Vischer & Bolli
OSG GROUP COMPANY

DRX Magic Drill

For stable and efficient drilling

- **MEGACOAT carbide grades: PR1230 for steel, PR1225 for stainless steel and PR1210 for cast iron.**
- **Ø 12-60mm.**

- **Chipbreaker: Universal GM, Tough GH and Less cutting force SM.**

MEGACOAT

DRX für stabile und effiziente Bohrungen

- MEGACOAT Hartmetall Sorten: PR1230 für Stahl, PR1225 für Rostfreier Stahl, PR1210 für Guss.
- Spanbrecher: GM Universal, stabiler GH und SM für geringe Schnittkräfte.

DRX pour un perçage stable et efficace

- Nuances carbure MEGACOAT: PR1230 pour l'acier, PR1225 pour l'acier inoxydable et PR1210 pour la fonte.
- Brise-copeaux: GM Universel, GH Tenace et SM Moins d'effort de coupe.

DRX per forature efficenti e stabilie

- Gradi MEGACOAT: PR1230 per acciaio, PR1225 per acciaio inox e PR1210 per ghisa.
- Rompitruciolo: GM Universale, GH Robusto e SM per minori sforzi di taglio.

KYOCERA

ADVANCING PRODUCTIVITY

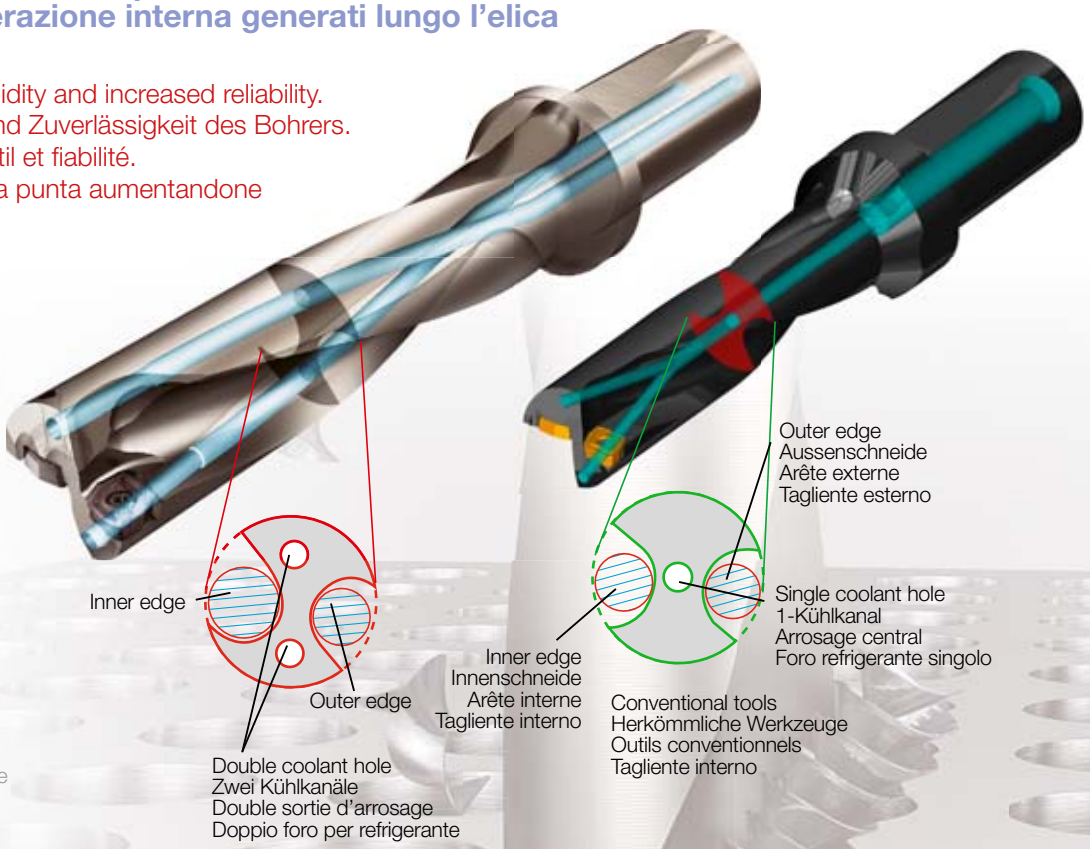
DRX for stable and efficient drilling | DRX für stabile und effiziente Bohrungen

2 twisted coolant holes
2 gedrallte Kühlkanäle
2 trous de lubrification séparés
2 fori per refrigerazione interna generati lungo l'elica

Improved tool holder rigidity and increased reliability.
Verbesserte Stabilität und Zuverlässigkeit des Bohrers.
Meilleure rigidité de l'outil et fiabilité.
Migliorata la rigidità della punta aumentandone l'affidabilità.

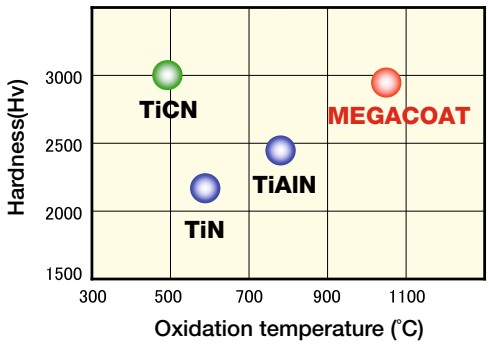
Enlarged flute space of internal cutting edge.
Vergrösserte Innere Spankammer.
Poche à copeaux de la plaquette intérieure élargie.
Aumentata la capacità di evacuazione dal lato del tagliente interno.

The coolant performance is 25% higher.
Kühlmittel-Durchsatz ist 25% höher.
Performance de lubrification améliorée de 25%.
L'efficenza della refrigerazione è aumentata del 25%.

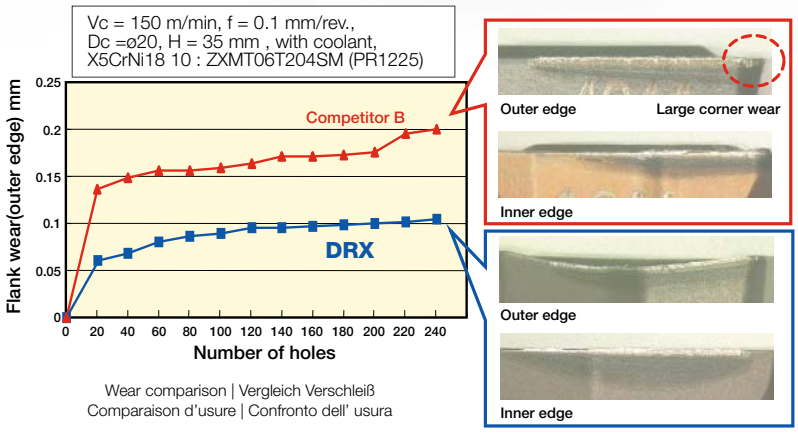


New Grades | Neue Sorten | Nouvelles nuances | Nuovi Gradi

PR1230	PR1225	PR1210
Carbon Steel	Stainless Steel, Low Carbon Steel	Cast Iron
Kohlenstoffstahl	Rostfreier Stahl, kohlenstoffarmer Stahl	Guss
Acier au carbone	Acier inoxydable, Acier bas carbone	Fonte
Acciaio al Carbonio	Acciaio Inox, Acciaio a basso contenuto di carbonio	Ghisa



MEGACOAT's High oxidation resistance



Wear comparison | Vergleich Verschleiß
Comparaison d'usure | Confronto dell' usura

MEGACOAT

Stable and longer tool life.
Stabile und höhere Standzeit.
Stabilité et longévité de l'outil grâce.
Durata utensile lunga e stabile per mezzo.

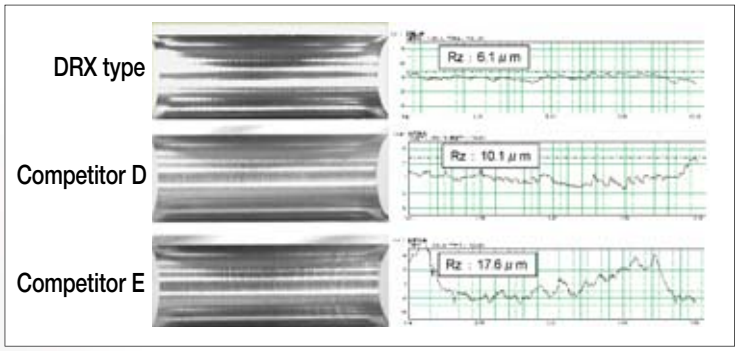
Better wear resistance.
Verbesserter Verschleißwiderstand.
Meilleure résistance à l'usure.
Resistenza all'usura migliore.

DRX pour un perçage stable et efficace | DRX per forature efficenti e stabilie

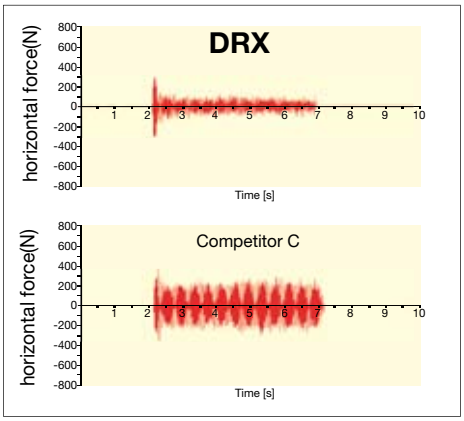
Precise Drilling | Präzise Bohrungen | Perçage précis | Foratura di precisione

- **Vibration comparison**
  Vergleich Vibrationsneigung
  Comparaison de vibrations
  Confronto delle vibrazioni

Vc=180m/min, f=0.15mm/rev., H=60mm(through hole), ø20-3D, with coolant, C45, NC Lathe

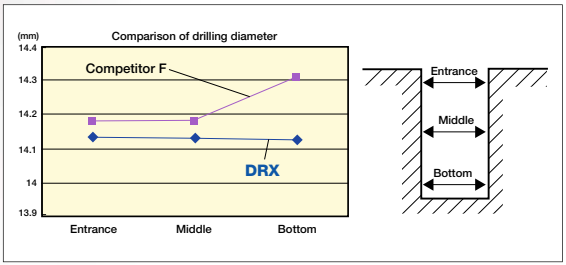


Vc=120m/min, f=0.1mm/ rev., H=15mm, ø20-3D, with coolant, C55



Less vibration due to well balanced at Drilling.
Geringe Vibration durch hohe Randgenauigkeit.
Moins de vibrations dû à un meilleur équilibrage en perçage.
Meno vibrazioni dovuto al buono bilanciamento in foratura.

- **Rectilinear performance**
  Geradlinigkeit der Ergebnisse
  Performance rectiligne
  Performance rettilinea

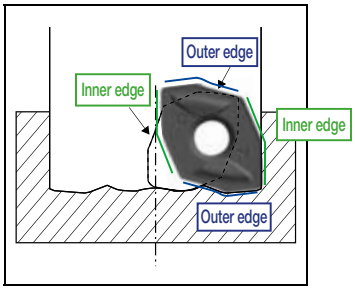


Vc=180m/min, f=0.08mm/rev., H=56mm(blind hole), ø14-4D, with coolant, C50

Better finishing surface.
Bessere Oberflächengenauigkeit.
Meilleure finition en surface.
Migliore finitura superficiale.

Due to its excellent chip evacuation less variation of drilling diameter.
Aufgrund der hervorragenden Spanabfuhr, geringste Abweichung im Bohrdurchmesser.
Grâce à l'excellente évacuation copeaux, il y a moins d'écart dans les diamètres de perçage.
Attraverso l'eccellente evacuazione del truciolo si ottengono minori variazioni del diametro in foratura.

4 cutting edges | 4 Schneidkanten | 4 arêtes de coupe | 4 taglienti

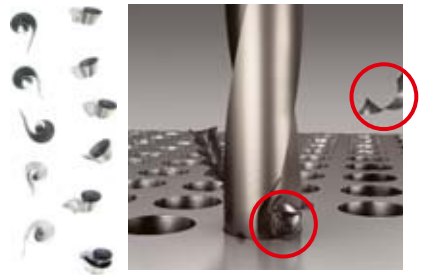


Two inner and outer cutting edges.
Zwei innere und äußere Schneidkanten.
2 arêtes de coupe internes et externes.
Due taglienti interni e due esterni.

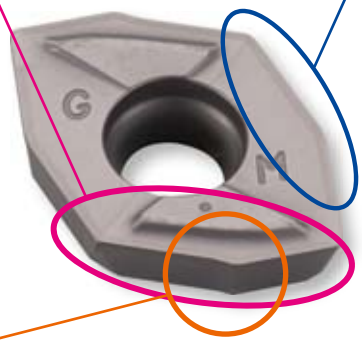
3 chipbreaker to cover various materials | 3 Spanbrecher für verschiedenste Materialien

■ Features | Eigenschaften | Propriétés | Proprietà

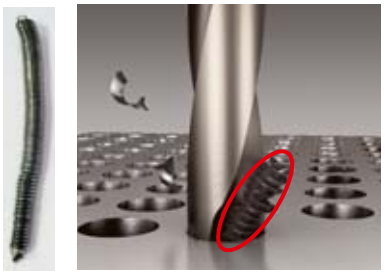
Wide chipbreaker (Outer Edge)
Großer Spanbrecher (Aussenschneide)
Brise-copeaux large (arête extérieure)
Rompitruciolo largo (Tagliente esterno)



Small chips for better evacuation.
Kleine Späne für bessere Abfuhr.
Petits copeaux pour une meilleure évacuation.
Truciolo piccolo per una migliore evacuazione.



Flat chipbreaker (inner edge)
Flacher Spanbrecher (Innenschneide)
Brise-copeaux plat (arête interne)
Rompitruciolo piatto (tagliente interno)



Ideal continuous chips.
Ideale gleichmäßige Späne.
Copeaux continus.
Truciolo continuo ideale.

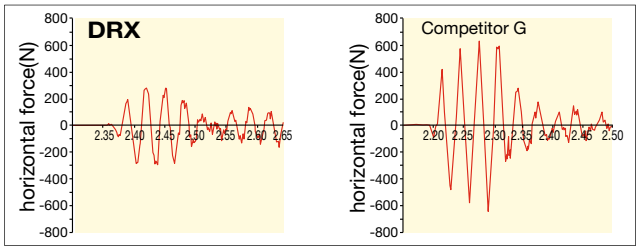
sigmoid cutting edge
S-förmige Schneidkante
Brise-copeaux en S
Tagliente a forma S

Sharp cutting | Scharfes zerspanen
Coupe affûtée | Taglio dolce

Lower impact force at start of drilling.
Geringe Schnittkräfte beim Anschnittt.
Faible effort de coupe au début du perçage.
Bassi sforzi di taglio nella parte iniziale della foraturai.

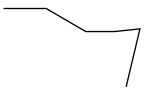
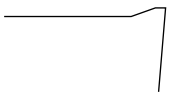
Less sudden breakage.
Reduktion plötzlicher Brüche.
Moins de casse soudaine.
Minori rotture improvvise.

Vc=120m/min, f=0.1mm/rev., H=15mm, ø20-3D, with coolant, C55



Cutting force comparison of outer edge at the start of drilling.
Schnittkräftevergleich auf der Aussenschneide bei Bohrbegin.
Comparaison de l'effort de coupe de l'arête externe au début du perçage.
Confronto dello sforzo di taglio del tagliente esterno all'inizio della foratura.

■ Advantages of the Chipbreaker

Shape | Ausführung Forme | Forma			Chipbreaker GM	Chipbreaker GH	Chipbreaker SM
Outer edge	Wide chipbreaker	Cross-Section Querschnitt Coupe de coté Sezione trasversale			
		Chips from Outer edge Span Aussenschneide Copeaux issus de l'arête externe Truciolo dal tagliente esterno			
Inner edge	Flat chipbreaker	Cross-Section Querschnitt Coupe de coté Sezione trasversale			
		Chips from Inner edge Span Innennschneide Copeaux issus de l'arête interne Truciolo dal tagliente esterno			
Workpiece Material			C50	C50	X5CrNi189

3 brise-copeaux pour couvrir divers matériaux | 3 rompitrucioli per gestire diversi materiali

♦ GM Chipbreaker - Universal | Universal |Universel | Universale

Carbon Steel | Kohlenstoffstahl | Acier au carbone | Acciaio al Carbonio ➤ PR1230

Cast Iron | Guss | Fonte | Ghisa ➤ PR1210

① Wider chipbreaker covers variety of materials.
Großer Spanbrecher deckt breites Anwendungsgebiet ab.
Gamme de brise-copeaux couvrant une plus large plage de materiaux.
Rompitruciolo largo per controllare vari tipi di materiali.

② Achieved good balance of cutting edge strength and sharp cutting.
Ausgewogene Schärfe und Stabilität der Schneidkante.
Bon équilibre entre arête de coupe renforcée et affûtée.
Raggiunto un buon equilibrio tra un robusto tagliente ed un taglio dolce e pulito.

♦ GH Chipbreaker - Tough edge | Stabile Schneidkante | Arête renforcée | Tagliente robusto

Hardened material, with interruption | Gehärtetes Material, mit Unterbrechungen

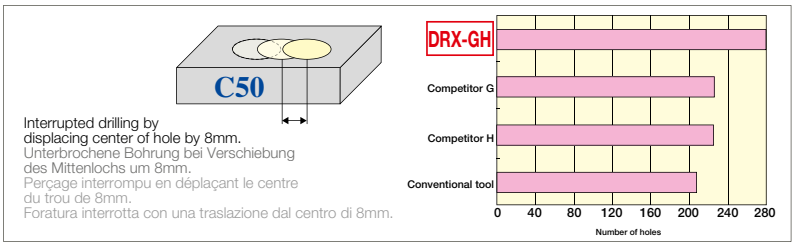
Matériaux trempés, coupe interrompue | Materiale temprato, con interruzioni ➤ PR1230

① Wider chipbreaker control breakage by pressed chips.
Großer Spanbrecher für gute Spankontrolle.
Contrôle du copeau par un brise-copeaux plus large.
Rompitruciolo largo per controllare la rottura del tagliente dovuta alla pressione in spinta.

② Stable cutting edge.
Stabile Schneidkante.
Arête de coupe stable.
Tagliente stabile.

- **Chipping resistance comparison**
  Vergleich Verschleißfestigkeit
  Comparaison de résistance à l'écaillage
  Confronto della resistenza alle scheggiature

Better chipping resistance
Höhere Verschleißfestigkeit
Meilleure résistance à l'écaillage
Migliore resistenza alla scheggiatura

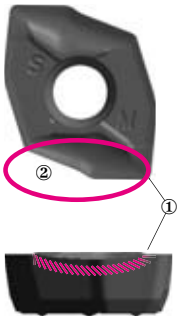


Vc=80m/min, f=0.08mm/rev., H=10mm, Dc=ø20mm, H=60mm, with coolant, C50

♦ SM Chipbreaker - Sharper edge | Schärfere Schneidkante | Arête plus affûtée | Tagliente affilato

Stainless steel, low carbon steel | Rostfreier Stahl, Kohlenstoffarmer Stahl

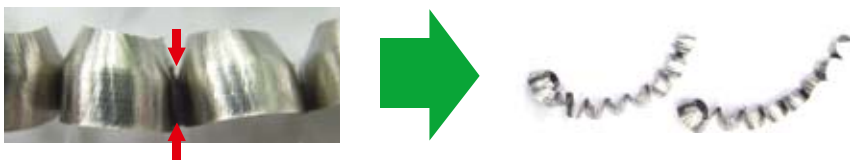
Acier inoxydable, Acier bas carbone | Accioa Inox, Acciaio a basso contenuto di carbonio ➤ PR1225



① U-shaped cutting edge. Good chipcontrol at sticky material.
U-förmige Schneidkante. Gute Spankontrolle bei schwer zu bearbeitendem Material.
Arête de coupe en forme de U. Bon contrôle copeaux pour les matières collantes.
Tagliente con forma ad "U". Buon controllo del truciolo per materiali pastosi.

② Sharp cutting by large rake angle.
Scharfe Schneide durch großen Spanwinkel.
Coupe affûtée grâce à l'angle d'attaque important.
Taglio dolce per mezzo di un largo angolo di spoglia.

Chips from outer edge are cracked and split.
Späne der Aussenschneide werden geknickt und gespalten.
Les copeaux de l'arête extérieure sont fissurés et scindés.
I trucioli generati dal tagliente esterno vengono rotti e scissi.



For deep drilling of difficult to control chips materials such as stainless steel and low carbon steel.

Für tiefe Bohrungen und langspanende Materialien wie Rostfreier Stahl und Kohlenstoffarmer Stahl.

Pour le perçage profond des matériaux dont le contrôle copeaux est difficile comme les aciers inoxydables et les aciers bas carbone.

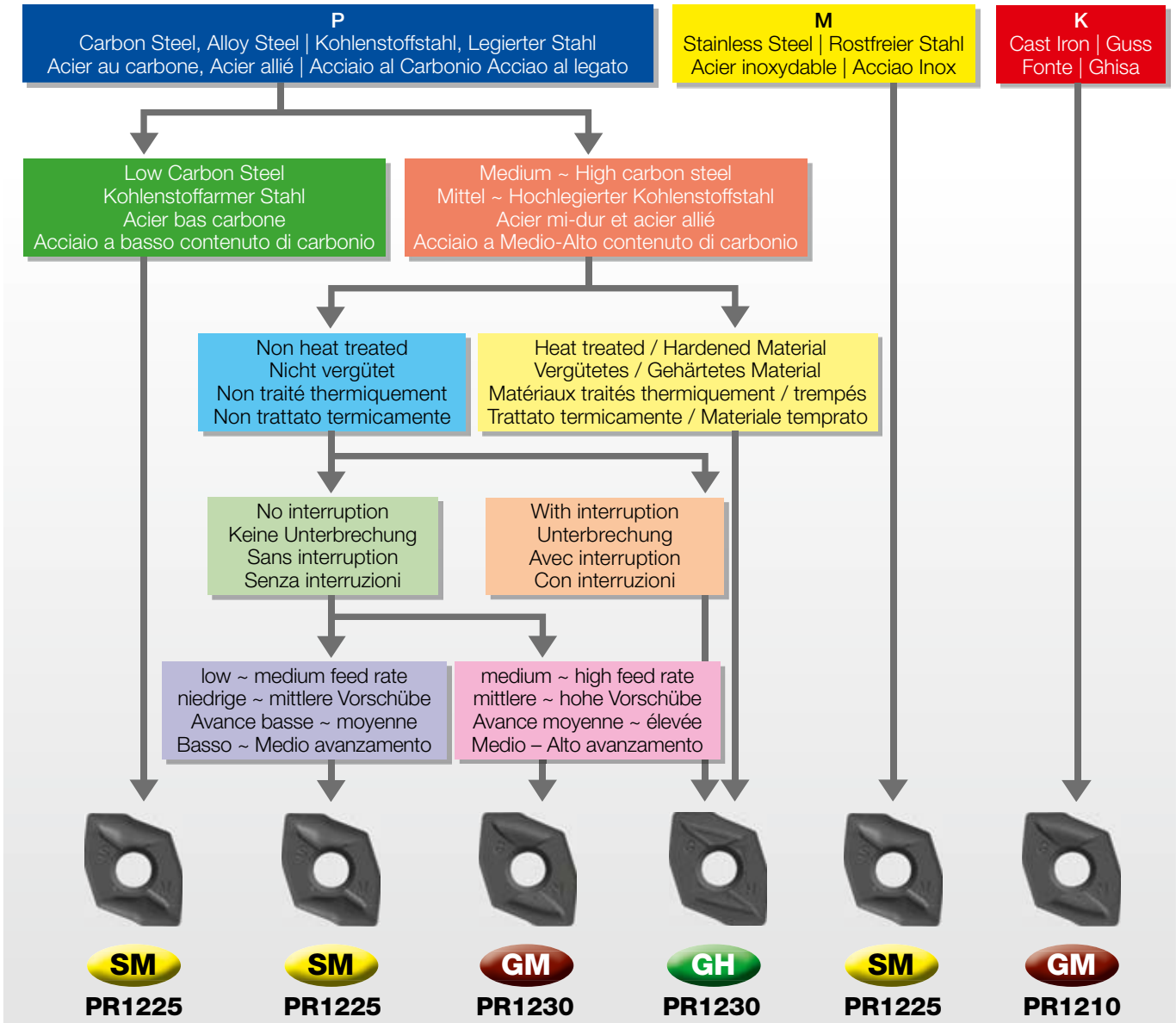
Per forature profonde ove ci sia la difficoltà di controllare il truciolo come negli acciai inox ed a basso contenuto di carbonio.

■ How to select ZXMT03 type

1) For outer edge, please select "-E" insert from three different chipbreakers for each application.
2) For inner edge, please select "-I" insert (GM chipbreaker only).

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

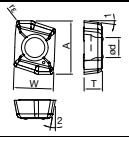
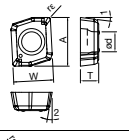
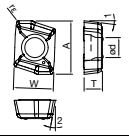
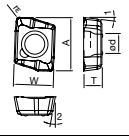
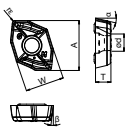
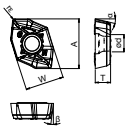
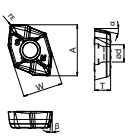
■ Chipbreaker selection | Spanbrecher Auswahl | Choix du brise-copeaux | Scelta del ompitruciolo



■ Insert Line Up

Indication of classification
●: 1st. Recommendation
○: 2nd. Recommendation
(Steel; non heat treated)

P	Carbon Steel,Alloy Steel	●	○			Ref. page for applicable Holder
	Tool Steel	●				
M	Stainless Steel	○	●			
K	Cast Iron			●		
N	Non-ferrous Material				●	

Shape	Description		Dimension(mm)					Angle(°)		PVD coated Carbide (MEGACOAT)			Carbide	Ref. page for applicable Holder
			A	T	ød	W	rε	α	β	PR1230	PR1225	PR1210	GW15	
 For outer edge		ZXMT 030203GM-E	6.5	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	6.5	2.30	2.4	4.8	0.3	7°	10°	●				P11 P13
 For outer edge		ZXMT 030203SM-E	6.5	2.30	2.4	4.8	0.3	7°	10°		●		●	
		ZXMT 040203GM	6.2	2.60	2.4	5.1	0.3	13°	10°	●		●		
		05T203GM	7.3	2.74	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			●		●		P 7
		ZXMT 040203GH	6.2	2.60	2.4	5.1	0.3	13°	10°	●				P 8
		05T203GH	7.3	2.74	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	2.74	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				●		●	

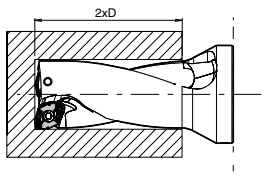
● : Standard Item

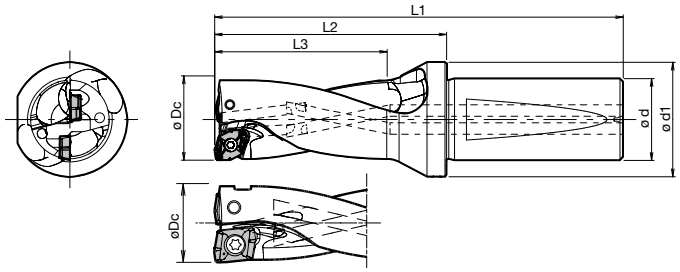
■ Suitable Chipbreaker (ZXMT type)

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, C15, 15CrMo5, 15Cr3)		☆	☆	☆	☆					★	★	★	★
Carbon Steel (C45)		★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★
Alloy Steel (4CrMo4, 37Cr4)		★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★
Tool Steel (X100CrMoV5))		☆	☆	☆	☆	★	★	★	★				
Stainless Steel (X5CrNi189, X6Cr17, 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 (GG-25,)		★	★	★	★								
Aluminum Alloy (AlCCuMg1, A1Mg2.5)										★	★	★	★
Brass										★	★	★	★
Titanium Alloy										★	★	★	★

■ Toolholder Line Up (2 X D)





2D

● Toolholder Dimensions

Description	Standard	No. of Insert	Dimension (mm)						Max. Offset (Radial) (mm)	Spare parts		Applicable Insert ➡ P6
			ϕDc	L1	L2	L3	ϕd	ϕd1		Clamp Screw	Wrench	
S20 -DRX120M-2-03	●	2	12	88	45	24	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT030203○○-E (External) ZXMT030203GM-I (Internal)
-DRX125M-2-03	●		12.5	89	46	25			+0.4			
-DRX123M-2-03	●		13	90	47	26			+0.3			
-DRX135M-2-04	●	2	13.5	91	48	27	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT040203 ○○
-DRX140M-2-04	●		14	92	49	28			+0.4			
-DRX145M-2-04	●		14.5	93	50	29			+0.3			
-DRX150M-2-04	●		15	94	51	30			+0.2			
S25 -DRX155M-2-05	●	2	15.5	109	55	31	25	32	+0.8	SB-2045TR	DTM-6	ZXMT05T203 ○○
-DRX160M-2-05	●		16	110	56	32			+0.7			
-DRX165M-2-05	●		16.5	111	57	33			+0.5			
-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	●	2	18.5	112	58	37	25	32	+0.9	SB-2250TR	DTM-7	ZXMT06T204 ○○
-DRX190M-2-06	●		19	113	59	38			+0.8			
-DRX195M-2-06	●		19.5	114	60	39			+0.7			
-DRX200M-2-06	●		20	115	61	40			+0.5			
-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	●	2	22	119	65	44	25	35	+1.2	SB-2570TR	DTM-8	ZXMT070305 ○○
-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	●		24	123	69	48			+0.7			
-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	●	2	27	136	77	54	32	42	+1.6	SB-3080TR	DTM-10	ZXMT09T306 ○○
-DRX280M-2-09	●		28	138	79	56			+1.3			
-DRX290M-2-09	●		29	140	81	58			+1.1			
-DRX300M-2-09	●		30	142	83	60		45	+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
Trouble Shooting ➡ P14

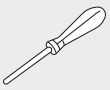
・Machining hole tolerance (2D)

Dc	Tolerance (mm)
ϕ12 ～ ϕ26	+ 0.20 − 0.10
ϕ27 ～ ϕ38	+ 0.25 − 0.15
ϕ39 ～ ϕ60	+ 0.30 − 0.20

※The above is for reference only.
It might be depends on machine, workpiece material, clamping and cutting condition etc.

● : Standard Item

● Toolholder Dimensions

Description	Standard	No. of Insert	Dimension (mm)						Max. Offset (Radial) (mm)	Spare parts		Applicable Insert ➡ P6
			ϕDc	L1	L2	L3	ϕd	ϕd1		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	55	+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		55	+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-5085TR	DT-20	ZXMT140408 ○○
-DRX440M-2-14	●		44	189	120	88			+1.5			
-DRX450M-2-14	●		45	191	122	90		60	+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		60	+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		65	+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 tare to 0.08mm/rev. or less.
・See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡ P15
Trouble Shooting ➡ P14

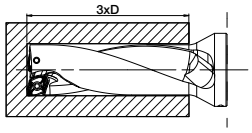
・Machining hole tolerance (2D)

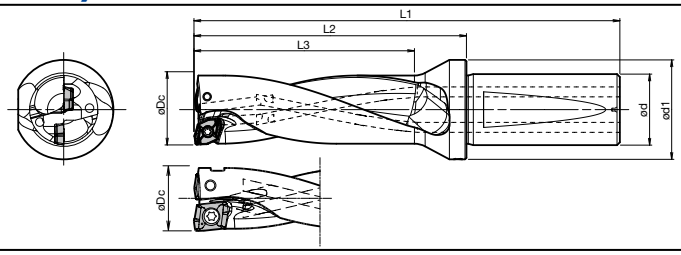
Dc	Tolerance (mm)
ϕ12 ～ ϕ26	+ 0.20 − 0.10
ϕ27 ～ ϕ38	+ 0.25 − 0.15
ϕ39 ～ ϕ60	+ 0.30 − 0.20

※The above is for reference only.
It might be depends on machine, workpiece material, clamping and cutting condition etc.

● : Standard Item

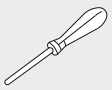
■ Toolholder Line Up (3 X D)





3D

● Toolholder Dimensions

Description	Standard	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare parts		Applicable Insert ➡ P6
										Clamp Screw	Wrench	
			ϕDc	L1	L2	L3	ϕd	ϕd1				
S20 -DRX120M-3-03	●	2	12	100	57	36	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT030203○○-E (External) ZXMT030203GM-I (Internal)
-DRX125M-3-03	●		12.5	102	59	37.5			+0.4			
-DRX130M-3-03	●		13	103	60	39			+0.3			
-DRX135M-3-04	●	2	13.5	105	62	40.5	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT040203 ○○
-DRX140M-3-04	●		14	106	63	42			+0.4			
-DRX145M-3-04	●		14.5	108	65	43.5			+0.3			
-DRX150M-3-04	●		15	109	66	45			+0.2			
S25 -DRX155M-3-05	●	2	15.5	124	70	46.5	25	32	+0.8	SB-2045TR	DTM-6	ZXMT05T203 ○○
-DRX160M-3-05	●		16	126	71	48			+0.7			
-DRX165M-3-05	●		16.5	127	73	49.5			+0.5			
-DRX170M-3-05	●		17	129	74	51			+0.4			
-DRX175M-3-05	●		17.5	130	76	52.5			+0.3			
-DRX180M-3-05	●		18	132	77	54			+0.2			
-DRX185M-3-06	●	2	18.5	131	77	55.5	25	32	+0.9	SB-2250TR	DTM-7	ZXMT06T204 ○○
-DRX190M-3-06	●		19	132	78	57			+0.8			
-DRX195M-3-06	●		19.5	134	80	58.5			+0.7			
-DRX200M-3-06	●		20	135	81	60			+0.5			
-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	●	2	22	141	86	66	25	35	+1.2	SB-2570TR	DTM-8	ZXMT070305 ○○
-DRX225M-3-07	●		22.5	142	88	67.5			+1.0			
-DRX230M-3-07	●		23	144	89	69			+0.9			
-DRX235M-3-07	●		23.5	145	91	70.5			+0.8			
-DRX240M-3-07	●		24	147	92	72			+0.7			
-DRX245M-3-07	●		24.5	148	94	73.5			+0.5			
-DRX250M-3-07	●		25	150	95	75			+0.4			
-DRX255M-3-07	●		25.5	151	97	76.5			+0.3			
-DRX260M-3-07	●		26	153	98	78			+0.2			
S32 -DRX265M-3-09	●	2	26.5	161	102	79.5	32	42	+1.7	SB-3080TR	DTM-10	ZXMT09T306 ○○
-DRX270M-3-09	●		27	163	103	81			+1.6			
-DRX275M-3-09	●		27.5	164	105	82.5			+1.5			
-DRX280M-3-09	●		28	166	106	84			+1.3			
-DRX285M-3-09	●		28.5	167	108	85.5			+1.2			
-DRX290M-3-09	●		29	169	109	87			+1.1			
-DRX295M-3-09	●		29.5	170	111	88.5		45	+1.1			
-DRX300M-3-09	●		30	172	112	90			+0.8			
-DRX305M-3-09	●		30.5	173	114	91.5			+0.7			
-DRX310M-3-09	●		31	175	115	93			+0.6			
-DRX315M-3-09	●		31.5	176	117	94.5			+0.5			
S40 -DRX320M-3-11	●	2	32	201	132	96	40	55	+2.2	SB-4085TR	DTM-15	ZXMT11T306 ○○
-DRX330M-3-11	●		33	204	135	99			+1.9			
-DRX340M-3-11	●		34	207	138	102			+1.7			
-DRX350M-3-11	●		35	210	141	105			+1.4			
-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 less.
・See page 16 for Adjustable Sleeve SHE.

Recommended Cutting Conditions ➡ P15
Trouble Shooting ➡ P14

・Machining hole tolerance (3D)

Dc	Tolerance (mm)
ϕ12 ～ ϕ26	+ 0.20 − 0.10
ϕ26.5 ～ ϕ38	+ 0.25 − 0.15
ϕ39 ～ ϕ60	+ 0.30 − 0.20

※The above is for reference only.
It might be depends on machine, workpiece material, clamping and cutting condition etc.

● : Standard Item

● Toolholder Dimensions

Description	Standard	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare parts		Applicable Insert ➡ P6
			ϕDc	L1	L2	L3	ϕd	ϕd1		Clamp Screw	Wrench	
S40 -DRX390M-3-14	●	2	39	218	149	117	40	55	+2.8	SB-5085TR	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		60	+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	60	+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		65	+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
Trouble Shooting ➡ P14

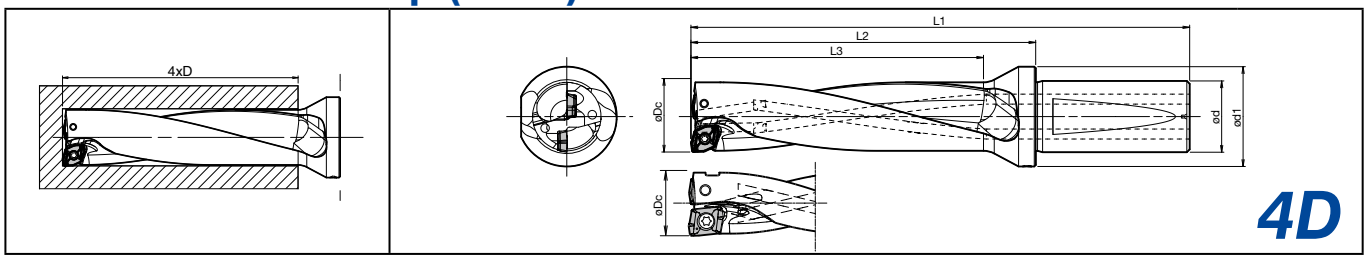
・Machining hole tolerance (3D)

Dc	Tolerance (mm)
ϕ12 ～ ϕ26	+ 0.20 − 0.10
ϕ26.5 ～ ϕ38	+ 0.25 − 0.15
ϕ39 ～ ϕ60	+ 0.30 − 0.20

※The above is for reference only.
It might be depends on machine, workpiece material, clamping and cutting condition etc.

● : Standard Item

■ Toolholder Line Up (4 X D)



● Toolholder Dimensions

Description	Standard	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare parts		Applicable Insert ➡ P6
			ϕDc	L1	L2	L3	ϕd	ϕd1		Clamp Screw	Wrench	
S20 -DRX120M-4-03	●	2	12	112	69	48	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT030203○○-E (External) ZXMT030203GM-I (Internal)
-DRX125M-4-03	●		12.5	114	71	50			+0.4			
-DRX130M-4-03	●		13	116	73	52			+0.3			
-DRX135M-4-04	●	2	13.5	118	75	54	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT040203 ○○
-DRX140M-4-04	●		14	120	77	56			+0.4			
-DRX145M-4-04	●		14.5	122	79	58			+0.3			
-DRX150M-4-04	●		15	124	81	60			+0.2			
S25 -DRX155M-4-05	●	2	15.5	140	86	62	25	32	+0.8	SB-2045TR	DTM-6	ZXMT05T203 ○○
-DRX160M-4-05	●		16	142	87	64			+0.7			
-DRX165M-4-05	●		16.5	144	90	66			+0.5			
-DRX170M-4-05	●		17	146	91	68			+0.4			
-DRX175M-4-05	●		17.5	148	94	70			+0.3			
-DRX180M-4-05	●		18	150	95	72			+0.2			
-DRX185M-4-06	●	2	18.5	149	95	74	25	32	+0.9	SB-2250TR	DTM-7	ZXMT06T204 ○○
-DRX190M-4-06	●		19	151	97	76			+0.8			
-DRX195M-4-06	●		19.5	153	99	78			+0.7			
-DRX200M-4-06	●		20	155	101	80			+0.5			
-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	●	2	22	163	108	88	25	35	+1.2	SB-2570TR	DTM-8	ZXMT070305 ○○
-DRX225M-4-07	●		22.5	165	111	90			+1.0			
-DRX230M-4-07	●		23	167	112	92			+0.9			
-DRX235M-4-07	●		23.5	169	115	94			+0.8			
-DRX240M-4-07	●		24	171	116	96			+0.7			
-DRX245M-4-07	●		24.5	173	119	98			+0.5			
-DRX250M-4-07	●		25	175	120	100			+0.4			
-DRX255M-4-07	●		25.5	177	123	102			+0.3			
-DRX260M-4-07	●		26	179	124	104			+0.2			
S32 -DRX270M-4-09	●	2	27	190	130	108	32	42	+1.6	SB-3080TR	DTM-10	ZXMT09T306 ○○
-DRX280M-4-09	●		28	194	134	112			+1.3			
-DRX290M-4-09	●		29	198	138	116			+1.1			
-DRX300M-4-09	●		30	202	142	120		45	+0.8			
-DRX310M-4-09	●		31	206	146	124			+0.6			
S40 -DRX320M-4-11	●	2	32	233	164	128	40	55	+2.2	SB-4085TR	DTM-15	ZXMT11T306 ○○
-DRX330M-4-11	●		33	237	168	132			+1.9			
-DRX340M-4-11	●		34	241	172	136			+1.7			
-DRX350M-4-11	●		35	245	176	140			+1.4			
-DRX360M-4-11	●		36	249	180	144			+1.2			
-DRX370M-4-11	●		37	253	184	148			+0.9			
-DRX380M-4-11	●		38	257	188	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
Trouble Shooting ➡ P14

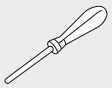
・Machining hole tolerance (4D)

Dc	Tolerance (mm)
ϕ12 ～ ϕ26	+ 0.25 − 0.10
ϕ27 ～ ϕ38	+ 0.30 − 0.15
ϕ39 ～ ϕ60	+ 0.35 − 0.20

※The above is for reference only.
It might be depends on machine, workpiece material, clamping and cutting condition etc.

● : Standard Item

● Toolholder Dimensions

Description	Standard	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare parts		Applicable Insert ➡ P6
			ϕDc	L1	L2	L3	ϕd	ϕd1		Clamp Screw 	Wrench 	
S40 -DRX390M-4-14	●	2	39	257	188	156	40	55	+2.8	SB-5085TR	DT-20	ZXMT140408 ○○
-DRX400M-4-14	●		40	261	192	160			+2.5			
-DRX410M-4-14	●		41	265	196	164			+2.3			
-DRX420M-4-14	●		42	269	200	168			+2.0			
-DRX430M-4-14	●		43	273	204	172		60	+1.8			
-DRX440M-4-14	●		44	277	208	176			+1.5			
-DRX450M-4-14	●		45	281	212	180			+1.3			
-DRX460M-4-14	●		46	285	216	184			+1.0			
-DRX470M-4-14	●		47	289	220	188			+0.8			
S50 -DRX480M-4-17	●	2	48	290	221	192	50	60	+3.8	SB-60120TR	DT-25	ZXMT170608 ○○
-DRX490M-4-17	●		49	294	225	196			+3.5			
-DRX500M-4-17	●		50	298	229	200			+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	●		54	314	245	216		65	+2.3			
-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			+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
Trouble Shooting ➡ P14

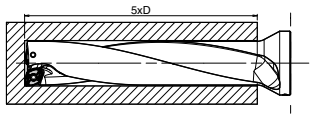
・Machining hole tolerance (4D)

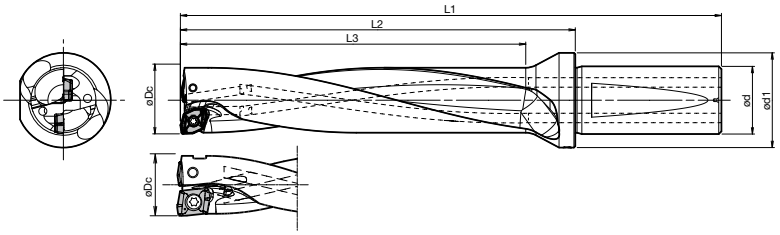
Dc	Tolerance (mm)
ϕ12～ϕ26	+ 0.25 − 0.10
ϕ27～ϕ38	+ 0.30 − 0.15
ϕ39～ϕ60	+ 0.35 − 0.20

※The above is for reference only.
It might be depends on machine, workpiece material, clamping and cutting condition etc.

● : Standard Item

■ Toolholder Line Up (5 X D)





5D

● Toolholder Dimensions

Description	Standard	No. of Inserts	Dimension (mm)						Max. Offset (Radial) (mm)	Spare parts		Applicable Insert ➔ P6
			ϕDc	L1	L2	L3	ϕd	ϕd1		Clamp Screw	Wrench	
S20 -DRX120M-5-03	●	2	12	124	81	60	20	27	+0.5	SB-2042TRG	DTM-6	ZXMT030203○○-E (External) ZXMT030203GM-I (Internal)
-DRX130M-5-03	●		13	129	86	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	●	2	16	158	103	80	25	32	+0.7	SB-2045TR	DTM-6	ZXMT05T203 ○○
-DRX170M-5-05	●		17	163	108	85			+0.4			
-DRX180M-5-05	●		18	168	113	90			+0.2			
-DRX190M-5-06	●	2	19	170	116	95	25	32	+0.8	SB-2250TR	DTM-7	ZXMT06T204 ○○
-DRX200M-5-06	●		20	175	121	100			+0.5			
-DRX210M-5-06	●		21	180	126	105			+0.3			
-DRX220M-5-07	●	2	22	185	130	110	25	32	+1.2	SB-2570TR	DTM-8	ZXMT070305 ○○
-DRX230M-5-07	●		23	190	135	115			+0.9			
-DRX240M-5-07	●		24	195	140	120			+0.7			
-DRX250M-5-07	●		25	200	145	125			+0.4			
-DRX260M-5-07	●		26	205	150	130			+0.2			
S32 -DRX270M-5-09	●	2	27	217	157	135	32	42	+1.6	SB-3080TR	DTM-10	ZXMT09T306 ○○
-DRX280M-5-09	●		28	222	162	140			+1.3			
-DRX290M-5-09	●		29	227	167	145			+1.1			
-DRX300M-5-09	●		30	232	172	150		45	+0.8			
-DRX310M-5-09	●		31	237	177	155			+0.6			
S40 -DRX320M-5-11	●	2	32	265	196	160	40	55	+2.2	SB-4085TR	DTM-15	ZXMT11T306 ○○
-DRX330M-5-11	●		33	270	201	165			+1.9			
-DRX340M-5-11	●		34	275	206	170			+1.7			
-DRX350M-5-11	●		35	280	211	175			+1.4			
-DRX360M-5-11	●		36	285	216	180			+1.2			
-DRX370M-5-11	●		37	290	221	185			+0.9			
-DRX380M-5-11	●		38	295	226	190			+0.7			
-DRX390M-5-14	●	2	39	296	227	195		55	+2.8	SB-5085TR	DT-20	ZXMT140408 ○○
-DRX400M-5-14	●		40	301	232	200			+2.5			
-DRX410M-5-14	●		41	306	237	205			+2.3			
-DRX420M-5-14	●		42	311	242	210			+2.0			
-DRX430M-5-14	●		43	316	247	215		60	+1.8			
-DRX440M-5-14	●		44	321	252	220			+1.5			
-DRX450M-5-14	●		45	326	257	225			+1.3			
-DRX460M-5-14	●		46	331	262	230			+1.0			
-DRX470M-5-14	●		47	336	267	235			+0.8			
S50 -DRX480M-5-17	●	2	48	338	269	240	50	60	+3.8	SB-60120TR	DT-25	ZXMT170608 ○○
-DRX490M-5-17	●		49	343	274	245			+3.5			
-DRX500M-5-17	●		50	348	279	250			+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	●		54	368	299	270		65	+2.3			
-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			+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
Trouble Shooting ➔ P14

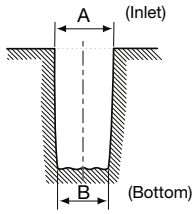
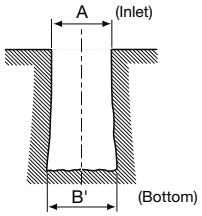
・Machining hole tolerance (5D)

Dc	Tolerance (mm)	Dc	Tolerance (mm)	Dc	Tolerance (mm)
ϕ12～ϕ26	+ 0.30 − 0.10	ϕ27～ϕ38	+ 0.35 − 0.15	ϕ39～ϕ60	+ 0.40 − 0.20

※ The above is for reference only.
It might be depends on machine, workpiece material, clamping and cutting condition etc.

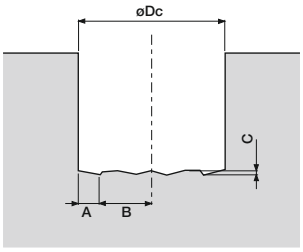
● : Standard Item

■ Trouble Shooting

Problem	Details		Cause	Countermeasure
Hole diameter become smaller at hole bottom		No problem at hole inlet, but hole diameter decreases gradually. A>B	Clogged chip 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 become larger at hole bottom		No problem at hole inlet, but hole diameter increases gradually. A<B'	Clogged chip 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 become smaller from the hole inlet		Hole diameter become smaller from inlet. (at stationary drilling)	Improper cutting dia. adjustment	When using with lathe, adjust the hole dia. by moving the tool the in 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)

øDc	A	B	C	øDc	A	B	C	øDc	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	0.5	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	0.7	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		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									



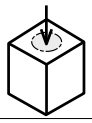
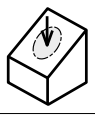
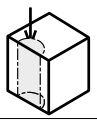
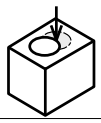
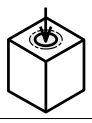
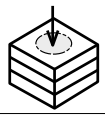
Available for 2XD,3XD,4XD,5XD.
Figures above are nominal sizes (Varies from -0.1mm to +0.1mm depending on workpiece material and cutting conditions).

■ DRX Recommended Cutting Conditions (with coolant)

Workpiece Material	Recommended Grade (Vc=m/min)				Cutting Dia (mm)	Holder Type (Cutting Depth)								
	PVD Coating MEGACOAT			Carbide		2D~3D			4D			5D		
	PR1230	PR1225	PR1210	GW15		feed (mm/rev)								
	GM GH	SM	GM			GM	GH	SM	GM	GH	SM	GM	GH	SM
Low Carbon Steel (1.0040, C15)	☆ 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 (C45)	★ 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	★ 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	★ 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 (GG)			★ 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 (GGG)			★ 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	~	~
Aluminium Non-ferrous Metal				★ 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 Alloy				★ 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

★ 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 type	Cutting Speed (mm/min)	120	120	120	120	120	120	Not Available
	Feed rate (mm/rev)	0.1	0.05	0.05	0.05	0.05 (Concave Surface) 0.1 (solid portion)	0.05	
Coolant(internal)		Yes	Yes	Yes	Yes	Yes	Yes	

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

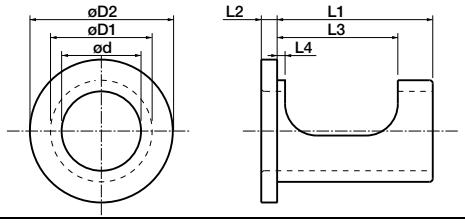
Drill type	2D~3D	4D	5D
Cutting width(Torus-shaped part)	10% of D or smaller	smaller than corner radius	Not Recommended

◆Max. depth with external coolant

When machining with external coolant. Max. depth should be 1.5 times of the cutting diameter.

Adjustable Sleeve for DRX Magic Drill

■ SHE type



● Sleeve dimension

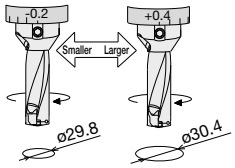
Description		Standard	Dimension(mm)							Dia. Adjustment Range	Center Height Adjustment Range
			ød	øD1	øD2	L1	L2	L3	L4		
SHE	2025-43	●	20	25	41	43	4	36	3.0	+0.4~-0.2	+0.2~-0.15
	2532-48	●	25	32	49	48	6	38	2.5	+0.4~-0.2	+0.2~-0.15
	3240-53	●	32	40	58	53	6	43	2.5	+0.4~-0.2	+0.2~-0.15
	4050-63	●	40	50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

- Dia. Adjustment Range refer to the cutting diameter.
- SHE type are only to be used with the Magic Drill (DRX and DRZ-type). Not recommended for the small dia. Magic Drill (DRS-type) because the adjustment range is too large.

●: Standard Item

1. Diameter Adjustment ~ For Machining Center ~

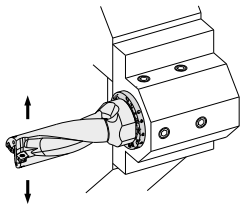
e.g.) ø30 drill



● Dia. Adjustment Range (mm)

Shank Diameter	Cutting Dia.	Adjustment Range
ø20	ø12~15	
ø25	ø15.5~26	+0.4~-0.2
ø32	ø26.5~31.5	
ø40	ø32~60	+0.6~-0.2

2. Center Height Adjustment ~ Relief troubles by height adjustment at lathes ~



● Center Height Adjustment Range (mm)

Shank Diameter	Cutting Dia.	Adjustment Range
ø20	ø12~15	
ø25	ø15.5~26	+0.2~-0.15
ø32	ø26.5~31.5	
ø40	ø32~60	+0.3~-0.2

◆ How to Use the Adjustable Sleeve | Gebrauchsanweisung Excenterhülsen | Comment utiliser l´excentrique ajustable | Modalità di regolazione della boccola eccentrica

1. Hole Diameter Adjustment when Drilling

① Adjust the scale at the flange periphery of the sleeve to the reference mark 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 rotating the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery and rotate the sleeve.
④ Using the bottom screw of the side-lock arbor, firmly tighten the drill directly through the sleeve's window.
The upper screw should be tightened slightly so that the sleeve will not be damaged. (Fig. 2)

1. Einstellen des Bohrungsdurchmessers auf Fräs- und Bohrmaschinen

① Bringen Sie den gewünschten Korrekturwert auf der Skala der Exzenterhülse mit der Mittenachse der Kühlkanalverschlussschraube auf eine Linie (Abb.1).
② Um den Bohrungsdurchmesser zu vergrößern, drehen Sie die Exzenterhülse in Richtung (+), um ihn zu verkleinern, drehen Sie in Richtung (-).
③ Um die Exzenterhülse zu drehen, stecken Sie einen Inbusschlüssel in das Loch auf dem Bund mit der Skala. Anschließend können Sie die Exzenterhülse drehen.
④ Ziehen Sie die hintere Schraube der Spannhülse, die durch das Fenster der Exzenterhülse direkt auf den Bohrer gespannt wird, an. Die Schraube nur so fest anziehen, dass die Exzenterhülse nicht beschädigt wird. (Abb. 2)

1. Ajustement du diamètre du trou durant le perçage

① Aligner la graduation sur la périphérie de l'excentrique avec le centre du bouchon d'arrosage du foret. (fig. 1)
② En cas d'élargissement du diamètre du trou, tourner l´excentrique dans la direction (+). Pour réduire le diamètre du trou, tourner l'excentrique dans la direction (-).
③ Lors de la rotation de l'excentrique, insérer la clé fournie avec le foret dans le trou situé en périphérie de la bride puis tourner l'excentrique.
④ A l'aide de la vis inférieure de blocage latéral de l'arbre, serrer fermement le foret directement à travers la fenêtre de l'excentrique. La vis supérieure devra être lègrérement serée afin de ne pas endommager l'excentrique. (Fig. 2)

1. Regolazione del diametro del foro su fresatrici e foratrici

① Regolare la scala graduata riportata sulla flangia della boccola allineando il valore desiderato all'asse centrale del foro del refrigerante (fig.1).
② Per allargare il diametro del foro, ruotare la boccola nella direzione contrassegnata dal segno (+) e per restringerlo ruotarla nella direzione contrassegnata dal segno (–).
③ Per ruotare la boccola, utilizzare la chiave fornita in dotazione inserendola nell'apposito foro situato sulla flangia della stessa.
④ Bloccare la punta stringendo bene la vite inferiore direttamente attraverso la finestra della boccola. La vite superiore deve essere avvitata leggermente in modo da non danneggiare la boccola (fig.2).

Caution
- Not applicable for Collet Chuck-type arbor.
- Scale on the sleeve is the reference value.
- Check the actual cutting diameter after adjusting.

Précautions
- Non applicable en cas d'arbre à mandrin à pince.
- SL'échelle graduée de l'excentrique correspond à la valeur de référence.
- Vérifier le diamètre réel après l'ajustage.

Hinweis
- Nicht im Spannfutter verwendbar.
- Die Werte von der Skala auf der Hülse sind Referenzwerte.
- Prüfen Sie den tatsächlichen Bohrungsdurchmesser durch eine Probebohrung.

Avvertenza
- Non utilizzabile su mandrini a pinza.
- La scala riportata sulla boccola corrisponde al valore standard.
- Controllare il diametro di taglio effettivo al termine della regolazione.

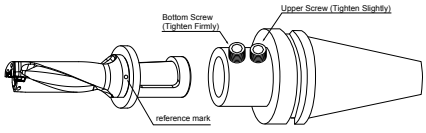


Fig. 1 Fig. 2

2. Center-Height Adjustment for Lathes

Most Lathe problems occur with Center Height Deviation. The Center Height is appropriate if a core approximately 0.5mm diameter remains at the center of the end face. (Fig. 3)

Center-height adjustment is necessary for the case as follows:

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

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 drill coolant plug.
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 at the flange periphery and rotate the sleeve.
⑤ After completing the adjustment, tighten the drill directly through the window on the sleeve.

2. Verstellbereich Mittenhöhe bei Drehmaschinen

Die meisten Probleme bei Drehmaschinen sind auf Abweichungen der Mitteneinstellung zurück zu führen. Die Mitteneinstellung ist richtig, wenn im Bohrungsgrund ein Kern von ca. 0,5 mm stehen bleibt. (Abb. 3)

Eine Mitteneinstellung ist in folgenden Fällen notwendig:

◆ Kein Kern bleibt stehen ◆ Der Kerndurchmesser ist größer 1 mm.

① Stellen Sie den Bohrer mit der äußeren Wendeplatte parallel zur x-Achse des Revolvers ein. (Abb. 4)
② Bringen Sie den gewünschten Korrekturwert auf der Skala der Exzenterhülse mit der Mittenachse der Kühlkanalverschlussschraube auf eine Linie.
③ Wenn kein Kern stehen bleibt, drehen Sie die Exzenterhülse ins Plus (+), wenn der Kern größer 1 mm ist, drehen Sie die Hülse ins Minus (-).
④ Um die Exzenterhülse zu drehen, stecken Sie den Inbusschlüssel in das Loch auf dem Bund mit der Skala. Anschließend können Sie die Exzenterhülse drehen.
⑤ Ziehen Sie die Spannschraube der Revolveraufnahme, die durch das Fenster der Exzenterhülse direkt auf den Bohrer gespannt wird, fest an.

2. Ajustement de la hauteur du centre pour les tours

La plupart des problèmes rencontrés avec les tours surviennent en raison d'une déviation de la hauteur du centre. La hauteur du centre est appropriée si un noyau d'environ 0,5 mm de diamètre reste au centre de la face arrière (Figure 3).

Un ajustement de la hauteur du centre est nécessaire dans les cas suivants:

◆ Il ne reste aucun noyau de matière ◆ Le diamètre du noyau est inférieur à 1 mm

① Aligner le foret avec la surface de la plaquette extérieure parallèle à l'axe X de la tourelle porte-plaquettes. (Figure 4)
② Aligner la graduation (pour tour) de l'excentrique avec le centre du bouchon d'arrosage du foret.
③ Lorsqu'il ne reste pas de noyau, tourner l'excentrique dans la direction (+) pour augmenter la taille du noyau. Lorsque le diamètre du noyau est supérieur à 1 mm, tourner l'excentrique dans la direction (-) pour diminuer la taille du noyau.
④ Lors de la rotation de l'excentrique, insérer la clé fournie avec le foret dans le trou situé en périphérie de la bride puis tourner l'excentrique.
⑤ Une fois l'ajustement terminé, serrer directement le foret via la fenêtre de l'excentrique.

2. Regolazione dell'altezza dal centro sui torni

La maggior parte dei problemi riscontrati sui torni è causata da deviazioni dell'altezza dal centro.
La regolazione dell'altezza dal centro è corretta se sul fondo del foro rimane un testimone del diametro di circa 0,5mm (fig.3).

E' necessario procedere alla regolazione dell'altezza dal centro nei seguenti casi:

◆ La punta non lascia un testimone sul fondo del foro ◆ Il diametro del testimone è superiore a 1mm.

① 1. Posizionare la punta con l'inserto esterno parallelo all'asse x della torretta del tornio (fig.4).
② Regolare la scala graduata riportata sulla flangia della boccola in modo che sia allineata col centro del foro per il refrigerante.
③ Se la punta non lascia un testimone sul fondo del foro, ruotare la boccola nella direzione indicata dal segno (+) e se il diametro del testimone è superiore a 1 mm, ruotare la boccola nel senso indicato dal segno (–).
④ Per ruotare la boccola, utilizzare la chiave fornita in dotazione inserendola nell'apposito foro situato sulla flangia della stessa.
⑤ Utilizzare la vite di serraggio dell'attacco della torretta per fissare la punta direttamente attraverso la finestra della boccola.

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

Hinweis: Der Durchmesser variiert je nach Mittenhöheneinstellung. Eine Überprüfung des Lochdurchmessers nach der Mittenhöheneinstellung wird empfohlen.

Remarque: Le diamètre de perçage peut changer suivant la valeur de l'ajustement de hauteur du centre. Il est recommandé de vérifier le diamtètre de perçage après l'ajustement de la hauteur du centre.

Nota: a seconda della regolazione dell'altezza dal centro, il diametro del foro potrebbe variare. Si raccomanda pertanto di controllare il diametro del foro al termine della regolazione.

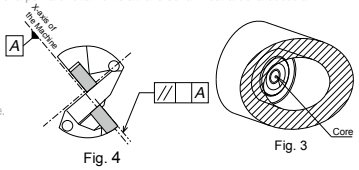


Fig. 4 Fig. 3

■ Lathe Installation | Einrichten der Drehmaschine | Installation sur un tour | Installazione

① The top face of the outer insert should be parallel to the X-axis to allow for offset cutting.
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 by setting 180° reverse position.) In case of the lathe with two turrets, when installing the drill to the lower turret, the outer insert should be set so as to face the operator. (It is also possible to use it by setting at 180° reverse position)

① Die Schneidkante der äußeren Wendeplatte muss parallel zur x-Achse ausgerichtet werden, um eine problemlose Offset-Bearbeitung zu gewährleisten.
② Wir empfehlen den Bohrer mit der äußeren Wendeplatte - zum Bediener zeigend - einzubauen (Abb.1). (Man kann ihn auch um 180° gedreht einbauen.) Falls Sie mit 2 Revolvern arbeiten und Sie den tiefer gelegenen Revolver verwenden, sollte der Bohrer auch mit der äußeren Wendeplatte - zum Bediener zeigend - eingebaut werden. (Man kann ihn auch um 180° gedreht einbauen.)

① La face supèrieure de la plaquette exterieure devra être parallèle à l´axe X afin d´autoriser un perçage excentre .
② Il est recommandé d´installer la plaquette ectérieure comme illustré dans la figure 1, avec ctte même plaquette faisant face à l´opérateur (Il est également possible d´installer la plaquette en position inversée à 180°). En cas de tour équipé de deux tourelles, et lors de l´installation de l´outil dans la tourelle inférieure, la plaquette extérieure devra être réglée de sorte à faire à l´opérateure (Il est également possible d´installer la plaquette en position inversée à 180°).

① Il tagliente dell'inserto esterno deve essere parallelo all'asse x per consentire la lavorazione disassata.
② Si consiglia di montare la punta con l'inserto esterno girato verso l'operatore, come illustrato in figura 1. (Si può anche montare girata di 180°). Qualora il tornio sia dotato di due torrette e si desideri utilizzare quella più bassa, l'inserto esterno deve essere girato verso l'operatore. (La punta si può anche montare girata di 180°).

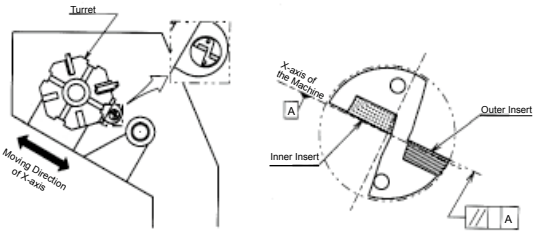


Fig. 1 Installation to the Lathe.

■ Cutting Diameter Adjustment

1. Cutting Diameter Adjustment

① 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 ho le 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 ø20 drill, the hole diameter must not be smaller than 19.8mm.

2. Offset Limit of the Cutting Diameter

For the maximum limit of the cutting diameter, refer to "Max. Offset (Radial)" in the Toolholder Dimension 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 ø20 drill, it is possible to make a hole up to ø21 since "Max. Offset (Radial)" is +0.5mm.

■ Ajustement du diamètre de perçage

1. Ajustement du diamètre de perçage

① La direction de déplacement de l'axe X dépend de la position du porte-plaquette.
② En cas d'agrandissement du diamètre de perçage, glisser l'outil le long de l'axe X dans la direction de la plaquette extérieure. (Figures 2 et 3). Pour réduire le diamètre de perçage, glisser l'outil le long de l'axe X dans la direction opposée. (Ce mouvement d' axe est appelé «déport») Il est toutefois nécessaire de réduire le diamètre de perçage de 0,2 mm ou plus par rapport au diamètre du foret. Sinon, le porte-plaquette risque d'interférer avec le perçage (Figure 4).

2. Limite de déport du diamètre de perçage

Concernant la limite maximale du diamètre de perçage, voir «Déport Maxi. (radial)» dans le tableau des dimensions des porteplaquettes. (La valeur mentionnée dans le tableau indique de combien il est possible de déporter le foret dans le sens radial) Ex. : En cas d'utilisation d'un foret de ø20, il est possible de réaliser un perçage de ø21 maxi. puisque l'excentration maxi dans le sens radial est +0,5 mm.

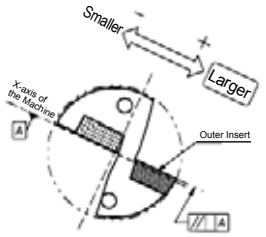


Fig. 2 Outer Insert Facing Up

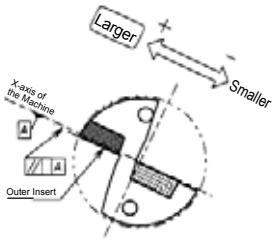


Fig. 3 Outer Insert Facing Down

■ Einstellen des Bohrungsdurchmessers

1. Einstellen des Bohrungsdurchmessers

① Die Bewegungsrichtung entlang der x-Achse hängt von der Position des Werkzeughalters ab.
② Wenn Sie den Bohrungsdurchmesser vergrößern möchten, müssen Sie ihn entlang der x-Achse zur äußeren Wendeplatte verschieben (Abb. 2 und 3). Wollen Sie den Bohrungsdurchmesser verkleinern, verschieben Sie ihn in die entgegengesetzte Richtung. (Dieses Verschieben entlang der Achse nennt man „Offset"). Versichern Sie sich, dass Sie den Bohrungsdurchmesser nicht kleiner einstellen als den Bohrerdurchmesser (Abweichung 0,2 mm oder mehr). Ansonsten verschweißt sich der Bohrer mit der Bohrung (Abb.4). *Beispiel*: Bei einem Bohrerdurchmesser von 20 mm darf der Bohrungsdurchmesser nicht kleiner als 19,8 mm eingestellt werden.

2. Grenzen der Offset-Bohrungsdurchmesser

Für den maximalen Durchmesser entnehmen Sie die Werte „Max. Offset (Radial)" aus der Tabelle mit den Werkzeugabmessungen. „Max. Offset (Radial)" der Abmessungsübersicht. (Die Werte in der Tabelle geben den maximalen radialen Zustand an.) *Beispiel*: Ein Bohrer mit Durchmesser 20 mm kann maximal eine Bohrung von 21 mm bohren, da der „Max. Offset (Radial)" +0,5 mm beträgt.

■ Regolazione del diametro del foro

1. Regolazione del diametro del foro

① Cutting diameter is adjusted by moving the tool to the X-axis direction. The moving direction of the X-axis depends on the position of the toolholder.
② Per ottenere un foro di diametro maggiore, occorre spostare l'utensile lungo l'asse x verso l'inserto esterno (fig. 2 e 3). Per ottenere un foro di diametro inferiore, spostare l'utensile nella direzione opposta. (Questo spostamento lungo l'asse x si chiama "disassamento"). Tuttavia accertarsi che la regolazione del diametro del foro non sia inferiore a quella del diametro della punta di 0,2mm o più, per evitare lo sfregamento da interferenza della punta nel foro (fig.4). Se si utilizza, *ad esempio*, una punta di diametro di 20mm, la regolazione del diametro del foro non deve essere inferiore a 19,8 mm.

2. Limiti di disassamento del diametro del foro

Per quanto riguarda l'indicazione del diametro massimo, si rimanda ai valori "Max. disassamento (radiale)" riportati nella tabella delle dimensioni dell'utensile (i valori della tabella indicano i limiti massimi per la regolazione del disassamento in senso radiale). Ad esempio, la punta di diametro q20 può praticare un foro massimo di q21 mm di diametro, poichè il valore del disassamento radiale massimo è di +0.5mm.

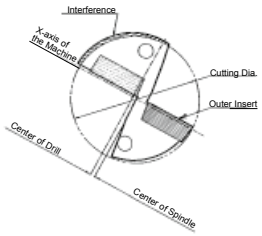


Fig. 4 Excessive offset (For Smaller Hole Diameter)

■ Center Height Adjustment

1. Center Height of the Inner Insert

When installing as shown in Fig. 1, the Inner Insert 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.

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 condition, the core, about 0.5mm in diameter, will remain after the machining.
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.

■ Verstellbereich Mittenhöhe

1. Mitteneinstellung der inneren Wendeplatte

Wenn Sie die innere Wendeplatte wie auf Abb. 1 gezeigt eingestellt haben,liegt sie ca. 0,2 mm unter der Zentrumshöhe der Spindel (Abb.5). Dies ist die Normalposition der Zentrumshöhe und der Bohrer kann so gut arbeiten. Falls jedoch der Revolver außerhalb der Mitte der Spindel ist, kann die innere Wendeplatte weit über oder unter der Mitte liegen. Für eine problemlose Bearbeitung muss die Mittenhöheneinstellung sorgfältig überprüft werden.

2. Prüfung der Mittenhöheneinstellung

Um die Mittenhöhe der inneren Wendeplatte zu prüfen, schauen Sie sich den stehengebliebenen Kern auf dem Bohrungsgrund an (Abb.6). Ist die Mittenhöhe richtig eingestellt, bleibt ein Kern von ca. 0,5 mm stehen. In folgenden Fällen ist eine Korrektur der Mittenhöheneinstellung notwendig:
- Es bleibt kein Kern stehen
- Der Kerndurchmesser ist größer als 1mm.

* Um die Einstellung zu prüfen, bohren Sie ca. 10 mm tief mit einem Vorschub f kleiner 0,1 mm/U.

■ Ajustement de la hauteur du centre

1. Hauteur du centre de la plaquette intérieure

En cas d'installation comme dans la figure 1, la plaquette intérieure est installée à environ 0,2 mm en dessous du centre de la broche (Figure 5). Il s'agit de la position normale de la hauteur du centre et le foret est conçu pour supporter ces conditions. Toutefois, si la tourelle de la machine (tour) est désaxée par rapport au centre de la broche, la plaquette intérieure peut parfois être installée au-dessus du centre ou excessivement en dessous du centre. Pour obtenir un usinage stable, il est essentiel de vérifier très précautionneusement la hauteur du centre.

2. Comment vérifier la hauteur du centre

Pour vérifier la hauteur du centre de la plaquette intérieure, voir le noyau restant au centre de l'extrémité du perçage réalisé (Fig. 6). Si la hauteur du centre est en condition normale, le noyau (d'environ 5 mm de diamètre) restera après l'usinage. Il est nécessaire d'ajuster la hauteur du centre dans les cas suivants:
- Pas de noyau restant
- Le diamètre du noyau est supérieur à 1 mm.

* Pour tester la hauteur du centre, percer un trou peu profond d'environ 10 mm de profondeur avec une avance faible, d'environ 0,1 mm/tv.

■ Regolazione dell'altezza dal centro

1. Medio impostazione interna della inserto

Montando l'inserto interno nel modo illustrato dalla fig. 1, esso sarà posizionato circa 0,2 mm al di sotto del centro del mandrino (fig.5). Questa è la regolazione normale dell'altezza dal centro e l'inserto centrale è appositamente studiato per essere installato in queste condizioni. Tuttavia, se la torretta del tornio è fuori dal centro del mandrino, l'inserto interno può venire a trovarsi al di sopra o molto al di sotto del centro. Per garantire una lavorazione stabile è pertanto fondamentale controllare accuratamente l'altezza dal centro dell'inserto interno.

2. Controllo dell'altezza dal centro dell'inserto interno

Per controllare l'altezza dal centro osservare il testimone che rimane sul fondo del foro(fig.6). Se l'altezza è regolata correttamente, sul fondo del foro rimane un testimone di circa 0,5mm di diametro. Nei seguenti casi è necessario procedere alla regolazione dell'altezza dal centro:
- Quando la punta non lascia un testimone sul fondo del foro
- Quando il diametro del testimone è superiore a 1 mm.

* Per controllare la regolazione, forare a 10 mm di profondità con un avanzamento inferiore a f=0,1 mm/giro.

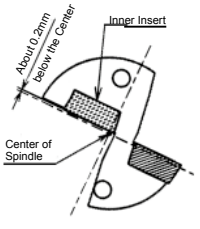


Fig. 5 Front view of the Drill

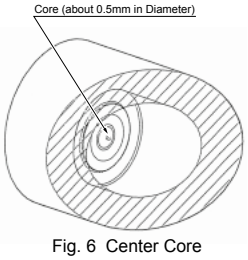


Fig. 6 Center Core

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 case, adjustment is necessary since insert breakage will be probable at the center of the drill. (Fig. 7)

[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 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 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 fundamental solution is to readjust the center position of the turret itself.

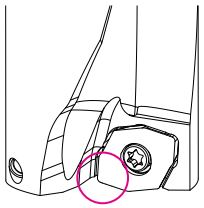


Fig.7 Insert breakage near the center of drill

3. Mittenhöhe Einstellung

a) Kein Kern / sehr kleiner Kern

Zustand, wenn die innere Wendeplatte oberhalb der Mittenhöhe liegt.
Eine Justierung ist in diesem Fall unbedingt nötig, da es leicht zu einem Bruch der Wendeplatte nahe der Bohrermitte kommen kann. (Abb. 7)

[Einstellungsempfehlung]

① Bauen Sie den Bohrer um 180° gedreht ein. Die meisten Probleme sind mit dieser Methode bereits behoben. (Abb.8)

② Sollte der Kerndurchmesser nach der o.g. Einstellung zu groß werden, drehen Sie den Bohrer um 90° gegen den Uhrzeigersinn wie in Abb.9 gezeigt. (Die äußere Wendeplatte zeigt nach unten.) Durch Verschieben des Werkzeugs auf der x-Achse verstellen Sie die Mittenhöhe. (Bei diesem Verfahren ist es jedoch nicht mehr möglich, den Schnittradius zu verändern.) Hinweis: Wenn Sie den Bohrer in der umgekehrten Richtung (mit der äußeren Wendeplatte nach oben zeigend) einbauen, wird der Bohrungsdurchmesser kleiner und könnte ein Verschweißen des Bohrers mit der Bohrung verursachen. ➤ Am besten stellt man die Mittenhöhe des Revolvers neu ein.

3. Ajustement de la hauteur du centre

a) Aucun noyau restant / noyau de diamètre excessivement petit

Cela se produit lorsque la plaquette intérieure est réglée au-dessus de la hauteur du centre. Un ajustement est alors nécessaire car la plaquette risque de se briser au perçage. (Figure 7)

[Procédure d'ajustement]

① Installer le foret à 180°. La plupart des problèmes seront résolus avec cette méthode. (Figure 8)

② Si le diamètre du noyau devient trop grand après l'ajustement ci-dessus, installer le foret à 90 ° dans le sens anti-horaire comme représenté dans la figure 9 (plaquette extérieure positionnée en dessous) puis ajuster la hauteur du centre en déplaçant l'outil dans la direction de l'axe X. (Cela ne permet cependant pas d'ajuster le diamètre de perçage). Précaution : Lorsque le foret est installé dans le sens opposé (plaquette extérieure positionnée au-dessus), le diamètre de perçage devient plus petit, ce qui peut provoquer l'interférence du corps du foret avec le trou réalisé. ➤ La meilleure solution consiste à réajuster la position du centre de la tourelle.

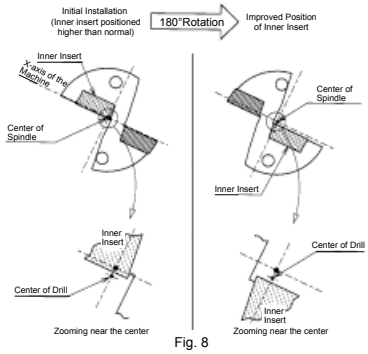


Fig. 8

3. Regolazione dell'altezza dal centro

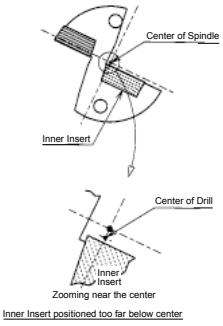
a) Il testimone non si forma oppure è molto piccolo

Si verifica quando l'inserto interno è al di sopra del centro.
E' pertanto assolutamente necessaria una regolazione in quanto è probabile un'imminente rottura dell'inserto in corrispondenza della parte centrale della punta (fig. 7).

[Modalità di regolazione]

① Montare la punta girata di 180°. Nella maggior parte dei casi i problemi con questa operazione si risolvono. (fig. 8)

② INei casi in cui il diametro del testimone formatosi dopo la summenzionata regolazione fosse troppo grande, ruotare la punta di 90° in senso antiorario nel modo illustrato dalla fig. 9 (inserto esterno posizionato più in basso) e regolare l'altezza del centro spostando l'utensile nella direzione dell'asse x (ciò impedisce il disassamento della punta). Montando la punta nel modo contrario (inserto esterno posizionato più in alto) il diametro di foratura si riduce, rischiando di causare lo sfregamento da interferenza della punta nel foro. ➤ In linea di massima ciò si risolve regolando nuovamente la centratura della torretta.



Inner Insert positioned too far below center

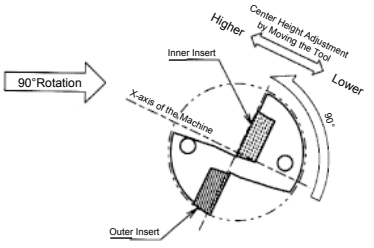


Fig. 9

b) Core with Excessively Large Diameter (More than 1mm)

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

[How to Adjust]

Install the drill as shown in Fig.10 (Outer insert is positioned on the upper side), 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: When installing the drill in the opposite diercton (Outer insert is positioned below), 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.

b) Kern mit sehr großem Durchmesser (über 1 mm)

Tritt auf, wenn die innere Wendeplatte deutlich unter der Mittenhöhe liegt.
Es entsteht schlechter Spanablauf und das Werkzeug muss neu eingestellt werden.

[Einstellungsempfehlung]

Drehen Sie den Bohrer wie in Abb. 10 gezeigt (äußere Wendeplatte zeigt nach oben). und verstellen Sie die Mittenhöhe durch Verschieben des Werkzeugs in Richtung der x-Achse (Dies macht das Einstellen des Schnittdurchmessers jedoch unmöglich).

Hinweis: Wenn Sie den Bohrer entgegengesetzt einbauen (äußere Wendeplatte zeigt nach unten), wird der Schnittdurchmesser kleiner und könnte ein Verschweißen des Bohrers mit der Bohrung verursachen. Am besten stellt man die Mittenhöhe des Revolvers neu ein.

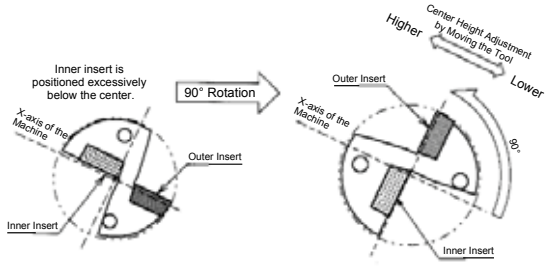


Fig.10

b) Noyau de diamètre excessivement important (plus de 1 mm)

Cela se produit lorsque la plaquette intérieure est réglée excessivement en dessous du centre.
Cette condition entraîne une mauvaise évacuation des copeaux et un ajustement s'avère nécessaire.

[Procédure d'ajustement]

Installer le foret comme illustré dans la figure 10 (plaquette extérieure positionnée sur le côté supérieur) et ajuster la hauteur du centre en déplaçant l'outil dans la direction de l'axe X. (Cela rend cependant impossible l'ajustement du diamètre de perçage).

Précaution : Lorsque le foret est installé dans le sens opposé (plaquette extérieure positionnée en dessous), le diamètre de perçage devient plus petit, ce qui peut provoquer l'interférence du corps du foret avec le trou réalisé. La meilleure solution consiste à réajuster la position du centre de la tourelle.

b) Testimone di diametro eccessivo (superiore a 1 mm)

Si verifica quando l'inserto interno è nettamente al di sotto del centro. Questa condizione influisce negativamente sulla formazione ed evacuazione del truciolo e pertanto richiede necessariamente una correzione.

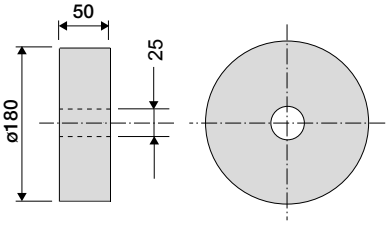
[Modalità di regolazione]

Ruotare la punta di 90° in senso antiorario nel modo descrito dalla fig. 10 (l'inserto esterno è posizionato più in alto) e regolare l'altezza dal centro spostndo la punta nella direzione dell'asse x (ciò impedisce il disassamento della punta).

Nota: Montando la punta nel modo contrario (inserto esterno posizionato più in basso) il diametro di foratura si riduce, rischiando di causare lo sfregamento da interferenza della punta nel foro. In linea di massima ciò si risolve regolando nuovamente la centratura della torretta.

G-X37CrMoW51 (45HRC)

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



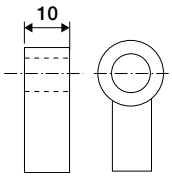
Magic Drill DRX	6pcs/edge
Competitor J	Breakage after 4 holes

Tool life 150%

·Magic Drill DRX shows 1.5 times longer tool life than Compe.J. Cutting edge of Competitor J's was broken after 4 holes. Magic drill DRX can drill 6 holes and more.
·Magic drill DRX requires no secondary finishing operation due to its excellent finishing quality.

X10CrNiS18-9 (1.4305)

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



Drilling diameter 20mm
depth 10mm
Partially interrupted

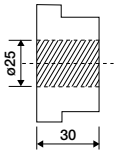
Magic Drill DRX	1300pcs/edge
Competitor K	500pcs/edge

Tool life 260%

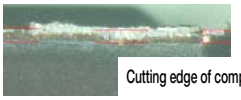
·Magic drill achieved 2.6 time longer stable machining without sudden breakage which occurred with Competitor K's drill.

25CrMo4 (cold forged)

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




Cutting edge of DRX (after 400 holes)

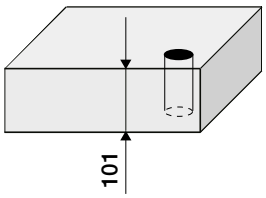

Cutting edge of competitors (after 400 holes)

Magic Drill DRX	Less material welding, continue to use even after 400 holes
Competitor L	Large material welding (after 400 holes)

·DRX shows better chip control and less welding than Competitor L.

55NiCrMoV6 (42HRC)

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



Die parts ø25x101mm (through hole) x 24 holes

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

50% reduction

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

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