	-	1926	S300Pb	CF9SMnPb36	12SMnP35	-
	55Si2Mn	9255	1.0904	55Si9	250A53	45	2085	55S7	55Si8	56Si7	-
	-	9262	1.0961	60SiCr7	-	-	-	60SC7	60SiCr8	60SiCr8	-
	15	1015	1.1141	Ck15	080M15	32C	1370	XC12	C16	C15K	S15C
	40Mn	1039	1.1157	40Mn4	150M36	15	-	35M5	-	-	-
	25	1025	1.1158	Ck25	-	-	-	-	-	-	S25C
	35Mn2	1335	1.1167	36Mn5	-	-	2120	40Mn5	-	36Mn5	SMn438(H)
	30Mn	1330	1.117	28Mn6	150M28	14A	-	20M5	C28Mn	-	SCMn1
	35Mn	1035	1.1183	Cf35	060A35	-	1572	XS38TS	C36	-	S35C
	Ck45	1045	1.1191	45	080M46	-	1672	XC42	C45	C45K	S45C
	55	1055	1.1203	Ck55	070M55	-	-	XC45	C50	C55K	S55C
	50	1050	1.1213	Cf53	060A52	-	1674	XC48TS	C53	-	S50C
	60Mn	1060	1.1221	Ck60	080A62	43D	1678	XC60	C60	-	S58C
	-	1095	1.1274	Ck101	060A96	-	1870	-	-	-	SUP4
	-	-	1.3401	X120Mn12	Z120M12	-	-	X120M12	XG120Mn12	X120Mn12	SCMnH/1
	Gr15;45Gr	52100	1.3505	100Cr6	534A99	31	2258	100C6	100Cr6	F.131	SUJ2
	-	ASTM A204Gr.A	1.5415	15Mo3	1501-240	-	2912	15D3	16Mo3KW	16Mo3	-
	-	4520	1.5426	16Mo5	1503-245-420	-	-	-	16Mo5	16Mo5	-
	-	ASTM A350LF5	1.5622	14Ni6	-	-	-	16N6	14Ni6	15Ni6	-
	-	ASTM A353	1.5662	X8Ni9	1501-509;510	-	-	-	X10Ni9	XBNi09	-
	-	2515	1.5680	12Ni19	-	-	-	Z18N5	-	-	-
	-	3135	1.5710	36NiCr6	640A35	111A	-	35NC6	-	-	SNC236
	-	3415	1.5732	14NiCr10	-	-	-	14NC11	16NiCr11	15NiCr11	SNC415(H)
	-	3415 3310	1.5752	14NiCr14	655M13 655A12	36A	-	12NC15	-	-	SNC815(H)
	-	9840	1.6511	36CrNiMo4	816M40	110	-	40NCD3	38CrNiMo4(KB)	35CrNiMo4	-
	-	8620	1.6523	21NiCrMo2	805M20	362	2503	20NCD2	20NiCrMo2	20NiCrMo2	SNCCM220(H)
	-	8740	1.6546	40NiCrMo2	311-Type7	-	-	-	40NiCrMo2(KB)	40NiCrMo2	SNC240

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Material Conversion Table

ISO	China	U.S.A	Germany		U.K.		Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
	Structural steel										
P	40CrNiMoA	4340	1.6582	34CrNiMo6	817M40	24	2541	35NCD6	35CrNiMo6 (KB)	-	-
	-	-	1.6587	17CrNiMo6	820A16	-	-	18NCD6	-	14CrNiMo13	-
	15Cr	5015	1.7015	1 5Cr3	523M15	-	-	12C3	-	-	SCr415(H)
	35Cr	5132	1.7033	34Cr4	530A32	18B	-	32C4	34Cr4(KB)	35Cr4	SCr430(H)
	40Cr	5140	1.7035	41Cr4	530M40	18	-	42C4	41Cr4	42Cr4	SCr440(H)
	40Cr	5140	1.7045	42Cr4	-	-	2245	-	-	42Cr4	SCr440
	18CrMn	5115	1.7131	16MnCr15	(527M20)	-	2511	16MC5	16MnCr15	16MnCr15	-
	20CrMn	5155	1.7176	55Cr3	527A60	48	-	55C3	-	-	SUP9(A)
	30CrMn	4130	1.7218	25CrMo4	1717CDS110	-	2225	25CD4	25CrMo4(KB)	55Cr3	SCM420 SCM430
	35CrMo	4137;4135	1.722	34CrMo4	708A37	19B	2234	35CD4	35CrMo4	34CrMo4	SCM432 SCRRM3
	40CrMoA	4140;4142	1.7223	41CrMo4	708M40	19A	2244	42CD4TS	41CrMo4	41CrMo4	SCM440
	42CrMo 42CrMnMo	4140	1.7225	42CrMo4	708M40	19A	2244	42CD4	42CrMo4	42CrMo4	SCM440(H)
	-	-	1.7262	15CrMo5	-	-	2216	12CD4	-	12CrMo4	SCM415(H)
	-	ASTM A182 F11;F12	1.7335	13CrMo44	1501-620 Gr.27	-	-	15CD3.5 15CD4.5	14CrMo44	14CrMo45	-
	-	-	1.7361	32CrMo12	722M24	40B	2240	30CD12	32CrMo12	F.124.A	-
	-	ASTM A182 F.22	1.738	10CrMo910	1501-622 Gr.31;45	-	2218	12CD9;10	12CrMo9,10	TU.H	-
	-	-	1.7715	14MoV63	1503-660-440	-	-	-	-	13MoCrV6	-
	50CrVA	6150	1.8159	50CrV4	735A50	47	2230	50CV4	50CrV4	51CrV4	-
	-	-	1.8509	41CrAlMo7	905M39	41B	2940	40CAD6,12	41CrAlMo7	41CrAlMo7	SUP10
	-	-	1.8523	39CrMoV139	897M39	40C	-	-	36CrMoV12	-	-
	Tool steel										
	T10	W.110	1.1545	C105W1	-	-	1880	Y1105	C98KU C100KU	F.515 F.516	-
	T12A	W.112	1.1663	C125W	-	-	-	Y2120	C120KU	(C120)	SK2
	CrV;9SiCr	L3	1.2067	100Cr6	BL3	-	-	Y100C6	-	100Cr6	-
	Cr12	D3	1.208	X210Cr12	BD3	-	-	Z200Cr12	X210Cr13KU X250Cr12KU	X210Cr12	SKD1
	4Cr5MoVSi	H13	1.2344	X40 CrMoV51	BH13	-	2242	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	SKD61
	Cr6WV	A2	1.2363	X100 CrMoV51	BA2	-	2260	Z100CDV5	X100 CrMoV51KU	X100CrMoV5	SKD12
	CrWMo	-	1.2419	105WCr6	-	-	2140	105WC13	10WCr6 107WCr5KU	1 05WCr5	SKS31 SKS2 SKS3
	Cr12W	-	1.2436	X210CrW12	-	-	2312	-	X215CrW12 1KU	X210CrW12	SKD2
	5CrNiMo	S1	1.2542	45WCrV7	BS1	-	2710	-	45WCrV8KU	45WCrSi8	-
	3Cr2W8V	H21	1.2581	X30WCrV93 X30WCrV93KU	BH21	-	-	Z30WCV9	X28W09KU X30WCrV9 3KU	X30WCrV9	SKD5
	Cr12MoV	-	1.2601	X165CrMoV 12	-	-	2310	-	X165 CrMoW12KU	X160 CrMoV12	SKD11
	5CrNiMo	L6	1.2713	55NiCrMoV6	-	-	-	55NCDV7	-	F.250.S	SKT4

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Material Conversion Table

ISO	China	U.S.A	Germany		U.K.		Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
P	Tool steel										
	V	W210	1.2833	100V1	BW2	-	-	Y1105V	-	-	SKS43
	W6Mo5 Cr4V2Co5	-	1.3243	S6-5-2-5	-	-	2723	Z85WDKCV	HS6-5-2-5	HS6-5-2-5	SKH55
	W1 8Cr4VCo5	T4	1.3255	S18-1-2-5	BT4	-	-	Z80WKCV 10-05-04-01	X78WCo 1805KU	HS18-1-1-5	SKH3
	W6Mo5 Cr4V2	M2	1.3343	S6-5-2	BM2	-	2722	Z85WDCV 06-05-04-02	X82WMo 0605KU	HS6-5-2	SKH9
	-	M7	1.3348	S2-9-2	-	Z	2782	Z100WCWV 9-02-04-02	HS2-9-2	HS2-9-2	-
	W18Cr4V	T1	1.3355	S18-0-1	BT1	-	-	Z80WCV 18-04-01	X75W18KU	HS1 8-0-1	SKH2
	W6Mo5 Cr4V3	M3	-	S6-5-3	-	-	-	-	-	-	SKH52
	-	M42	-	-	BM42	-	-	-	-	-	SKH59

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ISO	China	U.S.A	Germany	Japan	DAIDO (Japan)	Main application
	GB	AISI/SAE	DIN	JIS	DAIDO	
P	Plastic die steel					
	-	P20 mod.	-	-	PX5N	Large mirror mold for mass production. Car taillights, mirror shell front baffles, cameras, household appliances, etc
	-	-	-	-	NAK55	High precision mirror mold. Video camera, music, makeup container, transparent mask, transparent film, etc
	-	-	-	-	NAK80	High mirror high precision mold. Camera, makeup container, transparent mask, transparent film, etc
	3Cr13	420 mod.	-	SUS420J2 mod.	S-STAR	Ultra mirror corrosion resistant precision mold. Camera parts, compact discs, lenses, watch cases
	Cold working die steel					
	-	2	-	SKS93	YK30	Stamping die, gauge, paper cutter, auxiliary tool
	9CrWMn	01 mod.	-	SKS3 mod.	GOA	Blanking die, gauge, drawing die, tap, punch
	Cr12MoV	D2	-	SKD11	DC11	Blanking die, cold working forming die, cold drawing die, forming roll, punch
	-	D2 mod.	-	SKD11 mod.	DC53	Blanking die, cold working forming die, cold drawing die, forming roll, punch
	Hot work die steel					
	4Cr5MoSiV1	H13	X40CrMoV51	SKD61	DHA1	Aluminum die casting die, die casting die related parts, hot stamping die, hot extrusion die, hot shear blade
	-	-	-	-	DH21	Long life aluminum die casting mold
	-	-	-	-	DH31-S	Large die casting mold
	-	-	-	-	DH2F	Die casting mold, plastic mold

The material standards information of material is derived from public sources.
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Material Conversion Table

ISO	China	U.S.A	Germany		U.K.		Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
M	Structural steel										
	0Cr13 1Cr12	403	1.4	X6Cr13	403S17	-	2301	Z6C13	X6Cr13	F.3110	SUS403
	-	-	1.4001	X7Cr14	-	-	-	-	-	F.8401	-
	1Cr13	410	1.4006	X10Cr13	410S21	56A	2302	Z10C14	X12Cr13	F.3401	SUS410
	1Cr17	430	1.4016	X8Cr17	430S15	60	220	Z8C17	X8Cr17	F.3113	SUS430
	2Cr13	410	1.4021	X20Cr13	S62	56B;56C	-	Z20C13	X20C13	F.3401	SUS410
	-	-	1.4027	G-X20Cr14	420C29	56B	-	Z20C13M	-	-	SCS2
	4Cr13	-	1.4034	X46Cr13	420S45	56D	2304	Z40CM Z38C13M	X40Cr14	F.3405	SUS420J2
	1Cr17Ni2	431	1.4057	X20CrNi172	431S29	57	2321	Z15CNi6.02	X16CNi16	F.3427	SUS431
	Y1Cr17	430F	1.4104	X12CrMoS17	-	-	2383	Z10CF17	X10CrS17	F.3117	SUS430F
	1Cr17Mo	434	1.4113	X6CrMo171	434S17	-	2325	Z8CD17.01	X8CrMo17	-	SUS434
	-	-	1.4313	X5CrNi134	425C11	-	-	Z4CND 13.4M	-	-	SCS5
	-	-	1.4408	G-X6Cr NiMo1810	316C16	-	-	-	-	F.8414	SCS14
	4Cr9Si2	HW3	1.4718	X45CrSi93	401S45	52	-	Z45CS9	X45CrSi8	F.322	SUH1
	0Cr13Al	405	1.4724	X10CrAl13	403S17	-	-	Z10C13	X10CrAl12	F.311	SUS405
	Cr17	430	1.4742	X10CrAl18	430S15	60	-	Z10CAS18	X8Cr17	F.3113	SUS430
	8Cr20Si2Ni	HNV6	1.4757	X80CrNiSi20	443S65	59	-	Z80 CSN20.02	X80CrSiNi20	F.320V	SUH4
	2Cr25N	446	1.4762	X10CrAl24	-	-	2322	Z10CAS24	X16Cr26	-	SUH446
	Austenitic stainless steel										
	0Cr18Ni9	304	1.4301	X5CrNi1810	304S15	58E	2332	Z6CN18.09	X5CrNi1810	F.3551; F.3541;F.3504	SUS304
	1Cr18Ni9 MoZr	303	1.4305	X10CrNiS189	303S21	58M	2346	Z10CNF18.09	X10CrNiS18.09	F.3508	SUS303
	0Cr19Ni10	304L	1.4306	X2CrNi1911	304S12	-	2352	Z2CN18.10	X2CrNi18.11	F.3503	SCS19
	-	-	1.4308	G-X6CrNi189	304C15	-	-	Z6CN18.10M	-	-	SCS13
	Cr17Ni7	301	1.4310	X12CrNi177	-	-	2331	Z12CN17.07	X12CrNi1707	F.3517	SUS301
	-	304LN	1.4311	X2CrNiN1810	304S62	-	2371	Z2CN18.10	-	-	SUS304LN
	0Cr1 9Ni9	304	1.435	X5CrNi189	304S31	58E	-	Z6CN18.09	X5CrNi1810	-	SUS304
	0Cr17Ni11 Mo2	316	1.4401	X5CrNiMo1712	316S16	Z6CND17.11	2347	1.4401	X5CrNiMo 1712	F.3543	SUS316
	00Cr17Ni13 Mo2	316LN	1.4429	X2CrNiMoN 17133	-	-	2375	Z2CND17.13	-	-	SUS316LN
	0Cr27Ni12 Mo3	316L	1.4435	X2CrNiMo 18143	316S12	-	2353	Z2CDN17.13	X2CrNiMo 1713	-	SCS16,
	00Cr19Ni13 Mo3	317L	1.4438	X2CrNiMo 17133	317S12	-	2367	Z2CND19.15	X2CrNiMo 18.16	-	SUS317L
	-	329L	1.4460	X8CrNiMo275	-	-	2324	-	-	-	SUS329L; SCH11;SCS11
	1Cr18Ni9Ti	321	1.4541	X6CrNiTi1810	2337	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553	SUS321
	1Cr18Ni11Nb	347	1.455	X6CrNiNb1810	347S17	58F	2338	Z6CNNb18.1	X6CrNiTi1811	F.3552	SUS347
	Cr18Ni12 Mo2Ti	316Ti	1.4571	X6CrNiMoTi 17122	320S17	58J	2350	Z6NDT17.12	X6CrNiMoTi17	F.3535	-
	-	-	1.4581	G-X5CrNi MoNb1810	318C7	-	-	Z4CNDNb 1812M	XG8CrNiMo18	-	SCS22
	Cr17Ni12 Mo3Nb	318	1.4583	X10CrNi MoNb1812	-	-	-	Z6CNDNb 1713B	X6CrNiMo TiNb17	-	-
	1Cr23Ni13	309	1.4828	X15CrNiSi2012	309S24	-	-	Z1 5CNS20.1	-	-	SUH309
	0Cr25Ni20	310S	1.4845	X12CrNi2521	310S24	-	2361	Z12CN2520	X6CrNi2520	F.331	SUH310
	Cr15Ni36W3Ti	330	1.4864	X12NiCrSi3616	-	-	-	Z12CNS35.1	-	-	SUH330
	-	-	1.4865	G-X40NiCrSi 3818	330C11	-	-	-	XG50NiCr3919	-	SCH15
	5Cr2Mn9Ni4N	EV8	1 4871	X53CrMn NiN219	349S54 321S12	58B	-	Z52CMN21.0	X53CrMnNiN 219	-	SUH35
	1Cr1 8Ni9Ti	321	1.4878	X12CrNiTi189	321S320	58C	-	Z6CNT18.12	X6CrNiTi1811	F.3523	SU321

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Material Conversion Table

ISO	China	U.S.A	Germany		U.K.	S	weden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
M	Structural steel										
	0Cr27Ni12Mo3	316L	1.4435	X2CrNiMo 18143	316S12	-	2353	Z2CDN17.13	X2CrNiMo1713	-	SCS16,
	00Cr19 Ni13Mo3	317L	1.4438	X2CrNiMo 17133	317S12	-	2367	Z2CND19.15	X2CrNiMo18.16	-	SUS317L
	-	329L	1.4460	X8CrNiMo275	-	-	2324	-	-	-	SUS329L SCH11;SCS11
	1Cr18Ni9Ti	321	1.4541	X6CrNiTi1810	2337	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553	SUS321
	1Cr18Ni11Nb	347	1.455	X6CrNiNb1810	347S17	58F	2338	Z6CNNb18.1	X6CrNiTi1811	F.3552	SUS347
	Cr18Ni12 Mo2Ti	316Ti	1.4571	X6CrNiMoTi1 7122	320S17	58J	2350	Z6NDT17.12	X6CrNiMoTi17	F.3535	-
	-	-	1.4581	G-X5Cr NiMoNb1810	318C7	-	-	Z4CNDNb 1812M	XG8CrNiMo18	-	SCS22
	Cr17Ni12 Mo3Nb	318	1.4583	X10Cr NiMoNb1812	-	-	-	Z6CNDNb 1713B	X6CrNiMo TiNb17	-	-
	1Cr23Ni13	309	1.4828	X15CrNiSi2012	309S24	-	-	Z1 5CNS20.1	-	-	SUH309
	0Cr25Ni20	310S	1.4845	X12CrNi2521	310S24	-	2361	Z12CN2520	X6CrNi2520	F.331	SUH310
	Cr15Ni36W3Ti	330	1.4864	X12NiCrSi3616	-	-	-	Z12CNS35.1	-	-	SUH330
	-	-	1.4865	G-X40NiCrSi 3818	330C11	-	-	-	XG50NiCr3919	-	SCH15
	5Cr2Mn9Ni4N	EV8	1 4871	X53CrMnNiN 219	349S54 321S12	58B	-	Z52CMN21.0	X53CrMn NiN219	-	SUH35
	1Cr1 8Ni9Ti	321	1.4878	X12CrNiTi189	321S320	58C	-	Z6CNT18.12	X6CrNiTi1811	F.3523	SU321

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ISO	China	U.S.A	Germany	U.K.	Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	EN	SS	AFNOR	UNI	UNE	JIS
K	Nodular cast iron								
	QT400-18	60-40-1 8	GGG40	400/17	071 7-02	FGS370-17	GS370-17	FGE38-17	FCD400
	QT450-10	65-45-12	-	420/12	-	FGS400-12	GS400-12	FGE42-12	FCD450
	QT500-7	70-50-05	GGG50	500/7	0727-02	FGS500-7	GS500-7	FGE50-7	FCD500
	QT600-3	80-60-03	GGG60	600/7	0732-03	FGS600-2	GS600-2	FGE60-2	FCD600
	QT700-2	100- 70-03	GGG70	700/2	0737-01	FGS700-2	GS700-2	FGE70-2	FCD700
	QT800-2	120-90-02	GGG80	800/2	0864-03	FGS800-2	GS800-2	FGE80-2	FCD800
	QT900-2	-	-	900/2	-	-	-	-	-
	Grey cast iron								
	-	NO.60	GG40	-	0140	FGL 400	-	-	-
	HT350	NO.50	GG35	350	0135	FGL 350	G35	FG35	FC350
	HT300	NO.45	GG30	300	0130	FGL 300	G30	FG30	FC300
	HT250	NO.35	GG25	250	0125	FGL 250	G25	FG25	FC250
	HT200	NO.30	GG20	200	0120	FGL 200	G20	FG20	FC200
	HT150	NO.20	GG15	150	0115	FGL 150	G15	FG15	FC150
	HT100	-	-	100	0110	-	G10	-	FC100

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