

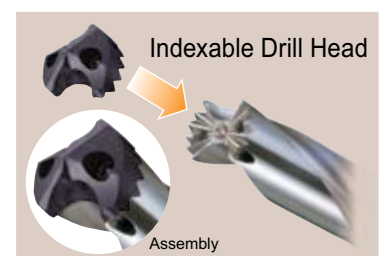
The Ultimate in Low Cost Drilling

SEC-MultiDrills SMD type

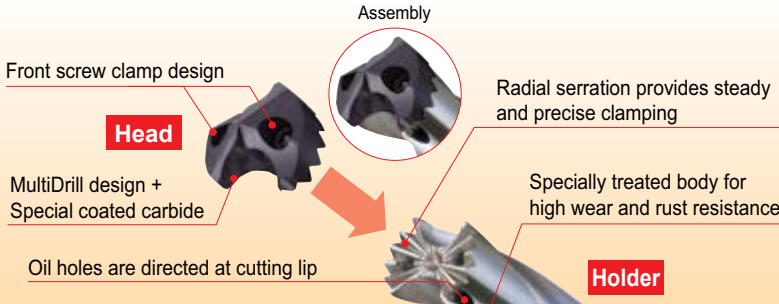

Utilizing **“DEX Coat”**, a dedicated coating developed for drills, to achieve more than double the tool life of conventional drills

- Different drill edge profiles can be selected based on application
- Drill heads have regrinding allowance
- Double the tool life of brazed carbide tip drills
- MEL type ranges from $\phi 12.0 \sim 30.8\text{mm}$, 136 items series expansion

SEC : Steady and Easy Clamp is the generic code for our indexable tools


Stocked Sizes (Drill Heads)

MTL	$\phi 12.0 \sim \phi 42.0\text{mm}$	P	M	K	N	S	H
MEL	$\phi 12.0 \sim \phi 30.8\text{mm}$	P	M	K	N	S	H
MB	$\phi 24.5 \sim \phi 26.7\text{mm}$	P	M	K	N	S	H



General Features

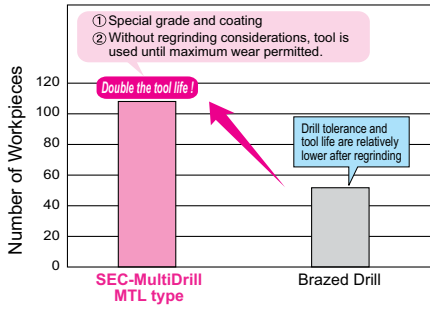
Exchangeable head drills that utilize a unique radial serration design for high precision and strength. Exchangeable drill heads provide easy tool change, higher productivity and cost efficiency, which contribute to easy tool management. Regrinding allowance of 1.5mm to 3.0mm makes further tool cost reductions possible.

Series Range

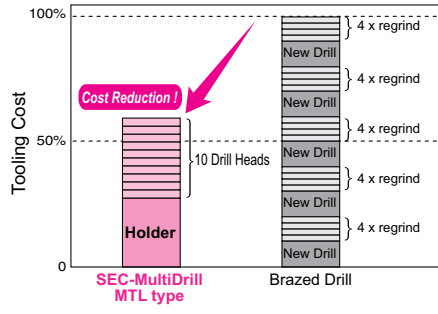
Head	Holder (L/D)	Application	ϕD_c Range	Icon
MTL type	M type (3D)	General Steel	$\phi 12.0 \sim \phi 42.5$	
	L type (5D)		$\phi 12.0 \sim \phi 42.5$	
	D type (8D)		$\phi 13.5 \sim \phi 42.5$	
MEL type	M type (3D)	SUS SS FC	$\phi 12.0 \sim \phi 30.8$	
	L type (5D)		$\phi 12.0 \sim \phi 30.8$	
	D type (8D)		$\phi 13.5 \sim \phi 30.8$	
MB type	B3 type (3D)	Structural Steel	$\phi 24.5 \sim \phi 26.7$	

Tool Life and Cost Comparison

Tool Life Comparison



Cost Comparison

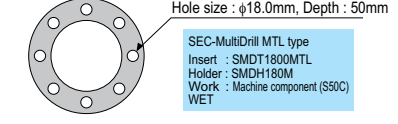


Conclusion

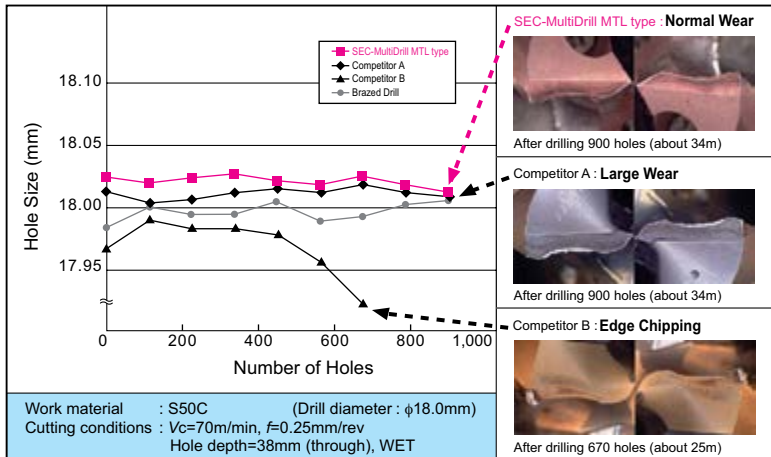
For regrinding purpose, brazed drills are used only up to 50-70% of its actual tool life potential. SEC-MultiDrill MTL type can be used up to 100%!

SEC-MultiDrill MTL type offers: **Double the tool life of brazed drills!** Tool change time is shortened!

Workpiece Example

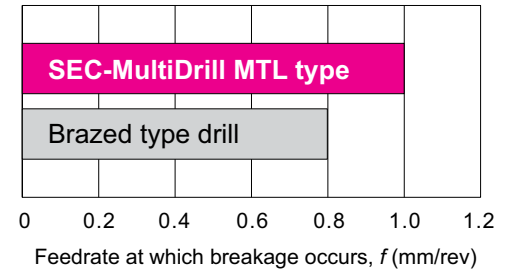


Drilling Precision



Drill Strength

Durability comparison at maximum feedrate



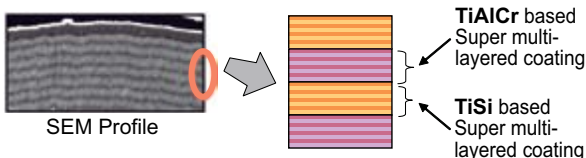
Characteristics Of The Next Generation Coating : DEX COAT

Sumitomo Electric Hardmetal's next generation drill coating utilizes the latest nano-coating technology to provide more than double the tool life of conventional coatings.

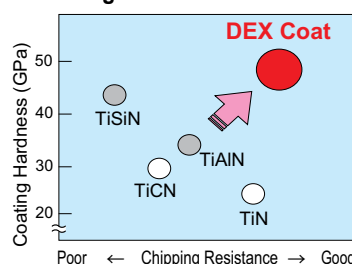
Inclusion of Silicon and Chrome greatly improve wear, thermal and adhesion resistance. Newly developed compound super multi-layered structure offers significant improvements to chipping resistance (coating strength).

Coating Structure

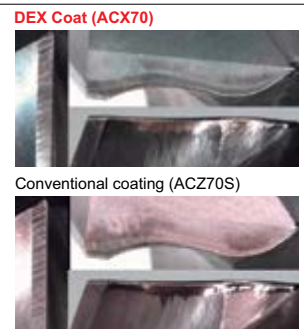
World's first compound coating layer that is made from combining two alternately stacked layers of super multi-layered coatings.



Coating Characteristics



Drastic Reduction of Rake Face Wear



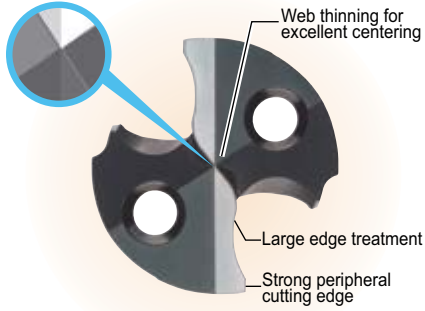
Work material : S50C
Cutting conditions : $V_c=80\text{m/min}$, $f=0.25\text{mm/rev}$
Hole depth=38mm, WET
Total cutting length : 32.8m

MTL type

Suitable for high efficiency drilling of General Steel

X-type Thinning

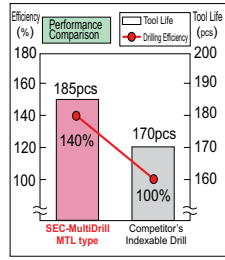
DEX Coat



Application Examples (MTL type)

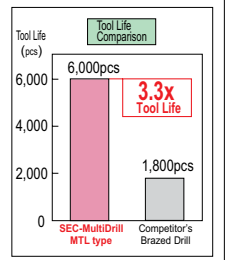
Improved tool life and efficiency

Part name : Housing
Work material : S20C
Drill size : $\phi 15\text{mm} \times 5\text{D}$
Conditions : $V_c = 107\text{m/min}$
 $f = 0.3\text{mm/rev}$
Hole depth : $32\text{mm} \times 12$ holes



3.3 times huge tool life improvement

Part name : Support bracket
Work material : S45C
Drill size : $\phi 20\text{mm} \times 3\text{D}$
Conditions : $V_c = 98\text{m/min}$
 $f = 0.18\text{mm/rev}$
Hole depth : 17mm

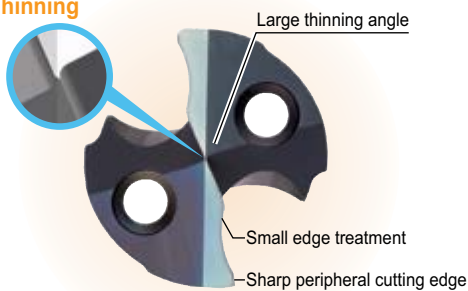


MEL type

Specially for hard-to-cut metals such as Stainless Steel, Soft Steel, Grey Cast Iron and low rigidity setups

Overlap-type Thinning

DEX Coat



- **Excellent cutting edge design for Stainless Steel and Soft Steel.**
Large thinning angle prevents breakage at the convex R-profile portion, particularly when drilling Soft Steel and it also reduces breakages caused by adhesion when drilling Stainless Steel.
- **Improved chipping resistance around the hole openings of Cast Iron**
Better edge sharpness at the peripheral edge prevents chipping around the hole openings when drilling Cast Iron.

Application Examples (MEL type)

MEL type (Drilling length 15m)

SEC-MultiDrill MEL type with excellent centering, is able to drill 15m without any edge chipping or visible rifle marks.

Work material : SUS304
Drill size : $\phi 14\text{mm} \times 5\text{D}$
Conditions : $V_c = 60\text{m/min}$, $f = 0.15\text{mm/rev}$
Coolant : Emulsion type

Competitor (Drilling length 11m)

Chipping at center portion

Competitor's indexable drill exhibited poor centering with visible rifle marks. The drill point chipped after 11m.

Workpiece image

Work : Hub (S55C equivalent)
Hole diameter : $\phi 14.0 \pm 0.027$
Hole depth : 10mm (through hole)
Drilling position : 4 holes
Coolant : Emulsion (external)

SEC-MultiDrill MEL type

Condition : $V_c = 60\text{m/min}$
 $f = 0.3\text{mm/rev}$ ($V_f = 409\text{mm/min}$)
Tool Life : 1,600pcs
- Work hardening is minimal with stable dimensional accuracy.
- Able to achieve 1.3 times better efficiency with 2.3 times longer tool life as compared to previous drill.

Competitor's Solid Drill

Condition : $V_c = 70\text{m/min}$
 $f = 0.2\text{mm/rev}$ ($V_f = 318\text{mm/min}$)
Tool Life : 700pcs
- The internal wall of the drilled hole was found to have work hardened, as such, the solid drill could not be used beyond 3 times grinding and re-coating.

Tool Type	Efficiency (%)	Tool Life (pcs)
SEC-MultiDrill MEL type	129%	1,600 pcs
Competitor's Solid Drill	100%	700 pcs

Stable Drilling On Low Rigidity Setups

- Achieving stable and long tool life even with low rigidity work, jig and machine.

MEL type : Output 2,000pcs

Smooth chip form.

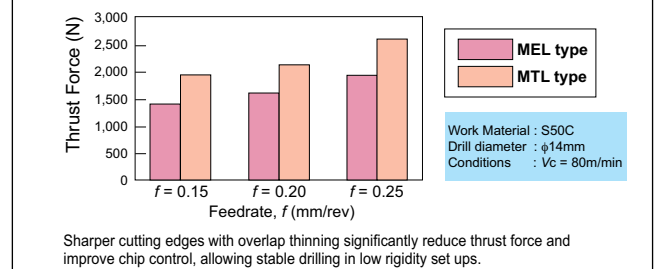
MTL type : Output 676pcs

Chips with multiple straight edges.

Work material : S48C (Axel component) Drill diameter : $\phi 28\text{mm}$ Machine : Vertical M/C (BT40)
Conditions : $V_c = 80\text{m/min}$, $f = 0.23\text{mm/rev}$, depth 30mm (blind hole), WET

Achieving Drastic Reduction In Cutting Resistance

- MEL type exhibits 25% less thrust force as compared to MTL type!



Recommended Cutting Conditions (MTL type / MEL type)

V_c : Cutting Speed (m/min), f : Feedrate (mm/rev)

Work	Soft Steel (~250HB)		General Steel (250~320HB)		Hardened Steel (45HRC)		Stainless Steel (~200HB)		Grey Cast Iron		Ductile Cast Iron		Aluminum Alloys*	
	Recommended Head	MTL type / MEL type	MTL type / MEL type	MTL type	MTL type	MEL type	MTL type / MEL type	MTL type / MEL type	MTL type / MEL type	MTL type / MEL type	MTL type / MEL type	MEL type		
~ $\phi 16.0$	Cond.	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max
	V_c	80-100-120 (50-70-80)	70-100-120 (50-70-80)	40-60-90 (30-50-70)	50-60-80 (40-50-60)	50-70-90 (40-60-80)	50-60-80 (40-50-60)	50-70-90 (40-60-80)	50-60-80 (40-50-70)	200-240-260 (180-200-240)				
~ $\phi 20.0$	f	0.15-0.20-0.35	0.15-0.20-0.30	0.10-0.15-0.20	0.10-0.15-0.20	0.10-0.15-0.20	0.10-0.15-0.20	0.10-0.15-0.20	0.20-0.25-0.30	0.20-0.25-0.30	0.20-0.25-0.30	0.35-0.45-0.55	0.35-0.45-0.55	0.35-0.45-0.55
	V_c	80-100-120 (50-70-80)	70-100-120 (50-70-80)	40-60-90 (30-50-70)	60-80-90 (40-60-70)	60-80-90 (40-60-70)	60-80-90 (40-60-70)	60-80-90 (40-60-70)	60-80-90 (40-60-80)	200-240-260 (180-200-240)				
~ $\phi 30.8$	f	0.15-0.25-0.35	0.15-0.25-0.35	0.15-0.20-0.25	0.15-0.20-0.25	0.15-0.20-0.25	0.15-0.20-0.25	0.15-0.20-0.25	0.20-0.30-0.35	0.20-0.25-0.35	0.20-0.25-0.35	0.35-0.50-0.60	0.35-0.50-0.60	0.35-0.50-0.60
	V_c	80-100-120 (50-70-80)	70-100-120 (50-70-80)	40-60-90 (30-50-70)	60-70-90 (40-60-70)	60-70-90 (40-60-70)	60-70-90 (40-60-70)	60-70-90 (40-60-70)	60-70-90 (40-60-80)	200-240-260 (180-200-240)				

Note : Where machine and work clamp rigidity are good, conditions may be increased up to the maximum range.

For 8xD drills, please use cutting speeds stated within the ().

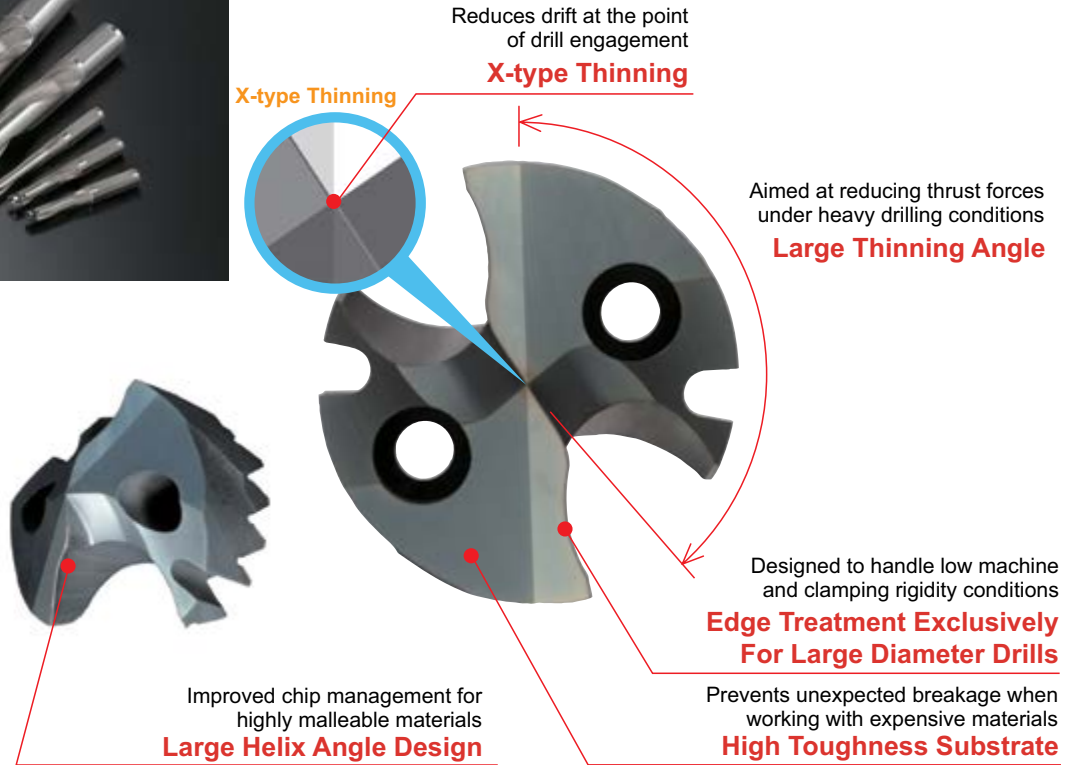
Before drilling 8xD holes, it is recommended that a guide hole of similar diameter is prepared.

* Inquire about drills designed specifically for Aluminum Alloys



Large Dia. MTL type

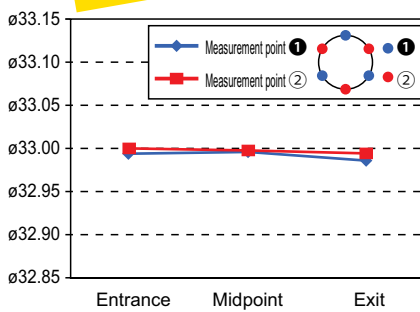
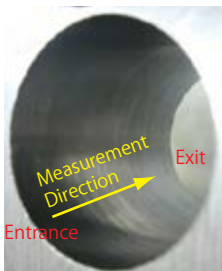
Optimized cutting edge design for malleable material used in large sized casings



■ Drilling Precision

Work material : SM490 (Base plate for construction machinery)
 Drill size : $\phi 33.0 \times 5D$
 Conditions : $V_c=120\text{m/min}$, $f=0.25\text{mm/rev}$
 Coolant : Emulsion type

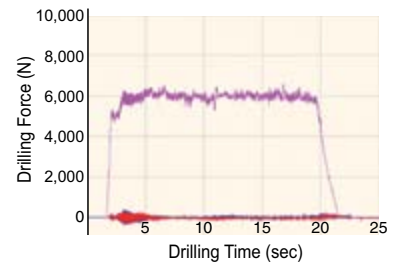
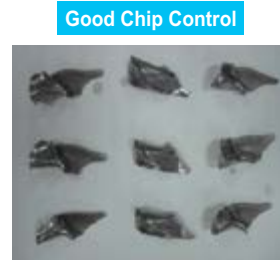
High hole accuracy even with large diameters



■ Drilling Resistance (Thrust)

Work material : SS400 (Stacked plates)
 Drill size : $\phi 37.5 \times 5D$
 Conditions : $V_c=90\text{m/min}$, $f=0.35\text{mm/rev}$
 Coolant : Emulsion type

Stable even when drilling stacked plates



■ Recommended Cutting Conditions (Large Diameter Drills)

V_c : Cutting Speed (m/min), f : Feedrate (mm/rev)

Work	Soft Steel (~250HB)	General Steel (250~320HB)	Hardened Steel (45HRC)	Stainless Steel (~200HB)	Grey Cast Iron	Ductile Cast Iron	Aluminum Alloys*	
								Cond.
$\phi 31.0$	V_c	40-60-120	60-80-120	40-50-80	40-60-80	50-70-100	50-60-90	200-240-260
~		(30-50-80)	(40-50-80)	(30-40-60)	(30-40-60)	(40-60-90)	(40-50-70)	
$\phi 42.5$	f	0.25-0.35-0.45	0.25-0.30-0.40	0.15-0.25-0.30	0.20-0.25-0.30	0.25-0.35-0.45	0.25-0.30-0.35	0.35-0.50-0.60

Note : Where machine and work clamp rigidity are good, conditions may be increased up to the maximum range.
 For 8xD drills, please use cutting speeds stated within the ().
 Before drilling 8xD holes, it is recommended that a guide hole of similar diameter is prepared.

* Inquire about drills designed specifically for Aluminum Alloys



MB type

Specialty for drilling Rolled Steel for Welded Structures (single or stacked plates)

X-type Thinning

DEX Coat

Excellent fracture resistance and excellent chip control
Cutting Edge Designed Exclusively For Drilling Structural Steel

Unique wide and smooth flute shape significantly improve chip control and evacuation

New J Flute Design

Reduces peripheral edge chipping caused by sudden work shift

High Toughness Substrate & Reinforced Edge Treatment

Directs coolant at the cutting edge even during MQL drilling

Centralized Oil Hole

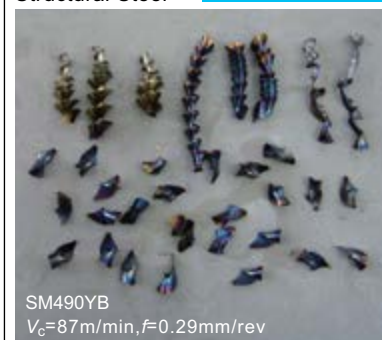
150° Point Angle

Smooth flute surface greatly improves chip evacuation

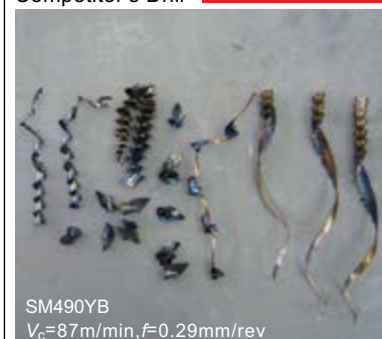
Highly Polished Flute

Application Examples

MB type for Structural Steel **Good Chip Control**



Competitor's Drill **Elongated Chips**



Drilling Length Comparison (MB type)

Case	Current Tool	Tool Life Comparison (Cutting Length)		Cutting Conditions
1	Comp A Indexable Head Drill	Comp A 17m	2.5x tool life MB type 42m	$V_c=46\text{m/min}$ $f=0.35\text{mm/rev}$ Coolant : MQL
2	Comp B Indexable Head Drill	Comp B 50m	1.7x tool life MB type 87m	$V_c=56\text{m/min}$ $f=0.30\text{mm/rev}$ Coolant : MQL
3	Comp C Braze Drill	Comp C 32m	3.0x tool life MB type 95m	$V_c=54\text{m/min}$ $f=0.30\text{mm/rev}$ Coolant : MQL
4	Comp D Indexable Head Drill	Comp D 70m	1.7x tool life MB type 120m	$V_c=60\text{m/min}$ $f=0.30\text{mm/rev}$ Coolant : MQL

Compared to Current Tools,

1.7x ~ 3.0x

Longer Tool Life



Tool Cost

Huge Potential Savings

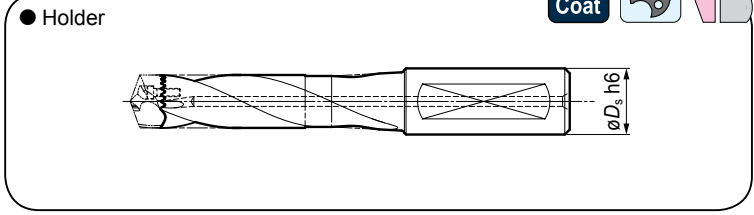
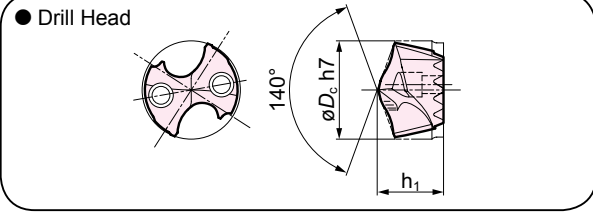
Recommended Cutting Conditions (MB type)

V_c : Cutting Speed (m/min), f : Feedrate (mm/rev)

Work		Rolled Steel for Welded Structures SS400	Rolled Steel for Welded Structures SM490	Rolled Steel for Welded Structures SM520	Rolled Steel for Welded Structures SM570
Drill Diameter ϕD_c (mm)	Conditions	min - optimum - max	min - optimum - max	min - optimum - max	min - optimum - max
$\phi 24.5$ ~ $\phi 26.7$	v_c	60-70-80	55-65-75	55-65-75	55-65-75
	f	0.20-0.30-0.40	0.20-0.30-0.40	0.20-0.25-0.35	0.20-0.25-0.35



	Carbon Steel- Alloy Steel ~0.28% C, 0.29% Mn	Tempered Steel	Hardened Steel ~45HRC-46HRC	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP	3D	5D	8D
MTL	⊙	⊙	○	○	○	○	⊙	⊙	○	○	○	DEX Coat	With Oil Hole	Indexable
MEL	⊙	○	○	⊙	○	○	⊙	⊙	○	○	○	DEX Coat	With Oil Hole	Indexable



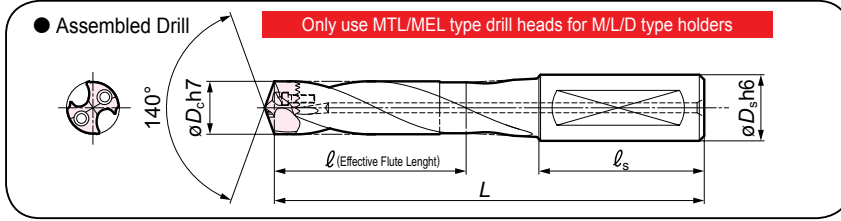
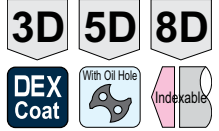
■ Drill Heads (ø12.0~ø18.5) [Grades - MTL type: ACX70 / MEL type: ACX80] ■ Holders M(3D) • L(5D) • D(8D)

Drill Diameter øD _c (mm)	Heads					Holders						
	MTL type		MEL type		h ₁	Drill Diameter (øD _c) Range	M (3D)		L (5D)		D (8D)	
	Cat. No.	Stock	Cat. No.	Stock			Cat. No.	Stock	Cat. No.	Stock	Cat. No.	Stock
12.0	SMDT 1200MTL	●	SMDT 1200MEL	●	9.1	From 12.0 to below 12.5	SMDH 120M	●	SMDH 120L	●	-	-
12.1	1210MTL	●	1210MEL	●								
12.2	1220MTL	●	1220MEL	●								
12.3	1230MTL	●	1230MEL	●								
12.4	1240MTL	●	1240MEL	●								
12.5	SMDT 1250MTL	●	SMDT 1250MEL	●	9.4	From 12.5 to below 13.0	SMDH 125M	●	SMDH 125L	●	-	-
12.6	1260MTL	●	1260MEL	●								
12.7	1270MTL	●	1270MEL	●								
12.8	1280MTL	●	1280MEL	●								
12.9	1290MTL	●	1290MEL	●								
13.0	SMDT 1300MTL	●	SMDT 1300MEL	●	9.7	From 13.0 to below 13.5	SMDH 130M	●	SMDH 130L	●	-	-
13.1	1310MTL	●	1310MEL	●								
13.2	1320MTL	●	1320MEL	●								
13.3	1330MTL	●	1330MEL	●								
13.4	1340MTL	●	1340MEL	●								
13.5	SMDT 1350MTL	●	SMDT 1350MEL	●	10.3	From 13.5 to 14.5	SMDH 140M	●	SMDH 140L	●	SMDH 140D	●
13.6	1360MTL	●	1360MEL	●								
13.7	1370MTL	●	1370MEL	●								
13.8	1380MTL	●	1380MEL	●								
13.9	1390MTL	●	1390MEL	●								
14.0	1400MTL	●	1400MEL	●								
14.1	1410MTL	●	1410MEL	●								
14.2	1420MTL	●	1420MEL	●								
14.3	1430MTL	●	1430MEL	●								
14.4	1440MTL	●	1440MEL	●								
14.5	1450MTL	●	1450MEL	●								
14.6	SMDT 1460MTL	●	SMDT 1460MEL	●	11.0	More than 14.5 to 15.5	SMDH 150M	●	SMDH 150L	●	SMDH 150D	●
14.7	1470MTL	●	1470MEL	●								
14.8	1480MTL	●	1480MEL	●								
14.9	1490MTL	●	1490MEL	●								
15.0	1500MTL	●	1500MEL	●								
15.1	1510MTL	●	1510MEL	●								
15.2	1520MTL	●	1520MEL	●								
15.3	1530MTL	●	1530MEL	●								
15.4	1540MTL	●	1540MEL	●								
15.5	1550MTL	●	1550MEL	●								
15.6	SMDT 1560MTL	●	SMDT 1560MEL	●	11.6	More than 15.5 to 16.5	SMDH 160M	●	SMDH 160L	●	SMDH 160D	●
15.7	1570MTL	●	1570MEL	●								
15.8	1580MTL	●	1580MEL	●								
15.9	1590MTL	●	1590MEL	●								
16.0	1600MTL	●	1600MEL	●								
16.1	1610MTL	●	1610MEL	●								
16.2	1620MTL	●	1620MEL	●								
16.3	1630MTL	●	1630MEL	●								
16.4	1640MTL	●	1640MEL	●								
16.5	1650MTL	●	1650MEL	●								
16.6	SMDT 1660MTL	●	SMDT 1660MEL	●	12.2	More than 16.5 to 17.5	SMDH 170M	●	SMDH 170L	●	SMDH 170D	●
16.7	1670MTL	●	1670MEL	●								
16.8	1680MTL	●	1680MEL	●								
16.9	1690MTL	●	1690MEL	●								
17.0	1700MTL	●	1700MEL	●								
17.1	1710MTL	●	1710MEL	●								
17.2	1720MTL	●	1720MEL	●								
17.3	1730MTL	●	1730MEL	●								
17.4	1740MTL	●	1740MEL	●								
17.5	1750MTL	●	1750MEL	●								
17.6	SMDT 1760MTL	●	SMDT 1760MEL	●	12.9	More than 17.5 to 18.5	SMDH 180M	●	SMDH 180L	●	SMDH 180D	●
17.7	1770MTL	●	1770MEL	●								
17.8	1780MTL	●	1780MEL	●								
17.9	1790MTL	●	1790MEL	●								
18.0	1800MTL	●	1800MEL	●								
18.1	1810MTL	●	1810MEL	●								
18.2	1820MTL	●	1820MEL	●								
18.3	1830MTL	●	1830MEL	●								
18.4	1840MTL	●	1840MEL	●								
18.5	1850MTL	●	1850MEL	●								

● mark: Stocked item ● mark: Stocked item (expansion item)



	Carbon Steel-Alloy Steel ~0.28% 0.29%	Tempered Steel	Hardened Steel ~45HRC 46HRC	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
MTL	○	○	○	○	○	○	○	○	○	○	○
MEL	○	○	○	○	○	○	○	○	○	○	○



■ Dimensions of Assembled Drill

■ Spare Parts, Recommended Tightening Torque

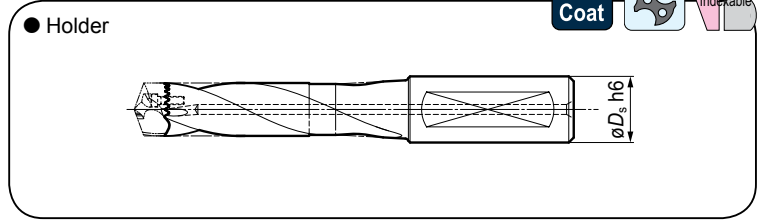
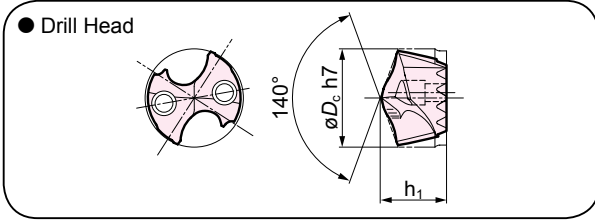
Drill Diameter ϕD_c (mm)	M (3D)		L (5D)		D (8D)		Shank		Cap Screw	Wrench	Recommended Tightening Torque (N·m)	Drill Diameter ϕD_c (mm)
	Dimensions		Dimensions		Dimensions		Dimensions					
	ℓ	L	ℓ	L	ℓ	L	ℓ_s	ϕD_s				
12.0												12.0
12.1												12.1
12.2	44	105	69	130	-	-	48	16	BXD02208IP	TRDR08IP	0.75~1.0	12.2
12.3												12.3
12.4												12.4
12.5												12.5
12.6												12.6
12.7	44	105	69	130	-	-	48	16	BXD02208IP	TRDR08IP	0.75~1.0	12.7
12.8												12.8
12.9												12.9
13.0												13.0
13.1												13.1
13.2	47	110	74	140	-	-	48	16	BXD02208IP	TRDR08IP	0.75~1.0	13.2
13.3												13.3
13.4												13.4
13.5												13.5
13.6												13.6
13.7												13.7
13.8												13.8
13.9												13.9
14.0	52.5	116.5	81.5	146.5	124.5	191.5	48	16	BXD02208IP	TRDR08IP	0.75~1.0	14.0
14.1												14.1
14.2												14.2
14.3												14.3
14.4												14.4
14.5												14.5
14.6												14.6
14.7												14.7
14.8												14.8
14.9												14.9
15.0	55.5	126.5	86.5	156.5	133.5	201.5	50	20	BXD02208IP	TRDR08IP	0.75~1.0	15.0
15.1												15.1
15.2												15.2
15.3												15.3
15.4												15.4
15.5												15.5
15.6												15.6
15.7												15.7
15.8												15.8
15.9												15.9
16.0	59.5	131.5	92.5	166.5	141.5	211.5	50	20	BXD02509IP	TRDR10IP	0.93~1.24	16.0
16.1												16.1
16.2												16.2
16.3												16.3
16.4												16.4
16.5												16.5
16.6												16.6
16.7												16.7
16.8												16.8
16.9												16.9
17.0	62.5	136.5	97.5	171.5	150.5	221.5	50	20	BXD02509IP	TRDR10IP	0.93~1.24	17.0
17.1												17.1
17.2												17.2
17.3												17.3
17.4												17.4
17.5												17.5
17.6												17.6
17.7												17.7
17.8												17.8
17.9												17.9
18.0	66.5	141.5	103.5	176.5	158.5	226.5	50	20	BXD02509IP	TRDR10IP	0.93~1.24	18.0
18.1												18.1
18.2												18.2
18.3												18.3
18.4												18.4
18.5												18.5

SEC-MultiDrill SMD type



	Carbon Steel- Alloy Steel ~0.28% C, 0.29%~	Tempered Steel	Hardened Steel ~45HRC-46HRC-	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
MTL	⊙	⊙	○	○	○	○	⊙	⊙	○	○	○
MEL	⊙	○	○	○	○	○	⊙	⊙	○	○	○

3D 5D 8D



■ Drill Heads (ø18.6~ø24.8) [Grades - MTL type: ACX70 / MEL type: ACX80] ■ Holders M(3D) • L(5D) • D(8D)

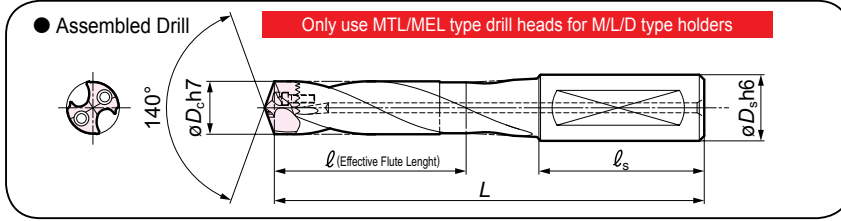
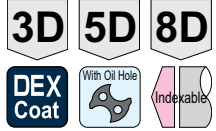
Drill Diameter ϕD_c (mm)	Heads					Holders						
	MTL type		MEL type		h_1	Drill Diameter (ϕD_c) Range	M (3D)		L (5D)		D (8D)	
	Cat. No.	Stock	Cat. No.	Stock			Cat. No.	Stock	Cat. No.	Stock	Cat. No.	Stock
18.6	SMDT 1860MTL	●	SMDT 1860MEL	●	13.5	More than 18.5 to 19.5	SMDH 190M	●	SMDH 190L	●	SMDH 190D	●
18.7	1870MTL	●	1870MEL	●								
18.8	1880MTL	●	1880MEL	●								
18.9	1890MTL	●	1890MEL	●								
19.0	1900MTL	●	1900MEL	●								
19.1	1910MTL	●	1910MEL	●								
19.2	1920MTL	●	1920MEL	●								
19.3	1930MTL	●	1930MEL	●								
19.4	1940MTL	●	1940MEL	●								
19.5	1950MTL	●	1950MEL	●								
19.6	SMDT 1960MTL	●	SMDT 1960MEL	●	14.1	More than 19.5 to 20.5	SMDH 200M	●	SMDH 200L	●	SMDH 200D	●
19.7	1970MTL	●	1970MEL	●								
19.8	1980MTL	●	1980MEL	●								
19.9	1990MTL	●	1990MEL	●								
20.0	2000MTL	●	2000MEL	●								
20.1	2010MTL	●	2010MEL	●								
20.2	2020MTL	●	2020MEL	●								
20.3	2030MTL	●	2030MEL	●								
20.4	2040MTL	●	2040MEL	●								
20.5	2050MTL	●	2050MEL	●								
20.6	SMDT 2060MTL	●	SMDT 2060MEL	●	14.8	More than 20.5 to 21.5	SMDH 210M	●	SMDH 210L	●	SMDH 210D	●
20.7	2070MTL	●	2070MEL	●								
20.8	2080MTL	●	2080MEL	●								
20.9	2090MTL	●	2090MEL	●								
21.0	2100MTL	●	2100MEL	●								
21.1	2110MTL	●	2110MEL	●								
21.2	2120MTL	●	2120MEL	●								
21.3	2130MTL	●	2130MEL	●								
21.4	2140MTL	●	2140MEL	●								
21.5	2150MTL	●	2150MEL	●								
21.6	SMDT 2160MTL	●	SMDT 2160MEL	●	14.8	More than 21.5 to 22.8	SMDH 220M	●	SMDH 220L	●	SMDH 220D	●
21.7	2170MTL	●	2170MEL	●								
21.8	2180MTL	●	2180MEL	●								
21.9	2190MTL	●	2190MEL	●								
22.0	2200MTL	●	2200MEL	●								
22.1	2210MTL	●	2210MEL	●								
22.2	2220MTL	●	2220MEL	●								
22.3	2230MTL	●	2230MEL	●								
22.4	2240MTL	●	2240MEL	●								
22.5	2250MTL	●	2250MEL	●								
22.6	2260MTL	●	2260MEL	●								
22.7	2270MTL	●	2270MEL	●								
22.8	2280MTL	●	2280MEL	●								
22.9	SMDT 2290MTL	●	SMDT 2290MEL	●	15.1	More than 22.8 to 23.8	SMDH 230M	●	SMDH 230L	●	SMDH 230D	●
23.0	2300MTL	●	2300MEL	●								
23.1	2310MTL	●	2310MEL	●								
23.2	2320MTL	●	2320MEL	●								
23.3	2330MTL	●	2330MEL	●								
23.4	2340MTL	●	2340MEL	●								
23.5	2350MTL	●	2350MEL	●								
23.6	2360MTL	●	2360MEL	●								
23.7	2370MTL	●	2370MEL	●								
23.8	2380MTL	●	2380MEL	●								
23.9	SMDT 2390MTL	●	SMDT 2390MEL	●	15.4	More than 23.8 to 24.8	SMDH 240M	●	SMDH 240L	●	SMDH 240D	●
24.0	2400MTL	●	2400MEL	●								
24.1	2410MTL	●	2410MEL	●								
24.2	2420MTL	●	2420MEL	●								
24.3	2430MTL	●	2430MEL	●								
24.4	2440MTL	●	2440MEL	●								
24.5	2450MTL	●	2450MEL	●								
24.6	2460MTL	●	2460MEL	●								
24.7	2470MTL	●	2470MEL	●								
24.8	2480MTL	●	2480MEL	●								

● mark: Stocked item ● mark: Stocked item (expansion item)

Please inquire about drill sizes not listed above.



	Carbon Steel-Alloy Steel ~0.28% 0.29%	Tempered Steel	Hardened Steel ~45HRC 46HRC	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
MTL	○	○	○	○	○	○	○	○	○	○	○
MEL	○	○	○	○	○	○	○	○	○	○	○



■ Dimensions of Assembled Drill

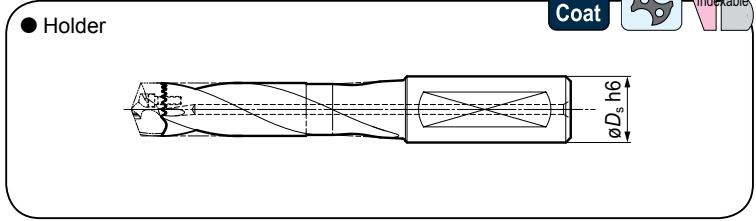
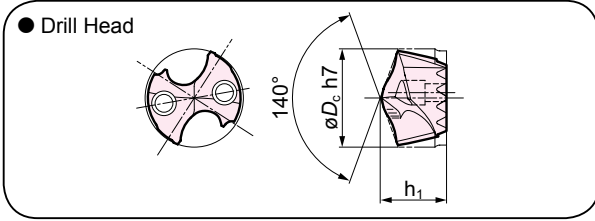
■ Spare Parts, Recommended Tightening Torque

Drill Diameter ϕD_c (mm)	M (3D)		L (5D)		D (8D)		Shank		Cap Screw	Wrench	Recommended Tightening Torque (N·m)	Drill Diameter ϕD_c (mm)
	Dimensions		Dimensions		Dimensions		Dimensions					
	ℓ	L	ℓ	L	ℓ	L	ℓ_s	ϕD_s				
18.6												18.6
18.7												18.7
18.8												18.8
18.9												18.9
19.0	69.5	156.5	108.5	191.5	167.5	251.5	56	25	BXD03011IP	TRDR15IP	1.83~2.44	19.0
19.1												19.1
19.2												19.2
19.3												19.3
19.4												19.4
19.5												19.5
19.6												19.6
19.7												19.7
19.8												19.8
19.9												19.9
20.0	73.5	156.5	114.5	196.5	175.5	262	56	25	BXD03011IP	TRDR15IP	1.83~2.44	20.0
20.1												20.1
20.2												20.2
20.3												20.3
20.4												20.4
20.5												20.5
20.6												20.6
20.7												20.7
20.8												20.8
20.9												20.9
21.0	76.5	156.5	119.5	201.1	184.5	266.5	56	25	BXD03011IP	TRDR15IP	1.83~2.44	21.0
21.1												21.1
21.2												21.2
21.3												21.3
21.4												21.4
21.5												21.5
21.6												21.6
21.7												21.7
21.8												21.8
21.9												21.9
22.0	80.1	161.1	125.1	210.6	192.1	271.1	56	25	BXD03512IP	TRDR15IP	2.79~3.72	22.0
22.1												22.1
22.2												22.2
22.3												22.3
22.4												22.4
22.5												22.5
22.6												22.6
22.7												22.7
22.8												22.8
22.9												22.9
23.0	82.6	160.6	129.6	220.2	200.6	280.6	56	25	BXD03512IP	TRDR15IP	2.79~3.72	23.0
23.1												23.1
23.2												23.2
23.3												23.3
23.4												23.4
23.5												23.5
23.6												23.6
23.7												23.7
23.8												23.8
23.9	86.2	170.2	135.2	225	208.2	295.2	60	32	BXD03512IP	TRDR15IP	2.79~3.72	23.9
24.0												24.0
24.1												24.1
24.2												24.2
24.3												24.3
24.4												24.4
24.5												24.5
24.6												24.6
24.7												24.7
24.8												24.8

SEC-MultiDrill SMD type



	Carbon Steel-Alloy Steel ~0.28% C, 0.29% Ni	Tempered Steel	Hardened Steel ~45HRC-46HRC	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP	3D	5D	8D
MTL	⊙	⊙	○	○	○	○	⊙	⊙	○	○	○	DEX Coat	With Oil Hole	Indexable
MEL	⊙	○	○	⊙	○	○	⊙	⊙	○	○	○	DEX Coat	With Oil Hole	Indexable



Drill Heads (ø24.9~ø30.8) [Grades - MTL type: ACX70 / MEL type: ACX80] Holders M(3D) • L(5D) • D(8D)

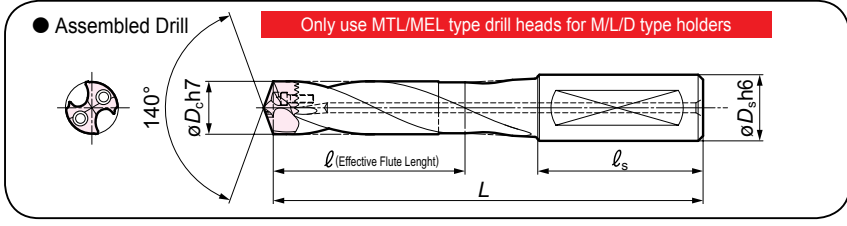
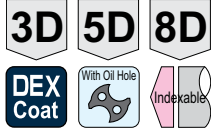
Drill Diameter ϕD_c (mm)	Heads					Holders						
	MTL type		MEL type		h_1	Drill Diameter (ϕD_c) Range	M (3D)		L (5D)		D (8D)	
	Cat. No.	Stock	Cat. No.	Stock			Cat. No.	Stock	Cat. No.	Stock	Cat. No.	Stock
24.9	SMDT 2490MTL	●	SMDT 2490MEL	●	15.8	More than 24.8 to 25.8	SMDH 250M	●	SMDH 250L	●	SMDH 250D	●
25.0	2500MTL	●	2500MEL	●								
25.1	2510MTL	●	2510MEL	●								
25.2	2520MTL	●	2520MEL	●								
25.3	2530MTL	●	2530MEL	●								
25.4	2540MTL	●	2540MEL	●								
25.5	2550MTL	●	2550MEL	●								
25.6	2560MTL	●	2560MEL	●								
25.7	2570MTL	●	2570MEL	●								
25.8	2580MTL	●	2580MEL	●								
25.9	SMDT 2590MTL	●	SMDT 2590MEL	●	16.4	More than 25.8 to 26.8	SMDH 260M	●	SMDH 260L	●	SMDH 260D	●
26.0	2600MTL	●	2600MEL	●								
26.1	2610MTL	●	2610MEL	●								
26.2	2620MTL	●	2620MEL	●								
26.3	2630MTL	●	2630MEL	●								
26.4	2640MTL	●	2640MEL	●								
26.5	2650MTL	●	2650MEL	●								
26.6	2660MTL	●	2660MEL	●								
26.7	2670MTL	●	2670MEL	●								
26.8	2680MTL	●	2680MEL	●								
26.9	SMDT 2690MTL	●	SMDT 2690MEL	●	17.1	More than 26.8 to 27.8	SMDH 270M	●	SMDH 270L	●	SMDH 270D	●
27.0	2700MTL	●	2700MEL	●								
27.1	2710MTL	●	2710MEL	●								
27.2	2720MTL	●	2720MEL	●								
27.3	2730MTL	●	2730MEL	●								
27.4	2740MTL	●	2740MEL	●								
27.5	2750MTL	●	2750MEL	●								
27.6	2760MTL	●	2760MEL	●								
27.7	2770MTL	●	2770MEL	●								
27.8	2780MTL	●	2780MEL	●								
27.9	SMDT 2790MTL	●	SMDT 2790MEL	●	17.7	More than 27.8 to 28.8	SMDH 280M	●	SMDH 280L	●	SMDH 280D	●
28.0	2800MTL	●	2800MEL	●								
28.1	2810MTL	●	2810MEL	●								
28.2	2820MTL	●	2820MEL	●								
28.3	2830MTL	●	2830MEL	●								
28.4	2840MTL	●	2840MEL	●								
28.5	2850MTL	●	2850MEL	●								
28.6	2860MTL	●	2860MEL	●								
28.7	2870MTL	●	2870MEL	●								
28.8	2880MTL	●	2880MEL	●								
28.9	SMDT 2890MTL	●	SMDT 2890MEL	●	18.3	More than 28.8 to 29.8	SMDH 290M	●	SMDH 290L	●	SMDH 290D	●
29.0	2900MTL	●	2900MEL	●								
29.1	2910MTL	●	2910MEL	●								
29.2	2920MTL	●	2920MEL	●								
29.3	2930MTL	●	2930MEL	●								
29.4	2940MTL	●	2940MEL	●								
29.5	2950MTL	●	2950MEL	●								
29.6	2960MTL	●	2960MEL	●								
29.7	2970MTL	●	2970MEL	●								
29.8	2980MTL	●	2980MEL	●								
29.9	SMDT 2990MTL	●	SMDT 2990MEL	●	19.0	More than 29.8 to 30.8	SMDH 300M	●	SMDH 300L	●	SMDH 300D	●
30.0	3000MTL	●	3000MEL	●								
30.1	3010MTL	●	3010MEL	●								
30.2	3020MTL	●	3020MEL	●								
30.3	3030MTL	●	3030MEL	●								
30.4	3040MTL	●	3040MEL	●								
30.5	3050MTL	●	3050MEL	●								
30.6	3060MTL	●	3060MEL	●								
30.7	3070MTL	●	3070MEL	●								
30.8	3080MTL	●	3080MEL	●								

● mark: Stocked item ● mark: Stocked item (expansion item)

Please inquire about drill sizes not listed above.



	Carbon Steel-Alloy Steel ~0.28%	Alloy Steel 0.29%~	Tempered Steel	Hardened Steel ~45HRC	Hardened Steel 46HRC~	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
MTL	○	○	○	○	○	○	○	○	○	○	○	○	○
MEL	○	○	○	○	○	○	○	○	○	○	○	○	○



■ Dimensions of Assembled Drill

■ Spare Parts, Recommended Tightening Torque

Drill Diameter øD _c (mm)	M (3D)		L (5D)		D (8D)		Shank		Cap Screw	Wrench	Recommended Tightening Torque (N·m)	Drill Diameter øD _c (mm)
	Dimensions		Dimensions		Dimensions		Dimensions					
	ℓ	L	ℓ	L	ℓ	L	ℓ _s	øD _s				
24.9	88	170	140	225	217	300	60	32	BXD04014IP	TRDR20IP	4.14~5.52	24.9
25.0												25.0
25.1												25.1
25.2												25.2
25.3												25.3
25.4												25.4
25.5												25.5
25.6												25.6
25.7	92	175	146	230	225	310	60	32	BXD04014IP	TRDR20IP	4.14~5.52	25.7
25.8												25.8
25.9												25.9
26.0												26.0
26.1												26.1
26.2												26.2
26.3												26.3
26.4												26.4
26.5	26.5											
26.6	26.6											
26.7	94	175	151	235	234	320	60	32	BXD04014IP	TRDR20IP	4.14~5.52	26.7
26.8												26.8
26.9												26.9
27.0												27.0
27.1												27.1
27.2												27.2
27.3												27.3
27.4												27.4
27.5	27.5											
27.6	27.6											
27.7	97	180	157	240	242	325	60	32	BXD04515IP	TRDR25IP	4.98~6.64	27.7
27.8												27.8
27.9												27.9
28.0												28.0
28.1												28.1
28.2												28.2
28.3												28.3
28.4												28.4
28.5	28.5											
28.6	28.6											
28.7	100	185	162	245	251	335	60	32	BXD04515IP	TRDR25IP	4.98~6.64	28.7
28.8												28.8
28.9												28.9
29.0												29.0
29.1												29.1
29.2												29.2
29.3												29.3
29.4												29.4
29.5	29.5											
29.6	29.6											
29.7	104	185	167	255	259	345	60	32	BXD04515IP	TRDR25IP	4.98~6.64	29.7
29.8												29.8
29.9												29.9
30.0												30.0
30.1												30.1
30.2												30.2
30.3												30.3
30.4												30.4
30.5	30.5											
30.6	30.6											
30.7	30.7											
30.8	30.8											

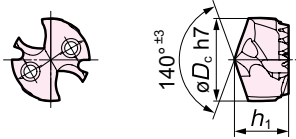
SEC-MultiDrill SMD type (Large Diameter Drills)



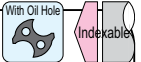
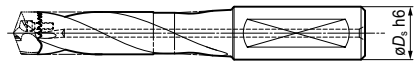
Carbon Steel-Alloy Steel	Tempered Steel	Hardened Steel	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
-0.28%~0.28%~		+45HRC~+60HRC~								

3D 5D 8D

● Drill Head



● Holder



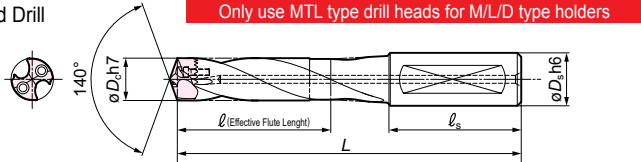
■ Drill Heads ($\phi 31.0 \sim \phi 42.5$) [Grade - MTL type: ACX80]

■ Holders M(3D) • L(5D) • D(8D)

Drill Diameter ϕD_c (mm)	Heads			Drill Diameter Range (ϕD_c)	Holders					
	MTL type		h_1		M (3D)		L (5D)		D (8D)	
	Cat. No.	Stock			Cat. No.	Stock	Cat. No.	Stock	Cat. No.	Stock
31.0	SMDT 3100MTL	●	21.0	More than 30.8 to 32.0	SMDH 320M	●	SMDH 320L	●	SMDH 320D	●
31.5	3150MTL	●								
32.0	3200MTL	●								
32.5	SMDT 3250MTL	●	21.0	More than 32.0 to 33.5	SMDH 335M	●	SMDH 335L	●	SMDH 335D	●
33.0	3300MTL	●								
33.5	3350MTL	●								
34.0	SMDT 3400MTL	●	23.0	More than 33.5 to 35.0	SMDH 350M	●	SMDH 350L	●	SMDH 350D	●
34.5	3450MTL	●								
35.0	3500MTL	●								
35.5	SMDT 3550MTL	●	23.0	More than 35.0 to 36.5	SMDH 365M	●	SMDH 365L	●	SMDH 365D	●
36.0	3600MTL	●								
36.5	3650MTL	●								
37.0	SMDT 3700MTL	●	25.0	More than 36.5 to 38.0	SMDH 380M	●	SMDH 380L	●	SMDH 380D	●
37.5	3750MTL	●								
38.0	3800MTL	●								
38.5	SMDT 3850MTL	●	25.0	More than 38.0 to 39.5	SMDH 395M	●	SMDH 395L	●	SMDH 395D	●
39.0	3900MTL	●								
39.5	3950MTL	●								
40.0	SMDT 4000MTL	●	27.0	More than 39.5 to 41.0	SMDH 410M	●	SMDH 410L	●	SMDH 410D	●
40.5	4050MTL	●								
41.0	4100MTL	●								
41.5	SMDT 4150MTL	●	27.0	More than 41.0 to 42.5	SMDH 425M	●	SMDH 425L	●	SMDH 425D	●
42.0	4200MTL	●								
42.5	4250MTL	●								

● mark: Stocked item

● Assembled Drill



■ Dimensions of Assembled Drill

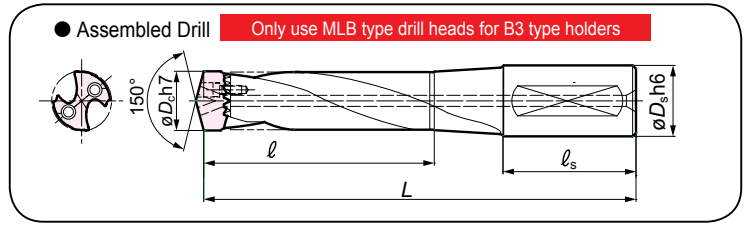
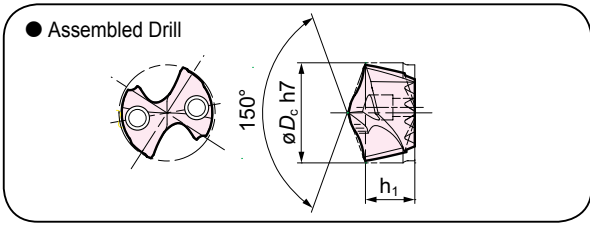
■ Spare Parts, Recommended Tightening Torque

Drill Diameter ϕD_c (mm)	M (3D)		L (5D)		D (8D)		Shank		Cap Screw	Wrench	Recommended Tightening Torque (N·m)
	Dimensions		Dimensions		Dimensions		Dimensions				
	l	L	l	L	l	L	l_s	ϕD_s			
31.0	110	195	175	260	270	355	60	32.0	BXD04515IP	TRDR25IP	4.98 ~ 6.44
31.5											
32.0											
32.5	115	200	185	270	285	370	60	32.0	BXD04515IP	TRDR25IP	4.98 ~ 6.44
33.0											
33.5											
34.0	120	215	195	290	300	395	60	32.0	BXD04515IP	TRDR25IP	4.98 ~ 6.44
34.5											
35.0											
35.5	125	220	200	295	310	405	60	32.0	BXD04515IP	TRDR25IP	4.98 ~ 6.44
36.0											
36.5											
37.0	130	225	210	305	325	420	70	40.0	BX0515	HD040	7.2
37.5											
38.0											
38.5	135	230	220	315	335	430	70	40.0	BX0515	HD040	7.2
39.0											
39.5											
40.0	145	245	225	325	350	450	70	40.0	BX0515	HD040	7.2
40.5											
41.0											
41.5	150	250	235	335	360	460	70	40.0	BX0515	HD040	7.2
42.0											
42.5											

SEC-MultiDrill SMD type (For Structural Steel)



Carbon Steel-Alloy Steel ~0.28% C, 0.23% Mn	Tempered Steel	Hardened Steel ~45HRC-146HRC	Stainless Steel	Ti Alloy	Heat-Resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
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■ Drill Heads [Grade - MB type: ACX80]

■ Holders B3 (3D)

■ Dimensions of Assembled Drill

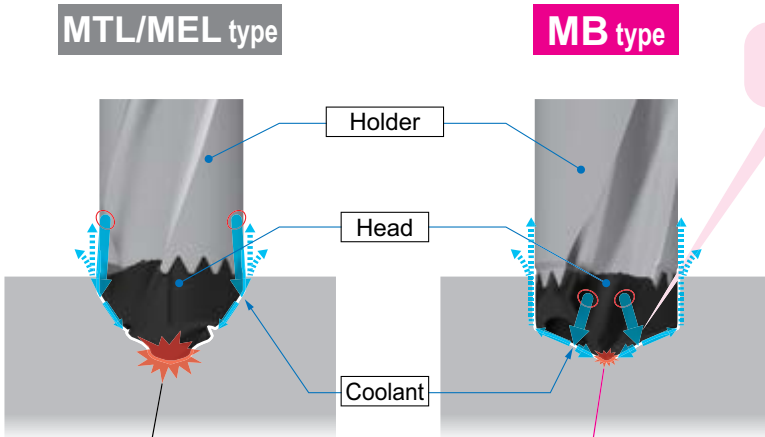
■ Spare Parts, Recommended Tightening Torque

Drill Diameter ϕD_c (mm)	Heads		h_1	Holders		Shank		Cap Screw	Wrench	Recommended Tightening Torque (N·m)		
	MB type			Cat. No.	Stock	Dimensions					Dimensions	
	Cat. No.	Stock				ℓ	L					ℓ_s
24.5	SMDT 2450MB	●	14.1	SMDH 240B3	●	87	170	60	32	BXD03512IP	TRDR15IP	2.79~3.72
24.7	2470MB	●		92	175	60	32	BXD04014IP	TRDR20IP	4.14~5.52		
26.5	SMDT 2650MB	●	15.3	SMDH 260B3	●	92	175	60	32	BXD04014IP	TRDR20IP	4.14~5.52
26.7	2670MB	●		92	175	60	32	BXD04014IP	TRDR20IP	4.14~5.52		

● mark: Stocked item

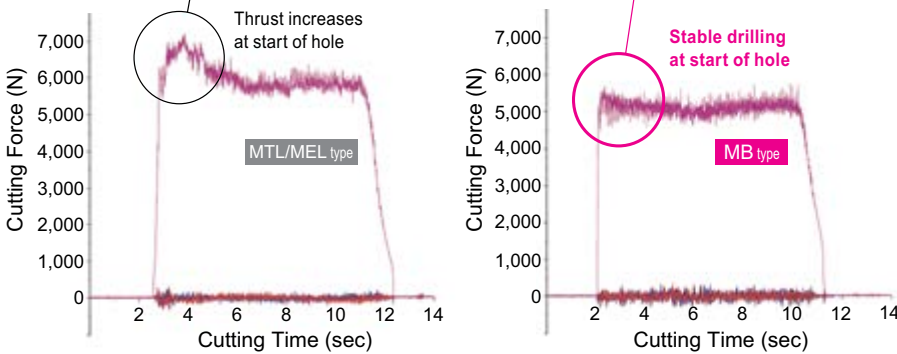
Please inquire about drill sizes not listed above.

● Improved Lubrication Supply to Cutting Edge



Coolant supply is directed closer to the cutting edge

Comparison of Cutting Resistance (Thrust Force)



Work Material: SS400, Drill Diameter: $\phi 24.7$, Conditions: $V_c=70\text{m/min}$, $f=0.35\text{mm/rev}$, Coolant: MQL

※ Due to the difference in the position of the oil holes and serration shape, MTL/MEL type drill heads are not compatible to use with B3 type holders and similarly incompatible for MB type drill heads to be use with normal holders.

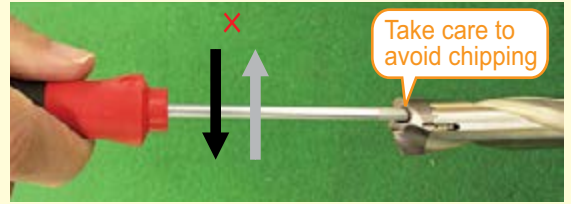
Head Replacement Instructions



(1) Remove the used head. Clean off all foreign particles from the serrated portion of the drill holder with air blow.



(2) With a wire brush, further remove any foreign particles that cannot be cleared by air blow.



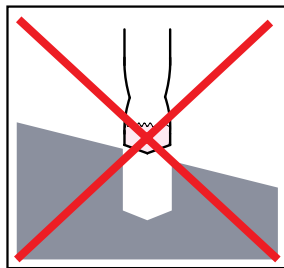
(3) Take care when tightening the screws as the area around the screw hole will easily chip if the wrench slips. Ensure that the wrench is positioned squarely and its head is sitting properly in the screw head pattern to prevent wearing out the pattern.

(4) Screws should be replaced as soon as they start to show signs of wear or shape deformation after long-term usage.

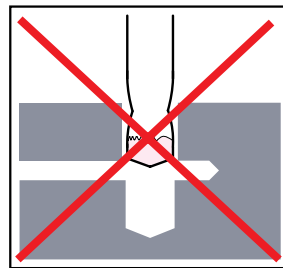
(5) Refer to the drill set tables for the appropriate tightening torque.

⚠ Precautions

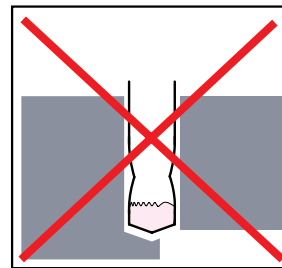
- If the SMD type drills are not utilized for long periods of time, it is advised that the drill heads and bodies are stored separately.
- Due to the difference in the position of the oil holes and serration shape, MTL/MEL type drill heads are not compatible to use with B3 type holders and similarly incompatible for MB type drill heads to be use with normal holders.
- The SMD drill is not recommended for the following work shapes. For such applications, it is advisable to either use a solid or brazed drill and ensure that the feedrate is reasonably reduced.



Slanted entry face



Intersecting holes



Interruption at exit or slanted exit face

※ Work examples

⚠ SAFETY NOTES

Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

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