ACHTECK
澳克泰工具

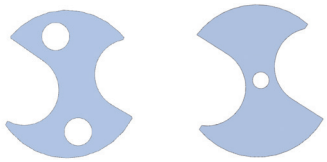
2025.01

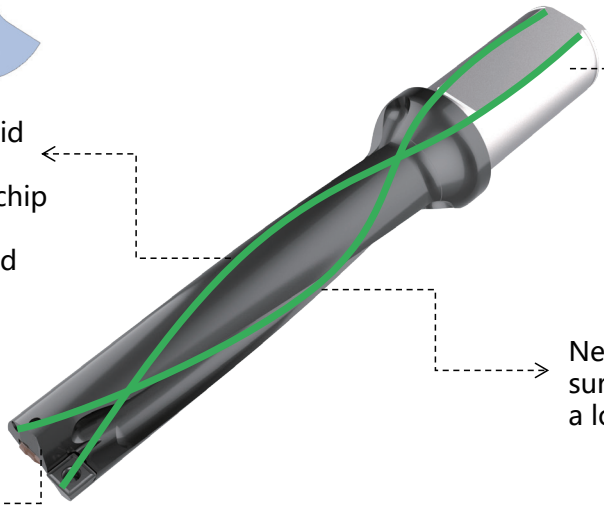
HY series for Drilling

NO.101

www.achtecktool.com

HY series--Drill body





0° side lock, shank tolerance h6

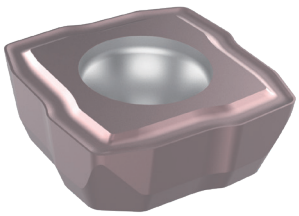
Spiral coolant holes, rigid drill body design and enough chip space for chip evacuation. Improved drilling performance and productivity

New drill body material with enhanced surface treatment, The drill body has a longer service life

Drills dia.: Ø14- 63mm
LU/DC: 2D/3D/4D/5D
Drill tolerance(ØDC): (0, +0.1mm)

Technical Information for the HY series drill inserts

Central

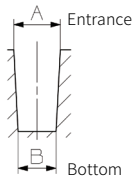
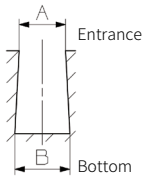
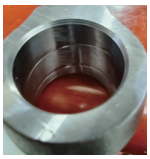
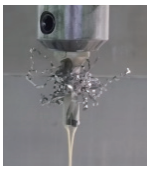
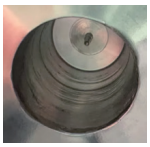


- Variable cutting edge, Make better centering performance
- The changing cutting edge width, Better matches the drilling characteristics of the center insert
- DM universal geometry and DL sharp geometry
- With AP301U, AP273U drilling grades

Peripheral

- With wiper, improves the strength of the tip and superior surface finish of the hole
- All ground inserts to create better stability for customers
- DM universal geometry and DL sharp geometry
- With AP273U, AC271P, AC371P, AP371M drilling grades

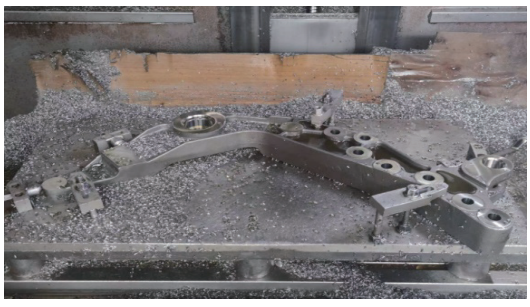
Application problems and solutions

Picture	phenomenon	analyze	solutions
	An inverted cone shaped hole	1.The cutting force of the periphery is greater than the center; 2. Peripheral insert wear 3. High hardness of the workpiece	1.Select a rigid drill body (reduce overhang length/ HY series) 2.Reducing the feed speed can reduce the axial force and the production speed of chips, and reduce the drilling resistance 3.The cooling hole of the peripheral insert is blocked, and chip evacuation is blocked 4.Peripheral insert wear out too quickly. Use a grade of insert that is more resistant to wear
	A horn shaped hole	The cutting force of the central insert is greater than the peripheral and causes the rotation axis of the drill body to change	1.Select a rigid drill body (reduce overhang length/ HY series) 2.Reducing the feed speed can reduce the axial force and the production speed of chips, and reduce the drilling resistance 3.Select a drill body with a larger flute for the center insert 4.Pecking or using multi-stage drilling procedures
	The hole has a spiral pattern of damage	Abnormal centering of the drill body. The chips make the drill body wobble	1.When entering the hole, reduce the feed speed; Or milling the uneven area of the workpiece to ensure the centering stability of the drilling 2.Allow the chips to be completely evacuated and reduce the speed of the drill body leaving the workpiece
	chips winding	The chip breaker does not match the workpiece material or the parameters are to be debugged	1.For alloy steel, by increasing the feed per turn, the thickness of the chips is increased and greater bending stress is generated, breaks the chips 2.For materials with good toughness such as low carbon steel/stainless steel, by reducing the feed per turn and increasing the speed , the chips are thinned and broken under the action of centrifugal force
	Residual bulges at the bottom of the hole	The runout between the centerline of the workpiece and the centerline of the drill body exceeds 0.03mm. Inaccurate use of eccentric device	1.In the lathe, re-set the cutting tool 2.Select eccentric device and matching the drill body

Application of HY series

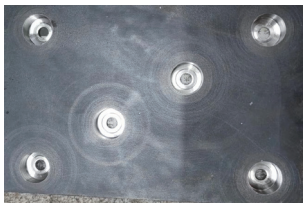
1. The diameter of the hole is required to be in a positive tolerance, such as the hole of the thread
2. The ordinary HP series has chips winding
3. The hardness of forgings, cast steel, ADI ductile iron and other materials is about HRC28-38, difficult machining workpiece

The HY series is a product supplement to the HP series under difficult machining conditions



Application examples

Tools	HY-2D155-S20-SP02 XONT 020204E-DM AP301U SPET 020205E-DL AP371M
Workpiece	
Materials	1.4837Heat-resistant stainless steel
Cutting Conditions	Vc= 107 m/min fn= 0.05 mm/rev
Coolant	Internal cooling
Test result	Solve the problems of the bad rigidity, breaking and processing time

Tools	HY-2D220-S25-SP04 XONT 040305E-DL AP273U SPET 040307E-DL AP273U
Workpiece	
Materials	SUS316L
Cutting Conditions	Vc= 120 m/min fn= 0.08 mm/rev
Coolant	Internal cooling
Test result	Solve the problems of chips winding and meet the needs of automated production

Grade introduction

P Carbon steel / Alloy steel

Basic application

AP273U(P15-P35)
1st choice for steel drilling; The composite nanostructure coating was deposited on the substrate with high strength and high wear resistance. It has controllable coating structure, good wear resistance and coating strength

AC271P(P15-P35)
Supplementary grades for cast steel and forged steel under complex working conditions; By chemical vapor deposition on the substrate with good toughness; Strengthen the abrasion resistance of the cutting tool and the oxidation resistance of the coating

AC371P(P25-P40)
Supplementary grades for bad working conditions or workpiece with hard points; The substrate has good toughness and wear resistance to complement safe drilling applications

M Stainless steel

Basic application

AP273U(M25-M35)
1st choice for stainless steel drilling; With controllable coating structure, better wear resistance and coating strength, it is a good universal grade

AP371M(M25-M40)
1st choice of heat-resistant stainless steel; The nano-structure coating is deposited on the fine crystalline substrate. The smooth surface and high hardness of the coating can improve the resistance of the cutting tool to Built-up edge and oxidation

S Ni-based superalloy/ Ti-alloy（Type α/ Type α+β）

Basic application

AP371M(S25-S35)
Supplementary grades for Ni-based superalloy, α+β type Ti-alloy. The nano-structure coating is deposited on the fine crystalline substrate. The smooth surface and high hardness of the coating can improve the resistance of the cutting tool to Built-up edge and oxidation

Code system

HP	-	2D	-	255	-	S32	-	S07
1		2		3		4		5

1- series of drill bodies

HP series
HY series

2- Aspectratio

Lu/Dc=2
Lu/Dc=3
Lu/Dc=4
Lu/Dc=5

3- Drill Dia.

255-- Drill Dia. Dc 25.5mm
0875-- Drill Dia. Dc 0.875 in

4- Shank Dia.

S32--- Side lock, Shank Dia. 32mm
S125-- Side lock, Shank Dia. 1.25 in

5- Matching Insert

S07-- Matching SPMT 07 insert
SP03-- Matching N0.03 insert

Drill tolerance and hole tolerance---HPseries

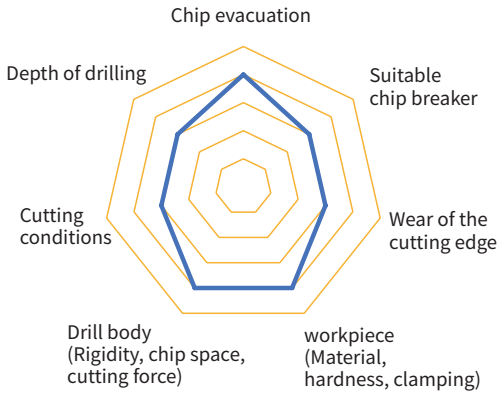
HP series		ϕ13-ϕ21.5mm	ϕ22-ϕ50mm
2*DC	Drill tolerance	0,-0.1	0,-0.1
	Hole tolerance	-0.1 ~ +0.15	-0.1 ~ +0.15
3*DC	Drill tolerance	0,-0.1	0,-0.1
	Hole tolerance	-0.1 ~ +0.18	-0.12 ~ +0.2
4*DC	Drill tolerance	0,-0.1	0,-0.1
	Hole tolerance	-0.15 ~ +0.20	-0.15 ~ +0.25

Drill tolerance and hole tolerance---HYseries

HY series		ϕ13-ϕ21.5mm	ϕ22-ϕ50mm
2*DC	Drill tolerance	0,+0.1	0,+0.1
	Hole tolerance	-0.1 ~ +0.15	-0.1 ~ +0.15
3*DC	Drill tolerance	0,+0.1	0,+0.1
	Hole tolerance	-0.1 ~ +0.18	-0.12 ~ +0.2
4*DC	Drill tolerance	0,+0.1	0,+0.1
	Hole tolerance	-0.15 ~ +0.20	-0.15 ~ +0.25

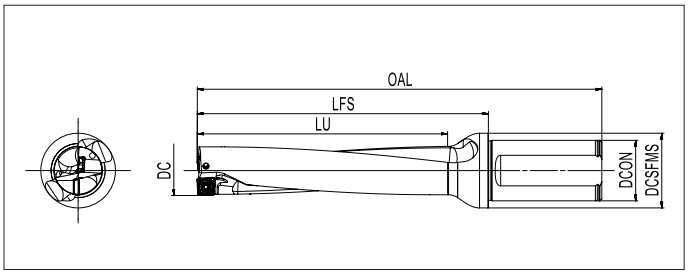
HY series drill body is easier to obtain positive tolerance aperture, but it is necessary to adjust the machining strategy according to the influence factors of drilling diameter

Influencing factors of drilling diameter



HY series drill body

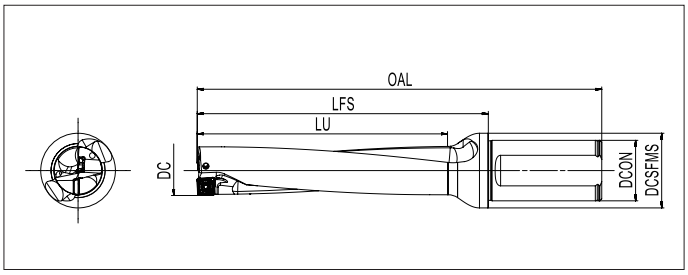
LU/DC=2



Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-2D140-S20-SP02	14.0	31	94	20	44	25	0.16	XONT 020204E SPET 020204E	SP020045 FT-TP06
HY-2D145-S20-SP02	14.5	33	96	20	46	25	0.16		
HY-2D150-S20-SP02	15.0	34	97	20	47	25	0.16		
HY-2D155-S20-SP02	15.5	36	99	20	49	25	0.17		
HY-2D160-S20-SP02	16.0	36	101	20	51	25	0.17		
HY-2D165-S20-SP03	16.5	37	102	20	52	25	0.17	XONT 030305E SPET 030305E	SP022049 FT-TP07
HY-2D170-S25-SP03	17.0	38	109	25	53	32	0.28		
HY-2D175-S25-SP03	17.5	40	111	25	55	32	0.29		
HY-2D180-S25-SP03	18.0	40	112	25	56	32	0.29		
HY-2D185-S25-SP03	18.5	40	112	25	56	32	0.29		
HY-2D188-S25-SP03	18.8	40	112	25	56	32	0.29		
HY-2D190-S25-SP03	19.0	42	114	25	58	32	0.30		
HY-2D195-S25-SP03	19.5	44	116	25	60	32	0.31		
HY-2D200-S25-SP04	20.0	44	117	25	61	32	0.32	XONT 040305E SPET 040305E	SP025072 FT-TP08
HY-2D205-S25-SP04	20.5	46	120	25	64	32	0.32		
HY-2D210-S25-SP04	21.0	46	120	25	64	32	0.32		
HY-2D215-S25-SP04	21.5	47	121	25	65	32	0.32		
HY-2D220-S25-SP04	22.0	48	122	25	66	32	0.34		
HY-2D230-S25-SP04	23.0	51	125	25	69	32	0.35		
HY-2D240-S25-SP05	24.0	53	127	25	71	32	0.35	XONT 050305E SPET 050305E	SP030082 FT-TP09
HY-2D250-S25-SP05	25.0	56	130	25	74	32	0.37		
HY-2D260-S32-SP05	26.0	56	137	32	77	40	0.58		
HY-2D270-S32-SP05	27.0	59	139	32	79	40	0.60		
HY-2D280-S32-SP05	28.0	60	142	32	82	40	0.63		
HY-2D290-S32-SP05	29.0	62	144	32	84	40	0.65		
HY-2D300-S32-SP06	30.0	65	147	32	87	40	0.65	XONT 060406E SPET 060406E	SP035094 FT-TP10
HY-2D310-S40-SP06	31.0	66	160	40	90	48	1.02		
HY-2D320-S40-SP06	32.0	68	162	40	92	48	1.04		
HY-2D330-S40-SP06	33.0	70	165	40	95	48	1.07		
HY-2D340-S40-SP06	34.0	73	168	40	98	48	1.10		
HY-2D350-S40-SP06	35.0	76	171	40	101	48	1.14		

HY series drill body

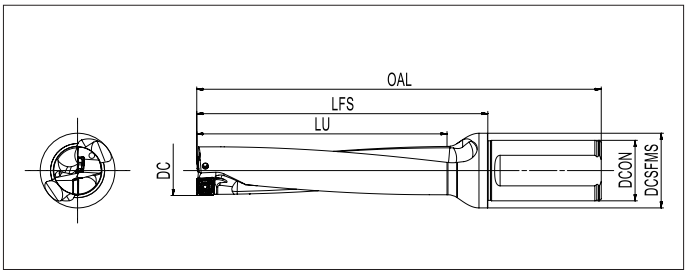
LU/DC=2



Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-2D360-S40-SP07	36.0	77	174	40	104	48	1.16	XONT 070406E SPET 070406E	SP035094 FT-TP10
HY-2D370-S40-SP07	37.0	79	175	40	105	48	1.19		
HY-2D380-S40-SP07	38.0	80	178	40	108	48	1.24		
HY-2D390-S40-SP07	39.0	82	180	40	110	48	1.29		
HY-2D400-S40-SP07	40.0	85	183	40	113	48	1.32		
HY-2D410-S40-SP07	41.0	90	187	40	117	48	1.38		
HY-2D420-S40-SP07	42.0	91	189	40	119	48	1.42		
HY-2D430-S40-SP07	43.0	91	192	40	122	50	1.47		
HY-2D440-S40-SP08	44.0	93	194	40	124	63	1.65	XONT 080508E SPET 080508E	SP040110 FT-TP15
HY-2D450-S40-SP08	45.0	95	197	40	127	63	1.71		
HY-2D460-S40-SP08	46.0	98	200	40	130	63	1.75		
HY-2D470-S40-SP08	47.0	101	202	40	132	63	1.80		
HY-2D480-S40-SP08	48.0	104	205	40	135	63	1.86		
HY-2D490-S40-SP08	49.0	105	207	40	137	63	1.92		
HY-2D500-S40-SP08	50.0	105	174	40	104	63	1.99		
HY-2D510-S40-SP08	51.0	108	214	40	144	63	2.11		
HY-2D520-S40-SP08	52.0	110	216	40	146	63	2.17		
HY-2D530-S40-SP09	53.0	113	219	40	149	63	2.15	XONT 090608E SPET 090608E	SP040110 FT-TP15
HY-2D540-S40-SP09	54.0	114	221	40	151	63	2.22		
HY-2D550-S40-SP09	55.0	116	224	40	154	63	2.31		
HY-2D560-S40-SP09	56.0	118	227	40	157	63	2.40		
HY-2D570-S40-SP09	57.0	120	229	40	159	63	2.48		
HY-2D580-S40-SP09	58.0	122	232	40	162	63	2.57		
HY-2D590-S40-SP09	59.0	124	234	40	164	63	2.61		
HY-2D600-S40-SP09	60.0	126	237	40	167	63	2.77		
HY-2D610-S40-SP09	61.0	129	241	40	171	63	2.89		
HY-2D620-S40-SP09	62.0	131	243	40	173	63	2.95		
HY-2D630-S40-SP09	63.0	133	246	40	176	63	3.06		

HY series drill body

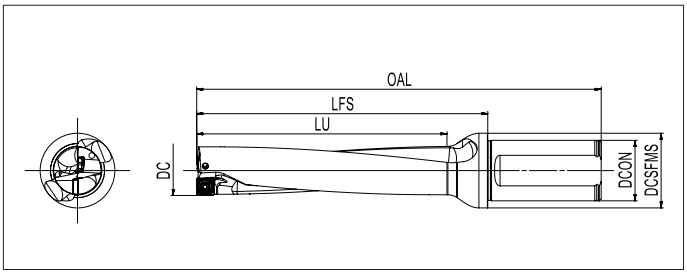
LU/DC=3



Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-3D140-S20-SP02	14.0	44	108	20	58	25	0.16	XONT 020204E SPET 020204E	SP020045 FT-TP06
HY-3D145-S20-SP02	14.5	47	110	20	60	25	0.16		
HY-3D150-S20-SP02	15.0	49	112	20	62	25	0.17		
HY-3D155-S20-SP02	15.5	51	114	20	64	25	0.17		
HY-3D160-S20-SP02	16.0	51	116	20	66	25	0.18		
HY-3D165-S20-SP03	16.5	53	118	20	68	25	0.18	XONT 030305E SPET 030305E	SP022049 FT-TP07
HY-3D170-S25-SP03	17.0	54	119	25	69	32	0.29		
HY-3D175-S25-SP03	17.5	57	122	25	72	32	0.30		
HY-3D180-S25-SP03	18.0	57	123	25	73	32	0.31		
HY-3D185-S25-SP03	18.5	59	125	25	75	32	0.31		
HY-3D190-S25-SP03	19.0	60	132	25	76	32	0.32		
HY-3D193-S25-SP03	19.3	63	135	25	79	32	0.32		
HY-3D195-S25-SP03	19.5	63	135	25	79	32	0.32		
HY-3D200-S25-SP04	20.0	63	137	25	81	32	0.34	XONT 040305E SPET 040305E	SP025072 FT-TP08
HY-3D205-S25-SP04	20.5	64	138	25	82	32	0.34		
HY-3D210-S25-SP04	21.0	66	140	25	84	32	0.34		
HY-3D215-S25-SP04	21.5	68	142	25	86	32	0.35		
HY-3D220-S25-SP04	22.0	69	143	25	87	32	0.36		
HY-3D225-S25-SP04	22.5	72	146	25	90	32	0.37		
HY-3D230-S25-SP04	23.0	73	147	25	91	32	0.38		
HY-3D235-S25-SP04	23.5	75	149	25	93	32	0.39		

HY series drill body

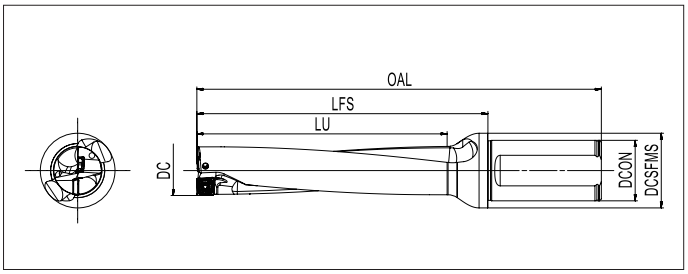
LU/DC=3



Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-3D240-S25-SP05	24.0	77	151	25	95	32	0.39	XONT 050305E SPET 050305E	SP030082 FT-TP09
HY-3D245-S25-SP05	24.5	79	153	25	97	32	0.39		
HY-3D250-S25-SP05	25.0	81	155	25	99	32	0.41		
HY-3D253-S25-SP05	25.3	81	155	25	99	32	0.41		
HY-3D255-S25-SP05	25.5	81	156	25	100	32	0.42		
HY-3D260-S32-SP05	26.0	81	162	32	102	40	0.63		
HY-3D265-S32-SP05	26.5	83	164	32	104	40	0.64		
HY-3D270-S32-SP05	27.0	85	165	32	105	40	0.65		
HY-3D275-S32-SP05	27.5	88	168	32	108	40	0.67		
HY-3D280-S32-SP05	28.0	88	169	32	109	40	0.68		
HY-3D285-S32-SP05	28.5	88	171	32	111	40	0.69		
HY-3D290-S32-SP05	29.0	90	172	32	112	40	0.71		
HY-3D295-S32-SP05	29.5	93	175	32	115	40	0.72		
HY-3D300-S32-SP06	30.0	95	177	32	117	40	0.72	XONT 060406E SPET 060406E	SP035094 FT-TP10
HY-3D305-S32-SP06	30.5	96	178	32	118	40	0.72		
HY-3D310-S40-SP06	31.0	97	191	40	121	48	1.09		
HY-3D315-S40-SP06	31.5	98	192	40	122	48	1.1		
HY-3D320-S40-SP06	32.0	100	194	40	124	48	1.12		
HY-3D325-S40-SP06	32.5	102	196	40	126	48	1.14		
HY-3D330-S40-SP06	33.0	103	198	40	128	48	1.15		
HY-3D335-S40-SP06	33.5	105	200	40	130	48	1.17		
HY-3D340-S40-SP06	34.0	106	201	40	131	48	1.19		
HY-3D345-S40-SP06	34.5	109	204	40	134	48	1.22		
HY-3D350-S40-SP06	35.0	110	205	40	135	48	1.24		
HY-3D355-S40-SP06	35.5	112	207	40	137	48	1.26		

HY series drill body

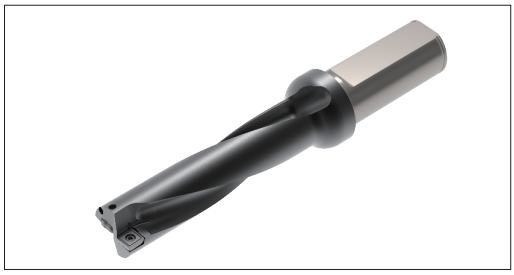
LU/DC=3

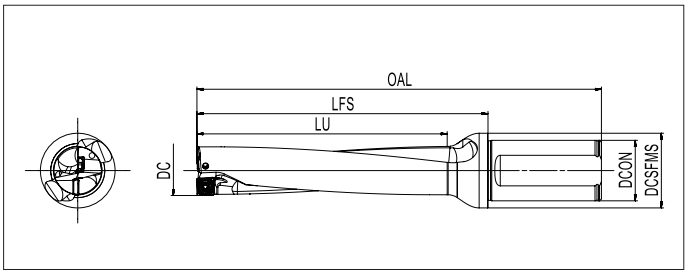


Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-3D360-S40-SP07	36.0	112	209	40	139	48	1.28	XONT 070406E SPET 070406E	SP035094 FT-TP10
HY-3D370-S40-SP07	37.0	115	212	40	142	48	1.33		
HY-3D380-S40-SP07	38.0	118	216	40	146	48	1.39		
HY-3D383-S40-SP07	38.3	119	217	40	147	48	1.41		
HY-3D385-S40-SP07	38.5	119	217	40	147	48	1.42		
HY-3D390-S40-SP07	39.0	121	219	40	149	48	1.44		
HY-3D395-S40-SP07	39.5	123	221	40	151	48	1.44		
HY-3D400-S40-SP07	40.0	125	223	40	153	48	1.47		
HY-3D405-S40-SP07	40.5	127	223	40	153	48	1.57		
HY-3D410-S40-SP07	41.0	127	227	40	157	48	1.62		
HY-3D420-S40-SP07	42.0	130	230	40	160	48	1.68		
HY-3D430-S40-SP07	43.0	133	234	40	164	50	1.77		
HY-3D440-S40-SP08	44.0	136	237	40	167	50	1.81	XONT 080508E SPET 080508E	SP040110 FT-TP15
HY-3D450-S40-SP08	45.0	104	242	40	172	50	1.90		
HY-3D460-S40-SP08	46.0	144	246	40	176	50	1.98		
HY-3D470-S40-SP08	47.0	146	249	40	179	63	2.12		
HY-3D480-S40-SP08	48.0	149	253	40	183	63	2.30		
HY-3D490-S40-SP08	49.0	152	256	40	186	63	2.39		
HY-3D495-S40-SP08	49.5	153	258	40	188	63	2.31		
HY-3D500-S40-SP08	50.0	155	260	40	190	63	2.37		
HY-3D510-S40-SP08	51.0	158	264	40	194	63	2.58		
HY-3D520-S40-SP08	52.0	161	267	40	197	63	2.69		
HY-3D530-S40-SP09	53.0	164	271	40	201	63	2.71	XONT 090608E SPET 090608E	SP040110 FT-TP15
HY-3D540-S40-SP09	54.0	167	274	40	204	63	2.81		
HY-3D550-S40-SP09	55.0	171	279	40	209	63	2.94		
HY-3D560-S40-SP09	56.0	174	283	40	213	63	3.07		
HY-3D570-S40-SP09	57.0	177	286	40	216	63	3.19		
HY-3D580-S40-SP09	58.0	180	290	40	220	63	3.32		
HY-3D590-S40-SP09	59.0	183	293	40	223	63	3.41		
HY-3D600-S40-SP09	60.0	186	297	40	227	63	3.55		
HY-3D610-S40-SP09	61.0	190	302	40	232	63	3.71		
HY-3D620-S40-SP09	62.0	193	305	40	235	63	3.94		
HY-3D630-S40-SP09	63.0	196	309	40	239	63	4.10		

HY series drill body

LU/DC=4

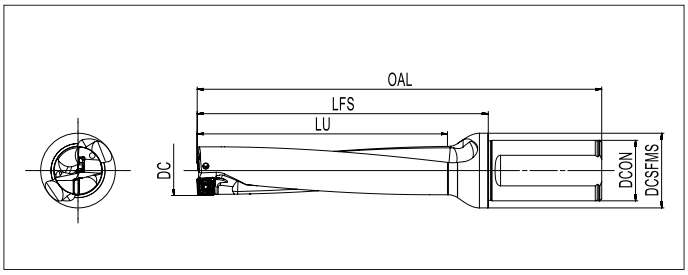




Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-4D140-S20-SP02	14.0	59	122	20	72	25	0.17	XONT 020204E SPET 020204E	SP020045 FT-TP06
HY-4D145-S20-SP02	14.5	62	125	20	75	25	0.17		
HY-4D150-S20-SP02	15.0	64	127	20	77	25	0.17		
HY-4D155-S20-SP02	15.5	66	129	20	79	25	0.18		
HY-4D160-S20-SP02	16.0	67	132	20	82	25	0.19		
HY-4D165-S20-SP03	16.5	69	134	20	84	25	0.19	XONT 030305E SPET 030305E	SP022049 FT-TP07
HY-4D170-S25-SP03	17.0	71	142	25	86	32	0.30		
HY-4D175-S25-SP03	17.5	73	145	25	89	32	0.31		
HY-4D180-S25-SP03	18.0	75	147	25	91	32	0.32		
HY-4D185-S25-SP03	18.5	77	149	25	93	32	0.33		
HY-4D190-S25-SP03	19.0	79	151	25	95	32	0.34		
HY-4D193-S25-SP03	19.3	83	155	25	99	32	0.34		
HY-4D195-S25-SP03	19.5	83	155	25	99	32	0.34		
HY-4D200-S25-SP04	20.0	83	157	25	101	32	0.36	XONT 040305E SPET 040305E	SP025072 FT-TP08
HY-4D205-S25-SP04	20.5	86	160	25	104	32	0.37		
HY-4D210-S25-SP04	21.0	89	161	25	105	32	0.37		
HY-4D215-S25-SP04	21.5	89	163	25	107	32	0.38		
HY-4D220-S25-SP04	22.0	91	165	25	109	32	0.39		
HY-4D225-S25-SP04	22.5	93	168	25	112	32	0.40		
HY-4D230-S25-SP04	23.0	95	170	25	114	32	0.41		
HY-4D240-S25-SP05	24.0	101	175	25	119	32	0.42	XONT 050305E SPET 050305E	SP030082 FT-TP09
HY-4D245-S25-SP05	24.5	102	177	25	121	32	0.44		
HY-4D250-S25-SP05	25.0	107	180	25	124	32	0.45		
HY-4D253-S25-SP05	25.3	107	180	25	124	32	0.46		
HY-4D260-S32-SP05	26.0	107	188	32	128	40	0.68		
HY-4D265-S32-SP05	26.5	109	190	32	130	40	0.70		
HY-4D270-S32-SP05	27.0	112	192	32	132	40	0.71		
HY-4D280-S32-SP05	28.0	115	197	32	137	40	0.74		
HY-4D290-S32-SP05	29.0	120	201	32	141	40	0.78		
HY-4D295-S32-SP05	29.5	123	204	32	144	40	0.80		
HY-4D300-S32-SP06	30.0	125	207	32	147	40	0.80	XONT 060406E SPET 060406E	SP035094 FT-TP10
HY-4D310-S40-SP06	31.0	128	222	40	152	48	1.18		
HY-4D320-S40-SP06	32.0	131	226	40	156	48	1.21		
HY-4D330-S40-SP06	33.0	136	231	40	161	48	1.26		
HY-4D340-S40-SP06	34.0	140	235	40	165	48	1.31		
HY-4D350-S40-SP06	35.0	145	240	40	170	48	1.36		

HY series drill body

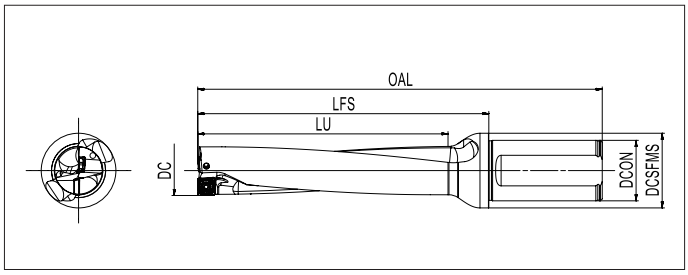
LU/DC=4



Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-4D360-S40-SP07	36.0	148	245	40	175	48	1.43	XONT 070406E SPET 070406E	SP035094 FT-TP10
HY-4D370-S40-SP07	37.0	151	249	40	179	48	1.48		
HY-4D380-S40-SP07	38.0	157	254	40	184	48	1.54		
HY-4D390-S40-SP07	39.0	161	258	40	188	48	1.62		
HY-4D400-S40-SP07	40.0	167	263	40	193	48	1.77		
HY-4D410-S40-SP07	41.0	168	268	40	198	48	1.86		
HY-4D420-S50-SP07	42.0	172	282	50	202	63	2.64		
HY-4D430-S50-SP07	43.0	176	287	50	207	63	2.74		
HY-4D440-S50-SP08	44.0	180	291	50	211	63	2.83	XONT 080508E SPET 080508E	SP040110 FT-TP15
HY-4D450-S50-SP08	45.0	185	297	50	217	63	2.95		
HY-4D460-S50-SP08	46.0	188	302	50	222	63	3.05		
HY-4D470-S50-SP08	47.0	193	306	50	226	63	3.12		
HY-4D480-S50-SP08	48.0	197	311	50	231	63	3.25		
HY-4D490-S50-SP08	49.0	201	315	50	235	63	3.36		
HY-4D500-S50-SP08	50.0	204	320	50	240	63	3.51		
HY-4D505-S50-SP08	50.5	208	322	50	242	63	3.56		
HY-4D510-S50-SP08	51.0	209	325	50	245	63	3.61		
HY-4D520-S50-SP08	52.0	213	329	50	249	63	3.75		
HY-4D530-S50-SP09	53.0	218	333	50	253	63	3.83	XONT 090608E SPET 090608E	SP040110 FT-TP15
HY-4D540-S50-SP09	54.0	221	338	50	258	63	3.92		
HY-4D550-S50-SP09	55.0	226	343	50	263	63	4.12		
HY-4D560-S50-SP09	56.0	230	349	50	269	63	4.32		
HY-4D570-S50-SP09	57.0	234	353	50	273	63	4.45		
HY-4D580-S50-SP09	58.0	238	357	50	277	63	4.63		
HY-4D590-S50-SP09	59.0	242	362	50	282	63	4.92		
HY-4D600-S50-SP09	60.0	246	367	50	287	63	5.23		
HY-4D610-S50-SP09	61.0	250	372	50	292	63	5.55		
HY-4D620-S50-SP09	62.0	254	376	50	296	63	5.87		
HY-4D630-S50-SP09	63.0	258	381	50	301	63	6.18		

HY series drill body

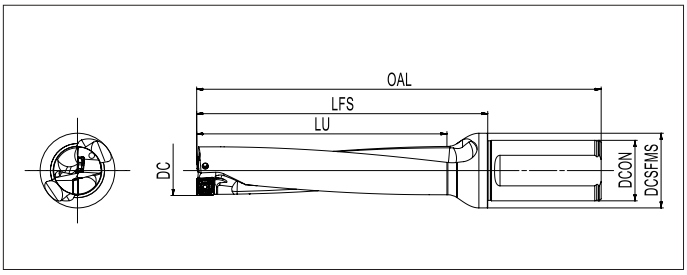
LU/DC=5



Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-5D140-S20-SP02	14.0	73	136	20	86	25	0.18	XONT 020204E SPET 020204E	SP020045 FT-TP06
HY-5D145-S20-SP02	14.5	76	139	20	89	25	0.18		
HY-5D150-S20-SP02	15.0	79	142	20	92	25	0.18		
HY-5D155-S20-SP02	15.5	82	145	20	95	25	0.19		
HY-5D160-S20-SP02	16.0	83	148	20	98	25	0.20		
HY-5D165-S20-SP03	16.5	86	151	20	101	25	0.20	XONT 030305E SPET 030305E	SP022049 FT-TP07
HY-5D170-S25-SP03	17.0	88	159	25	103	32	0.31		
HY-5D175-S25-SP03	17.5	91	163	25	107	32	0.33		
HY-5D180-S25-SP03	18.0	93	165	25	109	32	0.33		
HY-5D185-S25-SP03	18.5	96	168	25	112	32	0.34		
HY-5D190-S25-SP03	19.0	98	170	25	114	32	0.35		
HY-5D193-S25-SP03	19.3	102	174	25	118	32	0.36		
HY-5D195-S25-SP03	19.5	102	174	25	118	32	0.36		
HY-5D200-S25-SP04	20.0	103	177	25	121	32	0.38	XONT 040305E SPET 040305E	SP025072 FT-TP08
HY-5D205-S25-SP04	20.5	105	179	25	123	32	0.39		
HY-5D210-S25-SP04	21.0	108	182	25	126	32	0.40		
HY-5D215-S25-SP04	21.5	111	184	25	128	32	0.41		
HY-5D220-S25-SP04	22.0	113	187	25	131	32	0.42		
HY-5D230-S25-SP04	23.0	119	194	25	138	32	0.45		
HY-5D240-S25-SP05	24.0	125	199	25	143	32	0.47	XONT 050305E SPET 050305E	SP030082 FT-TP09
HY-5D250-S25-SP05	25.0	132	205	25	149	32	0.50		
HY-5D253-S25-SP05	25.3	132	205	25	149	32	0.50		
HY-5D260-S32-SP05	26.0	133	214	32	154	40	0.73		
HY-5D265-S32-SP05	26.5	136	216	32	156	40	0.75		
HY-5D270-S32-SP05	27.0	139	219	32	159	40	0.77		
HY-5D280-S32-SP05	28.0	143	225	32	165	40	0.81		
HY-5D290-S32-SP05	29.0	149	231	32	171	40	0.85		

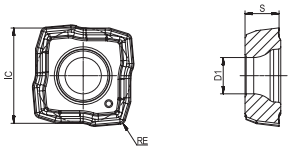
HY series drill body

LU/DC=5



Designation	Dimension (mm)						Weight Kg	Insert	Screw & Wrench
	DC	LU	OAL	DCON	LFS	DCSFMS			
HY-5D300-S32-SP06	30.0	155	237	32	177	40	0.88	XONT 060406E SPET 060406E	SP035094 FT-TP10
HY-5D310-S40-SP06	31.0	159	253	40	183	48	1.26		
HY-5D320-S40-SP06	32.0	164	258	40	188	48	1.31		
HY-5D330-S40-SP06	33.0	169	264	40	194	48	1.36		
HY-5D340-S40-SP06	34.0	175	270	40	200	48	1.42		
HY-5D350-S40-SP06	35.0	181	276	40	206	48	1.49		
HY-5D360-S40-SP07	36.0	186	282	40	212	48	1.57	XONT 070406E SPET 070406E	SP035094 FT-TP10
HY-5D370-S40-SP07	37.0	189	286	40	216	48	1.64		
HY-5D380-S40-SP07	38.0	195	292	40	222	48	1.72		
HY-5D390-S40-SP07	39.0	201	298	40	228	48	1.79		
HY-5D400-S40-SP07	40.0	208	304	40	234	48	1.84		
HY-5D410-S40-SP07	41.0	215	310	40	240	48	2.11		
HY-5D420-S50-SP07	42.0	219	325	50	245	63	2.85		
HY-5D430-S50-SP07	43.0	223	331	50	251	63	2.96		
HY-5D440-S50-SP08	44.0	226	335	50	255	63	3.15	XONT 080508E SPET 080508E	SP040110 FT-TP15
HY-5D450-S50-SP08	45.0	230	342	50	262	63	3.28		
HY-5D460-S50-SP08	46.0	234	348	50	268	63	3.41		
HY-5D470-S50-SP08	47.0	240	353	50	273	63	3.52		
HY-5D480-S50-SP08	48.0	245	359	50	279	63	3.67		
HY-5D490-S50-SP08	49.0	250	364	50	284	63	3.82		
HY-5D500-S50-SP08	50.0	254	370	50	290	63	3.99		
HY-5D510-S50-SP08	51.0	259	376	50	296	63	4.13		
HY-5D520-S50-SP08	52.0	265	381	50	301	63	4.30		

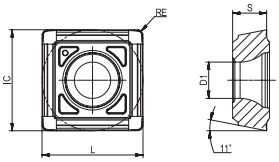
XONT---Central inserts

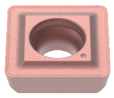


Central inserts	Designation	Machining conditions				●Good	◐ General	✱ Bad
						●	●	●
		Dimension(mm)				P	M	K
		IC	S	RE	D1	AP301U	AP273U	AP301U
 DM universal geometry	XONT 020204E-DM	4.9	2.4	0.4	2.2	●	-	●
	XONT 030305E-DM	5.7	2.6	0.5	2.5	●	-	●
	XONT 030305E-DL	5.7	2.6	0.5	2.5		●	-
	XONT 040305E-DM	6.8	2.8	0.5	2.8	●	-	●
	XONT 040305E-DL	6.8	2.8	0.5	2.8		●	-
	XONT 050305E-DM	8.4	3.0	0.5	3.2	●	-	●
	XONT 050305E-DL	8.4	3.0	0.5	3.2		●	-
	XONT 060406E-DM	10.2	3.5	0.6	4.0	●	-	●
 DL sharp geometry	XONT 060406E-DL	10.2	3.5	0.6	4.0		●	-
	XONT 070406E-DM	12.35	4.0	0.6	4.0	●	-	●
	XONT 070406E-DL	12.35	4.0	0.6	4.0		●	-
	XONT 080508E-DM	14.9	4.5	0.8	4.7	●	-	●
	XONT 080508E-DL	14.9	4.5	0.8	4.7		●	-
	XONT 090608E-DM	17.9	5.5	0.8	4.75	●	-	●
	XONT 090608E-DL	17.9	5.5	0.8	4.75			-

● Stocked ○ Unstocked ▲ Stopped in the near future

SPET--- Peripheral inserts



Peripheral inserts	Designation	Machining conditions				●Good		◐ General	✱ Bad	
						●	◐	●	●	●
		Dimension(mm)				P		M	K	S
		IC	S	RE	D1	AP273U	AC371P	AP371M	AC271P	AP471S
 DM universal geometry	SPET 020204E-DM	5.1	2.4	0.4	2.2	●			●	
	SPET 020205E-DL	5.1	2.4	0.5	2.2			●		○
	SPET 030305E-DM	6.0	2.6	0.5	2.5	●	●		●	
	SPET 030306E-DL	6.0	2.6	0.6	2.5		●	●		○
	SPET 040305E-DM	7.4	2.8	0.5	2.8	●	●		●	
	SPET 040307E-DL	7.4	2.8	0.7	2.8		●	●		○
	SPET 050305E-DM	8.9	3.0	0.5	3.2	●	●		●	
	SPET 050308E-DL	8.9	3.0	0.8	3.2		●	●		○
	SPET 060406E-DM	10.65	3.5	0.6	4.2	●	●		●	
 DL sharp geometry	SPET 060408E-DL	10.65	3.5	0.8	4.2		●	●		○
	SPET 070406E-DM	12.65	4.0	0.6	4.0	●	●		●	
	SPET 070410E-DL	12.65	4.0	1.0	4.0			-		-
	SPET 080508E-DM	15.45	4.5	0.8	4.7	●	●		●	
	SPET 080510E-DL	15.45	4.5	1.0	4.7			-		-
	SPET 090608E-DM	18.6	5.5	0.8	4.75	●			●	
	SPET 090610E-DL	18.6	5.5	1.0	4.75			-		-

● Stocked ○ Unstocked ▲ Stopped in the near future

Cutting data recommendation

Materials				Brinell hardness (HB)	Tensile strength (N/mm²)	Recommendation for HY series								
ISO	Classification of materials					AP273U			AC371P			AP371M		
						Vc (m/min)			Vc (m/min)			Vc (m/min)		
						●	◖◗	✱	●	◖◗	✱	●	◖◗	✱
P	Unalloyed steel	C ⩽ 0.25%	Annealed	125	428	200	150	130	240	180	160	-	-	-
		0.25 < C ⩽ 0.55%	Annealed	190	639	190	150	120	200	160	120	-	-	-
		0.25 < C ⩽ 0.55%	Heat-treated	210	708	180	140	100	190	150	120	-	-	-
		C > 0.55%	Annealed	190	639	180	140	100	190	150	120	-	-	-
		C > 0.55%	Heat-treated	300	1013	150	110	75	160	120	90	-	-	-
		Free cutting steel (short chip)	Annealed	220	745	180	140	100	190	150	120	-	-	-
	Low alloy steel	Annealed		175	591	160	130	100	180	140	100	-	-	-
		Heat-treated		300	1013	150	110	75	160	120	90	-	-	-
		Heat-treated		380	1282	-	-	-	-	-	-	-	-	-
		Heat-treated		430	1477	-	-	-	-	-	-	-	-	-
	High alloy steel	Annealed		200	675	180	140	100	190	150	120	-	-	-
		Hardened and tempered		300	1013	150	110	75	160	120	90	-	-	-
		Hardened and tempered		400	1361	-	-	-	-	-	-	-	-	-
	Stainless steel	Ferrite/Martensite, Annealed		200	675	180	140	100	190	150	120	-	-	-
		Martensite,Heat-treated		330	1114	-	-	-	-	-	-	-	-	-
M	Stainless steel	Austenite, hardened		200	675	150	120	90	-	-	-	140	120	90
		Austenitic, Precipitation hardened stainless steel		300	1013	130	100	80	-	-	-	130	100	80
		Austenite , ferrite, duplex		230	778	130	100	80	-	-	-	130	100	80
K	Malleable cast iron	Ferrite		200	400	150	120	85	200	150	110	-	-	-
		Pearlite		260	700	110	90	65	150	120	80	-	-	-
	Grey cast iron	Low tensile strength		180	200	200	150	130	240	180	160	-	-	-
		High tensile strength/austenite		245	350	150	110	75	160	120	90	-	-	-
	Nodular cast iron	Ferrite		155	400	140	110	80	180	140	100	-	-	-
		Pearlite		265	700	130	100	70	160	120	90	-	-	-
	GGV(CGI)			230	400	-	-	-	130	100	70	-	-	-
N	Wrough aluminium alloy	Non-aging alloy		30	-	-	-	-	-	-	-	-	-	-
		Agde alloy		100	340	-	-	-	-	-	-	-	-	-
	Cast aluminium alloy	⩽12% Si,Non-aging alloy		75	260	-	-	-	-	-	-	-	-	-
		⩽12% Si,Agde alloy		90	310	-	-	-	-	-	-	-	-	-
		>12% Si,Non-aging alloy		130	450	-	-	-	-	-	-	-	-	-
	Magnesium alloy			70	250	-	-	-	-	-	-	-	-	-
	Copper and copper alloys(Bronze/Brass)	Non-alloy, electrolytic copper		100	340	-	-	-	-	-	-	-	-	-
		Brass, bronze, red brass		90	310	-	-	-	-	-	-	-	-	-
		Cu alloy, short chips		110	380	-	-	-	-	-	-	-	-	-
		High strength Ampco alloy		300	1010	-	-	-	-	-	-	-	-	-
S	Heat-resisting alloy	Fe-based	Annealed	200	680	-	-	-	-	-	-	90	60	40
			Aged	280	940	-	-	-	-	-	-	70	50	30
		Ni or Co based	Annealed	250	840	-	-	-	-	-	-	70	50	30
			Aged	350	1180	-	-	-	-	-	-	50	40	30
			Cast	320	1080	-	-	-	-	-	-	50	40	30
	Titanium alloy	Pure titanium		200	680	-	-	-	-	-	-	120	90	60
		α and β alloy,aged		375	1260	-	-	-	-	-	-	90	70	50
		β alloy		410	1400	-	-	-	-	-	-	-	-	-
	Tungsten alloy			300	1010	-	-	-	-	-	-	-	-	-
	Molybdenum alloy			300	1010	-	-	-	-	-	-	-	-	-
H	Hardened steel	Hardened and tempered		50HRC		-	-	-	-	-	-	-	-	-
		Hardened and tempered		55HRC		-	-	-	-	-	-	-	-	-
		Hardened and tempered		60HRC		-	-	-	-	-	-	-	-	-
	Chilled cast iron	Hardened and tempered		50HRC		-	-	-	-	-	-	-	-	-

* This table shows the general cutting conditions, and the actual selection should be adjusted according to factors such as equipment rigidity, drilling depth, workpiece clamping and cooling pressure.

fn（mm/rev）															
φ14mm-16mm		φ16.5mm-19.5mm		φ20mm-23.5mm		φ24mm-29.5mm		φ30mm-35mm		φ36mm-43mm		φ44mm-52mm		φ53mm-63mm	
XONT 02/SPET 02		XONT 03/SPET 03		XONT 04/SPET 04		XONT 05/SPET 05		XONT 06/SPET 06		XONT 07/SPET 07		XONT 08/SPET 08		XONT 09/SPET 09	
-DM	-DL	-DM	-DL	-DM	-DL	-DM	-DL	-DM	-DL	-DM	-DL	-DM	-DL	-DM	-DL
0.04-0.06	0.04-0.08	0.04-0.06	0.04-0.09	0.04-0.10	0.04-0.12	0.04-0.10	0.04-0.12	0.06-0.12	0.06-0.14	0.06-0.12	0.06-0.14	0.08-0.12	0.08-0.14	0.08-0.12	0.08-0.14
0.04-0.08	0.04-0.08	0.06-0.11	0.06-0.11	0.06-0.14	0.06-0.14	0.08-0.14	0.08-0.14	0.08-0.20	0.08-0.20	0.08-0.20	0.08-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
0.04-0.08	0.04-0.08	0.06-0.11	0.06-0.11	0.06-0.14	0.06-0.14	0.08-0.14	0.08-0.14	0.08-0.20	0.08-0.20	0.08-0.20	0.08-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
0.04-0.08	0.04-0.08	0.06-0.11	0.06-0.11	0.06-0.14	0.06-0.14	0.08-0.14	0.08-0.14	0.08-0.20	0.08-0.20	0.08-0.20	0.08-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
0.04-0.06	0.04-0.06	0.06-0.09	0.06-0.08	0.06-0.11	0.06-0.08	0.08-0.11	0.06-0.08	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.13	0.10-0.16	0.08-0.16	0.10-0.16	0.08-0.16
0.04-0.08	0.04-0.08	0.06-0.11	0.06-0.11	0.06-0.14	0.06-0.14	0.08-0.14	0.08-0.14	0.08-0.20	0.08-0.20	0.08-0.20	0.08-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
0.04-0.08	0.04-0.08	0.06-0.11	0.06-0.11	0.06-0.14	0.06-0.14	0.08-0.14	0.08-0.14	0.08-0.20	0.08-0.20	0.08-0.20	0.08-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
0.04-0.06	0.04-0.06	0.06-0.09	0.06-0.08	0.06-0.11	0.06-0.08	0.08-0.11	0.06-0.08	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.13	0.10-0.16	0.08-0.16	0.10-0.16	0.08-0.16
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.04-0.08	0.04-0.08	0.06-0.11	0.06-0.11	0.06-0.14	0.06-0.14	0.08-0.14	0.08-0.14	0.08-0.20	0.08-0.20	0.08-0.20	0.08-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
0.04-0.06	0.04-0.06	0.06-0.09	0.06-0.08	0.06-0.11	0.06-0.08	0.08-0.11	0.06-0.08	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.13	0.10-0.16	0.08-0.16	0.10-0.16	0.08-0.16
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.04-0.08	0.04-0.08	0.06-0.11	0.06-0.11	0.06-0.14	0.06-0.14	0.08-0.14	0.08-0.14	0.08-0.20	0.08-0.20	0.08-0.20	0.08-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.04-0.06	0.04-0.08	0.06-0.08	0.04-0.09	0.04-0.10	0.04-0.12	0.06-0.10	0.06-0.12	0.08-0.13	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.16	0.10-0.16	0.08-0.16	0.10-0.16
0.04-0.06	0.04-0.06	0.04-0.06	0.06-0.08	0.06-0.11	0.06-0.08	0.08-0.11	0.06-0.08	0.06-0.14	0.06-0.12	0.06-0.14	0.06-0.12	0.08-0.14	0.08-0.12	0.08-0.14	0.08-0.12
0.04-0.06	0.04-0.08	0.06-0.08	0.04-0.09	0.04-0.10	0.04-0.12	0.06-0.10	0.06-0.12	0.08-0.13	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.16	0.10-0.16	0.08-0.16	0.10-0.16
0.06-0.12	0.06-0.10	0.08-0.12	0.08-0.10	0.10-0.16	0.10-0.12	0.10-0.16	0.10-0.12	0.10-0.20	0.10-0.15	0.10-0.20	0.10-0.15	0.12-0.20	0.12-0.15	0.12-0.20	0.12-0.15
0.06-0.10	0.06-0.08	0.06-0.10	0.06-0.08	0.08-0.14	0.08-0.10	0.08-0.14	0.08-0.10	0.08-0.18	0.08-0.12	0.08-0.18	0.08-0.12	0.10-0.08	0.10-0.12	0.10-0.08	0.10-0.12
0.06-0.12	0.06-0.10	0.08-0.12	0.08-0.10	0.10-0.16	0.10-0.12	0.10-0.16	0.10-0.12	0.10-0.20	0.10-0.15	0.10-0.20	0.10-0.15	0.12-0.20	0.12-0.15	0.12-0.20	0.12-0.15
0.06-0.10	-	0.06-0.10	-	0.08-0.14	-	0.08-0.14	-	0.08-0.18	-	0.08-0.18	-	0.10-0.08	-	0.10-0.08	-
0.06-0.12	0.06-0.10	0.08-0.12	0.08-0.10	0.10-0.16	0.10-0.12	0.10-0.16	0.10-0.12	0.10-0.20	0.10-0.15	0.10-0.20	0.10-0.15	0.12-0.20	0.12-0.15	0.12-0.20	0.12-0.15
0.06-0.10	0.06-0.08	0.06-0.10	0.06-0.08	0.08-0.14	0.08-0.10	0.08-0.14	0.08-0.10	0.08-0.18	0.08-0.12	0.08-0.18	0.08-0.12	0.10-0.18	0.10-0.12	0.10-0.18	0.10-0.12
0.06-0.10	-	0.06-0.10	-	0.08-0.14	-	0.08-0.14	-	0.08-0.18	-	0.08-0.18	-	0.10-0.08	-	0.10-0.08	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.04-0.06	0.04-0.08	0.06-0.08	0.04-0.09	0.04-0.10	0.04-0.12	0.06-0.10	0.06-0.12	0.08-0.13	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.16	0.10-0.16	0.08-0.16	0.10-0.16
0.04-0.06	0.04-0.08	0.06-0.08	0.04-0.09	0.04-0.10	0.04-0.12	0.06-0.10	0.06-0.12	0.08-0.13	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.16	0.10-0.16	0.08-0.16	0.10-0.16
0.04-0.06	0.04-0.08	0.06-0.08	0.04-0.09	0.04-0.10	0.04-0.12	0.06-0.10	0.06-0.12	0.08-0.13	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.16	0.10-0.16	0.08-0.16	0.10-0.16
0.04-0.06	0.04-0.06	0.04-0.06	0.06-0.08	0.06-0.11	0.06-0.08	0.08-0.11	0.06-0.08	0.06-0.14	0.06-0.12	0.06-0.14	0.06-0.12	0.08-0.14	0.08-0.12	0.08-0.14	0.08-0.12
0.04-0.06	0.04-0.06	0.04-0.06	0.06-0.08	0.06-0.11	0.06-0.08	0.08-0.11	0.06-0.08	0.06-0.14	0.06-0.12	0.06-0.14	0.06-0.12	0.08-0.14	0.08-0.12	0.08-0.14	0.08-0.12
0.04-0.06	0.04-0.08	0.06-0.08	0.04-0.09	0.04-0.10	0.04-0.12	0.06-0.10	0.06-0.12	0.08-0.13	0.08-0.16	0.08-0.13	0.08-0.16	0.08-0.16	0.10-0.16	0.08-0.16	0.10-0.16
0.04-0.06	0.04-0.06	0.04-0.06	0.06-0.08	0.06-0.11	0.06-0.08	0.08-0.11	0.06-0.08	0.06-0.14	0.06-0.12	0.06-0.14	0.06-0.12	0.08-0.14	0.08-0.12	0.08-0.14	0.08-0.12
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The parameters are based on 3*Dc drill body, 2*Dc reference 1.1 coefficient; 4*Dc reference 0.8 coefficient; 5*Dc can refer to the 0.7 coefficien