

Solution for Tube Sheet Processing

- » Brazed Drill Head
- » Indexable Carbide Deep Hole Drill



Deep Hole Drilling

A deep hole is defined by its depth-to-diameter ratio (D:d), and typically holes greater than 10:1 are considered deep holes. Deep hole drilling into metal has a range of applications across several industries, with its origins tracing back to the need for straighter, more accurate gun barrels, and expanding as other industries integrated deep hole drilling processes to improve their own applications.

Deep hole drilling consists of BTA drilling and gun drilling, with additional processes designed for specific tolerance objectives and generally performed on BTA-style deep hole drilling machines. Deep hole drilling is used in a variety of materials from aluminum to super-alloys, and is capable of achieving tight diameter control, straightness, and superior surface finish into workpieces.

Deep hole drilling processes work by using special tools and setups to deliver high pressure coolant, evacuate chips cleanly, and achieve depth-to-diameter holes into metal beyond what a common CNC machine can reach. This allows manufacturers to achieve their manufacturing tolerances and production requirements reliably, accurately, and efficiently.

BTA Drilling

BTA deep hole drilling is used for larger hole drilling, typically 20 – 200 mm [0.80 – 8.00 in] in diameter. High-pressure coolant is introduced around the outside of the tool through the pressure head assembly. Chips are discharged through the tool center, through the drill tube and machine spindle.

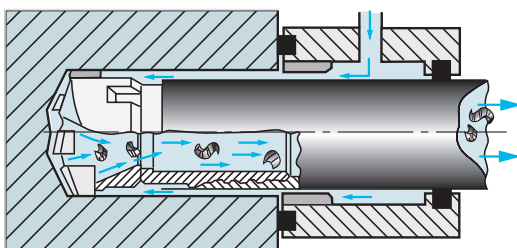
BTA drilling typically performs 5-7 times faster than gundrilling, and requires higher power.

Additional extended diameters can be drilled on BTA machines with secondary deep hole operations, such as counter-boring.

There is 2 types of drilling which are DTS systems and STS systems. We will only focus on STS systems as all our drill heads are for STS system.

The BTA—STS Drill is a single Tube Drilling system used in Deep Hole Drilling applications where fast metal removal is needed. Drill sizes in BTA Drills are from 0.312"-2.559" diameter. New drills are manufactured in a number of grades to fit individual customer requirements. BTA (STS) Drills of brazed construction can be re-tipped in our plant to an "as new" condition at a significant cost reduction and savings to the customer. These drills require high pressure coolant to flush the chips through the tube to the chip box. The STS may also be referred to as the BTA system in the deep hole drilling process.

STS DRILLING SYSTEM

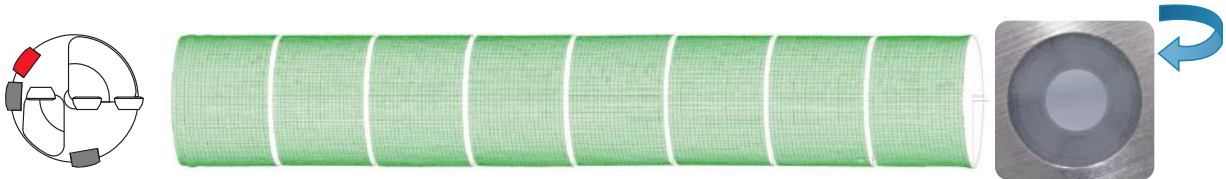


CT Coated Drills: Suitable for Medium and High speed drilling with highly accuracy and longer tool's life. (CT coating is a very special Japanese technology coating)

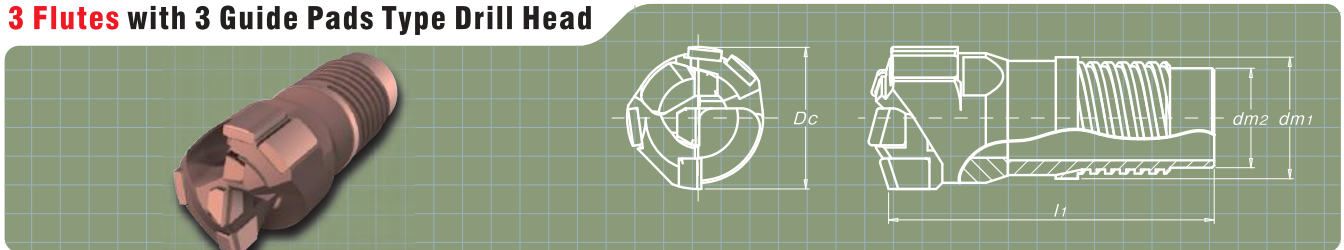
Drill Heads Design with 3 Guide Pads(CT Coating)

A. Unique Design of 3 Flutes with 3 Guide Pads Drill Head(CT Coating)

Feature: Reduced vibration during drilling and highly improved the roundness of the drilling holes
Holes with perfect roundness after drilling



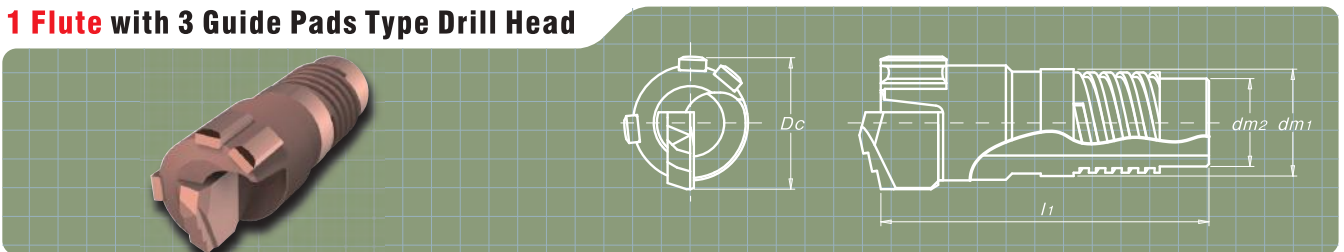
3 Flutes with 3 Guide Pads Type Drill Head



Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimension			
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1	Stock
BTA-Dxxxx-CT-3	15.60-16.70	BA4S-0097	14	12.6	10.8	40	●
BTA-Dxxxx-CT-3	17.71-18.90	BA4S-0099	16	14.5	12.5	40	●
BTA-Dxxxx-CT-3	18.91-20.00	BA4S-0000	17	15.5	13.5	44	●
BTA-Dxxxx-CT-3	20.01-21.80	BA4S-00	18	16	14	49	●
BTA-Dxxxx-CT-3	21.81-24.10	BA4S-01	20	18	16	52	●
BTA-Dxxxx-CT-3	24.11-26.00	BA4S-02	22	19.5	17.5	54	●

1 Flute with 3 Guide Pads Type Drill Head



Unit (mm)

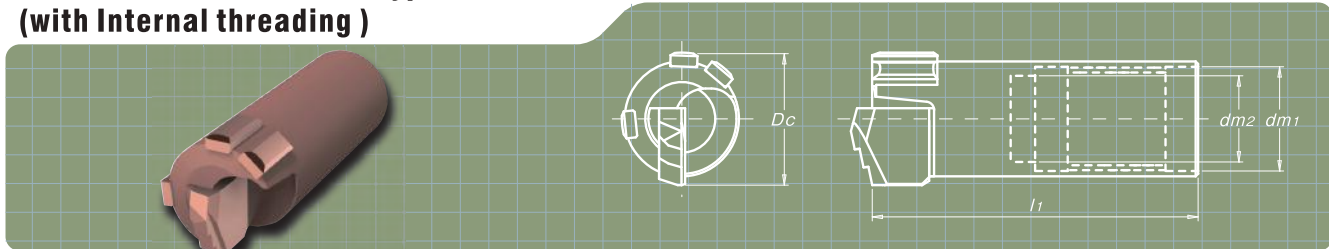
Drill Head Model	Drilling Range	Suitable Tube		Dimension			
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1	Stock
BTA-Dxxxx-CT-T-3	15.60-16.70	BA4S-0097	14	12.6	10.8	40	●

● Stock ○ Non-stock

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Drill Heads Design with 3 Guide Pads(CT Coating)

1 Flute with 3 Guide Pads Type Drill Head (with Internal threading)



Unit (mm)

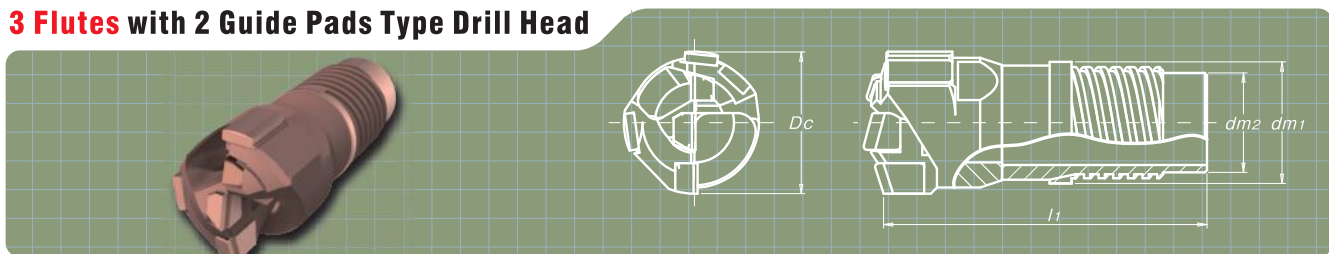
Drill Head Model	Drilling Range	Suitable Tube		Dimention			
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1	Stock
BTA-Dxxxx-CT-E-3	15.51-16.00	BA1S-1301	13	12.4	10.8	40	●
BTA-Dxxxx-CT-E-3	16.01-16.50	BA1S-1302	13	12.7	11.1	40	●
BTA-Dxxxx-CT-E-3	16.51-17.25	BA1S-1401	14	13.4	11.8	40	●
BTA-Dxxxx-CT-E-3	17.26-18.00	BA1S-1402	14	13.7	12.1	40	●
BTA-Dxxxx-CT-E-3	18.01-19.00	BA1S-1500	15	14.4	12.8	40	●
BTA-Dxxxx-CT-E-3	19.01-19.50	BA1S-1650	16.5	15.4	13.8	40	●

Drill Heads Design with 2 Guide Pads(CT Coating)

B. Drill Heads Design with 2 Guide Pads(CT Coating)

Feature: With 2 guide pads, drill is able to reduce machining resistance, achieving fast and high-precision machining.

3 Flutes with 2 Guide Pads Type Drill Head



Unit (mm)

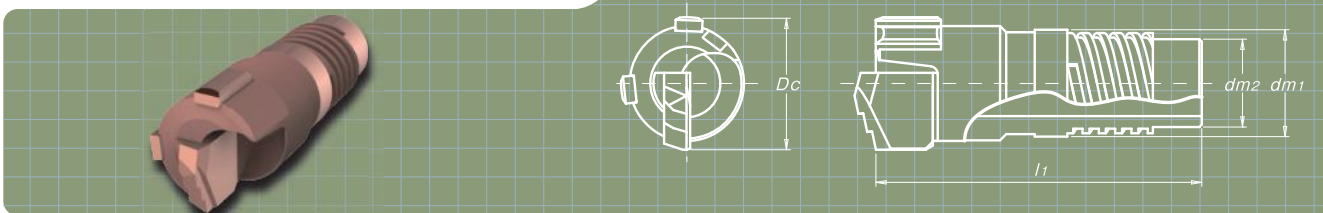
Drill Head Model	Drilling Range	Suitable Tube		Dimention			
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1	Stock
BTA-Dxxxx-CT	15.60-16.70	BA4S-0097	14	12.6	10.8	40	●
BTA-Dxxxx-CT	17.71-18.90	BA4S-0099	16	14.5	12.5	40	●
BTA-Dxxxx-CT	18.91-20.00	BA4S-0000	17	15.5	13.5	44	●
BTA-Dxxxx-CT	20.01-21.80	BA4S-00	18	16	14	49	●
BTA-Dxxxx-CT	21.81-24.10	BA4S-01	20	18	16	52	●
BTA-Dxxxx-CT	24.11-26.00	BA4S-02	22	19.5	17.5	54	●

● Stock ○ Non-stock

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Drill Heads Design with 2 Guide Pads(CT Coating)

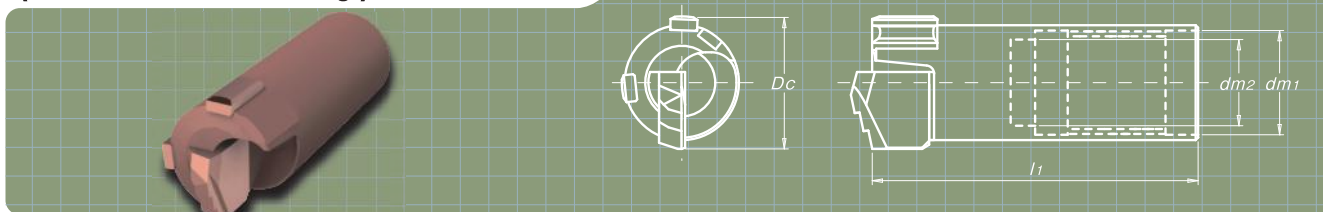
1 Flute with 2 Guide Pads Type Drill Head



Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention			
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1	Stock
BTA-Dxxxx-CT-T	15.60-16.70	BA4S-0097	14	12.6	10.8	40	●

1 Flute with 2 Guide Pads Type Drill Head (with Internal threading)



Unit (mm)

Drill Head Model	Drilling Range	Suitable Tube		Dimention			
		Tube Model	Tube Dia(mm)	dm1(mm)	dm2(mm)	L1	Stock
BTA-Dxxxx-CT-E	15.51-16.00	BA1S-1301	13	12.4	10.8	40	●
BTA-Dxxxx-CT-E	16.01-16.50	BA1S-1302	13	12.7	11.1	40	●
BTA-Dxxxx-CT-E	16.51-17.25	BA1S-1401	14	13.4	11.8	40	●
BTA-Dxxxx-CT-E	17.26-18.00	BA1S-1402	14	13.7	12.1	40	●
BTA-Dxxxx-CT-E	18.01-19.00	BA1S-1500	15	14.4	12.8	40	●
BTA-Dxxxx-CT-E	19.01-19.50	BA1S-1650	16.5	15.4	13.8	40	●

● Stock ○ Non-stock

Carbide Drills

U Drills

Head Exchangeable Drills

Deep Hole Drills

CDR 45° Chamfer Cutter

Non-standard Tools

Recommended Cutting Conditions

Machining data for BTA

Unit (mm)

ISO	Material	Condition	Tensile strength (N/mm ²)	Hardness HB	Material No.	Cutting speed Vc (m/min)	Ø15.60 - Ø20.00
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C Annealed	420	125	1	70-120	0.08-0.15
		>=0.25%C Annealed	650	190	2	70-120	0.08-0.15
		<0.55%C Quenched and tempered	850	250	3	40-70	0.08-0.15
		>=0.55%C Annealed	750	220	4	70-120	0.08-0.15
	Low alloy steel and cast steel (Less than 5% of alloying elements)	Quenched and tempered	1000	300	5	55-100	0.08-0.12
		Annealed	600	200	6	70-100	0.08-0.15
		Quenched and tempered	930	275	7	55-100	0.08-0.12
			1000	300	8	55-100	0.08-0.12
	High alloy steel, cast steel and tool steel	1200	350	9	55-100	0.08-0.12	
		Annealed	680	200	10	50-85	0.08-0.15
M	Stainless steel and cast steel	Quenched and tempered	1100	325	11	55-100	0.08-0.12
		Ferritic / martensitic	680	200	12	60-100	0.08-0.15
		Martensitic	820	240	13	60-100	0.08-0.15
K	Grey cast iron (GG)	Austenitic	600	180	14	60-100	0.05-0.12
		Ferritic		160	15	60-100	0.06-0.13
	Cast iron nodular (GGG)	Pearlitic		250	16	60-100	0.06-0.13
		Ferritic		180	17	80-100	0.08-0.15
	Malleable cast iron	Pearlitic		260	18	80-100	0.08-0.15
N	Aluminum - wrought alloy	Ferritic		130	19	50-100	0.06-0.13
		Pearlitic		230	20	50-100	0.06-0.13
	Aluminum-cast, alloyed	Not cureable		60	21	65-130	0.08-0.15
		Cured		100	22	65-100	0.08-0.15
	<=12% Si	Not cureable		75	23	65-130	0.08-0.15
		Cured		90	24	65-130	0.08-0.15
		High temp.		130	25	65-130	0.08-0.15
	>12% Si	Free cutting		110	26	65-130	0.08-0.15
		Brass		90	27	65-130	0.08-0.15
	Copper alloys	Electrolytic copper		100	28	65-130	0.08-0.15
Duroplastics, fiber plastics				29			
S	High temp. alloys	Hard rubber			30		
		Fe based	Annealed		200	31	10-50
	Ni or Co based	Cured		280	32	10-50	0.06-0.12
		Annealed		250	33	10-50	0.06-0.12
		Cured		350	34	10-50	0.06-0.12
		Cast		320	35	10-50	0.06-0.12
	Titanium, Ti alloys		Rm 400		36	30-50	0.05-0.10
		Alpha+beta alloys cured	Rm 1050		37	30-50	0.05-0.10
H	Hardened steel	Hardened		55HRC	38		
		Hardened		60HRC	39		
	Chilled cast iron	Cast		400	40		
Cast iron nodular	Hardened		55HRC	41			

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

TOTIME

Make it Simple



www.totimetools.com
www.totimetools.net

Dalian Totime Tools Co.,Ltd
Email: info@totimetools.com
Mobile: 13840810606

Chongqing Branch Office
Email: 2355431069@qq.com
Mobile: 15162402492

Wuxi Branch Office
Email: 18605102687@163.com
Mobile: 18651588111

Shenyang Branch Office
Email: 3247756004@qq.com
Mobile: 13898300401



Totime Tools Co.,Ltd
Email: info@totimetools.co.jp
Web: www.totimetools.co.jp



Totime Polska SP .ZO.O.
Email: biuro@totimetools.pl
Web: www.totimetools.eu



Totime Tools De Mexico
Email: info@totimetools.mx
Web: www.totimetools.mx