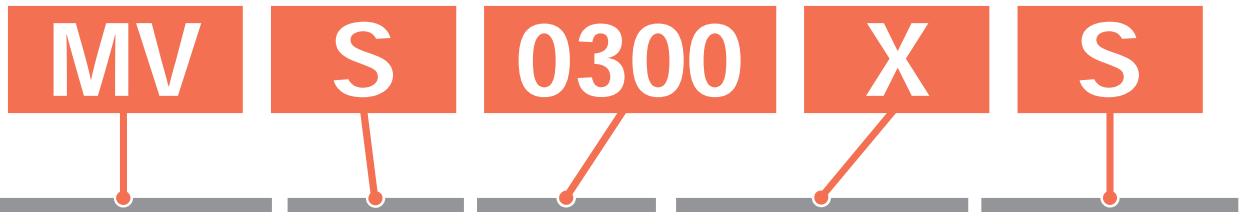
IDENTIFICATION

PRODUCT CODE OF DRILLS



Applications	Coolant	Diameter	L/D	Type of Shank
MV : General-purpose **MF** : Solid Carbide Flat Bottom **MG** : Micro Solid Carbide Gun Drill **MS** : For Small Diameter Machining **MN** : For Machining of Aluminium Alloys **MH** : For Die & Mould Machining **MM** : For Machining of Stainless Steel **MC** : For Composite Materials **DL** : For Centering and Chamfering **MA** : For Aluminium Cast Iron High Precision Hole Machining	**E** : External Coolant **S** : Internal Coolant	**ex.** 0050 → ϕ0.5 0300 → ϕ3.0	**S** : 2D **M** : 3D **L** : 5D (MAE, MAS : 6D) **X** : 12D **X＊＊D** : ＊＊D	**A** : Straight Shank **B** : Integral Shank **S＊＊＊** : Shank Diameter

＊Other special types can be ordered.

Product Name	Applications	Type of Shank	Flute Length	Diameter	Others
VC : Miracle Drills **DC** : Diamond Coated Drills **VA** : Violet Coated Precision Drills (High Grade, High Speed Steel) **SE** : SE High Precision Drill (High-Speed Steel) **V** : Violet Drills **G** : Tin Coated Drills (High-Speed Steel) **E** : Co-Hss Drills **None**: High-Speed Steel	**SD** : General-purpose Straight Drill **TD** : General-purpose Taper Drill **S** : For Steel **H** : For High Hardness **PD** : For High-precision Machining **U** : For Stainless **T** : For Steel Frame **W** : For Deep Hole	**S** : Straight **T** : Taper **3K** : Triangular **6K** : Hexagonal	**S** : Short **M** : Medium **J** : Semi Long **L** : Long	**ex.** D0050 → ϕ0.5 D0300 → ϕ3.0	**A＊＊＊** : Overall Length **S＊＊** : Shank Diameter **M＊** : Taper Size

＊Other special types can be ordered.

SYMBOL DESCRIPTIONS

Tool Material

Ultra Micro Grain Carbide
Ultra micro grain carbide is used as the substrate material.

High Grade High Alloy HSS
High grade high alloy HSS is used as the substrate material.

Cobalt High Speed Steel
Cobalt high speed steel is used as the substrate material.

D-STH Cobalt High Speed Steel
Cobalt high-speed steel is used as the substrate material with D-STH.

High Speed Steel
High speed steel is used as the substrate material.

Web Thinning

X Web Thinning
X web thinning is used at the drill point.

Z Web Thinning
Z web thinning is used at the drill point.

XR Web Thinning
XR web thinning is used at the drill point.

C Web Thinning
C web thinning is used at the drill point.

S Web Thinning
S web thinning is used at the drill point.

N Web Thinning
N web thinning is used at the drill point.

Tolerance

Drill Diameter Tolerance

Shank Diameter Tolerance

Coolant Hole

Coolant Hole

Coating

Diamond Coating
Pure Diamond high performance coating excelling in film adhesion to the substrate.

Violet Coating
Increased tool life of 2—3 times that of TiN coated products.

TiN Coating
Increased tool life of 2—3 times that of non coated products.

PVD Coating
DP102A is a PVD coated cemented carbide grade specialized for small diameter drills, with greatly improved wear resistance.

PVD Coating
Exhibits outstanding wear resistance with a wide range of work materials including mild steel, carbon steel, alloy steel, stainless steel, cast iron-based materials, and aluminium alloys.

PVD Coating
Super multi-layer PVD coating material provides a life over 2 times longer than conventional materials.

PVD Coating
An ultra micro-grain cemented carbide optimal for stainless steel, and a PVD coating with outstanding heat resistance and lubricity.

MIRACLE Coating
The original Miracle (Al,Ti)N coating.
Also suitable for dry cutting.

CVD Diamond Coating
Unique multi-layer micro-grain diamond crystal control technology drastically improves wear resistance and smoothness.

Angle

Point Angle
Indicates drill point angle the tip.
* The icon shown is an example only.

CARBIDE

DRILLS SELECTION CHART CEMENTED CARBIDE

SOLID DRILLS

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page
For Small Diameter	MVS...X02	ϕ1.0 –ϕ2.9	2	Internal	DP1	◎	◎	○	○	○			P020
	MVS...X07		7	Internal	DP1	◎	◎	○	○	○			
	MVS...X12		12	Internal	DP1	◎	◎	○	○	○			
	MVS...X20		20	Internal	DP1	◎	◎	○	○	○			
	MVS...X25		25	Internal	DP1	◎	◎	○	○	○			
	MVS...X30		30	Internal	DP1	◎	◎	○	○	○			
General Drilling	MVE...X02	ϕ3.0 –ϕ20.0	2	External	DP1	◎	○	◎	○	○	○		P042
	MVE...X03		3	External	DP1	◎	○	◎	○	○	○		
	MVS...X02	ϕ3.0 –ϕ14.0	2	Internal	DP1	◎	◎	◎	○	○			P024
	MVS...X03	ϕ3.0 –ϕ20.0	3	Internal	DP1	◎	◎	◎	○	○			
	MVS...X05		5	Internal	DP1	◎	◎	◎	○	○			
	MVS...X08	ϕ3.0 –ϕ16.0	8	Internal	DP1	◎	◎	◎	○	○			
	MVS...X10	ϕ3.0 –ϕ14.0	10	Internal	DP1	◎	◎	◎	○	○			
	MVS...X15		15	Internal	DP1	◎	◎	◎	○	○			
	MVS...X20		20	Internal	DP1	◎	◎	◎	○	○			
	MVS...X25	ϕ3.0 –ϕ12.0	25	Internal	DP1	◎	◎	◎	○	○			
	MVS...X30	ϕ3.0 –ϕ10.0	30	Internal	DP1	◎	◎	◎	○	○			
	MVS...X35		35	Internal	DP1	◎	◎	◎	○	○			
	MVS...X40	ϕ3.0 –ϕ9.0	40	Internal	DP1	◎	◎	◎	○	○			

P

DRILLING

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page
For Machining of Stainless Steel	MMS...X3DB	ϕ3.0 –ϕ20.0	3	Internal	DP7		◎						P057
For Machining of Stainless Steel	MMS...X5DB	ϕ3.0 –ϕ20.0	5	Internal	DP7		◎						P057
For Die & Mold Machining	MHS	ϕ0.95 –ϕ12.0	1 –30	Internal	VP	○	○			○	◎		P064
For Machining of Aluminium Alloys	MNS...LB	ϕ3.0 –ϕ14.0	5	Internal	–				◎				P076
For Machining of Aluminium Alloys	MNS...X10DB		10	Internal	–				◎				P076
For Machining of Aluminium Alloys	MNS...X20DB		20	Internal	–				◎				P076
For Machining of Aluminium Alloys	MNS...X30DB	ϕ3.0 –ϕ10.0	30	Internal	–				◎				P076
Aluminium Alloy, Cast Iron	MAE...MB	ϕ3.0 –ϕ16.0	3	External	–			○	◎				P087
Aluminium Alloy, Cast Iron	MAS...MB		3	Internal	–			○	◎				P083
Aluminium Alloy, Cast Iron	MAS...LB		6	Internal	–			○	◎				P083
Composite Materials	MCC	ϕ4.76 –ϕ11.14	3	External	DD	Composite Materials							P090
Composite Materials	MCA	ϕ6.38 –ϕ9.55	5	Internal	DD								P091
Composite Materials	MCT	ϕ6.38 –ϕ9.55	5	Internal	–								P092
Composite Materials	MCW	ϕ6.38 –ϕ9.55	5	Internal	DD								P093
Composite Materials	MCCH	ϕ2.5 –ϕ9.55	2 –15	External	–								P094
Composite Materials	MCAH	ϕ2.5 –ϕ9.55	3 –15	External	–								P095

CARBIDE

DRILLS SELECTION CHART CEMENTED CARBIDE

SOLID DRILLS

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Work Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
For Centering and Chamfering	NEW DLE	ϕ3.0 –ϕ16.0	–	External	DP1	◎	◎	◎					P012
Solid Carbide Flat Bottom	NEW MFE	ϕ0.75 –ϕ2.95	2	External	DP1A	◎	◎	◎	○				P015
		ϕ3.0 –ϕ20.0	2	External	DP1	◎	◎	◎	○				P016
For Small Diameter Machining	MSE	ϕ0.1 –ϕ0.99	–	External	VP	◎	○	◎	○	○			P097
	MSP0300SB	–	–	External	VP	◎	○	◎	○	○		 *MSE drill for prepared hole.	P096
Deep Hole Drilling	MGS	ϕ0.7 –ϕ3.0	–80	Internal	–	◎	◎	◎	◎				P130
For Non-ferrous Material	DCSSS	ϕ0.2 –ϕ2.0	–	External	DC				○				P136
	DCSSM	ϕ2.1 –ϕ3.0	–	External	DC				○				P136
For Hard Brittle Materials	DCBSS	ϕ0.05 –ϕ3.0	–	External	DC	Hard brittle materials such as ceramics							P138

INDEXABLE DRILLS

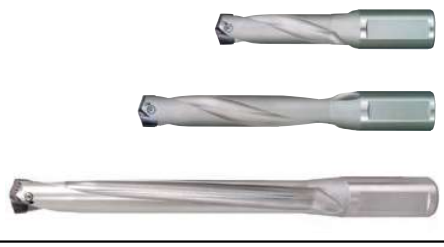
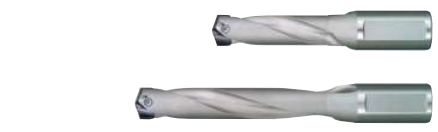
Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Work Material P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat Resistant Alloy	H Hardened Steel	Shape	Page
General Drilling	MVX...X2	ϕ14.0 –ϕ63.0	2	Internal	–	◎	○	◎	○		○		P230
	MVX...X3		3	Internal	–	◎	○	◎	○		○		
	MVX...X4		4	Internal	–	◎	○	◎	○		○		
	MVX...X5		5	Internal	–	◎	○	◎	○		○		
	MVX...X6	ϕ17.0 –ϕ43.0	6	Internal	–	◎	○	◎	○		○		

P

DRILLING

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page
General Drilling	TAFS	ϕ12.0 –ϕ56.0	2	Internal	–	◎	◎	◎					P241
	TAFM		3	Internal	–	◎	◎	◎					
	TAFL	ϕ16.0 –ϕ34.0	4	Internal	–	◎	◎	◎					

EXCHANGEABLE-HEAD DRILLS

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page
General Drilling	STAWSS	ϕ10.0 –ϕ18.4	1.5	Internal	–	◎	○	◎					P210
	STAWSN		3	Internal	–	◎	○	◎					
	STAWMN		5	Internal	–	◎	○	◎					
	STAWLN		8	Internal	–	◎	○	◎					
	TAWSN	ϕ18.5 –ϕ30.4	3	Internal	–	◎	○	◎					P219
	TAWMN		5	Internal	–	◎	○	◎					
	TAWLN		8	Internal	–	◎	○	◎					
For Bridge Construction	TAWSB	ϕ24.5 –ϕ26.7	3	Internal	–	◎							P229
	TAWMB		5	Internal	–	◎							

BRAZED GUN REAMER

Applications	Product Code (Series Title)	Size Range	Hole Depth (L/D)	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page
Finish Drilling	GUN REAMER	ϕ6.0 –ϕ30.0	–	Internal	–	○	○	○	○				P250
	GUN REAMER With Diamond Compound	ϕ6.0 –ϕ30.3	–	Internal	–				◎				P251

DRILLS SELECTION CHART HSS

Drill Type	Applications	Product Code (Series Title)	Size Range	Tool Material	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page
Violet Coated Drills	General, High Precision	VAPDS	ϕ0.5 –ϕ13.0	High Grade, High Speed Steel	External	V	◎	○	○					P144
		VAPDM	ϕ0.5 –ϕ32.0		External	V	◎	○	○					P149
		NEW VAPDJ	ϕ1.0 –ϕ10.0		External	V	◎	○	○					P153
	General, High Precision Steel	VAPDSSUS	ϕ0.5 –ϕ20.0	Cobalt High Speed Steel	External	V	○	◎	○	○	○			P155
		VAPDMSUS	ϕ0.5 –ϕ13.0		External	V	○	◎	○	○	○			P161
	Spot Milling	VAPDSCB	ϕ2.0 –ϕ32.0	High Grade, High Speed Steel	External	V	◎	○	○	○				P168
Violet Drill	General Drilling	VSD	ϕ0.5 –ϕ13.0	High Speed Steel	External	V	◎	○	○	○				P170
		VTDS	ϕ6.0 –ϕ32.0		External	V	◎	◎		○				P172
SE High Precision Drill	General Drilling	SEPDS	ϕ0.5 –ϕ4.0	High Speed Steel	External	–	◎	○	◎	◎	○			P140
		SEPDM	ϕ0.5 –ϕ4.0		External	–	◎	○	◎	◎	○			P142
Straight Shank Drill	General Drilling	GSD	ϕ0.5 –ϕ13.0	High Speed Steel	External	G	◎	○	○	○				P174
		SD	ϕ0.2 –ϕ17.5		External	–	◎	○	○	○				P176
		SD (1/100 Straight)	ϕ0.25 –ϕ5.95		External	–	◎	○	○	○				P178
	General, Long Shank	SDLS	ϕ1.0 –ϕ10.0	High Speed Steel	External	–	◎	○	○	○				P179
	General Drilling	KSD	ϕ1.0 –ϕ13.0	Cobalt High Speed Steel	External	–	◎	◎	○	○				P182

Drill Type	Applications	Product Code (Series Title)	Size Range	Tool Material	Coolant	Coating	Work Material P Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Non-ferrous Metal	Work Material S Heat Resistant Alloy	Work Material H Hardened Steel	Shape	Page
Straight Shank Drill	Deep Hole Drilling	GWSS	ϕ1.0 –ϕ13.0	Cobalt High Speed Steel	External	G	◎	○	○	○				P184
		GWSL	ϕ2.0 –ϕ13.0	Cobalt High Speed Steel	External	G	◎	○	○	○				P186
		LSD	ϕ1.0 –ϕ13.0	High Speed Steel	External	–	○	○	○	○				P189
	Sheet Steel	EPSS	ϕ2.0 –ϕ13.0	High Speed Steel	External	–	○	○	○	○				P192
Taper Shank Drill	General Drilling	GTD	ϕ6.0 –ϕ40.0	High Speed Steel	External	G	◎	○	○	○				P193
		TD	ϕ3.0 –ϕ75.0		External	–	◎	○	○	○				P194
		KTD	ϕ5.0 –ϕ50.0	Cobalt High Speed Steel	External	–	◎	○	○	○				P198
	Deep Hole Drilling	GWTS	ϕ6.0 –ϕ32.0	Cobalt High Speed Steel	External	G	◎	○	○	○				P204
		LTD	ϕ6.0 –ϕ40.0	High Speed Steel	External	–	○		○	○				P200
	For Steel Frame	GTTD	ϕ17.0 –ϕ32.0	High Speed Steel	External	G	◎							P205
		TTD	ϕ17.0 –ϕ32.0	High Speed Steel	External	–	○							P206
Triangular Shank Drill	For General-purpose Electric Drills	3KD	ϕ7.0 –ϕ26.0	High Speed Steel	External	–	○		○	○				P207