THE NEW VALUE FRONTIER

KYOCERA

Drilling DRX

Magic Drill®

DRX

Change !!

The total product lineup is now complete!
ø12~ø60
2D,3D,4D,5D

Magic Drill DRX

Change I New Technology: Twisted coolant hole → Improved chip evacuation performance

Change II New Concept: Chipbreaker → Covers a variety of workpiece materials

Change III New Grades: 4 new grades! → PR1230, PR1225, PR1210, GW15
Carbon Steel / Stainless Steel, Low-Carbon Steel / Cast Iron / Non-Ferrous Metals

Change IV Precise Drilling: Balanced system → Better finished surface

GM Chipbreaker GH Chipbreaker SM Chipbreaker

Diameter 12mm~60 mm line up!
Large Dia. and small Dia. lineup is expanded.

Large Dia. ø39~ø60

Small Dia. ø12~ø13

ADVANCING PRODUCTIVITY

- KYOCERA, Contributing To Advancing Productivity -

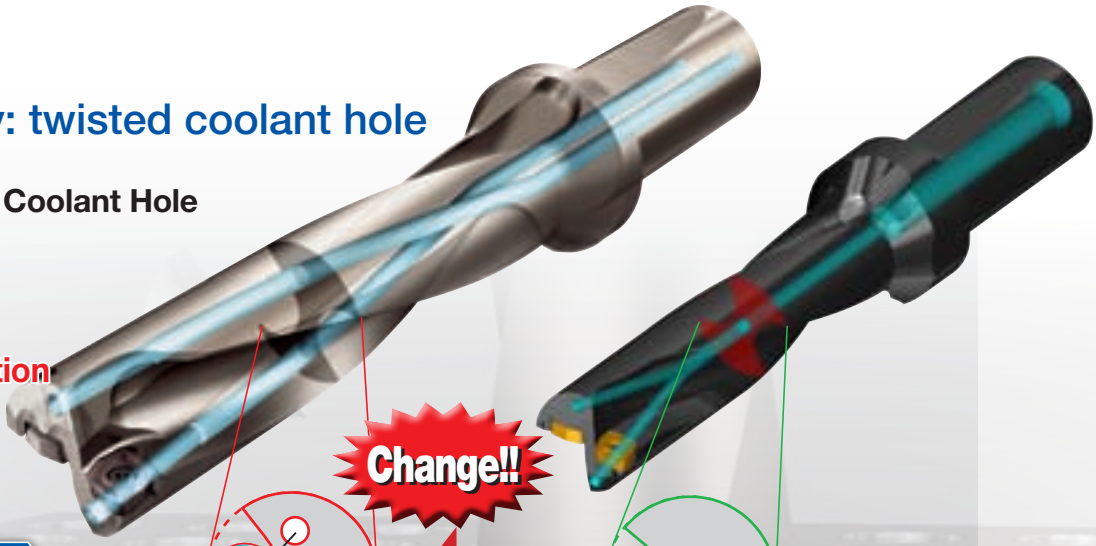
The DRX offers stable and

Change I

■ New technology: twisted coolant hole

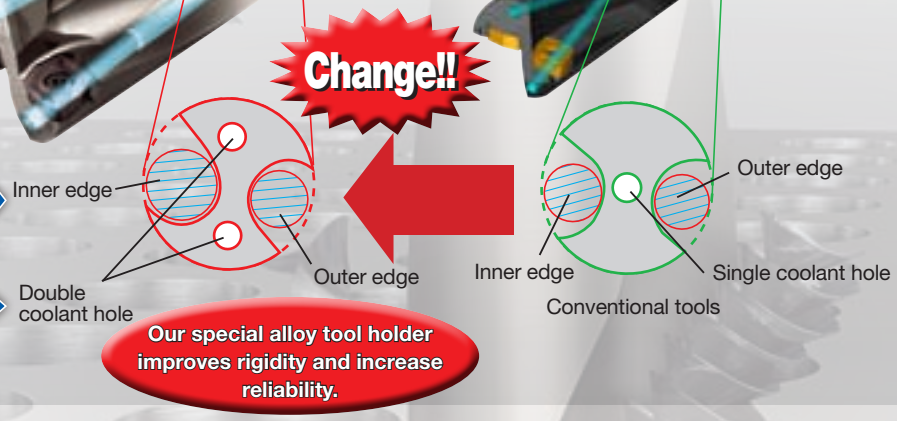
Adoption of Twisted Coolant Hole design provides

Superior Chip Evacuation



The flute space of internal cutting edge side where chips get stuck easily is 1.6 times larger.

25% better coolant performance



Our special alloy tool holder improves rigidity and increase reliability.

Change II

■ New concept: Chipbreaker design with new concept
Three new Chipbreakers

- Applicable to a wide variety of workpiece materials

GM Chipbreaker
Universal type for Carbon Steel and Cast Iron

GH Chipbreaker
Strong-edge type for extra-hard materials and interrupted machining

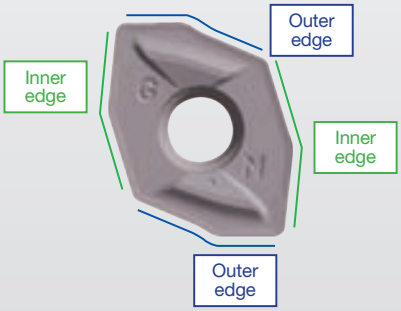
SM Chipbreaker
Stainless Steel, Low-Carbon Steel, Non-Ferrous Metals Sharp cutting for deeper drilling

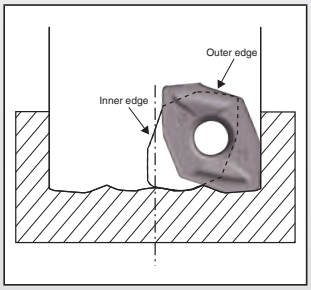
- Solves sticky chips problems associated with stainless steel and low-carbon steel workpieces.

Long, entangled chips (Competitor A)

- Economical four-corner edge type

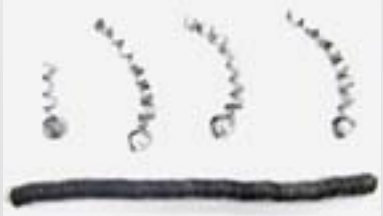
2 inner pocket cutting edges and 2 outer pocket cutting edges





Positioning of outer edge and inner edge

Change!!



Chips by SM Chipbreaker (SUS304)

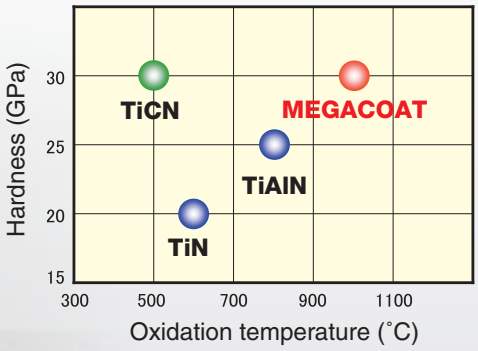
efficient machining

Change III

MEGACOAT

■ New Grade: 4 new grades!

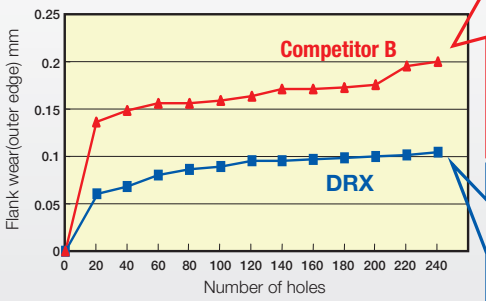
(PR1230: Carbon Steel, PR1225: Stainless Steel, Low-Carbon Steel, PR1210: Cast Iron, GW15: Non-Ferrous Metals)



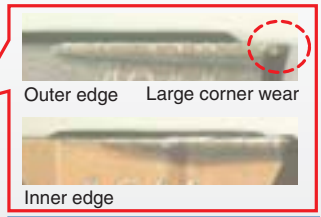
MEGACOAT's High oxidation resistance

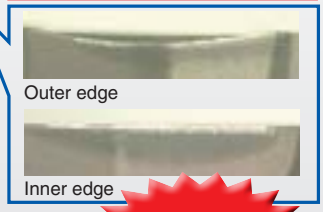
MEGACOAT technology extends the life of your cutters

Vc = 150 m/min, f = 0.1 mm/rev,
Dc = ø20, H = 35 mm , WET,
SUS304 : ZXMT06T204SM (PR1225)



Wear comparison





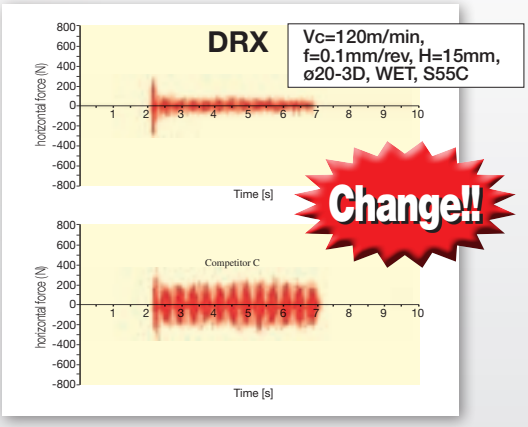
Change!!

Better wear resistance than competitor B
Stable, long tool life

Change IV

■ Precise Drilling: Balanced system

• Vibration comparison

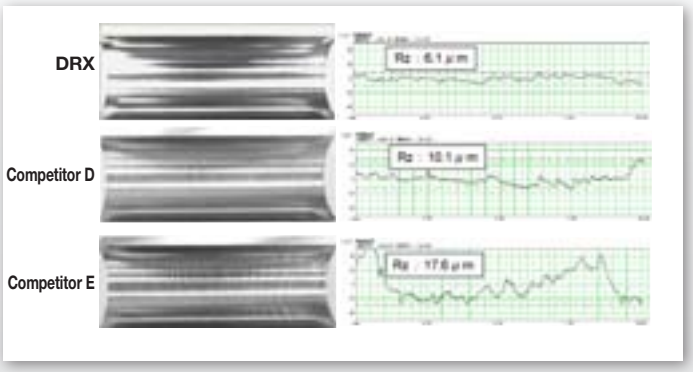


Drill's structure has good balance, thus reduces vibration during machining.

Better finished surface

• Finished surface comparison

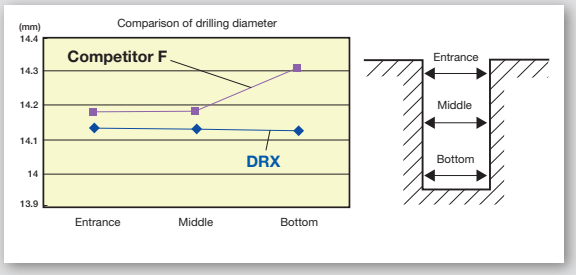
Vc=180m/min, f=0.15mm/rev, H=60mm(through hole),
ø20-3D, WET, S45C, NC Lathe



Better finished surface than Competitors D and E

Possible to extend tool life to the next machining step

• Variation of drilling diameter



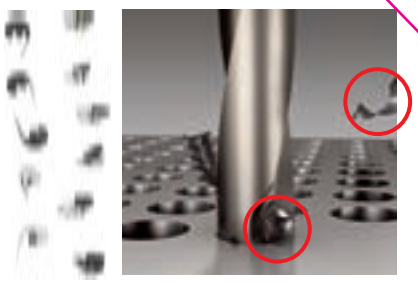
Vc=180m/min, f=0.08mm/rev, H=56mm(blind hole),
ø14-4D, WET, S50C

Excellent chip evacuation leads to a well-balanced system since it causes less variation of drilling diameter than competitor F's cutter.

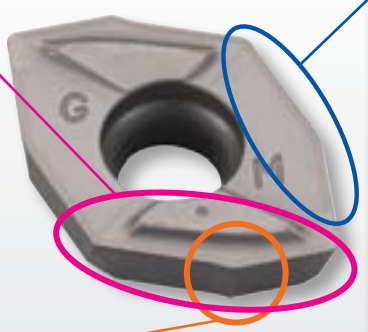
The Chipbreaker's new techno to a wide variety of workpiece

New Chipbreaker features

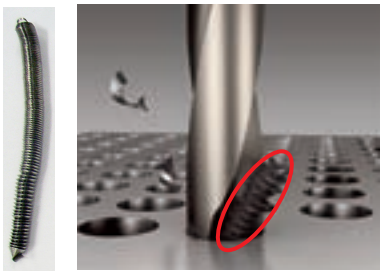
♦ Wider Chipbreaker (outer edge)



Small chips for better evacuation



♦ Flat Chipbreaker (inner edge)

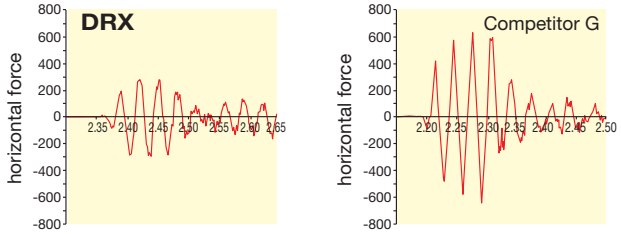


Ideal continuous chips

♦ Sigmoid cutting edge (outer edge)

Sigmoid outer cutting edge
↓
sharp cutting

Vc=120m/min, f=0.1mm/rev, H=15mm, ø20-3D, WET, S55C



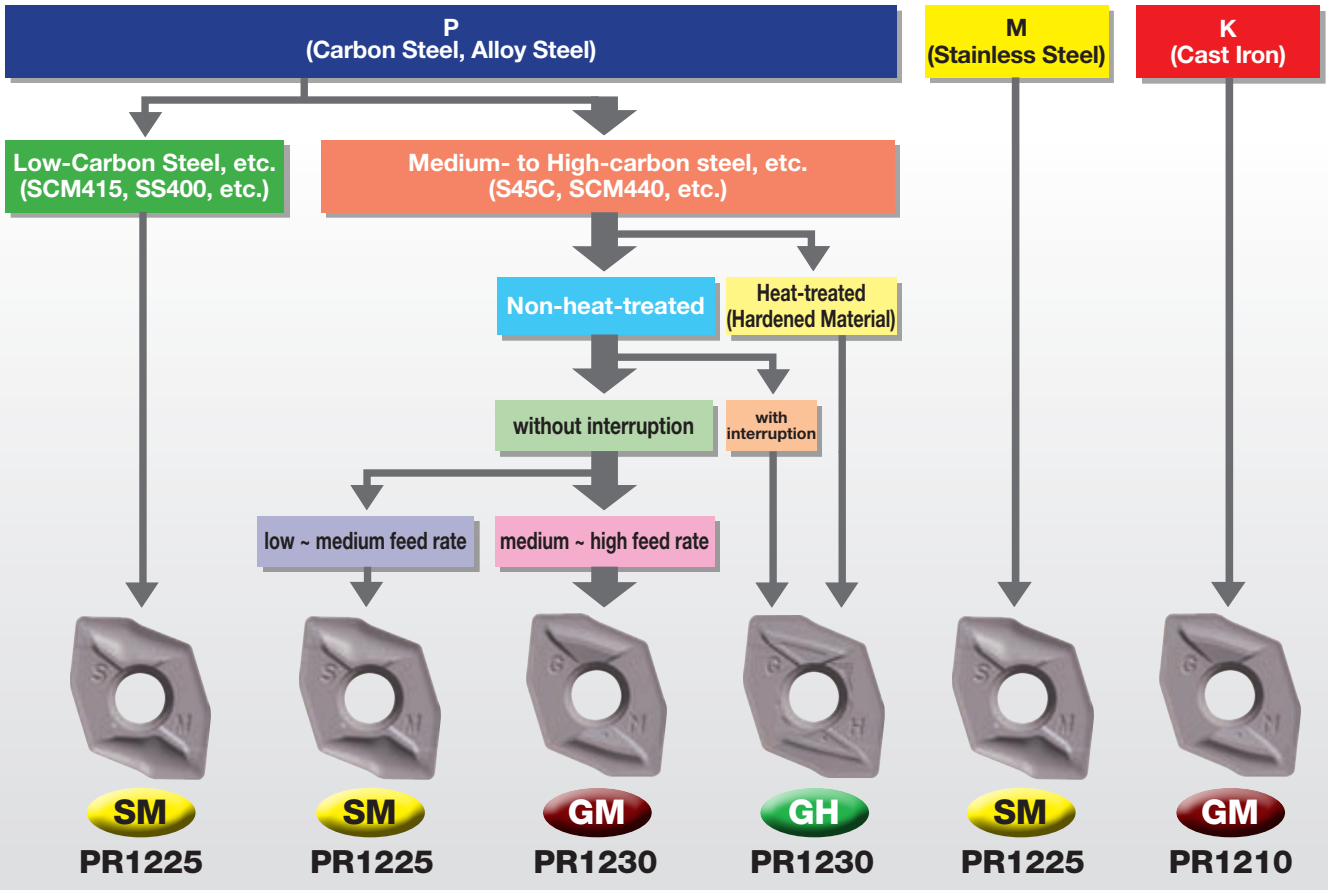
Cutting force comparison of outer edge at the start of drilling

Lower impact force when starting to cut

↓

Reduce sudden breakage at the start

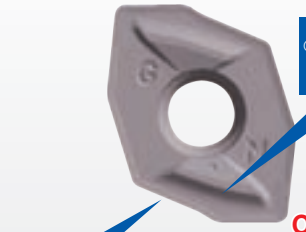
Chipbreaker selection



logical innovation is applicable materials!

● 3 Chipbreakers for machining of various materials

♦ GM Chipbreaker ··· Universal type



①Wider Chipbreaker can cover variety of materials

for general cutting

Optimized cutting edge strength, sharpness and chip control

②Achieves a good balance between cutting-edge strength and sharp cutting

For Carbon Steel: PR1230 **For Cast iron: PR1210**

♦ GH Chipbreaker ··· Strong-edge type

1st recommendation for hardened material, interrupted operation

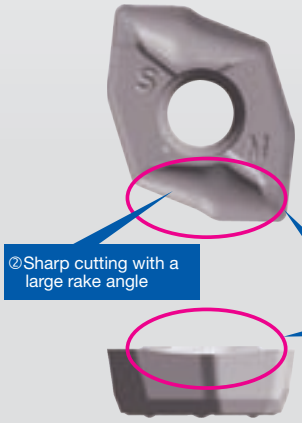
Cutting edge strength-oriented design

②Cutting edge strength-oriented design

①Wider Chipbreaker controls breakage caused by pressed chips

For hardened material, interrupted operation: PR1230

♦ SM Chipbreaker ··· Sharp cutting for deeper drilling



For deep drilling of materials, such as stainless steel and low carbon steel, for which produce hard-to-deal-with chips

Sharp cutting with a large rake angle
Reliable chip control by newly designed Chipbreaker and U-shaped cutting edge

②Sharp cutting with a large rake angle

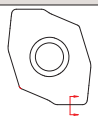
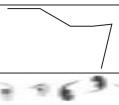
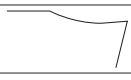
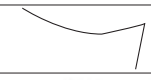
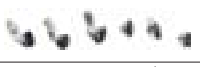
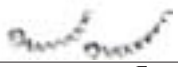
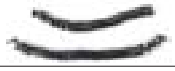
①U-shaped cutting edge
Breaks up chips by growing cracks from both ends

Chip breaking system of SM Chipbreaker (outer edge)

Outstanding chip control achieved by splitting chips from the outer edges

For stainless steel and low-carbon steel: PR1225 **For non-ferrous metals: GW15**

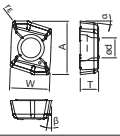
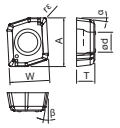
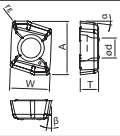
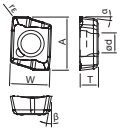
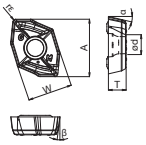
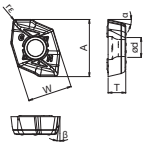
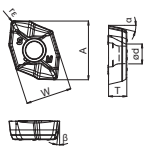
■ Advantages of the Chipbreaker

Chipbreaker			**GM** (Generic)	**GH** (Cutting edge enhanced)	**SM** (For low-resistance deep holes)
Shape					
Advantages			1st recommendation for carbon steel and alloy steel 1st recommendation for cast iron	1st recommendation for hardened materials Cutting edge strength-oriented design	Suitable for sticky materials such as stainless steel and low-carbon steel
			Good balance between sharp cutting and cutting edge strength	Middle to high feed rates of steel, GM alternative	Sharp cutting, prevents chattering For low to medium feed rates of steel
Outer edge	 Wide Chipbreaker	cross-section			
		Chips from outer edge			
Inner edge	 Flat Chipbreaker	cross-section			
		Chips from inner edge			
Workpiece Material			**S50C**	**S50C**	**SUS304**

■ Insert LineUp

Usage Classification
● : 1st. Recommendation
○ : 2nd. Recommendation
(Steel; non heat treated)

P	Carbon Steel, Alloy Steel	●	○	
	Tool Steel	●		
M	Stainless Steel	○	●	
K	Cast Iron			●
N	Non-Ferrous Material			●

Shape	Description	Dimension (mm)					Angle (°)		MEGACOAT			Carbide	Ref. page for applicable Holder
		A	T	ød	W	r	α	β	PR1230	PR1225	PR1210	GW15	
 For outer edge	 ZXMT 030203GM-E	6.4	2.30	2.4	4.8	0.3	7°	10°	●		●		
 For inner edge	 ZXMT 030203GM-I	5.9	2.30	2.4	4.8	0.3	7°	10°	●	●	●	●	P 7 P 9
 For outer edge	 ZXMT 030203GH-E	6.4	2.30	2.4	4.8	0.3	7°	10°	●				P11 P13
 For outer edge	 ZXMT 030203SM-E	6.4	2.30	2.4	4.8	0.3	7°	10°		●		●	
	 ZXMT 040203GM	6.2	2.60	2.4	5.1	0.3	13°	10°	●		●		P 7
	05T203GM	7.3	2.76	2.5	5.5	0.3		7°	●		●		
	06T204GM	8.6	2.89	2.8	6.4	0.4			●		●		
	070305GM	10.2	3.24	3.0	8.0	0.5			●		●		
	09T306GM	12.2	4.03	3.6	9.6	0.6			●		●		
	11T306GM	14.5	4.06	4.6	11.6	0.6			●		●		
	140408GM	18.0	4.88	5.7	14.4	0.8			●		●		
	170608GM	22.1	6.58	6.8	17.7	0.8			●		●		
	 ZXMT 040203GH	6.2	2.60	2.4	5.1	0.3	13°	10°	●				P 8
	05T203GH	7.3	2.76	2.5	5.5	0.3		7°	●				P 9
	06T204GH	8.6	2.89	2.8	6.4	0.4			●				P10
	070305GH	10.2	3.24	3.0	8.0	0.5			●				P11
	09T306GH	12.2	4.03	3.6	9.6	0.6			●				P12
	11T306GH	14.5	4.06	4.6	11.6	0.6			●				
	140408GH	18.0	4.88	5.7	14.4	0.8			●				
	170608GH	22.1	6.58	6.8	17.7	0.8			●				
	 ZXMT 040203SM	6.2	2.60	2.4	5.1	0.3	13°	10°		●		●	P13
	05T203SM	7.3	2.76	2.5	5.5	0.3		7°		●		●	
	06T204SM	8.6	2.89	2.8	6.4	0.4				●		●	
	070305SM	10.2	3.24	3.0	8.0	0.5				●		●	
	09T306SM	12.2	4.03	3.6	9.6	0.6				●		●	
	11T306SM	14.5	4.06	4.6	11.6	0.6				●		●	
	140408SM	18.0	4.88	5.7	14.4	0.8				●		●	
	170608SM	22.1	6.58	6.8	17.7	0.8				●		●	

■ Suitable Chipbreaker

Workpiece Material	Insert Size	ZXMT											
	Chipbreaker	GM				GH				SM			
	Drilling Depth	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D
Low-Carbon Steel (SS400, S15C, SCM415, SCr415)		☆	☆	☆	☆					★	★	★	★
Carbon Steel (S45C)		★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★
Alloy Steel (SCM435, SCr435)		★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★
Tool Steel (SKD11)		☆	☆	☆	☆	★	★	★	★				
Stainless Steel (SUS304, SUS430, SUS440F)										★	★	★	★

Workpiece Material	Insert Size	ZXMT											
	Chipbreaker	GM				GH				SM			
	Drilling Depth	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D
Cast Iron (FC250, FCD400)		★	★	★	★								
Aluminum Alloys (A2017, A5052)										★	★	★	★
Brass										★	★	★	★
Titanium Alloys										★	★	★	★

★: 1st. Recommendation ☆ 2nd. Recommendation

●: Standard Stock

■ How to select ZXMT03

For ZXMT03 (DRX-03 type insert),

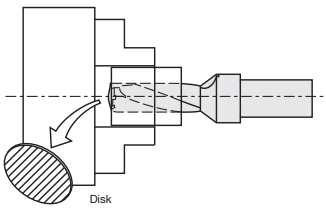
1) For external edge, please select -E insert, and also select from among the three types of Chipbreakers one that fits your application.
2) For internal edge, please select -I insert (only one type).

Outer Edge	Inner Edge
	
ZXMT030203◯◯-E	**ZXMT030203GM-I**
	
GM-E　GH-E　SM-E	**GM-I**

■ Criteria for judging tool life

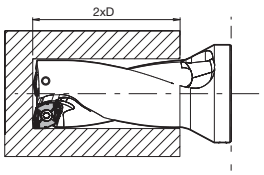
How to judge tool life	Guidelines for judging tool life
Tool marks occur due to large edge wear	• In case using new insert In general, since the holder was designed to deflect outward during operation and return to its original position after machining is complete, no tool marks remain. (Depending on the workpiece and cutting conditions, however, in some cases slight marking may occur even with new insert) • When the tool has reached the end of its life It starts to bow inward due to increasing cutting forces on the outer edge caused by increasing wear. Tool marks remain when the tool is retracted because the cutting edge is in contact with finished surface.
Control by drilled diameter	It can be judged to have reached the end of its life when the drilling diameter suddenly becomes smaller.
Burr generation status at the end	Ilt can be judged to have reached the end of its life when the remaining burrs become large at the end due to the worn outer edge.
Change in cutting noise	Cutting noise increases
Change in vibration	When the tool gets near the end of its life, there will be stronger vibration and louder noise. It is difficult to confirm these differences in the case of smaller diameter cutters.

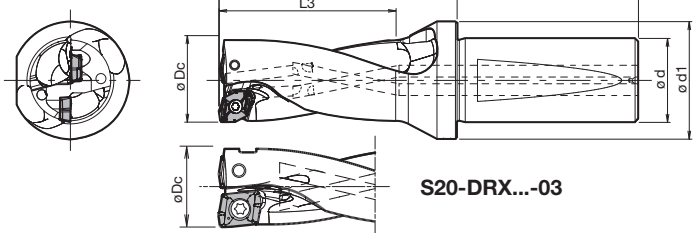
♦ Caution

	When drilling through the workpiece, a disk may form and be expelled. Provide proper machine guards to prevent injuries when operating a machine with no cover.

■ Holder Lineup

DRX (2 x D Drilling Depth)





S20-DRX...-03

2D

● Holder Dimensions

Description	Stock	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare Parts		Applicable Insert ➡P5
										Clamp Screw	Wrench	
			øDc	L1	L2	L3	ød	ød1				
S20 -DRX120M-2-03	●		12	88	45	24			+0.5			ZXMT030203○○-E (Outer Edge) ZXMT030203GM-I (Inner Edge)
-DRX125M-2-03	●	2	12.5	89	46	25	20	27	+0.4	SB-2042TRG	DTM-6	
-DRX130M-2-03	●		13	90	47	26			+0.3			
-DRX135M-2-04	●		13.5	91	48	27			+0.5			
-DRX140M-2-04	●	2	14	92	49	28	20	27	+0.4	SB-2042TRG	DTM-6	ZXMT040203○○
-DRX145M-2-04	●		14.5	93	50	29			+0.3			
-DRX150M-2-04	●		15	94	51	30			+0.2			
S25 -DRX155M-2-05	●		15.5	109	55	31			+0.8			
-DRX160M-2-05	●		16	110	56	32			+0.7			
-DRX165M-2-05	●	2	16.5	111	57	33	25	32	+0.5	SB-2045TR	DTM-6	ZXMT05T203○○
-DRX170M-2-05	●		17	112	58	34			+0.4			
-DRX175M-2-05	●		17.5	113	59	35			+0.3			
-DRX180M-2-05	●		18	114	60	36			+0.2			
-DRX185M-2-06	●		18.5	112	58	37			+0.9			
-DRX190M-2-06	●		19	113	59	38			+0.8			
-DRX195M-2-06	●		19.5	114	60	39			+0.7			
-DRX200M-2-06	●	2	20	115	61	40	25	32	+0.5	SB-2250TR	DTM-7	ZXMT06T204○○
-DRX205M-2-06	●		20.5	116	62	41			+0.4			
-DRX210M-2-06	●		21	117	63	42			+0.3			
-DRX215M-2-06	●		21.5	118	64	43			+0.2			
-DRX220M-2-07	●		22	119	65	44			+1.2			
-DRX225M-2-07	●		22.5	120	66	45			+1.0			
-DRX230M-2-07	●		23	121	67	46			+0.9			
-DRX235M-2-07	●		23.5	122	68	47			+0.8			
-DRX240M-2-07	●	2	24	123	69	48	25	33	+0.7	SB-2570TR	DTM-8	ZXMT070305○○
-DRX245M-2-07	●		24.5	124	70	49			+0.5			
-DRX250M-2-07	●		25	125	71	50			+0.4			
-DRX255M-2-07	●		25.5	126	72	51			+0.3			
-DRX260M-2-07	●		26	127	73	52			+0.2			
S32 -DRX270M-2-09	●		27	136	77	54			+1.6			
-DRX280M-2-09	●		28	138	79	56		41	+1.3			
-DRX290M-2-09	●	2	29	140	81	58	32		+1.1	SB-3080TR	DTM-10	ZXMT09T306○○
-DRX300M-2-09	●		30	142	83	60		43	+0.8			
-DRX310M-2-09	●		31	144	85	62			+0.6			

• When offset machining, reduce feed rate to 0.08mm/rev or less.
• See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡P15
Troubleshooting ➡P14

●: Standard Stock

● Holder Dimensions

Description	Stock	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare Parts		Applicable Insert ⇒P5
			øDc	L1	L2	L3	ød	ød1		Clamp Screw 	Wrench 	
S40 -DRX320M-2-11	●		32	169	100	64			+2.2			
-DRX330M-2-11	●		33	171	102	66			+1.9			
-DRX340M-2-11	●		34	173	104	68			+1.7			
-DRX350M-2-11	●	2	35	175	106	70	40	54	+1.4	SB-4085TR	DTM-15	ZXMT11T306○○
-DRX360M-2-11	●		36	177	108	72			+1.2			
-DRX370M-2-11	●		37	179	110	74			+0.9			
-DRX380M-2-11	●		38	181	112	76			+0.7			
-DRX390M-2-14	●		39	179	110	78			+2.8			
-DRX400M-2-14	●		40	181	112	80		54	+2.5			
-DRX410M-2-14	●		41	183	114	82			+2.3			
-DRX420M-2-14	●		42	185	116	84			+2.0			
-DRX430M-2-14	●	2	43	187	118	86	40		+1.8	SB-5090TR	DT-20	ZXMT140408○○
-DRX440M-2-14	●		44	189	120	88			+1.5			
-DRX450M-2-14	●		45	191	122	90		59	+1.3			
-DRX460M-2-14	●		46	193	124	92			+1.0			
-DRX470M-2-14	●		47	195	126	94			+0.8			
-DRX480M-2-17	●		48	194	125	96			+3.8			
-DRX490M-2-17	●		49	196	127	98			+3.5			
-DRX500M-2-17	●		50	198	129	100		59	+3.3			
-DRX510M-2-17	●		51	200	131	102			+3.0			
-DRX520M-2-17	●		52	202	133	104			+2.8			
-DRX530M-2-17	●		53	204	135	106			+2.5			
-DRX540M-2-17	●	2	54	206	137	108	40		+2.3	SB-60120TR	DT-25	ZXMT170608○○
-DRX550M-2-17	●		55	208	139	110			+2.0			
-DRX560M-2-17	●		56	210	141	112			+1.8			
-DRX570M-2-17	●		57	212	143	114		64	+1.5			
-DRX580M-2-17	●		58	214	145	116			+1.3			
-DRX590M-2-17	●		59	216	147	118			+1.0			
-DRX600M-2-17	●		60	218	149	120			+0.8			

• When offset machining, reduce feed rate to 0.08mm/rev or less.
• See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ⇒P15
Troubleshooting ⇒P14

• Cutting Tolerance (2D Type)

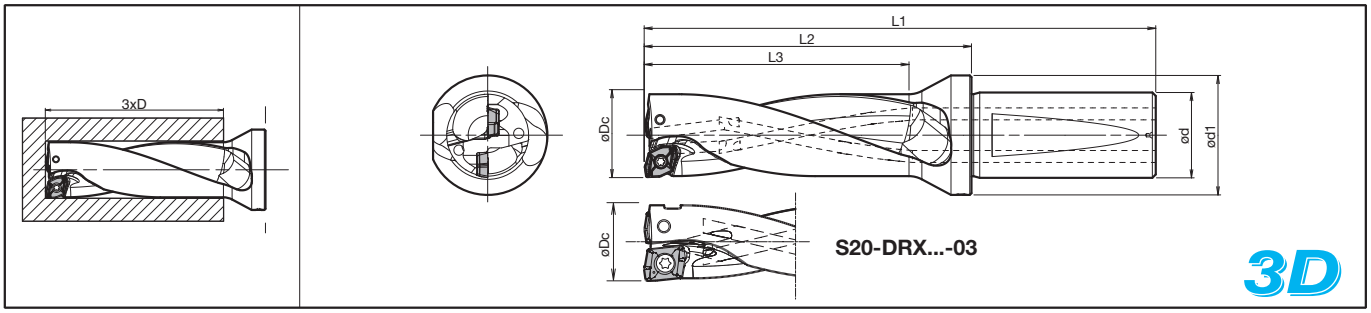
Dc	Cutting Tolerance (mm)
ø12~ø26	+0.20 −0.10
ø27~ø38	+0.25 −0.15
ø39~ø60	+0.30 −0.20

※Listed tolerance is given as a guideline.
These guideline values may vary depending on the machines, workpieces, clamping conditions and cutting conditions.

●: Standard Stock

■ Holder Lineup

DRX (3 x D Drilling Depth)



● Holder Dimensions

Description		Stock	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare Parts		Applicable Insert ➡P5
				øDc	L1	L2	L3	ød	ød1		Clamp Screw	Wrench	
S20	-DRX120M-3-03	●		12	100	57	36			+0.5			ZXMT030203○○-E (Outer Edge) ZXMT030203GM-I (Inner Edge)
	-DRX125M-3-03	●	2	12.5	102	59	37.5	20	27	+0.4	SB-2042TRG	DTM-6	
	-DRX130M-3-03	●		13	103	60	39			+0.3			
	-DRX135M-3-04	●		13.5	105	62	40.5			+0.5			
	-DRX140M-3-04	●	2	14	106	63	42	20	27	+0.4	SB-2042TRG	DTM-6	ZXMT040203○○
	-DRX145M-3-04	●		14.5	108	65	43.5			+0.3			
	-DRX150M-3-04	●		15	109	66	45			+0.2			
S25	-DRX155M-3-05	●		15.5	124	70	46.5			+0.8			
	-DRX160M-3-05	●		16	126	72	48			+0.7			
	-DRX165M-3-05	●	2	16.5	127	73	49.5	25	32	+0.5	SB-2045TR	DTM-6	ZXMT05T203○○
	-DRX170M-3-05	●		17	129	75	51			+0.4			
	-DRX175M-3-05	●		17.5	130	76	52.5			+0.3			
	-DRX180M-3-05	●		18	132	78	54			+0.2			
	-DRX185M-3-06	●		18.5	131	77	55.5			+0.9			
	-DRX190M-3-06	●		19	132	78	57			+0.8			
	-DRX195M-3-06	●		19.5	134	80	58.5			+0.7			
	-DRX200M-3-06	●	2	20	135	81	60	25	32	+0.5	SB-2250TR	DTM-7	ZXMT06T204○○
	-DRX205M-3-06	●		20.5	137	83	61.5			+0.4			
	-DRX210M-3-06	●		21	138	84	63			+0.3			
	-DRX215M-3-06	●		21.5	140	86	64.5			+0.2			
	-DRX220M-3-07	●		22	141	87	66			+1.2			
	-DRX225M-3-07	●		22.5	142	88	67.5			+1.0			
	-DRX230M-3-07	●		23	144	90	69			+0.9			
	-DRX235M-3-07	●		23.5	145	91	70.5			+0.8			
	-DRX240M-3-07	●	2	24	147	93	72	25	33	+0.7	SB-2570TR	DTM-8	ZXMT070305○○
	-DRX245M-3-07	●		24.5	148	94	73.5			+0.5			
	-DRX250M-3-07	●		25	150	96	75			+0.4			
	-DRX255M-3-07	●		25.5	151	97	76.5			+0.3			
	-DRX260M-3-07	●		26	153	99	78			+0.2			
S32	-DRX265M-3-09	●		26.5	161	102	79.5			+1.7			
	-DRX270M-3-09	●		27	163	104	81			+1.6			
	-DRX275M-3-09	●		27.5	164	105	82.5		41	+1.5			
	-DRX280M-3-09	●		28	166	107	84			+1.3			
	-DRX285M-3-09	●		28.5	167	108	85.5			+1.2			
	-DRX290M-3-09	●	2	29	169	110	87	32		+1.1	SB-3080TR	DTM-10	ZXMT09T306○○
	-DRX295M-3-09	●		29.5	170	111	88.5			+1.1			
	-DRX300M-3-09	●		30	172	113	90			+0.8			
	-DRX305M-3-09	●		30.5	173	114	91.5		43	+0.7			
	-DRX310M-3-09	●		31	175	116	93			+0.6			
	-DRX315M-3-09	●		31.5	176	117	94.5			+0.5			
S40	-DRX320M-3-11	●		32	201	132	96			+2.2			
	-DRX330M-3-11	●		33	204	135	99			+1.9			
	-DRX340M-3-11	●		34	207	138	102			+1.7			
	-DRX350M-3-11	●	2	35	210	141	105	40	54	+1.4	SB-4085TR	DTM-15	ZXMT11T306○○
	-DRX360M-3-11	●		36	213	144	108			+1.2			
	-DRX370M-3-11	●		37	216	147	111			+0.9			
	-DRX380M-3-11	●		38	219	150	114			+0.7			

• When offset machining, reduce feed rate to 0.08mm/rev or
• See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡P15
Troubleshooting ➡P14

●: Standard Stock

● Holder Dimensions

Description	Stock	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare Parts		Applicable Insert ➡P5
			øDc	L1	L2	L3	ød	ød1		Clamp Screw 	Wrench 	
S40 -DRX390M-3-14	●	2	39	218	149	117	40	54	+2.8	SB-5090TR	DT-20	ZXMT140408○○
-DRX400M-3-14	●		40	221	152	120			+2.5			
-DRX410M-3-14	●		41	224	155	123			+2.3			
-DRX420M-3-14	●		42	227	158	126			+2.0			
-DRX430M-3-14	●		43	230	161	129		59	+1.8			
-DRX440M-3-14	●		44	233	164	132			+1.5			
-DRX450M-3-14	●		45	236	167	135			+1.3			
-DRX460M-3-14	●		46	239	170	138			+1.0			
-DRX470M-3-14	●		47	242	173	141			+0.8			
-DRX480M-3-17	●	2	48	242	173	144	40	59	+3.8	SB-60120TR	DT-25	ZXMT170608○○
-DRX490M-3-17	●		49	245	176	147			+3.5			
-DRX500M-3-17	●		50	248	179	150			+3.3			
-DRX510M-3-17	●		51	251	182	153			+3.0			
-DRX520M-3-17	●		52	254	185	156			+2.8			
-DRX530M-3-17	●		53	257	188	159			+2.5			
-DRX540M-3-17	●		54	260	191	162		64	+2.3			
-DRX550M-3-17	●		55	263	194	165			+2.0			
-DRX560M-3-17	●		56	266	197	168			+1.8			
-DRX570M-3-17	●		57	269	200	171			+1.5			
-DRX580M-3-17	●		58	272	203	174			+1.3			
-DRX590M-3-17	●		59	275	206	177			+1.0			
-DRX600M-3-17	●		60	278	209	180			+0.8			

• When offset machining, reduce feed rate to 0.08mm/rev or less.
• See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡P15
Troubleshooting ➡P14

• Cutting Tolerance (3D Type)

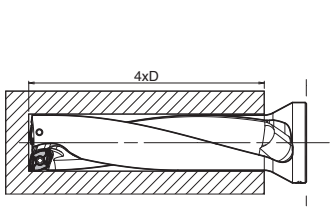
Dc	Cutting Tolerance (mm)
ø12~ø26	+0.20 −0.10
ø26.5~ø38	+0.25 −0.15
ø39~ø60	+0.30 −0.20

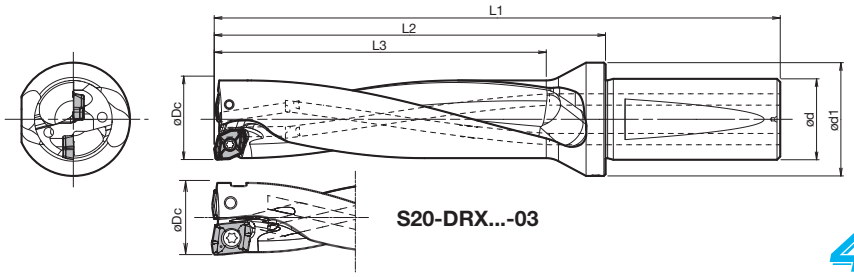
※Listed tolerance is given as a guideline.
These guideline values may vary depending on the machines, workpieces, clamping conditions and cutting conditions.

●: Standard Stock

■ Holder Lineup

DRX (4 X D Drilling Depth)





S20-DRX...-03

4D

● Holder Dimensions

Description	Stock	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare Parts		Applicable Insert ➡P5
			øDc	L1	L2	L3	ød	ød1		Clamp Screw	Wrench	
S20 -DRX120M-4-03	●		12	112	69	48			+0.5			ZXMT030203○○-E (Outer Edge) ZXMT030203GM-I (Inner Edge)
-DRX125M-4-03	●	2	12.5	114	71	50	20	27	+0.4	SB-2042TRG	DTM-6	
-DRX130M-4-03	●		13	116	73	52			+0.3			
-DRX135M-4-04	●		13.5	118	75	54			+0.5			
-DRX140M-4-04	●	2	14	120	77	56	20	27	+0.4	SB-2042TRG	DTM-6	ZXMT040203○○
-DRX145M-4-04	●		14.5	122	79	58			+0.3			
-DRX150M-4-04	●		15	124	81	60			+0.2			
S25 -DRX155M-4-05	●		15.5	140	86	62			+0.8			
-DRX160M-4-05	●		16	142	88	64			+0.7			
-DRX165M-4-05	●	2	16.5	144	90	66	25	32	+0.5	SB-2045TR	DTM-6	ZXMT05T203○○
-DRX170M-4-05	●		17	146	92	68			+0.4			
-DRX175M-4-05	●		17.5	148	94	70			+0.3			
-DRX180M-4-05	●		18	150	96	72			+0.2			
-DRX185M-4-06	●		18.5	149	95	74			+0.9			
-DRX190M-4-06	●		19	151	97	76			+0.8			
-DRX195M-4-06	●		19.5	153	99	78			+0.7			
-DRX200M-4-06	●	2	20	155	101	80	25	32	+0.5	SB-2250TR	DTM-7	ZXMT06T204○○
-DRX205M-4-06	●		20.5	157	103	82			+0.4			
-DRX210M-4-06	●		21	159	105	84			+0.3			
-DRX215M-4-06	●		21.5	161	107	86			+0.2			
-DRX220M-4-07	●		22	163	109	88			+1.2			
-DRX225M-4-07	●		22.5	165	111	90			+1.0			
-DRX230M-4-07	●		23	167	113	92			+0.9			
-DRX235M-4-07	●		23.5	169	115	94			+0.8			
-DRX240M-4-07	●	2	24	171	117	96	25	33	+0.7	SB-2570TR	DTM-8	ZXMT070305○○
-DRX245M-4-07	●		24.5	173	119	98			+0.5			
-DRX250M-4-07	●		25	175	121	100			+0.4			
-DRX255M-4-07	●		25.5	177	123	102			+0.3			
-DRX260M-4-07	●		26	179	125	104			+0.2			
S32 -DRX270M-4-09	●		27	190	131	108			+1.6			
-DRX280M-4-09	●		28	194	135	112		41	+1.3			
-DRX290M-4-09	●	2	29	198	139	116	32		+1.1	SB-3080TR	DTM-10	ZXMT09T306○○
-DRX300M-4-09	●		30	202	143	120		43	+0.8			
-DRX310M-4-09	●		31	206	147	124			+0.6			
S40 -DRX320M-4-11	●		32	223	154	128			+2.2			
-DRX330M-4-11	●		33	227	158	132			+1.9			
-DRX340M-4-11	●		34	231	162	136			+1.7			
-DRX350M-4-11	●	2	35	235	166	140	40	49	+1.4	SB-4085TR	DTM-15	ZXMT11T306○○
-DRX360M-4-11	●		36	239	170	144			+1.2			
-DRX370M-4-11	●		37	243	174	148			+0.9			
-DRX380M-4-11	●		38	247	178	152			+0.7			

• When offset machining, reduce feed rate to 0.06mm/rev or less.
• See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡P15
Troubleshooting ➡P14

●: Standard Stock

● Holder Dimensions

Description	Stock	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare Parts		Applicable Insert ➡P5
			øDc	L1	L2	L3	ød	ød1		Clamp Screw	Wrench	
S40 -DRX390M-4-14	●		39	257	188	156			+2.8			
-DRX400M-4-14	●		40	261	192	160		54	+2.5			
-DRX410M-4-14	●		41	265	196	164			+2.3			
-DRX420M-4-14	●		42	269	200	168			+2.0			
-DRX430M-4-14	●	2	43	273	204	172	40		+1.8	SB-5090TR	DT-20	ZXMT140408○○
-DRX440M-4-14	●		44	277	208	176			+1.5			
-DRX450M-4-14	●		45	281	212	180		59	+1.3			
-DRX460M-4-14	●		46	285	216	184			+1.0			
-DRX470M-4-14	●		47	289	220	188			+0.8			
S50 -DRX480M-4-17	●		48	290	221	192			+3.8			
-DRX490M-4-17	●		49	294	225	196			+3.5			
-DRX500M-4-17	●		50	298	229	200		59	+3.3			
-DRX510M-4-17	●		51	302	233	204			+3.0			
-DRX520M-4-17	●		52	306	237	208			+2.8			
-DRX530M-4-17	●		53	310	241	212			+2.5			
-DRX540M-4-17	●	2	54	314	245	216	50		+2.3	SB-60120TR	DT-25	ZXMT170608○○
-DRX550M-4-17	●		55	318	249	220			+2.0			
-DRX560M-4-17	●		56	322	253	224			+1.8			
-DRX570M-4-17	●		57	326	257	228		64	+1.5			
-DRX580M-4-17	●		58	330	261	232			+1.3			
-DRX590M-4-17	●		59	334	265	236			+1.0			
-DRX600M-4-17	●		60	338	269	240			+0.8			

• When offset machining, reduce feed rate to 0.06mm/rev or less.
• See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡P15
Troubleshooting ➡P14

• Cutting Tolerance (4D Type)

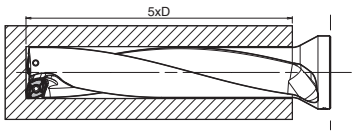
Dc	Cutting Tolerance (mm)
ø12~ø26	+0.25 −0.10
ø27~ø38	+0.30 −0.15
ø39~ø60	+0.35 −0.20

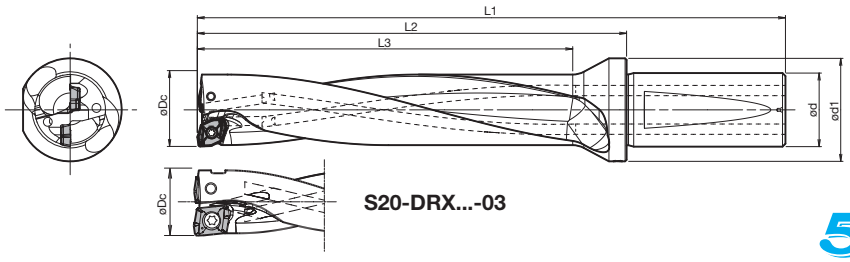
※Listed tolerance is given as a guideline.
These guideline values may vary depending on the machines, workpieces, clamping conditions and cutting conditions.

●: Standard Stock

■ Holder Lineup

DRX (5 x D Drilling Depth)





S20-DRX...-03

5D

● Holder Dimensions

Description	Stock	No. of Inserts	Dimension (mm) øDc	L1	L2	L3	ød	ød1	Max. Offset (Radial) (mm)	Spare Parts: Clamp Screw	Spare Parts: Wrench	Applicable Insert ➡P5
S20 -DRX120M-5-03	●	2	12	120	77	60	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT030203○○-E (Outer Edge) ZXMT030203GM-I (Inner Edge)
-DRX130M-5-03	●		13	125	82	65			+0.3			
-DRX140M-5-04	●	2	14	134	91	70	20	27	+0.4	SB-2042TRG	DTM-6	ZXMT040203○○
-DRX150M-5-04	●		15	139	96	75			+0.2			
S25 -DRX160M-5-05	●		16	158	104	80			+0.7			
-DRX170M-5-05	●	2	17	163	109	85	25	32	+0.4	SB-2045TR	DTM-6	ZXMT05T203○○
-DRX180M-5-05	●		18	168	114	90			+0.2			
-DRX190M-5-06	●		19	170	116	95			+0.8			
-DRX200M-5-06	●	2	20	175	121	100	25	32	+0.5	SB-2250TR	DTM-7	ZXMT06T204○○
-DRX210M-5-06	●		21	180	126	105			+0.3			
-DRX220M-5-07	●		22	185	131	110			+1.2			
-DRX230M-5-07	●		23	190	136	115			+0.9			
-DRX240M-5-07	●	2	24	195	141	120	25	33	+0.7	SB-2570TR	DTM-8	ZXMT070305○○
-DRX250M-5-07	●		25	200	146	125			+0.4			
-DRX260M-5-07	●		26	205	151	130			+0.2			
S32 -DRX270M-5-09	●		27	217	158	135			+1.6			
-DRX280M-5-09	●		28	222	163	140		41	+1.3			
-DRX290M-5-09	●	2	29	227	168	145	32		+1.1	SB-3080TR	DTM-10	ZXMT09T306○○
-DRX300M-5-09	●		30	232	173	150		43	+0.8			
-DRX310M-5-09	●		31	237	178	155			+0.6			
S40 -DRX320M-5-11	●		32	255	186	160			+2.2			
-DRX330M-5-11	●		33	260	191	165			+1.9			
-DRX340M-5-11	●		34	265	196	170			+1.7			
-DRX350M-5-11	●	2	35	270	201	175	40	49	+1.4	SB-4085TR	DTM-15	ZXMT11T306○○
-DRX360M-5-11	●		36	275	206	180			+1.2			
-DRX370M-5-11	●		37	280	211	185			+0.9			
-DRX380M-5-11	●		38	285	216	190			+0.7			
-DRX390M-5-14	●		39	296	227	195			+2.8			
-DRX400M-5-14	●		40	301	232	200		54	+2.5			
-DRX410M-5-14	●		41	306	237	205			+2.3			
-DRX420M-5-14	●		42	311	242	210			+2.0			
-DRX430M-5-14	●	2	43	316	247	215	40		+1.8	SB-5090TR	DT-20	ZXMT140408○○
-DRX440M-5-14	●		44	321	252	220			+1.5			
-DRX450M-5-14	●		45	326	257	225		59	+1.3			
-DRX460M-5-14	●		46	331	262	230			+1.0			
-DRX470M-5-14	●		47	336	267	235			+0.8			
S50 -DRX480M-5-17	●		48	338	269	240			+3.8			
-DRX490M-5-17	●		49	343	274	245			+3.5			
-DRX500M-5-17	●		50	348	279	250		59	+3.3			
-DRX510M-5-17	●		51	353	284	255			+3.0			
-DRX520M-5-17	●		52	358	289	260			+2.8			
-DRX530M-5-17	●		53	363	294	265			+2.5			
-DRX540M-5-17	●	2	54	368	299	270	50		+2.3	SB-60120TR	DT-25	ZXMT170608○○
-DRX550M-5-17	●		55	373	304	275			+2.0			
-DRX560M-5-17	●		56	378	309	280			+1.8			
-DRX570M-5-17	●		57	383	314	285		64	+1.5			
-DRX580M-5-17	●		58	388	319	290			+1.3			
-DRX590M-5-17	●		59	393	324	295			+1.0			
-DRX600M-5-17	●		60	398	329	300			+0.8			

• When offset machining, reduce feed rate to 0.05mm/rev or less.
• See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡P15
Troubleshooting ➡P14

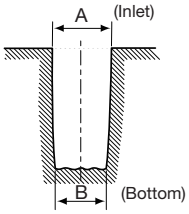
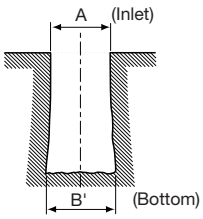
●: Standard Stock

• Cutting Tolerance (5D Type)

Dc	Cutting Tolerance (mm)	Dc	Cutting Tolerance (mm)	Dc	Cutting Tolerance (mm)
ø12~ø26	+0.30 −0.10	ø27~ø38	+0.35 −0.15	ø39~ø60	+0.40 −0.20

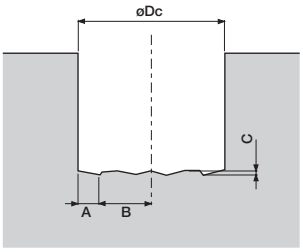
※Listed tolerance is given as a guideline.
These guideline values may vary depending on the machines, workpieces, clamping conditions and cutting conditions.

■ Troubleshooting

Problem	Details		Cause	Countermeasure
Hole diameter becomes smaller at the bottom of the hole.		No problem at hole inlet, but hole diameter decreases gradually. A>B	Clogged with chips, etc. from inner and outer edge.	Change the cutting conditions • Increase the cutting speed • Reduce the feed rate. See "Recommended Cutting Conditions" on page 15.
Hole diameter becomes larger at the bottom of the hole.		No problem at hole inlet, but hole diameter increases gradually. A<B'	Clogged with chips, etc. from inner edge.	Change the cutting conditions • Increase the cutting speed • Reduce the feed rate See "Recommended Cutting Conditions" on page 15. • Check the center height See page 17-18.
Hole diameter becomes smaller than the hole inlet.		Hole diameter becomes smaller from inlet (stationary drilling).	Improper cutting dia. adjustment	When using with lathe, adjust the hole dia. by moving the tool in the X-axis direction. See page 17.
			Inner insert is above the center (no core remains).	Adjust the center height See page 17-18.

♦ DRX Hole Bottom Shape (mm)

⌀Dc	A	B	C	⌀Dc	A	B	C	⌀Dc	A	B	C
12.0	1.8	4.2	0.5	24.5	3.2	9.1	0.8	39.0	5.8	13.7	1.5
12.5		4.5		25.0		9.3	0.9	40.0		14.2	
13.0		4.7		25.5		9.6		41.0		14.7	
13.5	2	4.8		26.0		9.8		42.0		15.2	
14.0		5.0		26.5	3.9	9.4	1.0	43.0		15.7	
14.5		5.3		27.0		9.6		44.0		16.2	
15.0		5.5		27.5		9.9		45.0		16.7	
15.5		5.8	0.6	28.0		10.1		46.0		17.2	
16.0		6.0		28.5		10.4		47.0		17.7	1.6
16.5		6.3		29.0		10.6		48.0	7.1	16.9	1.7
17.0		6.5		29.5		10.9		49.0		17.4	
17.5		6.8		30.0		11.1	1.1	50.0		17.9	
18.0		7.0	0.7	30.5		11.4		51.0		18.4	
18.5	2.4	6.9		31.0		11.6		52.0		18.9	
19.0		7.1		31.5		11.9	1.2	53.0		19.4	
19.5		7.4	0.7	32.0	4.7	11.3	1.1	54.0		19.9	
20.0		7.6		33.0		11.8		55.0		20.4	1.8
20.5		7.9		34.0		12.3		56.0		20.9	
21.0		8.1	0.8	35.0		12.8		57.0		21.4	1.9
21.5		8.4		36.0		13.3	1.2	58.0		21.9	2.0
22.0	3.2	7.8	0.8	37.0		13.8	1.3	59.0		22.4	
22.5		8.1		38.0		14.3		60.0		22.9	2.1
23.0		8.3									
23.5		8.6									
24.0		8.8									



Available for 2XD, 3XD, 4XD, 5XD
※ Figures above are nominal sizes (varies from -0.1mm to +0.1mm depending on workpiece material and cutting conditions)

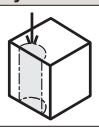
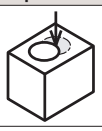
■ DRX Recommended Cutting Conditions (Coolant)

Workpiece Material	Recommended Grade (Vc=m/min)				øDc (mm)	Holder Type (Cutting Depth)								
	MEGACOAT			Carbide		2D~3D			4D			5D		
	PR1230	PR1225	PR1210	GW15		feed (mm/rev)								
	GM GH	SM	GM	SM		GM	GH	SM	GM	GH	SM	GM	GH	SM
Low-Carbon Steel (SS400, S15C, etc.)	☆ 120-240	★ 120-240			ø12~ø15	0.06~0.10	0.06~0.10	0.04~0.10	0.05~0.08	0.05~0.08	0.04~0.08	0.04~0.07	0.04~0.07	0.04~0.08
					ø15.5~ø18	0.06~0.12	0.06~0.12	0.06~0.12	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.08	0.05~0.08	0.04~0.09
					ø18.5~ø26	0.08~0.14	0.08~0.14	0.06~0.14	0.06~0.12	0.08~0.12	0.05~0.12	0.06~0.10	0.06~0.10	0.04~0.10
					ø26.5~ø60	0.08~0.14	0.08~0.14	0.06~0.14	0.06~0.12	0.08~0.12	0.05~0.12	0.06~0.10	0.06~0.10	0.04~0.10
Carbon Steel (S45C, etc.)	★ 100-180	☆ 100-180			ø12~ø15	0.04~0.14	0.04~0.14	0.04~0.10	0.04~0.10	0.04~0.10	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.07
					ø15.5~ø18	0.06~0.16	0.06~0.16	0.06~0.12	0.05~0.12	0.05~0.12	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.08
					ø18.5~ø26	0.08~0.20	0.08~0.20	0.06~0.14	0.07~0.16	0.07~0.16	0.05~0.12	0.06~0.12	0.06~0.12	0.05~0.10
					ø26.5~ø60	0.08~0.20	0.08~0.20	0.06~0.14	0.07~0.16	0.07~0.16	0.05~0.12	0.06~0.12	0.06~0.12	0.05~0.10
Alloy Steel (SCM, SCr, etc.)	★ 100-160	☆ 100-160			ø12~ø15	0.04~0.14	0.04~0.14	0.04~0.10	0.04~0.10	0.04~0.10	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.07
					ø15.5~ø18	0.06~0.16	0.06~0.16	0.06~0.12	0.05~0.12	0.05~0.12	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.08
					ø18.5~ø26	0.08~0.20	0.08~0.20	0.06~0.14	0.07~0.16	0.07~0.16	0.05~0.12	0.06~0.12	0.06~0.12	0.05~0.10
					ø26.5~ø60	0.08~0.20	0.08~0.20	0.06~0.14	0.07~0.16	0.07~0.16	0.05~0.12	0.06~0.12	0.06~0.12	0.05~0.10
Tool Steel (SKD,NAK, etc.)	★ 80-150	☆ 80-150			ø12~ø15	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.07	0.04~0.07	0.04~0.07	0.04~0.06	0.04~0.06	0.04~0.06
					ø15.5~ø18	0.06~0.12	0.06~0.12	0.06~0.10	0.05~0.10	0.05~0.10	0.05~0.08	0.04~0.08	0.04~0.08	0.04~0.07
					ø18.5~ø26	0.08~0.15	0.08~0.15	0.06~0.12	0.06~0.12	0.06~0.12	0.06~0.10	0.05~0.10	0.05~0.10	0.05~0.08
					ø26.5~ø60	0.08~0.15	0.08~0.15	0.06~0.12	0.06~0.12	0.06~0.12	0.06~0.10	0.05~0.10	0.05~0.10	0.05~0.08
Stainless Steel (Austinitic)	☆ 70-140	★ 70-140			ø12~ø15	0.06~0.10	0.06~0.10	0.04~0.10	0.05~0.08	0.05~0.08	0.04~0.08	0.04~0.07	0.04~0.08	0.04~0.08
					ø15.5~ø18	0.06~0.10	0.06~0.10	0.06~0.12	0.05~0.08	0.05~0.08	0.05~0.11	0.04~0.07	0.04~0.07	0.04~0.10
					ø18.5~ø26	0.08~0.12	0.08~0.12	0.06~0.14	0.07~0.10	0.07~0.10	0.06~0.12	0.07~0.10	0.07~0.10	0.06~0.12
					ø26.5~ø60	0.08~0.12	0.08~0.12	0.06~0.14	0.07~0.10	0.07~0.10	0.06~0.12	0.07~0.10	0.07~0.10	0.06~0.12
Gray Cast Iron (FC)			★ 100-150		ø12~ø15	0.08~0.14	~	~	0.06~0.12	~	~	0.04~0.10	~	~
					ø15.5~ø18	0.08~0.18	~	~	0.08~0.16	~	~	0.06~0.12	~	~
					ø18.5~ø26	0.08~0.20	~	~	0.08~0.18	~	~	0.06~0.14	~	~
					ø26.5~ø60	0.08~0.20	~	~	0.08~0.18	~	~	0.06~0.14	~	~
Nodular Cast Iron (FCD)			★ 80-120		ø12~ø15	0.08~0.12	~	~	0.06~0.10	~	~	0.04~0.08	~	~
					ø15.5~ø18	0.08~0.16	~	~	0.08~0.14	~	~	0.06~0.10	~	~
					ø18.5~ø26	0.08~0.18	~	~	0.08~0.16	~	~	0.06~0.12	~	~
					ø26.5~ø60	0.08~0.18	~	~	0.08~0.16	~	~	0.06~0.12	~	~
Aluminum / Non-Ferrous Metals				★ 200-600	ø12~ø15	~	~	0.06~0.12	~	~	0.05~0.10	~	~	0.04~0.08
					ø15.5~ø18	~	~	0.08~0.14	~	~	0.06~0.12	~	~	0.05~0.10
					ø18.5~ø26	~	~	0.08~0.16	~	~	0.06~0.14	~	~	0.05~0.12
					ø26.5~ø60	~	~	0.08~0.20	~	~	0.08~0.16	~	~	0.07~0.14
Titanium Alloys				★ 40-70	ø12~ø15	~	~	0.05~0.08	~	~	0.04~0.07	~	~	0.04~0.06
					ø15.5~ø18	~	~	0.05~0.08	~	~	0.04~0.07	~	~	0.04~0.06
					ø18.5~ø26	~	~	0.06~0.10	~	~	0.06~0.08	~	~	0.05~0.07
					ø26.5~ø60	~	~	0.06~0.10	~	~	0.06~0.08	~	~	0.05~0.07

• Apply sufficient amount of coolant

★: 1st. Recommendation ☆: 2nd. Recommendation

■ Cutting Conditions by Application

Application		Plain Surface	Slant Surface	Half Cylindrical	Hole Expansion	Concave Surface	Pre-drilled Surface	Stacked Plates
Shape of workpiece								
DRX	Cutting Speed (m/min)	120	120	120	120	120	120	Not Available
	Feed rate (mm/rev)	0.1	0.05	0.05	0.05	Concave Surface 0.05 solid portion 0.1	0.05	Not Available
Coolant (internal)		Yes	Yes	Yes	Yes	Yes	Yes	Not Available

* Cutting width (Torus-shaped part) when machining pre-drilled surface

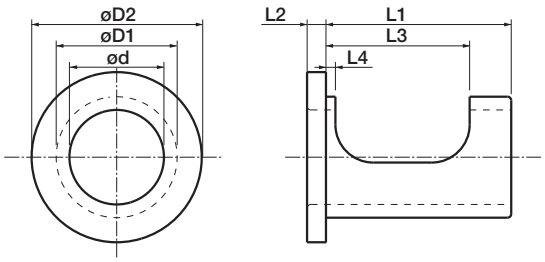
Drill type	2D~3D	4D	5D
Cutting width (Torus-shaped part)	0.1XD or less	less than corner radius	not recommended

♦ Max. depth with outer coolant

When machining with outer coolant, Max. depth should be 1.5 times the cutting diameter

Adjustable Sleeve [Magic Drill DRX for cutting dia. / center height adjustment]

■ SHE



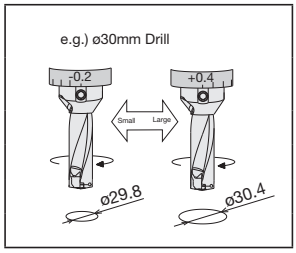
● Sleeve Dimensions

Description		Stock	Dimension (mm)							※ Dia. Adjustment Range	Center Height Adjustment Range
			ød	øD1	øD2	L1	L2	L3	L4		
SHE	2025-43	●	20	25	41	43	4	36	3.0	+0.4~-0.2	+0.2~-0.15
	2532-48	●	25	32	49	48	6	38	2.5	+0.4~-0.2	+0.2~-0.15
	3240-53	●	32	40	58	53	6	43	2.5	+0.4~-0.2	+0.2~-0.15
	4050-63	●	40	50	74	63	6	49	3.0	+0.6~-0.2	+0.2~-0.2

• Dia. Adjustment Range refers to the cutting diameter.

●: Standard Stock

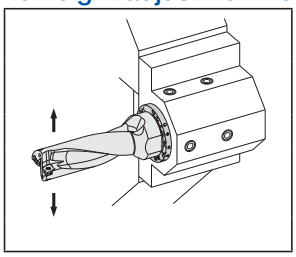
1. Diameter Adjustment ~ For Machining Centers~



• Diameter Adjustment Range (mm)

Shank Dia.	Adjustment Range
ø20	+0.4~-0.2
ø25	
ø32	
ø40	+0.6~-0.2

2. Center Height Adjustment ~Fewer problems owing to height adjustment for lathes~



• Center Height Adjustment Range (mm)

Shank Dia.	Adjustment Range
ø20	+0.2~-0.15
ø25	
ø32	
ø40	+0.3~-0.2

♦ How to Use

1. Hole Diameter Adjustment when Drilling

① Adjust the scale at the flange periphery of the sleeve to the center of the coolant plug of the drill. (Fig. 1)
② When making the hole diameter bigger, rotate the sleeve in (+) direction and to make it smaller, rotate the sleeve in (-) direction.
③ When rotati ng the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery to rotate the sleeve.
④ Using the bottom screw of the side-lock arbor, firmly tighten on the drill directly through the sleeve's window. The upper screw should be tightened slightly so that the sleeve will not be damage.

Caution:
• Not for use with Collet Chuck type Arbor.
• Check the actual cutting diameter after adjusting.

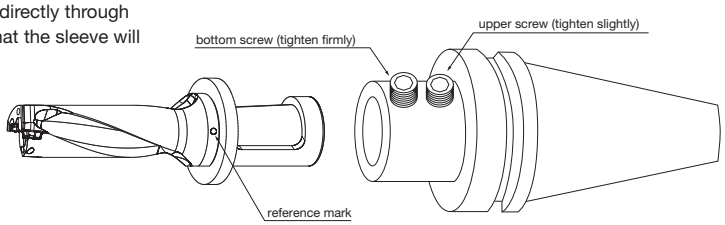


Fig. 1 Fig. 2

2. Center-Height Adjustment for Lathes

Most lathe problems are caused by center height deviation.
The center height is appropriate if a core of approximately 0.5mm dia. remains at the center of the end face.
Center-height adjustment is necessary in the following cases:

◆ No core remains ◆ Core diameter is more than 1mm

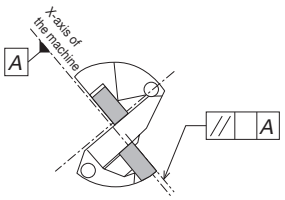


Fig. 4

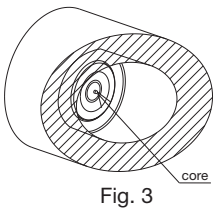


Fig. 3

① Align the drill with the outer insert face parallel to the X-axis of the tool turret. (Fig. 4)
② Align the scale (for the lathe) on the flange face of the sleeve to the center of the reference mark.
③ When no core remains, rotate the sleeve to (+) direction to make the core larger, and when the core diameter is more than 1mm, rotate the sleeve to (-) direction to make the core smaller.
④ When rotating the sleeve, insert the wrench supplied with the drill into the hole of the flange and then rotate the sleeve.
⑤ After Completing the adjustment, tighten the drill directly through the window on the sleeve.

Note: Depending on the amount of the center height adjustment, the hole diameter may change. It is recommended that the hole diameter be checked after adjusting the center height.

■ Lathe Installation

① The top face of the outer insert should be parallel to the X-axis to allow for offset cutting.

Cutting 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. (Fig. 1)

(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 it in 180° reverse position.)

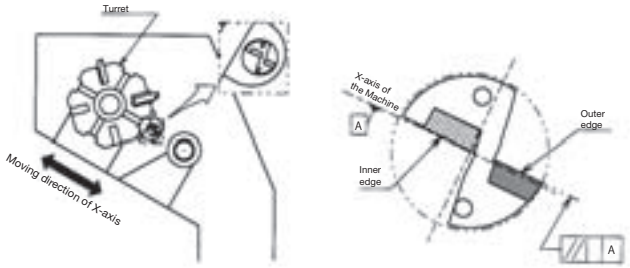


Fig. 1 Installed to the lathe

■ Cutting Diameter Adjustment

1. Cutting Diameter Adjustment

① Cutting 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.) When using a ø20 drill, the hole diameter must not be smaller than 19.8mm.

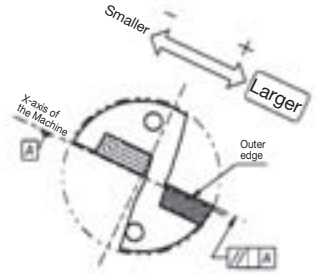


Fig. 2 Outer insert facing up

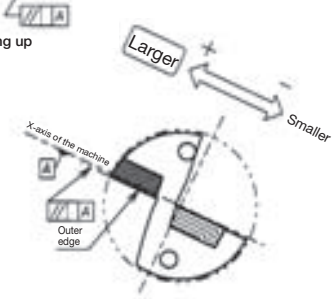


Fig. 3 Outer insert facing down

2. Offset Limit of the Cutting Diameter

For the maximum limit of the cutting diameter, refer to “Max. Offset (Radial)” in the Toolholder Dimensions table.
(The figure in the table shows how much the drill can be offset in the radial direction.)
e.g.) When using a ø20 drill, it is possible to make a hole of up to ø21 since "Max. Offset (Radial)" is +0.5mm.

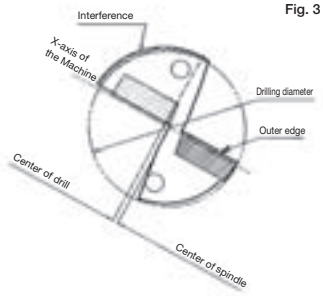


Fig. 4 Excessive offset (for smaller hole diameter)

■ Center Height Adjustment

1. Center Height of the Inn er 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 machining, it is essential to check the Center Height carefully.

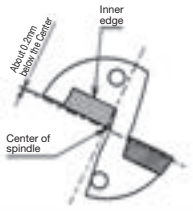


Fig. 5 Front view of the drill

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.
If the center height is in the normal condition, the core about 0.5mm in diameter, will remain after the machining. (Fig. 6)
In the following cases, it is necessary to adjust the Center Height.
- No core remains
- Core diameter is more than 1mm

* To test the Center Height, drill a shallow hole about 10mm in depth at low feed rate, less than 0.1mm/rev.

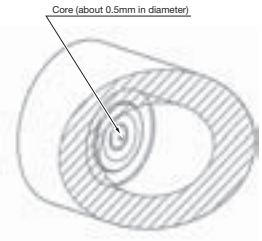


Fig. 6 Center core

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.

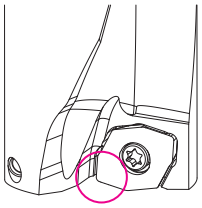


Fig. 7 Insert breakage near the center of the drill

[How to Adjust]

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

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 edge 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 cutting diameter)
Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the cutting 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.

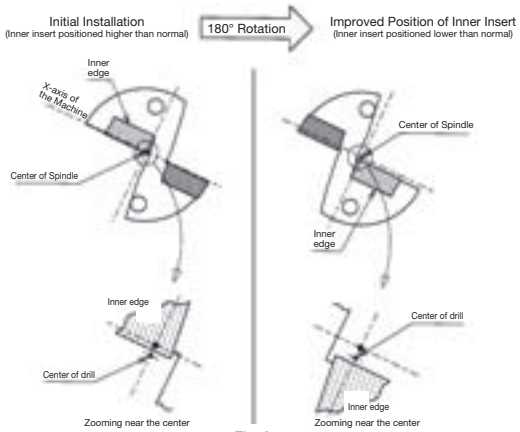


Fig. 8

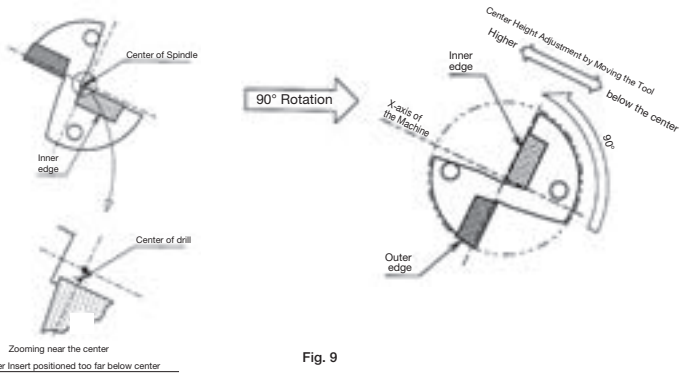


Fig. 9

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 cutting diameter)
Caution: When installing the drill in the opposite direction (outer insert is positioned lower), the cutting 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.

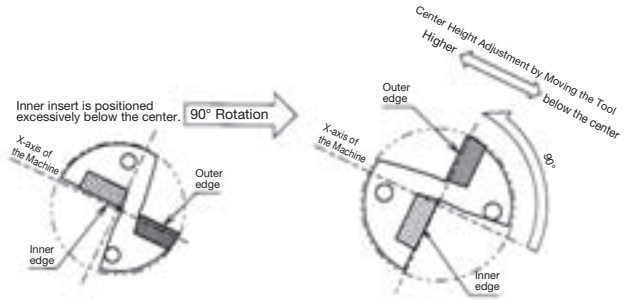
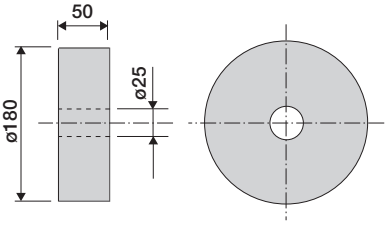


Fig. 10

SKD62(45HRC)

- Vc=60 m/min
- f=0.05 mm/rev
- H=50 mm (Through Hole)
- WET (internal coolant)
- ZXMT070305GH (PR1230)
- S25-DRX250M-4-07



Magic Drill DRX	6pcs/edge
Compe. J	Breakage after 4 holes

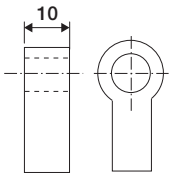
Tool life 150%

results

- Magic Drill DRX has a tool life 1.5 times longer than Competitor J's tool. Cutting edge of Competitor J's was damaged after just 4 holes. Magic Drill DRX can drill 6 or more holes.
- Magic Drill DRX requires no secondary finishing operation due to its excellent finishing quality.

SUS303

- Vc=75 m/min
- f=0.1 mm/rev
- H=10 mm (Through Hole)
- WET (internal coolant)
- ZXMT06T204SM (PR1225)
- S25-DRX200M-3-06



Drilling diameter
20mm
depth 10mm
Partially interrupted

Magic Drill DRX	1300pcs/edge
Compe. K	500pcs/edge

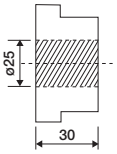
Tool life 260%

results

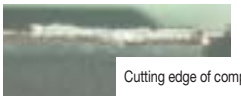
- Magic Drill DRX achieved 2.6 time longer stable machining without the sudden breakage that occurred with Competitor K's cutter.

SCM420HV (cold forging)

- Vc=118 m/min
- f=0.08 mm/rev (0.05 at starting)
- H=30 mm (Through Hole)
- WET (internal coolant)
- ZXMT070305SM (PR1225)
- S25-DRX250M-3-07



Cutting edge of DRX (after 400 holes)



Cutting edge of competitors (after 400 holes)

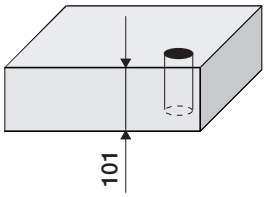
Magic Drill DRX	Less adhesion, allowing for continual use up to 400 or more holes
Compe. L	Considerable adhesion (after 400 holes)

results

- The DRX deals with chips better and experiences less adhesion than Competitor L's cutter.

SKT4(42HRC)

- Vc=100 m/min
- f=0.07~0.08 mm/rev
- H=101 mm (Through Hole)
- WET
- ZXMT070305GM (PR1230)
- S25-DRX250M-4-07



Die parts ø25x101mm (through hole) x 24 holes

Magic Drill DRX	Cycle time: 28 minutes/pc
Conventional tool M	Cycle time: 58 minutes/pc

50% reduction

results

- Non-step drilling is available by 4xD- DRX even with outer coolant due to the superior chip evacuation performance
- Magic Drill DRX achieves a tool life 3 times longer than conventional tool M.