



For more information

Deep hole drilling system

Brazed BTA heads

Tungaloy Report No. 563-G

New brazed **BTA** heads with **unique chipbreaker and carbide grade** for lower power consumption and longer tool life



Brazed BTA heads








Enables light cutting action on low-power BTA drilling machines, providing secure and efficient drilling

Light cutting geometry for improved performance

- Unique chipbreaker design provides 15-20% lower cutting forces and power consumption compared with conventional products.
- No vibrations during machining on low-power BTA machines, while allowing increased feed rates and process security.

Line up

Brazed drill head

Tube system	STS (Single Tube System) 					
Designation	MBU	UTE	New BSG	New BTG	New BTL	BTU
Shape						
Drill diameter (mm)	ø8 - ø14.79	ø12.6 - ø20	ø15.6 - ø16.7	ø15.6 - ø65	ø15.6 - ø65	ø12.6 - ø65
Application	General purpose	General purpose	General purpose	General purpose	Chip control	General purpose

Tube system	DTS (Double Tube System) 		
Designation	New ETG	New ETL	ETU
Shape			
Drill diameter (mm)	ø18.4 - ø65	ø18.4 - ø65	ø18.4 - ø65
Application	General purpose	Chip control	General purpose



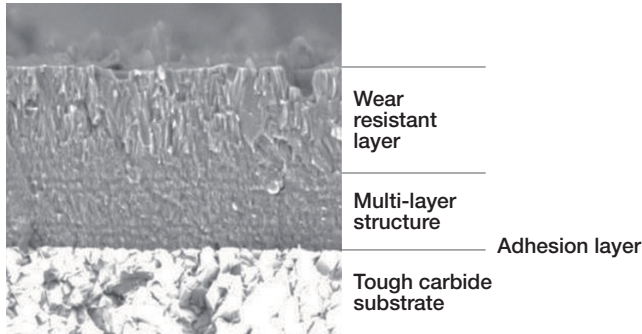
Excellent chip evacuation

The cutting edges with optimized rake profile form chips, which are easily evacuated through a large chip mouth (opening in the drill head) inside the drill pipe, eliminating chip clogging and other chip-associated issues.

Grades

The latest wear-resistant AHM930 grade provides prolonged tool life

AHM930



ISO classifications for AHM930 grade

ISO	ISO area							
	5	10	15	20	25	30	35	40
P								
M								
K								
N								
S								
H								

Improved resistance to chipping and fractures

The innovative multilayered coating structure of AH3135, combined with tough carbide substrate, is post-treated to optimize the as-deposited compressive residual stress in the coating. This significantly reduces microchipping formation and microcrack propagation in the coating surface, which often induces catastrophic insert failures.

Improved thermal crack resistance

Dedicated carbide substrate features superior thermal shock resistance, preventing thermal crack formation.

Wear resistance

The grain size of the outermost coating layer is strictly controlled to improve wear resistance for extended tool life.

Enhanced coating-substrate adhesion

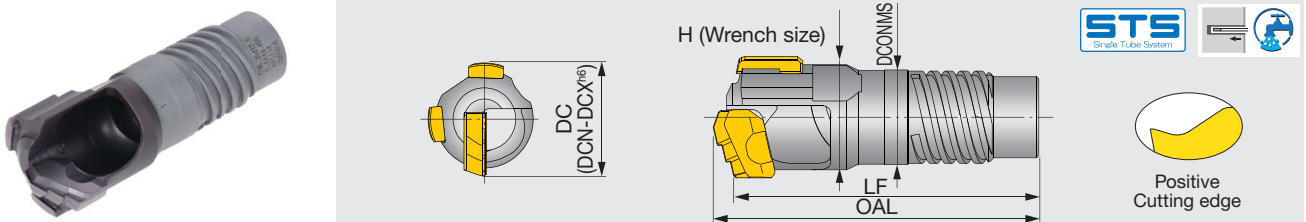
The microstructure and grain size of the bottom layer is controlled for enhanced adherence quality of the coating and carbide substrate.

DRILL HEAD

BSG STS

BSG type drill head(for general purpose)

Brazed drill head with external 4-start thread for single tube system (STS), tool diameter $\phi 15.6 - \phi 16.70$ mm, CICT = 1



Non-standard products (to be supplied on request)

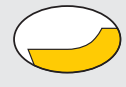
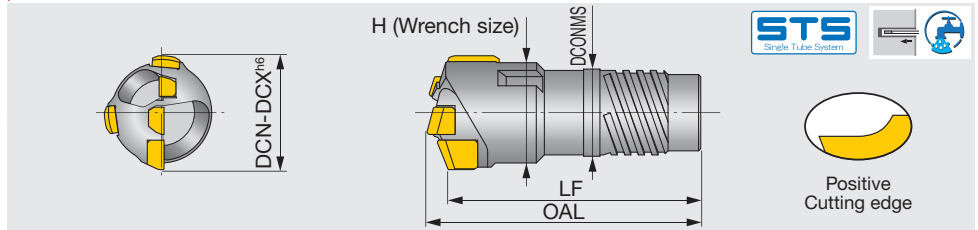
When ordering

BSG0097-	xx.xx	AHM930
Drill head	Diameter (mm)	Grade

e.g. Designation for tool diameter $\phi 15.90$ mm: BSG0097-15.90 AHM930

Designation	DCN	DCX	Drill tube		OAL	LF	DCONMS	H
			Designation	Dia. (mm)				
BSG0097-xx.xx	15.6	16.7	ST0097	14	43.39	40	12.6	13

Brazed drill head with external 4-start thread for single tube system (STS),
tool diameter $\phi 15.6$ - $\phi 65$ mm, CICT = 3



Positive Cutting edge

Non-standard products (to be supplied on request)

When ordering

BTG**-**

Drill head

XX.XX

Diameter (mm)

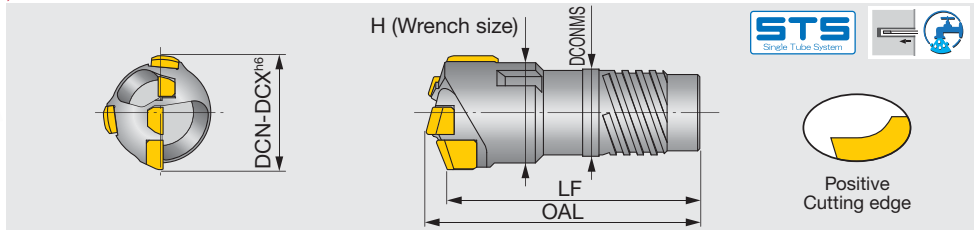
AHM930

Grade

e.g. Designation for tool diameter $\phi 16.2$ mm: **BTG00971-16.20 AHM930**

Designation	DCN	DCX	Drill tube		OAL	LF	DCONMS	H
			Designation	Dia. (mm)				
BTG00971-xx.xx	15.6	16.2	ST0097	14	43	40.3	12.6	-
BTG00972-xx.xx	16.21	16.7	ST0097	14	43	40.3	12.6	14
BTG00981-xx.xx	16.71	17.2	ST0098	15	43	40.3	13.6	15
BTG00982-xx.xx	17.21	17.7	ST0098	15	43	40.3	13.6	15
BTG00991-xx.xx	17.71	18.4	ST0099	16	47	44.2	14.5	15
BTG00992-xx.xx	18.41	18.9	ST0099	16	47	44.1	14.5	-
BTG001-xx.xx	18.91	19.2	ST0000	17	47	44.1	15.5	17
BTG002-xx.xx	19.21	20	ST0000	17	47	44	15.5	18
BTG011-xx.xx	20.01	20.9	ST00	18	52.5	49.4	16	18
BTG012-xx.xx	20.91	21.8	ST00	18	52.5	49.4	16	19
BTG021-xx.xx	21.81	22.9	ST01	20	56	52.8	18	20
BTG022-xx.xx	22.91	24.1	ST01	20	56	52.6	18	21
BTG031-xx.xx	24.11	25.2	ST02	22	57.5	54	19.5	23
BTG032-xx.xx	25.21	26.4	ST02	22	57.5	54	19.5	24
BTG041-xx.xx	26.41	27.5	ST03	24	57.5	53.8	21	25
BTG042-xx.xx	27.51	28.7	ST03	24	57.5	53.8	21	26
BTG051-xx.xx	28.71	29.8	ST04	26	63.5	59.5	23.5	27
BTG052-xx.xx	29.81	31	ST04	26	63.5	59.3	23.5	28
BTG061-xx.xx	31.01	32.1	ST05	28	63.5	59.4	25.5	29
BTG062-xx.xx	32.11	33.3	ST05	28	63.5	59.1	25.5	30
BTG071-xx.xx	33.31	34.8	ST06	30	63.5	59	28	32
BTG072-xx.xx	34.81	36.2	ST06	30	63.5	58.9	28	33
BTG081-xx.xx	36.21	37.3	ST07	33	73.5	68.7	30	34
BTG082-xx.xx	37.31	38.4	ST07	33	73.5	68.5	30	35
BTG083-xx.xx	38.41	39.6	ST07	33	73.5	68.3	30	36
BTG091-xx.xx	39.61	40.6	ST08	36	73.5	68.2	33	37
BTG092-xx.xx	40.61	41.8	ST08	36	73.5	68	33	38
BTG093-xx.xx	41.81	43	ST08	36	73.5	67.8	33	39
BTG101-xx.xx	43.01	44.3	ST09	39	75	69.5	36	41
BTG102-xx.xx	44.31	45.6	ST09	39	75	69.3	36	42
BTG103-xx.xx	45.61	47	ST09	39	75	69.1	36	43
BTG111-xx.xx	47.01	48.5	ST10	43	75	68.8	39	44
BTG112-xx.xx	48.51	50.1	ST10	43	75	68.7	39	46
BTG113-xx.xx	50.11	51.7	ST10	43	75	68.5	39	47
BTG121-xx.xx	51.71	53.2	ST11	47	82	75.2	43	49
BTG122-xx.xx	53.21	54.7	ST11	47	82	75.2	43	50
BTG123-xx.xx	54.71	56.2	ST11	47	82	75.2	43	51
BTG131-xx.xx	56.21	58.4	ST12	51	84	77.4	47	54
BTG132-xx.xx	58.41	60.6	ST12	51	84	76.9	47	55
BTG133-xx.xx	60.61	62.8	ST12	51	84	76.8	47	57
BTG134-xx.xx	62.81	65	ST12	51	84	76.5	47	59
BTG133L-xx.xx	60.61	62.8	ST13	56	84	76.8	51	57
BTG134L-xx.xx	62.81	65	ST13	56	84	76.5	51	59

Brazed drill head with external 4-start thread for single tube system (STS),
tool diameter $\phi 15.6 - \phi 65$ mm, CICT = 3



Non-standard products (to be supplied on request)

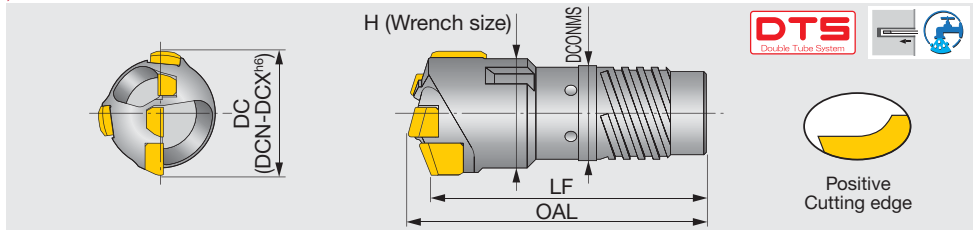
When ordering

BTL****-	XX.XX	AHM930
Drill head	Diameter (mm)	Grade

e.g. Designation for tool diameter $\phi 16.2$ mm: BTL00971-16.20 AHM930

Designation	DCN	DCX	Drill tube		OAL	LF	DCONMS	H
			Designation	Dia. (mm)				
BTL00971-xx.xx	15.6	16.2	ST0097	14	43	40.3	12.6	-
BTL00972-xx.xx	16.21	16.7	ST0097	14	43	40.3	12.6	14
BTL00981-xx.xx	16.71	17.2	ST0098	15	43	40.3	13.6	15
BTL00982-xx.xx	17.21	17.7	ST0098	15	43	40.3	13.6	15
BTL00991-xx.xx	17.71	18.4	ST0099	16	47	44.2	14.5	15
BTL00992-xx.xx	18.41	18.9	ST0099	16	47	44.1	14.5	-
BTL001-xx.xx	18.91	19.2	ST0000	17	47	44.1	15.5	17
BTL002-xx.xx	19.21	20	ST0000	17	47	44	15.5	18
BTL011-xx.xx	20.01	20.9	ST00	18	52.5	49.4	16	18
BTL012-xx.xx	20.91	21.8	ST00	18	52.5	49.4	16	19
BTL021-xx.xx	21.81	22.9	ST01	20	56	52.8	18	20
BTL022-xx.xx	22.91	24.1	ST01	20	56	52.6	18	21
BTL031-xx.xx	24.11	25.2	ST02	22	57.5	54	19.5	23
BTL032-xx.xx	25.21	26.4	ST02	22	57.5	54	19.5	24
BTL041-xx.xx	26.41	27.5	ST03	24	57.5	53.8	21	25
BTL042-xx.xx	27.51	28.7	ST03	24	57.5	53.8	21	26
BTL051-xx.xx	28.71	29.8	ST04	26	63.5	59.5	23.5	27
BTL052-xx.xx	29.81	31	ST04	26	63.5	59.3	23.5	28
BTL061-xx.xx	31.01	32.1	ST05	28	63.5	59.4	25.5	29
BTL062-xx.xx	32.11	33.3	ST05	28	63.5	59.1	25.5	30
BTL071-xx.xx	33.31	34.8	ST06	30	63.5	59	28	32
BTL072-xx.xx	34.81	36.2	ST06	30	63.5	58.9	28	33
BTL081-xx.xx	36.21	37.3	ST07	33	73.5	68.7	30	34
BTL082-xx.xx	37.31	38.4	ST07	33	73.5	68.5	30	35
BTL083-xx.xx	38.41	39.6	ST07	33	73.5	68.3	30	36
BTL091-xx.xx	39.61	40.6	ST08	36	73.5	68.2	33	37
BTL092-xx.xx	40.61	41.8	ST08	36	73.5	68	33	38
BTL093-xx.xx	41.81	43	ST08	36	73.5	67.8	33	39
BTL101-xx.xx	43.01	44.3	ST09	39	75	69.5	36	41
BTL102-xx.xx	44.31	45.6	ST09	39	75	69.3	36	42
BTL103-xx.xx	45.61	47	ST09	39	75	69.1	36	43
BTL111-xx.xx	47.01	48.5	ST10	43	75	68.8	39	44
BTL112-xx.xx	48.51	50.1	ST10	43	75	68.7	39	46
BTL113-xx.xx	50.11	51.7	ST10	43	75	68.5	39	47
BTL121-xx.xx	51.71	53.2	ST11	47	82	75.2	43	49
BTL122-xx.xx	53.21	54.7	ST11	47	82	75.2	43	50
BTL123-xx.xx	54.71	56.2	ST11	47	82	75.2	43	51
BTL131-xx.xx	56.21	58.4	ST12	51	84	77.4	47	54
BTL132-xx.xx	58.41	60.6	ST12	51	84	76.9	47	55
BTL133-xx.xx	60.61	62.8	ST12	51	84	76.8	47	57
BTL134-xx.xx	62.81	65	ST12	51	84	76.5	47	59
BTL133L-xx.xx	60.61	62.8	ST13	56	84	76.8	51	57
BTL134L-xx.xx	62.81	65	ST13	56	84	76.5	51	59

Brazed drill head with external 4-start thread for double tube system (DTS),
tool diameter $\phi 18.4 - \phi 65$ mm, CICT = 3



Non-standard products (to be supplied on request)

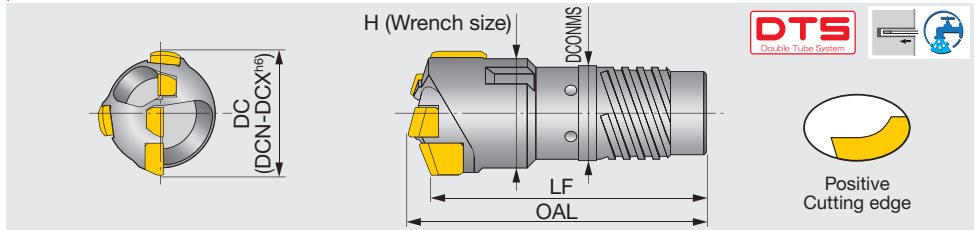
When ordering

ETG***-	XX.XX	AHM930
Drill head	Diameter (mm)	Grade

e.g. Designation for tool diameter $\phi 19.2$ mm: **ETG001-19.20 AHM930**

Designation	DCN	DCX	Drill tube		OAL	LF	DCONMS	H
			Designation	Dia. (mm)				
ETG001-xx.xx	18.4	19.2	OT00	18	50	47.1	16	17
ETG002-xx.xx	19.21	20	OT00	18	50	47	16	18
ETG011-xx.xx	20.01	20.9	OT01	19.5	56	52.8	18	18
ETG012-xx.xx	20.91	21.8	OT01	19.5	56	52.7	18	19
ETG021-xx.xx	21.81	22.9	OT02	21.5	56	52.8	19.5	20
ETG022-xx.xx	22.91	24.1	OT02	21.5	56	52.6	19.5	21
ETG031-xx.xx	24.11	25.2	OT03	23.5	57.5	54	21	23
ETG032-xx.xx	25.21	26.4	OT03	23.5	57.5	54	21	24
ETG041-xx.xx	26.41	27.5	OT04	26	60.5	56.8	23.5	25
ETG042-xx.xx	27.51	28.7	OT04	26	60.5	56.8	23.5	26
ETG051-xx.xx	28.71	29.8	OT05	28	63.5	59.5	25.5	27
ETG052-xx.xx	29.81	31	OT05	28	63.5	59.3	25.5	28
ETG061-xx.xx	31.01	32.1	OT06	30.5	63.5	59.4	28	29
ETG062-xx.xx	32.11	33.3	OT06	30.5	63.5	59.2	28	30
ETG071-xx.xx	33.31	34.8	OT07	33	70.5	66	30	32
ETG072-xx.xx	34.81	36.2	OT07	33	70.5	65.8	30	33
ETG081-xx.xx	36.21	37.3	OT08	35.5	73.5	68.7	33	34
ETG082-xx.xx	37.31	38.4	OT08	35.5	73.5	68.5	33	35
ETG083-xx.xx	38.41	39.6	OT08	35.5	73.5	68.3	33	36
ETG091-xx.xx	39.61	40.6	OT09	39	73.5	68.2	36	37
ETG092-xx.xx	40.61	41.8	OT09	39	73.5	68	36	38
ETG093-xx.xx	41.81	43	OT09	39	73.5	67.9	36	39
ETG101-xx.xx	43.01	44.3	OT10	42.5	75	69.5	39	41
ETG102-xx.xx	44.31	45.6	OT10	42.5	75	69.3	39	42
ETG103-xx.xx	45.61	47	OT10	42.5	75	69.1	39	43
ETG111-xx.xx	47.01	48.5	OT11	46.5	79	72.9	43	44
ETG112-xx.xx	48.51	50.1	OT11	46.5	79	72.8	43	46
ETG113-xx.xx	50.11	51.7	OT11	46.5	79	72.5	43	47
ETG121-xx.xx	51.71	53.2	OT12	51	82	75.3	47	49
ETG122-xx.xx	53.21	54.7	OT12	51	82	75.5	47	50
ETG123-xx.xx	54.71	56.2	OT12	51	82	75.3	47	51
ETG131-xx.xx	56.21	58.4	OT13	55.5	84	77.4	51	54
ETG132-xx.xx	58.41	60.6	OT13	55.5	84	76.9	51	55
ETG133-xx.xx	60.61	62.8	OT13	55.5	84	77	51	57
ETG134-xx.xx	62.81	65	OT13	55.5	84	76.6	51	59

Brazed drill head with external 4-start thread for double tube system (DTS),
tool diameter $\phi 18.4 - \phi 65$ mm, CICT = 3



Non-standard products (to be supplied on request)

When ordering

ETL***-	XX.XX	AHM930
Drill head	Diameter (mm)	Grade

e.g. Designation for tool diameter $\phi 19.2$ mm: ETL001-19.20 AHM930

Designation	DCN	DCX	Drill tube		OAL	LF	DCONMS	H
			Designation	Dia. (mm)				
ETL001-xx.xx	18.4	19.2	OT00	18	50	47.1	16	17
ETL002-xx.xx	19.21	20	OT00	18	50	47	16	18
ETL011-xx.xx	20.01	20.9	OT01	19.5	56	52.8	18	18
ETL012-xx.xx	20.91	21.8	OT01	19.5	56	52.7	18	19
ETL021-xx.xx	21.81	22.9	OT02	21.5	56	52.8	19.5	20
ETL022-xx.xx	22.91	24.1	OT02	21.5	56	52.6	19.5	21
ETL031-xx.xx	24.11	25.2	OT03	23.5	57.5	54	21	23
ETL032-xx.xx	25.21	26.4	OT03	23.5	57.5	54	21	24
ETL041-xx.xx	26.41	27.5	OT04	26	60.5	56.8	23.5	25
ETL042-xx.xx	27.51	28.7	OT04	26	60.5	56.8	23.5	26
ETL051-xx.xx	28.71	29.8	OT05	28	63.5	59.5	25.5	27
ETL052-xx.xx	29.81	31	OT05	28	63.5	59.3	25.5	28
ETL061-xx.xx	31.01	32.1	OT06	30.5	63.5	59.4	28	29
ETL062-xx.xx	32.11	33.3	OT06	30.5	63.5	59.2	28	30
ETL071-xx.xx	33.31	34.8	OT07	33	70.5	66	30	32
ETL072-xx.xx	34.81	36.2	OT07	33	70.5	65.8	30	33
ETL081-xx.xx	36.21	37.3	OT08	35.5	73.5	68.7	33	34
ETL082-xx.xx	37.31	38.4	OT08	35.5	73.5	68.5	33	35
ETL083-xx.xx	38.41	39.6	OT08	35.5	73.5	68.3	33	36
ETL091-xx.xx	39.61	40.6	OT09	39	73.5	68.2	36	37
ETL092-xx.xx	40.61	41.8	OT09	39	73.5	68	36	38
ETL093-xx.xx	41.81	43	OT09	39	73.5	67.9	36	39
ETL101-xx.xx	43.01	44.3	OT10	42.5	75	69.5	39	41
ETL102-xx.xx	44.31	45.6	OT10	42.5	75	69.3	39	42
ETL103-xx.xx	45.61	47	OT10	42.5	75	69.1	39	43
ETL111-xx.xx	47.01	48.5	OT11	46.5	79	72.9	43	44
ETL112-xx.xx	48.51	50.1	OT11	46.5	79	72.8	43	46
ETL113-xx.xx	50.11	51.7	OT11	46.5	79	72.5	43	47
ETL121-xx.xx	51.71	53.2	OT12	51	82	75.3	47	49
ETL122-xx.xx	53.21	54.7	OT12	51	82	75.5	47	50
ETL123-xx.xx	54.71	56.2	OT12	51	82	75.3	47	51
ETL131-xx.xx	56.21	58.4	OT13	55.5	84	77.4	51	54
ETL132-xx.xx	58.41	60.6	OT13	55.5	84	76.9	51	55
ETL133-xx.xx	60.61	62.8	OT13	55.5	84	77	51	57
ETL134-xx.xx	62.81	65	OT13	55.5	84	76.6	51	59

RECOMMENDED DRILL HEAD

ISO	Workpiece material	Hardness	Drill dia. (mm)			
			15.6-65			
			STS		DTS	
		First choice	Troubleshooting Chip Control	First choice	Troubleshooting Chip Control	
P	Low carbon steels (C ≤ 0.3%)	- 200 HB	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
	Carbon steels (C > 0.3%)	- 300 HB	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
	Alloy steels	- 300 HB	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
	Low alloy steels	- 300 HB	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
M	Stainless steel	- 200 HB	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
K	Grey cast irons	150 - 250 HB	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
	Ductile cast irons	150 - 250 HB	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
N	Aluminium alloy	-	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
S	Titanium alloys Heat-resistant alloys	- 40 HRC	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930
H	Hardened steel	- 50 HRC	BSG / BTG, AHM930	BTL, AHM930	ETG, AHM930	ETL, AHM930

STANDARD CUTTING CONDITIONS







ISO	Workpiece material	JIS	Condition	Hardness (HB)	Cutting speed Vc (m/min)	Feed: f (mm/rev)					
						Drill dia. (mm)					
						15.6-16.7	12.6 - 20	20.01 - 31	31.01 - 43	43.01 - 65	
						BSG, BTG, ETG, BTL, ETL, BTU, ETU					
P	Carbon steel	S10C - S25C, SS	0.1 - 0.25 %C Non-hardened	125	70 - 130	0.1 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
				190	70 - 130	0.1 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
	Cast steel	S25C - S55C	0.25 - 0.25 %C Non-hardened	250	70 - 130	0.1 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
				220	70 - 130	0.1 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
	High carbon steel	SK	0.55 - 0.80 %C Non-hardened	300	70 - 130	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28	
				300	70 - 130	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28	
	Carbon tool steel	SK	0.55 - 0.80 %C Hardened	200	70 - 110	0.1 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
				275	60 - 110	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28	
	Low alloy steel	SNC, DCr, SNCN	SCM, SMn	Hardened	300	60 - 110	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28
					350	60 - 110	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28
350					60 - 110	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28	
Cast steel (alloying element < 5%)	SNC, DCr, SNCN	SCM, SMn	Hardened	300	60 - 110	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28	
				350	60 - 110	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28	
High alloy steel, Cast steel, Tool steel	SNS, SKD, SKT	SKH, SK	Non-hardened	200	70 - 130	0.1 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
				325	70 - 130	0.1 - 0.12	0.08 - 0.12	0.1 - 0.15	0.13 - 0.17	0.15 - 0.28	
M	Stainless steel	SUS430	Ferritic	200	40 - 110	0.04 - 0.16	0.08 - 0.15	0.1 - 0.28	0.13 - 0.3	0.16 - 0.35	
				240	40 - 110	0.04 - 0.16	0.08 - 0.15	0.1 - 0.28	0.13 - 0.3	0.16 - 0.35	
				180	40 - 110	0.04 - 0.14	0.05 - 0.12	0.08 - 0.25	0.1 - 0.28	0.15 - 0.33	
Ductile cast iron	FCD400 - FCD450	FCD500 - FCD700	Ferritic / Pearlitic	180	50 - 110	0.06 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
				260	50 - 110	0.06 - 0.16	0.08 - 0.15	0.1 - 0.17	0.13 - 0.2	0.16 - 0.3	
Grey cast iron	FC100 - FC200	FC250 - FC350	Low tensile strength	160	60 - 110	0.06 - 0.16	0.06 - 0.13	0.08 - 0.18	0.1 - 0.2	0.15 - 0.25	
				250	60 - 110	0.06 - 0.16	0.06 - 0.13	0.08 - 0.18	0.1 - 0.2	0.15 - 0.25	
Malleable cast iron	FCMB, FCMW	FCMWP, FCMP	Ferritic	130	70 - 110	0.06 - 0.16	0.06 - 0.13	0.08 - 0.18	0.1 - 0.2	0.15 - 0.25	
				230	70 - 110	0.06 - 0.16	0.06 - 0.13	0.08 - 0.18	0.1 - 0.2	0.15 - 0.25	
N	Aluminium alloys Wrought		Non-aged	60	65 - 130	0.08 - 0.16	0.08 - 0.15	0.1 - 0.2	0.15 - 0.25	0.16 - 0.3	
				100	65 - 130	0.08 - 0.16	0.08 - 0.15	0.1 - 0.2	0.15 - 0.25	0.16 - 0.3	
	Aluminium alloys Cast		≤12% Si	Non-aged	75	65 - 130	0.08 - 0.16	0.08 - 0.15	0.1 - 0.2	0.15 - 0.25	0.16 - 0.3
					90	65 - 130	0.08 - 0.16	0.08 - 0.15	0.1 - 0.2	0.15 - 0.25	0.16 - 0.3
	Copper alloys		>12% Si	High silicon content	130	65 - 130	0.08 - 0.16	0.08 - 0.15	0.1 - 0.2	0.15 - 0.25	0.16 - 0.3
					110	65 - 130	0.08 - 0.16	0.08 - 0.15	0.1 - 0.2	0.15 - 0.25	0.16 - 0.3
S	Heat-resistant alloys		Fe based alloys	Non-aged	200	20 - 50	0.06 - 0.14	0.06 - 0.12	0.08 - 0.15	0.12 - 0.18	0.15 - 0.25
					280	20 - 50	0.06 - 0.14	0.06 - 0.12	0.08 - 0.15	0.12 - 0.18	0.15 - 0.25
	Titanium alloys		Ni / Co based alloys	Non-aged	250	20 - 50	0.06 - 0.14	0.06 - 0.12	0.08 - 0.15	0.12 - 0.18	0.15 - 0.25
					350	20 - 50	0.06 - 0.14	0.06 - 0.12	0.08 - 0.15	0.12 - 0.18	0.15 - 0.25
	Hardened steel		α	Cast	320	20 - 50	0.06 - 0.14	0.06 - 0.12	0.08 - 0.15	0.12 - 0.18	0.15 - 0.25
					Rm400	30 - 60	0.06 - 0.12	0.05 - 0.1	0.08 - 0.12	0.1 - 0.15	0.12 - 0.2
Hardened steel		α-β	Cast	Rm1050	30 - 60	0.06 - 0.12	0.05 - 0.1	0.08 - 0.12	0.1 - 0.15	0.12 - 0.2	
				20 - 50	0.06 - 0.12	0.06 - 0.1	0.08 - 0.12	0.1 - 0.15	0.1 - 0.2		

Cutting parameters shown here are relating to the basic recommendations for cutting materials given.

Cutting conditions, material hardness, and other relevant variables must be taken into considerations to determine the actual cutting parameters.

Line up

Drill tube

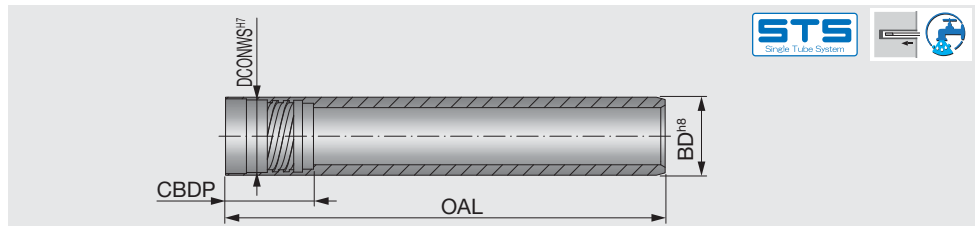
Drill tubes		STS (Single Tube System) 			DTS (Double Tube System) 			
Designation		UMBB	ST	ST	OT	IT		
Shape								
Tube diameter (mm)		ø7.1 - ø12	ø11 - ø13	ø14 - ø56	ø18 - ø55.5	ø12 - ø43		
Thread type		Internal single-start thread	Internal 2-start thread	Internal 4-start thread	Internal 4-start thread	-		
Drill heads	Brazed	For solid drilling	MBU	○	-	-	-	
			New UTE, New BSG, New BTG, BTL, BTU	-	○	○	-	-
			New ETG, New ETL, ETU	-	-	-	○	○
Drill diameter (mm)		ø8 - ø14.79	ø12.6 - ø15.59	ø15.6 - ø65	ø18.4 - ø65	ø18.4 - ø65		

DRILL TUBE

ST STS

ST - for single tube system

Drill tube for single tube system (STS), internal thread type, 2-start thread (tool dia. ≤ ø15.59 mm) or 4-start thread (tool dia. ≥ ø15.6 mm)



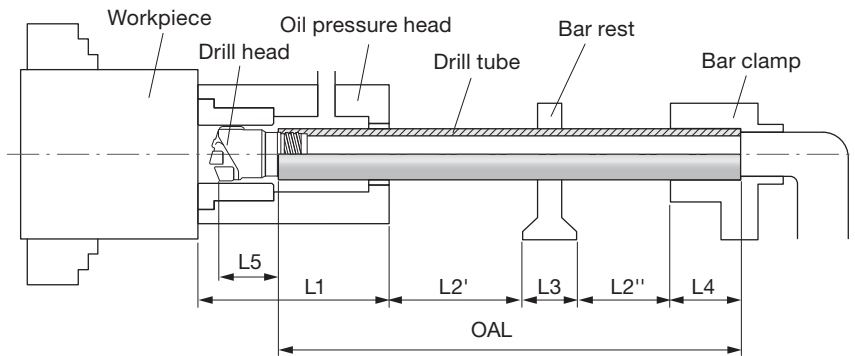
Designation	DCN-DCX	OAL		Special length	BD	DCONWS	CBDP	Designation	DCN-DCX	OAL		Special length	BD	DCONWS	CBDP
		1600	2600							1600	2600				
ST0097	15.6 - 16.7	●		○	14	12.6	21	ST06	33.31 - 36.2		●	○	30	28	33
ST0098	16.71 - 17.7	●	●	○	15	13.6	21	ST07	36.21 - 39.6		●	○	33	30	40
ST0099	17.71 - 18.9	●	●	○	16	14.5	22	ST08	39.61 - 43		●	○	36	33	40
ST0000	18.91 - 20	●	●	○	17	15.5	22	ST09	43.01 - 47		●	○	39	36	40
ST00	20.01 - 21.8	●	●	○	18	16	27.5	ST10	47.01 - 51.7		●	○	43	39	40
ST01	21.81 - 24.1		●	○	20	18	30	ST11	51.71 - 56.2		●	○	47	43	44
ST02	24.11 - 26.4		●	○	22	19.5	30	ST12	56.21 - 60.6		●	○	51	47	44
ST03	26.41 - 28.7		●	○	24	21	30	ST13	60.61 - 65			○	56	51	44
ST04	28.71 - 31		●	○	26	23.5	33								
ST05	31.01 - 33.3		●	○	28	25.5	33								

● : Line up
○ : Item to be customized

Please specify the length (L) when ordering.
e.g. For ø60 mm drill diameter / 2600 mm drill tube length: ST12X2600
The lengths that are not in the above will be available upon request.

■ Tube length (STS)

Drill tubes with non-standard lengths will be available upon request. Please use the guide below to calculate the drill tube length.



- OAL = Drill tube overall length
- L1 = Oil pressure head length
- L2 = Drilling depth (L2' + L2'')
- L3 = Bar rest length
- L4 = Drill tube clamp length
- L5 = Length from drill tube tip and peripheral edge tip

$$\text{Drill tube length OAL} = L1 + L2 + L3 + L4 - L5$$

New **New**
BTG, BTL



DCN-DCX	L5
15.6 - 17.7	20
17.71 - 19.2	23
19.21 - 21.8	22
21.81 - 24.1	23
24.11 - 28.7	24
28.71 - 33.3	27
33.31 - 36.2	26
36.21 - 40.6	29
40.61 - 43	28
43.01 - 47	30
47.01 - 51.7	29
51.71 - 56.2	32
56.21 - 58.4	34
58.41 - 65	33

New
BSG

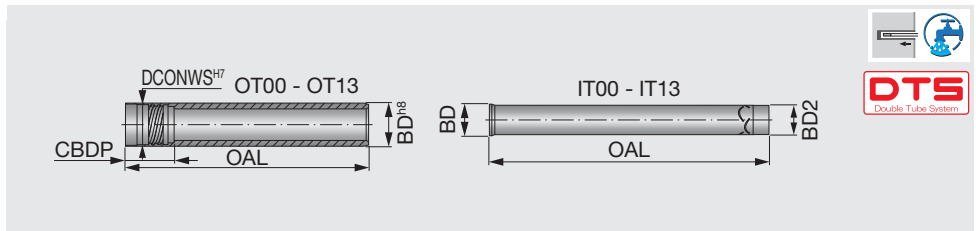


DCN-DCX	L5
15.60-16.70	19

OT & IT DTS

OT & IT - for double tube system

Outer tube and inner tube for double tube system (DTS)



Outer tube (OT)

Designation	DCN-DCX	OAL Special length	BD	DCONWS	CBDP
OT00	18.4 - 20	○	18	16	27.5
OT01	20.01 - 21.8	○	19.5	18	30
OT02	21.81 - 24.1	○	21.5	19.5	30
OT03	24.11 - 26.4	○	23.5	21	30
OT04	26.41 - 28.7	○	26	23.5	33
OT05	28.71 - 31	○	28	25.5	33
OT06	31.01 - 33.3	○	30.5	28	33
OT07	33.31 - 36.2	○	33	30	40
OT08	36.21 - 39.6	○	35.5	33	40
OT09	39.61 - 43	○	39	36	40
OT10	43.01 - 47	○	42.5	39	40
OT11	47.01 - 51.7	○	46.5	43	44
OT12	51.71 - 56.2	○	51	47	44
OT13	56.21 - 65	○	55.5	51	44

Inner tube (IT)

Designation	DCN-DCX	OAL Special length	BD	BD2
IT00	18.4 - 20	○	12	10
IT01	20.01 - 21.8	○	14	12
IT02	21.81 - 24.1	○	15	13
IT03	24.11 - 26.4	○	16	14
IT04	26.41 - 28.7	○	18	16
IT05	28.71 - 31	○	20	18
IT06	31.01 - 33.3	○	22	20
IT07	33.31 - 36.2	○	24	22
IT08	36.21 - 39.6	○	26	24
IT09	39.61 - 43	○	29	27
IT10	43.01 - 47	○	32	30
IT11	47.01 - 51.7	○	35	32
IT12	51.71 - 56.2	○	39	36
IT13	56.21 - 65	○	43	40

Please specify the length when ordering.

e.g. For ø60 mm drill diameter / 1070 mm drill outer tube length: OT13X1070

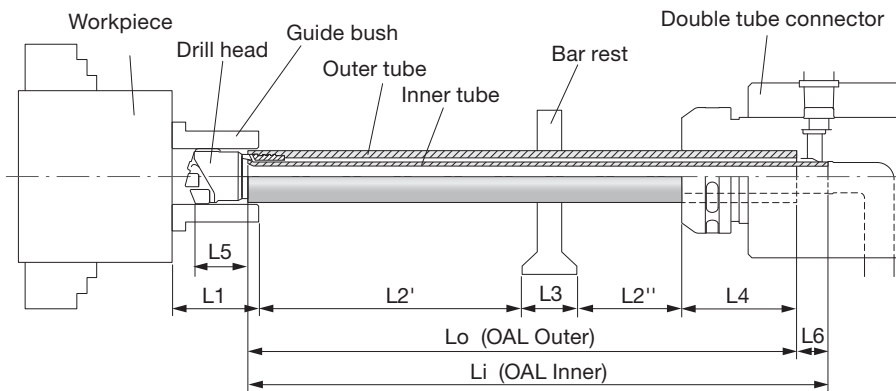
Please choose the inner tube length according to the guide below:

▶ tool diameter: ø18.40 - ø65.00 mm (OT00 - OT13) Inner tube length = Outer tube length + 30 mm

○ : Item to be customized

Tube length (DTS)

Please use the guide below to calculate the drill tube length.



- Lo = Outer tube overall length
- Li = Inner tube overall length
- L1 = Guide bush length (or Pilot hole depth)
- L2 = Drilling depth (L2' + L2'')
- L3 = Bar rest length
- L4 = Length of outer tube in connector
- L5 = Length from drill tube tip and peripheral edge tip
- L6 = Difference between outer tube length and inner tube length

Outer tube overall length
 $Lo = L1 + L2 + L3 + L4 - L5$

Inner tube overall length
 $Li = Lo + L6$

DTC	L4	L6
DTC 4R (OT00 - OT13)	120	30

(mm)


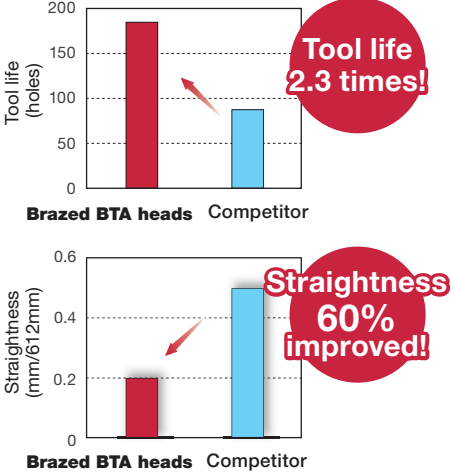
New New
ETG, ETL



DCN-DCX	L5
18.4 - 20	20
20.01 - 24.1	23
24.11 - 28.7	24
28.71 - 33.3	27
33.31 - 36.2	26
36.21 - 40.6	29
40.61 - 43	28
43.01 - 47	30
47.01 - 51.7	29
51.71 - 56.2	32
56.21 - 58.4	34
58.41 - 65	33

To facilitate a smooth drill entry into the workpiece, make sure that the drill is inside the guiding bush or pilot hole all the way up to 5 mm over the outer tube before starting the drilling.

PRACTICAL EXAMPLES

Workpiece type		Shaft
Drill		BSG-00971-15.70
Grade		AHM930
		41NiCrMo4
Workpiece material		
Cutting conditions	Cutting speed: V_c (m/min)	79
	Feed : f (mm/rev)	0.12
	Feed speed : V_f (mm/min)	192
	Drilling depth : H (mm)	612
	Machine	BTA machine
Coolant		Wet
Results		



tungaloy.com

follow us at:

facebook.com/tungaloyjapan

twitter.com/tungaloyjapan

www.youtube.com/tungaloycorporation

Distributed by:



Tungaloy APP & SNS

FIND US ON THE CLOUD!
machingcloud.com



AS9100 Certified
78006
2015.11.04
ISO 14001 Certified
EC97J1123
1997.11.26