
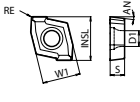



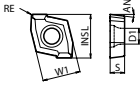


ZCMT

		Carbon steel / Alloy steel		● ○		P						
		Mold and die steel		● ○		P						
		Stainless steel		● ○		M						
		Cast iron		● ○		K						
		Non-ferrous metals		● ○		N						
Insert	Description	Dimension (mm)					Angle (°)	Carbide			Applicable toolholder ● K78~K85	
		S	D1	RE	INSL	W1		PVD	-			
							PRI210	PRI225	PRI230	KW10		
  General purpose	ZCMT 050203	2.38	2.3	0.3	5.9	5	7	●	●	●	●	S..-DRZ....-05
	ZCMT 06T204	2.8	2.5	0.4	7	6	7	●	●	●	●	S..-DRZ....-06
	ZCMT 080304	3.18	2.9	0.4	9.7	8.2	7	●	●	●	●	S..-DRZ....-08
	ZCMT 10T304	3.97	4.4	0.4	12	10.4	7	●	●	●	●	S..-DRZ....-10
	ZCMT 12T306	3.97	5.6	0.6	14.3	12.8	7	●	●	●	●	S..-DRZ....-12
	ZCMT 150408	4.76	5.6	0.8	17.8	15.8	7	●	●	●	●	S..-DRZ....-15
	ZCMT 200608	6.35	6.5	0.8	22.8	20.3	7	●	●	●	●	S..-DRZ....-20
  Deep drilling / Low cutting force	ZCMT 050203SP	2.38	2.3	0.3	5.9	5	7	●	●	●	●	S..-DRZ....-05
	ZCMT 06T204SP	2.8	2.5	0.4	7	6	7	●	●	●	●	S..-DRZ....-06
	ZCMT 080304SP	3.18	2.9	0.4	9.7	8.2	7	●	●	●	●	S..-DRZ....-08
	ZCMT 10T304SP	3.97	4.4	0.4	12	10.4	7	●	●	●	●	S..-DRZ....-10
	ZCMT 12T304SP	3.97	5.6	0.4	14.3	12.8	7	●	●	●	●	S..-DRZ....-12
	ZCMT 150406SP	4.76	5.6	0.6	17.8	15.8	7	●	●	●	●	S..-DRZ....-15
	ZCMT 200608SP	6.35	6.5	0.8	22.8	20.3	7	●	●	●	●	S..-DRZ....-20
  Stainless steel	ZCMT 050203SU	2.38	2.3	0.3	5.9	5	7	●	●	●	●	S..-DRZ....-05
	ZCMT 06T204SU	2.8	2.5	0.4	7	6	7	●	●	●	●	S..-DRZ....-06

Features of SP Chipbreaker

1. Less cutting force with large rake angle
2. Suitable for chip control of sticky materials such as stainless steel or soft steel.
3. Larger size inserts have smaller corner-R(RE) than standard chipbreaker type and can reduce burrs.

Recommended cutting conditions ● K87

Drilling

DRA

DRC

DRV

DRZ

DRXR

DRW

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Suitable chipbreaker (ZCMT)

Workpiece material	Insert size		ZCMT05									ZCMT06									ZCMT08						
	Chipbreaker		Standard			SP			SU			Standard			SP			SU			Standard			SP			
	Drilling depth		2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	
Low carbon steel	☆	☆	-	★	★	★	-	-	-	☆	☆	-	★	★	★	☆	☆	☆	☆	☆	-	★	★	★			
Carbon steel	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	☆	★
Alloy steel	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	☆	★
Mold steel	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	☆	★
Stainless steel	☆	☆	-	★	★	★	☆	☆	-	-	-	-	☆	☆	☆	★	★	★	☆	☆	-	★	★	★	☆	☆	★
Cast iron	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	☆
Aluminum alloys	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	☆	☆	★
Brass	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	☆
Titanium alloys	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	☆	☆	★

Workpiece material	Insert size		ZCMT10							ZCMT12							ZCMT15							ZCMT20						
	Chipbreaker		Standard				SP			Standard				SP			Standard				SP			Standard						
	Drilling depth		2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	
Low carbon steel	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	★	★	★	★
Carbon steel	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★	★	★	★	
Alloy steel	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★	★	★	★	
Mold steel	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★	★	★	★	
Stainless steel	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	★	★	★	★	
Cast iron	★	★	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★	★	
Aluminum alloys	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	
Brass	★	★	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★	★	
Titanium alloys	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	

Standard chipbreakers (Without symbol) may function better when interrupted drilling.

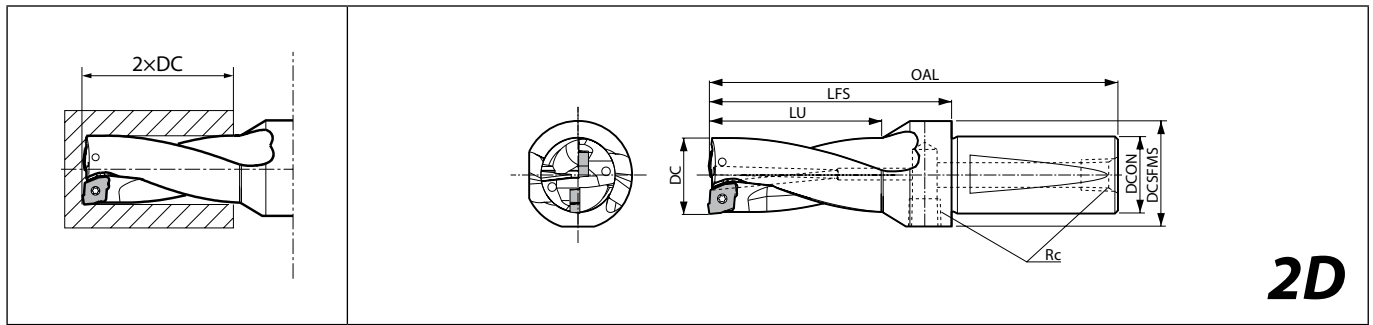
When drilling aluminum alloys, chips become long and difficult to be discharged at the depth over 2D.

5D type is the same as 4D type.

★: 1st choice ☆: 2nd choice



DRZ (Drilling depth : 2 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts K76														
			DC	DCON	OAL	LFS	LU	DC5FMS	Rc			Plug	Screw	Wrench	Wrench															
S20- DRZ1326-05	●	2	13	20	95	52	26	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU														
DRZ135270-05	●		13.5														98	55	28											
DRZ1428-05	●		14																	100	57	30								
DRZ145290-05	●		14.5		31																									
DRZ1530-05	●		15																											
DRZ155310-05	●		15.5																											
S25- DRZ1632-06	●	2	16	25	115	61	32	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU														
DRZ165330-06	●		16.5														116	62	33											
DRZ1734-06	●		17																	118	64	34								
DRZ175350-06	●		17.5		35																									
DRZ1836-06	●		18			36																								
DRZ185370-06	●		18.5		37																									
DRZ1938-06	●		19			38																								
DRZ195390-06	●		19.5		39																									
DRZ2040-06	●		20			40																								
DRZ205410-06	●		20.5		41																									
DRZ2142-06	●		21			42																								
S25- DRZ215430-08	●		2		21.5		25										128	74	43	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP		
DRZ2244-08	●				22	130																							76	44
DRZ225450-08	●				22.5																									
DRZ2346-08	●	23		46																										
DRZ235470-08	●	23.5			47																									
DRZ2448-08	●	24		48																										
DRZ245490-08	●	24.5			49																									
DRZ2550-08	●	25		50																										
DRZ255510-08	●	25.5			51																									
DRZ2652-08	●	26		52																										
DRZ265530-08	●	26.5			53																									

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K72 for Adjustable Sleeve (SHE).

Recommended cutting conditions K87
Trouble shooting K67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K

Drilling

DRA

DRC

DRV

DRZ

DRXR

DRW

Toolholder dimensions

2xDC

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts ● K76
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
S32- DRZ2754-10 DRZ275550-10 DRZ2856-10 DRZ285570-10 DRZ2958-10 DRZ295590-10 DRZ3060-10 DRZ305610-10 DRZ3162-10 DRZ315630-10 DRZ3264-10 DRZ325650-10	● ● ● ● ● ● ● ● ● ● ● ●	2	27 27.5 28 28.5 29 29.5 30 30.5 31 31.5 32 32.5	32	149 151 153 154 155 158	90 92 94 95 96 99	54 55 56 57 58 59 60 61 62 63 64 65	42 45	Rc1/4	Yes	+2.5 +2.3 +2.2 +2.1 +2 +1.8 +1.7 +1.5 +1.5 +1.3 +1.2 +1	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
S40- DRZ3366-12 DRZ3468-12 DRZ3570-12 DRZ3672-12 DRZ3774-12 DRZ3876-12 DRZ3978-12 DRZ4080-12	● ● ● ● ● ● ● ●	2	33 34 35 36 37 38 39 40	40	173 176 177 180 181 183 185	104 107 108 111 112 114 116	66 68 70 72 74 76 78 80	55	Rc1/4	Yes	+2.9 +2.7 +2.4 +2.2 +1.9 +1.7 +1.4 +1.2	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
S40- DRZ4182-15 DRZ4284-15 DRZ4386-15 DRZ4488-15 DRZ4590-15 DRZ4692-15 DRZ4794-15 DRZ4896-15 DRZ4998-15 DRZ50100-15 DRZ51102-15 DRZ52104-15 DRZ53106-15	● ● ● ● ● ● ● ● ● ● ● ● ●	2	41 42 43 44 45 46 47 48 49 50 51 52 53	40	186 188 190 192 198 201 203 204	117 119 121 123 129 132 134 135	82 84 86 88 90 92 94 96 98 100 102 104 106	55 60	Rc1/4	Yes	+4 +3.7 +3.5 +3.2 +3 +2.7 +2.5 +2.2 +2 +1.7 +1.2 +1 +0.7	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
S40- DRZ54108-20 DRZ55110-20 DRZ56112-20 DRZ57114-20 DRZ58116-20 DRZ59118-20	● ● ● ● ● ●	2	54 55 56 57 58 59	40	214 215 217 219 221 223	145 146 148 150 152 154	108 110 112 114 116 118	65	Rc1/4	Yes	+5 +4.7 +4.4 +4.1 +3.8 +3.5	GP-2	SB-60120TR	DT-25	-	ZCMT200608

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K72 for Adjustable Sleeve (SHE).

Recommended cutting conditions ● K87
Trouble shooting ● K67

Hole Dia. Tolerance (2D type)

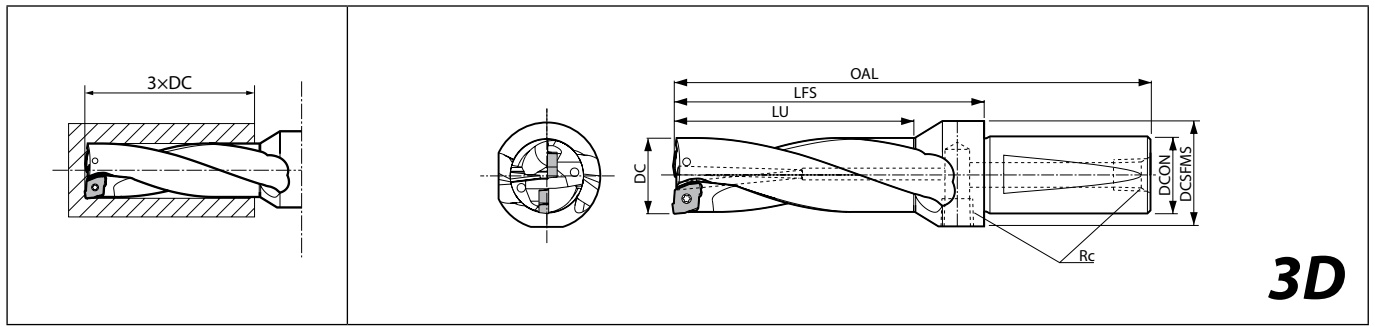
DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



DRZ (Drilling depth : 3 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts K76
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
S20- DRZ1339-05 DRZ135405-05 DRZ1442-05 DRZ145435-05 DRZ1545-05 DRZ155465-05	●	2	13 13.5 14 14.5 15 15.5	20	108 112 115	65 69 72	39 40.5 42 43.5 45 46.5	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU
S25- DRZ1648-06 DRZ165495-06 DRZ1751-06 DRZ175525-06 DRZ1854-06 DRZ185555-06 DRZ1957-06 DRZ195585-06 DRZ2060-06 DRZ205615-06 DRZ2163-06	●	2	16 16.5 17 17.5 18 18.5 19 19.5 20 20.5 21	25	131 133 136 139 143 146 146	77 79 82 85 89 92 92	48 49.5 51 52.5 54 55.5 57 58.5 60 61.5 63	32	Rc1/8	Yes	+1.1 +0.9 +0.8 +0.7 +0.6 +0.5 +0.5 +0.3 +0.2	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU
S25- DRZ215645-08 DRZ2266-08 DRZ225675-08 DRZ2369-08 DRZ235705-08 DRZ2472-08 DRZ245735-08 DRZ2575-08 DRZ255765-08 DRZ2678-08 DRZ265795-08	●	2	21.5 22 22.5 23 23.5 24 24.5 25 25.5 26 26.5	25	147 150 152 155 158	93 96 98 101 104	64.5 66 67.5 69 70.5 72 73.5 75 76.5 78 79.5	33	Rc1/8	Yes	+1.8 +1.6 +1.4 +1.3 +1.2 +1.1 +0.9 +0.8 +0.7 +0.6 +0.5	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K72 for Adjustable Sleeve (SHE).

Recommended cutting conditions K87
Trouble shooting K67

Hole Dia. Tolerance (3D type)

DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K

Drilling

DRA

DRC

DRV





DRZ

DRXR

DRW

Toolholder dimensions

3xDC

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts ● K76			
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench				
																			
S32- DRZ2781-10	●	2	27	32	173	114	81	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP			
DRZ275825-10	●	27.5	82.5								+2.3								
DRZ2884-10	●	28	176								117						84	+2.2	
DRZ285855-10	●	28.5																85.5	+2.1
DRZ2987-10	●	29	179								120						87	+2	
DRZ295885-10	●	29.5			88.5	+1.8													
DRZ3090-10	●	30	45		181	122	90				+1.7								
DRZ305915-10	●	30.5									91.5						+1.5		
DRZ3193-10	●	31									183						124	93	+1.5
DRZ315945-10	●	31.5																	94.5
DRZ3296-10	●	32		187	128	96	+1.2												
DRZ325975-10	●	32.5					97.5	+1											
S32- DRZ3399-12	●	2		33	32	193	134	99	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306		
DRZ34102-12	●	34		102								+2.7							
DRZ35105-12	●	35	105	+2.4															
DRZ36108-12	●	36	108	+2.2															
DRZ37111-12	●	37	111	+1.9															
DRZ38114-12	●	38	114	+1.7															
DRZ39117-12	●	39	117	+1.4															
DRZ40120-12	●	40	120	+1.2															
S40- DRZ3399-12	●	2	33	40								203						134	99
DRZ34102-12	●	34	102		+2.7														
DRZ35105-12	●	35	105		+2.4														
DRZ36108-12	●	36	108		+2.2														
DRZ37111-12	●	37	111		+1.9														
DRZ38114-12	●	38	114		+1.7														
DRZ39117-12	●	39	117		+1.4														
DRZ40120-12	●	40	120		+1.2														
S40- DRZ41123-15	●	2	41		40	224	155	123	55	Rc1/4	Yes		+4	GP-2	SB-5085TR	DT-20	-		
DRZ42126-15	●	42	126	+3.7															
DRZ43129-15	●	43	129	+3.5															
DRZ44132-15	●	44	132	+3.2															
DRZ45135-15	●	45	135	+3															
DRZ46138-15	●	46	138	+2.7															
DRZ47141-15	●	47	60	245		176	141	+2.5											
DRZ48144-15	●	48						144				+2.2							
DRZ49147-15	●	49						147				+2							
DRZ50150-15	●	50						150				+1.7							
DRZ51153-15	●	51			153			+1.2											
DRZ52156-15	●	52	156	+1															
DRZ53159-15	●	53	159	+0.7															
S40- DRZ54162-20	●	2	54	40	266	197	162	65	Rc1/4	Yes	+5	GP-2	SB-60120TR	DT-25	-	ZCMT200608			
DRZ55165-20	●	55	165								+4.7								
DRZ56168-20	●	56	168								+4.4								
DRZ57171-20	●	57	171								+4.1								
DRZ58174-20	●	58	174								+3.8								
DRZ59177-20	●	59	177								+3.5								

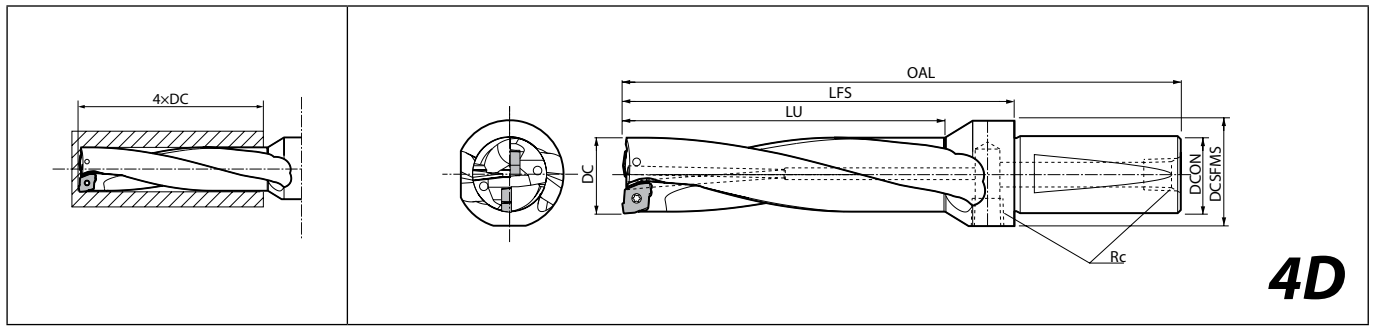
When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K72 for Adjustable Sleeve (SHE).

Recommended cutting conditions ● K87
Trouble shooting ● K67



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ (Drilling depth : 4 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts K76											
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench												
																	Plug	Screw	Wrench	Wrench							
S20- DRZ1352-05	●	2	13	20	121	78	52	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU											
DRZ135540-05	●		13.5														126	83	56								
DRZ1456-05	●		14																	130	87	60					
DRZ145580-05	●		14.5		126	83	58																				
DRZ1560-05	●		15														126	83	58								
DRZ155620-05	●		15.5																				126	83	58		
S25- DRZ1664-06	●	2	16	25	147	93	64	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU											
DRZ165660-06	●		16.5														147	93	66								
DRZ1768-06	●		17																	149	95	70					
DRZ175700-06	●		17.5		149	95	70																				
DRZ1872-06	●		18														153	99	74								
DRZ185740-06	●		18.5																				153	99	74		
DRZ1976-06	●		19		157	103	76																				
DRZ195780-06	●		19.5														157	103	78								
DRZ2080-06	●		20		156	102	80																				
DRZ205820-06	●		20.5														156	102	82								
DRZ2184-06	●		21		161	107	84										+0.2										
S25- DRZ215860-08	●		2		21.5	25	169										115	86	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
DRZ2288-08	●				22																						
DRZ225900-08	●	22.5		173	119			92																			
DRZ2392-08	●	23					173		119	94																	
DRZ235940-08	●	23.5									173	119	94														
DRZ2496-08	●	24												173	119	94											
DRZ245980-08	●	24.5		176	122		96																				
DRZ25100-08	●	25						176	122	98																	
DRZ2551020-08	●	25.5		180	126		100																				
DRZ26104-08	●	26						180	126	102																	
DRZ2651060-08	●	26.5		184	130		106	+0.5																			

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page K72 for Adjustable Sleeve (SHE).

Recommended cutting conditions K87
Trouble shooting K67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

4xDC

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts K76						
			DC	DCON	OAL	LFS	LU	DCSFMS			Rc	Plug	Screw	Wrench		Wrench					
S32- DRZ27108-10 DRZ2751100-10 DRZ28112-10 DRZ2851140-10 DRZ29116-10 DRZ2951180-10 DRZ30120-10 DRZ3051220-10 DRZ31124-10 DRZ3151260-10 DRZ32128-10 DRZ3251300-10	●	2	27	32	200	141	108	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP					
	●		27.5								+2.3										
	●		28								+2.2										
	●		28.5		+2.1																
	●		29		+2																
	●		29.5		+1.8																
	●		30	+1.7																	
	●		30.5	+1.5																	
	●		31	45	214	155	124	45	Rc1/4	Yes	GP-2						SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306	
	●		31.5																		+1.3
	●		32																		+1.2
	●		32.5		+1																
●	33	+2.9																			
●	34	+2.7																			
S40- DRZ33132-12 DRZ34136-12 DRZ35140-12 DRZ36144-12 DRZ37148-12 DRZ38152-12 DRZ39156-12 DRZ40160-12	●	2	33	40	236	167	132	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306					
	●		34								+2.7										
	●		35								+2.4										
	●		36								+2.2										
	●		37		+1.9																
	●		38		+1.7																
	●		39		+1.4																
	●		40		+1.2																
S40- DRZ41164-15 DRZ42168-15 DRZ43172-15 DRZ44176-15 DRZ45180-15 DRZ46184-15 DRZ47188-15 DRZ48192-15 DRZ49196-15 DRZ50200-15	●	2	41	40	265	196	164	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408					
	●		42								+3.7										
	●		43								+3.5										
	●		44		+3.2																
	●		45		+3																
	●		46		+2.7																
	●		47	+2.5																	
	●		48	+2.2																	
	●		49	+2																	
	●		50	+1.7																	

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page K72 for Adjustable Sleeve (SHE).

Recommended cutting conditions K87
Trouble shooting K67

Hole Dia. Tolerance (4D type)

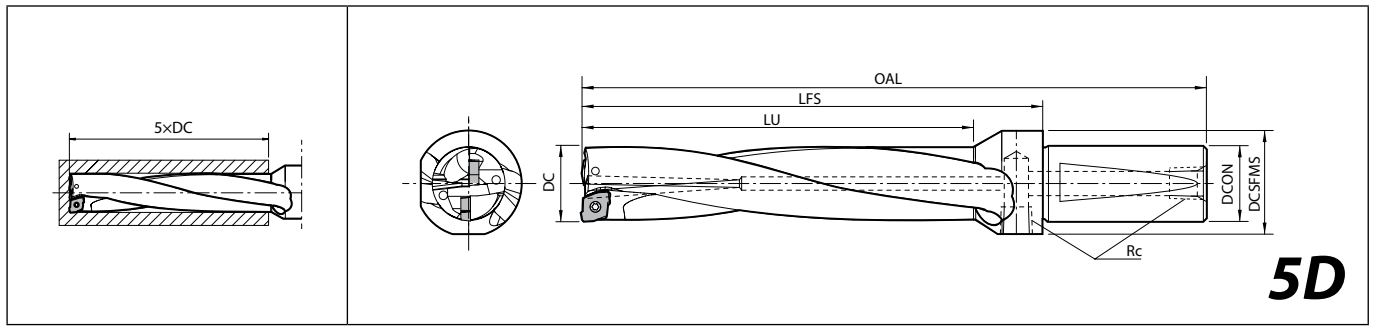
DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.25 -0.10
ø27~ø40	+0.30 -0.15
ø41~ø50	+0.35 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



DRZ (Drilling depth : 5 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts			Applicable inserts K76
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	
S32- DRZ27135-10 DRZ28140-10 DRZ29145-10 DRZ30150-10 DRZ31155-10 DRZ32160-10	●	2	27	32	277	168	135	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	ZCMT10T304 ZCMT10T304SP
	●		28		232	173	140				+2.2				
	●		29		237	178	145				+2				
	●		30		241	182	150				+1.7				
	●		31		245	186	155				+1.5				
	●		32		251	192	160				+1.2				
S40- DRZ33165-12 DRZ34170-12 DRZ35175-12 DRZ36180-12 DRZ37185-12 DRZ38190-12 DRZ39195-12 DRZ40200-12	●	2	33	40	269	200	165	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	●		34		275	206	170				+2.7				
	●		35		279	210	175				+2.4				
	●		36		285	216	180				+2.2				
	●		37		289	220	185				+1.9				
	●		38		294	225	190				+1.7				
	●		39		299	230	195				+1.4				
	●		40		302	233	200				+1.2				
S40- DRZ41205-15 DRZ42210-15 DRZ43215-15 DRZ44220-15 DRZ45225-15 DRZ46230-15 DRZ47235-15 DRZ48240-15 DRZ49245-15 DRZ50250-15	●	2	41	40	306	237	205	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	ZCMT150406SP ZCMT150408
	●		42		311	242	210				+3.7				
	●		43		316	247	215				+3.5				
	●		44		321	252	220				+3.2				
	●		45		324	255	225				+3				
	●		46		333	264	230				+2.7				
	●		47		339	270	235	+2.5							
	●		48		344	275	240	+2.2							
	●		49		349	280	245	+2							
	●		50		351	282	250	+1.7							

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page K72 for Adjustable Sleeve (SHE).

Recommended cutting conditions K87
Trouble shooting K67

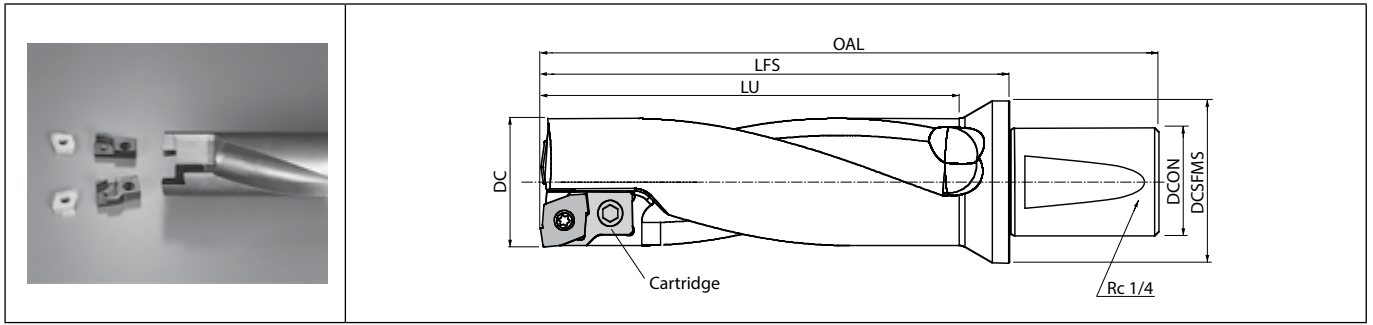
Hole Dia. Tolerance (5D type)

DC	Hole Dia. Tolerance (mm)
ø27~ø40	+0.35 -0.15
ø41~ø50	+0.40 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ-CR



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➔ K76
			DC	DCON	OAL	LFS	LU	DCSFMS			Cartridge (inner edge)	Cartridge (outer edge)	Screw	Wrench	
S50- DRZ60180-20CR DRZ65195-20CR DRZ70210-20CR	MTO	2	60	286	217	195	75	Yes	+3	DR20CR-IN (1pc)	DR20CR-OUT (1pc)	SB-60120TR	DT-25	ZCMT200608	
	MTO		65	50	296	227			206						+1.5
	MTO		70		308	239			220						+0.2
S50- DRZ75225-12CR DRZ80240-12CR	MTO	4	75	50	330	261	225	80	Yes	Offset	DR12CR-IN (2pcs)	DR12CR-OUT (2pcs)	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	MTO		80		340	271	240			N.A.					

Clamp screws for cartridges are included in toolholders : HH6X12 for DR20CR and HH4X12 for DR12CR.

Recommended cutting conditions ➔ K87

K



Drilling

DRZ hole bottom shape (Common for 2D, 3D, 4D, 5D) (mm)

DC	A	B	C	DC	A	B	C	DC	A	B	C
13.0		4.4		21.5		7.7		33.0		10.8	
13.5		4.7	0.4	22.0		7.9		34.0		11.3	
14.0	2.1	4.9		22.5		8.2	0.6	35.0		11.8	0.8
14.5		5.2		23.0		8.4		36.0	5.7	12.3	
15.0		5.4	0.5	23.5	3.1	8.7		37.0		12.8	
15.5		5.7		24.0		8.9		38.0		13.3	
16.0		5.3		24.5		9.2		39.0		13.8	0.9
16.5		5.6		25.0		9.4		40.0		14.3	
17.0		5.8	0.6	25.5		9.7	0.7	41.0		14.0	
17.5		6.1		26.0		9.9		42.0		14.5	
18.0		6.3		26.5		10.2		43.0		15.0	
18.5	2.7	6.6		27.0		9.5		44.0		15.5	1.0
19.0		6.8		27.5		9.8		45.0		16.0	
19.5		7.1	0.7	28.0		10.0		46.0		16.5	
20.0		7.3		28.5		10.3	0.7	47.0	6.5	17.0	
20.5		7.6		29.0		10.5		48.0		17.5	
21.0		7.8	0.8	29.5	4.0	10.8		49.0		18.0	
				30.0		11.0		50.0		18.5	1.1
				30.5		11.3		51.0		19.0	
				31.0		11.5		52.0		19.5	
				31.5		11.8	0.8	53.0		20.0	
				32.0		12.0		54.0		18.5	
				32.5		12.3		55.0		19.0	
								56.0	8.5	19.5	1.2
								57.0		20.0	
								58.0		20.5	
								59.0		21.0	

The diagram shows a cross-section of a hole with a chamfered bottom. Dimension DC is the total diameter of the hole. Dimension A is the diameter of the chamfered section. Dimension B is the diameter of the central bottom section. Dimension C is the height of the chamfered section.

* Above is numeric guideline.
(Varies within ±0.1mm depending on workpiece materials and cutting conditions)

K



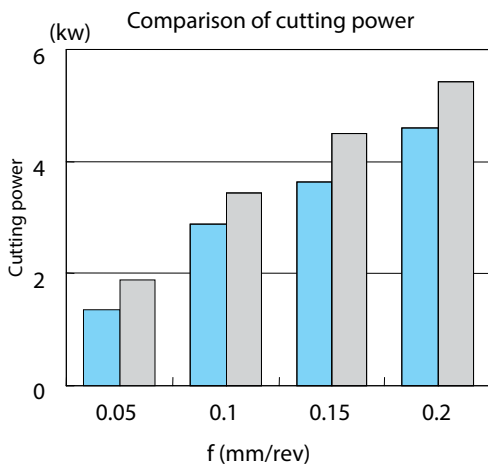
Drilling

Cutting power

ø20 cutting power comparison

- Magic Drill DRZ
- Competitor A

Vc=100m/min, (n=1,600min⁻¹)
ø20 indexable drill
15CrMo4 wet (Internal coolant)



Case studies

MagicDrill dia.	ø16	ø27	ø50				
Machine	Competitor A	Competitor B	Competitor C	Competitor D			
Machine power	AC 5.5/7.5 kW	AC 5.5/7.5 kW	AC 5.5/7.5 kW	AC 7.5/11 kW			
Cutting conditions	Vc (mm/min)	150	130	150	120	110	157
	f (mm/rev)	0.06	0.13		0.1	0.08	0.12
Workpiece material	SS400	34CrMo4		15CrMo4	SS400		
Required power (Load meter values)	60%	80%	95%	100%	60%	100%	
Remarks	-	-		With conventional drill, limited up to ø40	-		

Formula for calculating required power (Approximate value)

Recommended cutting conditions (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)				DC (mm)	Drill type (Drilling depth)			
	MEGACOAT			Carbide		2D	3D	4D	5D
	PR1230	PR1225	PR1210	KW10					
	Standard SP SU	Standard SP SU	Standard	Standard SP		f (mm/rev)			
Low carbon steel	★ 120~220	☆ 120~220	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Carbon steel	★ 100~160	☆ 100~160	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Alloy steel	★ 80~140	☆ 80~140	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Mold steel	★ 70~130	☆ 70~130	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.07	-
					ø16~ø26.5	0.08~0.12	0.06~0.10	0.06~0.08	-
					ø27~ø50	0.08~0.15	0.06~0.12	0.06~0.10	0.04~0.07
					ø50~	0.08~0.15	0.06~0.12	0.06~0.10	-
Stainless steel (Austenitic related)	☆ 60~120	★ 60~120	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.06	-
					ø16~ø26.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø27~ø50	0.06~0.10	0.06~0.12	0.04~0.10	0.04~0.07
					ø50~	0.06~0.12	0.06~0.12	0.04~0.10	-
Gray cast iron	-	-	★ 100~150	☆ 100~120	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Nodular cast iron	-	-	★ 80~120	☆ 80~100	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Non-ferrous metals	-	-	-	★ 200~600	ø13~ø15.5	0.06~0.12	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.18	0.08~0.15	0.06~0.15	-
					ø27~ø50	0.08~0.20	0.08~0.18	0.06~0.15	0.05~0.10
					ø50~	0.08~0.20	0.08~0.18	0.06~0.15	-
Titanium alloys	-	-	-	★ 40~70	ø13~ø15.5	0.05~0.06	0.05~0.06	0.05~0.06	-
					ø16~ø26.5	0.05~0.07	0.05~0.07	0.05~0.07	-
					ø27~ø50	0.06~0.08	0.06~0.08	0.06~0.08	0.04~0.05
					ø50~	0.06~0.08	0.06~0.08	0.06~0.08	-

• Apply a sufficient amount of coolant.

★: 1st recommendation ☆: 2nd recommendation



Cutting conditions by application

[Workpiece material: C50]

Applications	Plain surface	Slant surface	Half cylindrical	Hole expansion	Concave surface	Cored hole	Stacked plates
Shape of workpiece							
DRZ	Cutting speed Vc (m/min)	120	120	120	120	120	Not available
	f (mm/rev)	0.1	0.05	0.05	0.05	Concave surface 0.05 Continuous part 0.1	*0.05 Not available
Coolant (Internal)	Yes	Yes	Yes	Yes	Yes	Yes	Not available

* Cutting width (Torus-shaped part) when drilling cored hole. (Same as when using a boring bar).

Drill type	2D ~ 3D	4D ~ 5D
Cutting width (Torus-shaped part)	0.1 x DC or less	Not recommended

e.g.) In case of drilling using DRZ3090-10 (3 x DC)

1. For milling, pre-drilled hole should be cut ø24 (ø30 - 0.1 x 30 x 2) or bigger

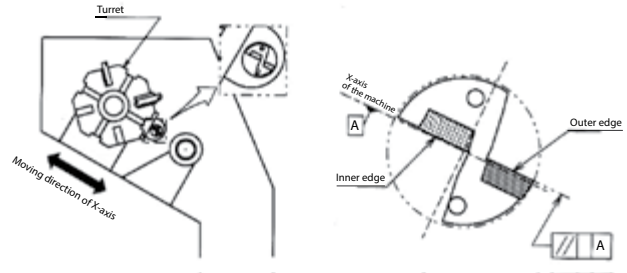
2. For turning, ap should be set ap = 3mm (0.1 x 30) or under

Max. depth for drilling with external coolant

In case of using external coolant system, chip evacuation will be bad. Therefore ap should be measured within 1.5 times (1.5 x DC) of drill diameter (DC).

Lathe installation (DRZ and DRXR)

1. The top face of the outer insert should be parallel to the X-axis to allow for offset machining.
Drill diameter can be changed by moving X-axis.
2. It is recommended to set the outer insert as shown in Fig. 1 with the outer insert facing the operator.
(It is also possible to use it by setting it in 180° reverse position)
If the lathe has two turrets, when installing the drill into the lower turret, the outer insert should be set to face the operator.
(It is also possible to use it by setting at 180° reverse position)



(Fig. 1) Installed to the lathe

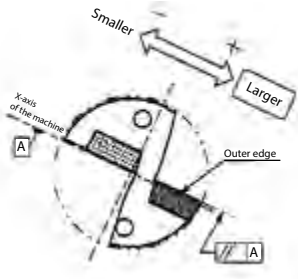
Drill diameter adjustment

1. Drill diameter adjustment

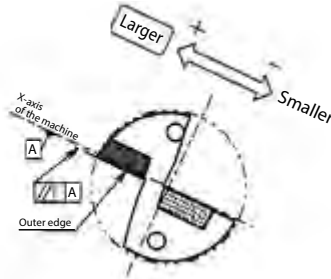
1. Drill diameter is adjusted by moving X-axis.
The moving direction of the X-axis depends on the position of the toolholder.
2. In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
(This movement of the axis is called "Offset")
However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more. Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
e.g.) In case of using $\phi 20$ drill, the hole diameter must not be smaller than 19.8mm.

2. Offset limit of the drill diameter

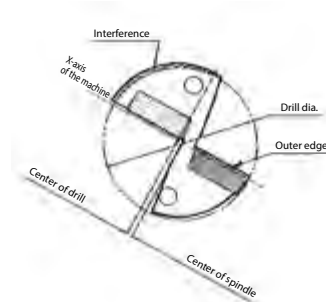
For the maximum limit of the drill diameter, refer to "Max. Offset (Radial)" in the Toolholder Dimensions table.
(The figure in the table shows how much it is possible the offset the drill in the radial direction.)
e.g.) In case of using $\phi 20$ drill, it is possible to make a hole up to $\phi 21$ since "Max. Offset (Radial)" is +0.5mm.



(Fig. 2) Outer insert facing up



(Fig. 3) Outer insert facing down



(Fig. 4) Excessive offset (For smaller hole diameter)

K



Drilling

DRA

DRC

DRV

DRZ

DRXR

DRW

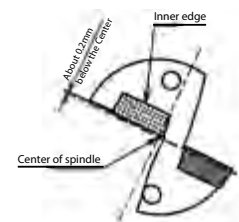
Center height adjustment

1. Center height of the inner insert

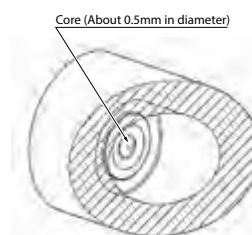
When installing inner insert as shown in Fig. 1, it will be set around 0.2mm below the Center of Spindle. (Fig. 5)
This is the normal position of the center height and the drill is designed to be handled in this condition.
However, in case that the turret of the lathe is out of the center of Spindle, sometimes the inner insert may be set above the center, or excessively below the center.
For stable drilling, it is essential to check the Center Height carefully.

2. How to check the center height

For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal position, a core about 0.5mm in diameter, will remain after machining.
In the following cases, it is necessary to adjust the center height.
· No core remains
· Core diameter is more than 1mm
* The drilled hole for verification purposes needs to be machined at approximately 10mm in depth and at a feed rate of 0.1mm/rev or lower.



(Fig. 5) Front view of the drill

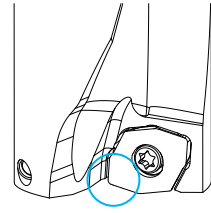


(Fig. 6) Center core

3. Center height adjustment

a) No core remains / Core with Excessively Small Diameter

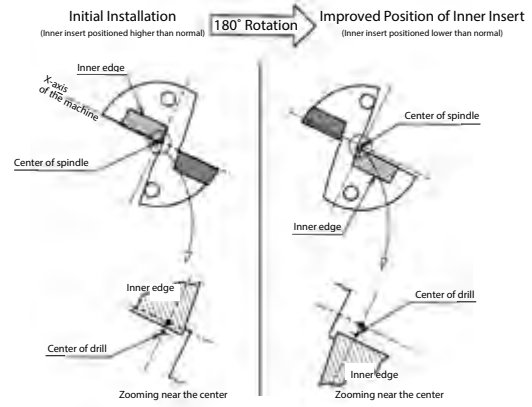
This happens when the inner insert is set above the center height. In this case, adjustment is necessary since insert breakage will be probable at the center of the drill. (Fig. 7)



(Fig. 7) Insert breakage near the center of the drill

[How to adjust]

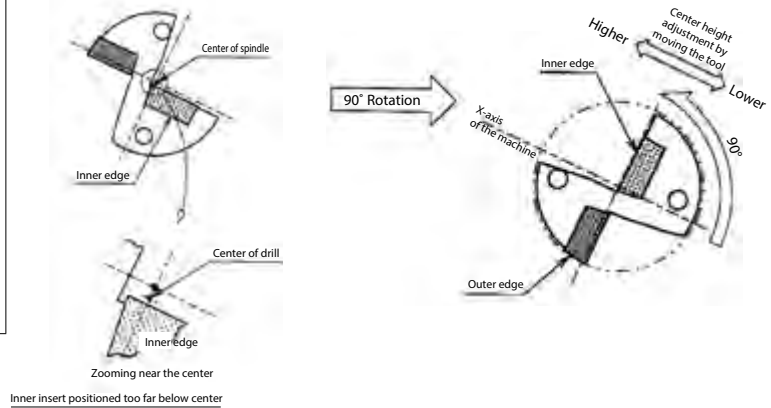
1. Install the drill rotated 180°. Most problems will be solved by this method. (Fig. 8)



(Fig. 8)

[How to adjust]

2. If the core diameter becomes too large after the above adjustment, install the drill by rotating 90° counter-clockwise as shown in Fig. 9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction. (However, this makes it impossible to adjust the drill diameter)
 Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
 The best solution is to readjust the center position of the turret itself.



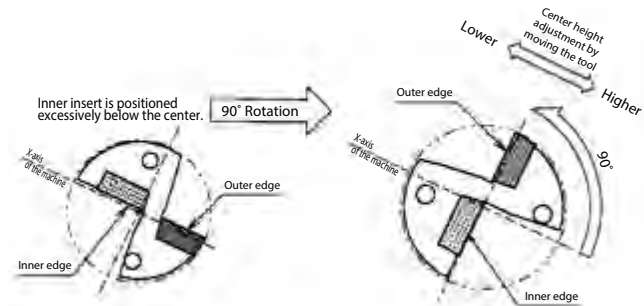
(Fig. 9)

b) Core with excessively large diameter (More than 1mm)

This occurs when the inner insert is excessively below the center. This condition causes poor chip evacuation and an adjustment is required.

[How to adjust]

- Install the drill rotating 90° as shown in Fig. 10 (outer insert is positioned on the upper side) and adjust the center height by moving tool in the X-axis direction. (However, this makes it impossible to adjust the drill diameter)
 Caution: In case of installing the drill in the opposite direction (outer insert is positioned lower), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
 The best solution is to readjust the center position of the turret itself.



(Fig. 10)

