DIA EDGE

DLE LEADING DRILL SERIES

SOLID CARBIDE DRILLS FOR CENTERING AND CHAMFERING

ABOUT OUR BRAND

Your manufacturing success is our success.

It's simple. We want to provide high-quality cutting tool products that help deliver unparalleled performance and control for you to manufacture precisely perfect products every day.

Our long heritage of building partnerships through cutting tool solutions to metal working manufacturers, like yours, has given Mitsubishi Materials USA a solid reputation as an industry leader. We understand the importance of getting it right the first time by delivering high-quality cutting tool product brands to help overcome machining challenges to improve machining processes.

Your success is our success and is the driving force behind our innovative products. Our product brands, DIAEDGE and MOLDINO, are trusted globally in the metal manufacturing and die & mold industries for delivering expertly-designed manufactured tools of the trade for highly specialized industries like yours.

With the acquisition of MOLDINO Tool Engineering, LTD, our traditional Mitsubishi Materials USA cutting tool product line is now sold under the DIAEDGE product brand name.

Brands you can trust:

MITSUBISHI MATERIALS U.S.A.

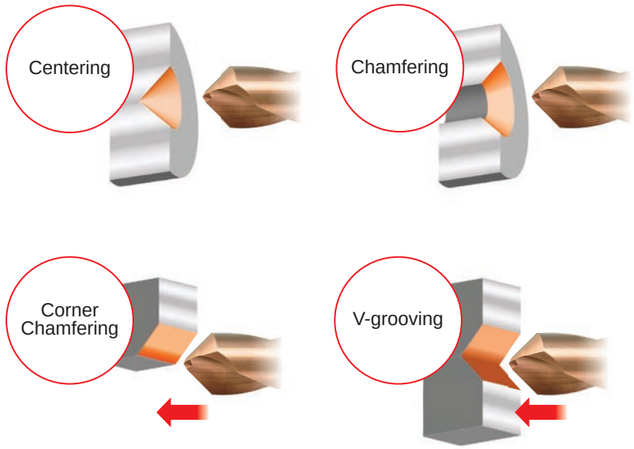
TRUSTED PRODUCT BRANDS

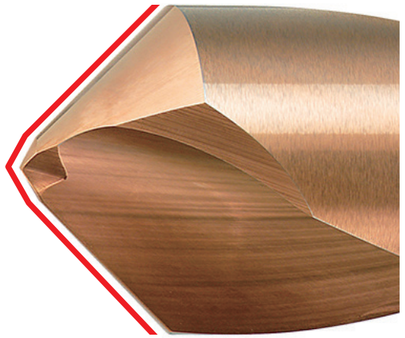
DIAEDGE MOLDINO

DIA EDGE

DLE LEADING DRILL SERIES SOLID CARBIDE DRILLS FOR CENTERING AND CHAMFERING

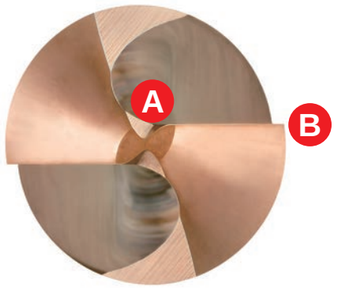
Completes strict standards for centering and chamfering.



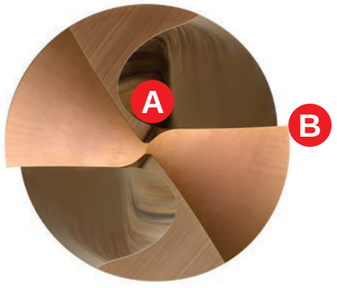


Range of Use

Features



Point Angles SIG 60° 90°



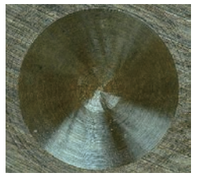
Point Angles SIG 120° 145°

A THINNING GEOMETRY

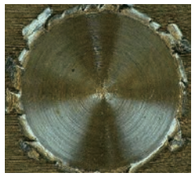
The thinning pocket promotes smooth chip evacuation and provides excellent hole position accuracy. Additionally, the negative cutting edge of the drill point offers high cutting edge strength.

B SHARP CUTTING EDGE AND HIGH FRACTURE RESISTANCE

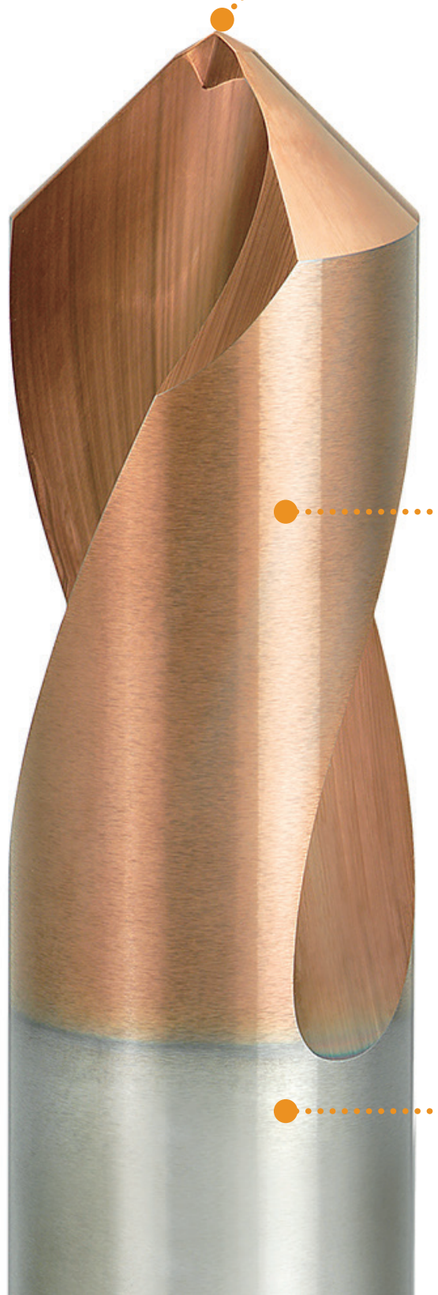
Sharp cutting edge and high fracture resistance provides stable cutting and burr prevention.



DLE



Conventional



TWO-STEP POINT ANGLES 60°, 90°

Two-step point angles ensure strength at the center and prevent sudden fracturing.

*The central area will not have a 60°, 90° bottom hole angle.

DLE

High Strength of Center

Conventional

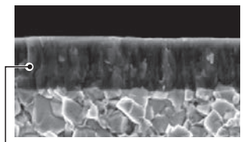
Fractures of Center

ONE-STEP POINT ANGLES 120°, 145°

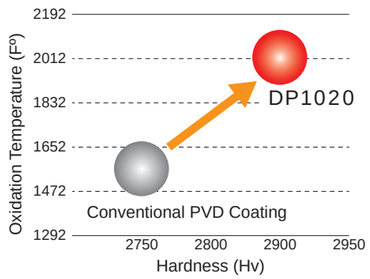
One-step point angles help high-speed steel or carbide drills to bite from the center in next processes.

COATED GRADE DP1020

DP1020 grade offers excellent wear resistance and reduced friction for longer tool life and a versatile range of applications.



With Accumulated Al-Ti-Cr-N Based PVD Coating



EXTENSIVE SUPPORT FOR CNC AUTOMATIC LATHES

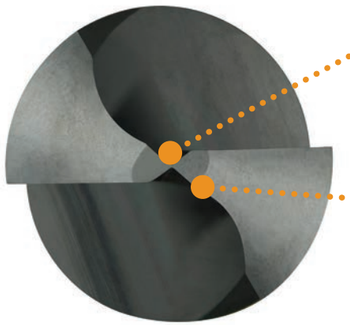
Diverse lineup of shanks compatible with ER collets.

DCON(Connection Diameter)	.197 inch=ER8
DCON	.276 inch=ER11

DIA EDGE

DLE LEADING DRILL SERIES

SIG 90° Small Dia. ø.0394"—ø.0984"



THINNING GEOMETRY

Chip evacuation space in center part improves the bite performance, and ensure for good finished hole position accuracy.

TWO-STEP POINT ANGLES

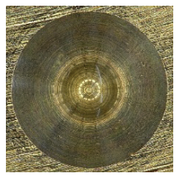
Two-step point angles ensure strength at the center and prevent sudden fracturing.

*The central area will not have a 90° hole bottom.

UNIQUE CUTTING EDGE SHAPE

Large rake angle and sharp cutting edges can minimize the generation of burrs.

AISI 304
Cutting Example



DLE

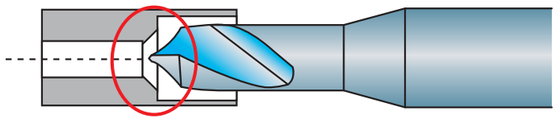
Conventional

NEW GRADE "DP102A" EXCELLENT LUBRICITY AND HEAT RESISTANCE

The PVD-coated carbide grade DP102A has excellent lubricity and heat resistance, and exhibit outstanding wear resistance particularly under low-speed to medium-speed cutting speed.

LONG-NECK DESIGN

Long neck length allows to use the chamfering even deep inside holes.



Memo

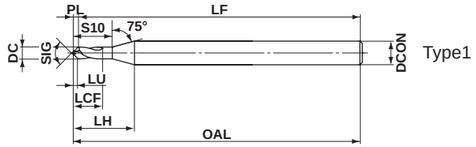
Solid Carbide Drills for Centering and Chamfering

DLE

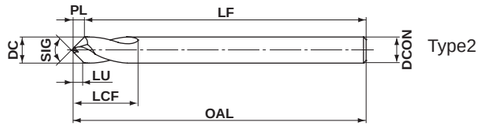
Leading Drill Series

P M K N S H

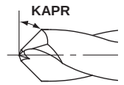
External Coolant



Type1



Type2



(mm)

h7	DCON=3	3 < DCON ≤ 6	6 < DCON ≤ 10	10 < DCON ≤ 16
	0 −0.010	0 −0.012	0 −0.015	0 −0.018

(inch)

h7	DCON=.1181	.1181 < DCON ≤ .2362	.2362 < DCON ≤ .3937	.3937 < DCON ≤ .6299
	0 −.0004	0 −.0005	0 −.0006	0 −.0007

DC (mm)	DC (inch)	SIG	Stock DP1020	Stock DP102A	Order Number	LU (mm)	LU (inch)	LCF (mm)	LCF (inch)	LH (mm)	LH (inch)		S10 (mm)	S10 (inch)	OAL (mm)	OAL (inch)	LF (mm)	LF (inch)	PL (mm)	PL (inch)	KAPR	DCON (mm)	DCON (inch)	Fig.
3.0	.1181	60°	●		**DLE0300S030P060**	2.0	.079	9	.354	—	—		—	—	45	1.772	42.9	1.689	2.1	.083	60°	3	.118	2
4.0	.1575	60°	●		**DLE0400S040P060**	2.7	.106	12	.472	—	—		—	—	50	1.969	47.2	1.858	2.8	.110	60°	4	.157	2
5.0	.1969	60°	●		**DLE0500S050P060**	3.4	.134	14	.551	—	—		—	—	60	2.362	56.5	2.224	3.5	.138	60°	5	.197	2
6.0	.2362	60°	●		**DLE0600S060P060**	4.0	.157	15	.591	—	—		—	—	66	2.598	61.8	2.433	4.2	.165	60°	6	.236	2
7.0	.2756	60°	●		**DLE0700S070P060**	4.7	.185	18	.709	—	—		—	—	74	2.913	69.1	2.720	4.9	.193	60°	7	.276	2
8.0	.3150	60°	●		**DLE0800S080P060**	5.4	.213	20	.787	—	—		—	—	74	2.913	68.4	2.693	5.6	.220	60°	8	.315	2
10.0	.3937	60°	●		**DLE1000S100P060**	6.8	.268	24	.945	—	—		—	—	84	3.307	77	3.031	7.0	.276	60°	10	.394	2
12.0	.4724	60°	●		**DLE1200S120P060**	8.1	.319	28	1.102		—		—	—	95	3.740	86.6	3.409	8.4	.331	60°	12	.472	2
NEW 1.0	.0394	90°		●	**DLE0100S030P090**	0.35	.014	2	.079	6.7	.264		3.0	.118	45	1.772	44.6	1.756	0.4	.016	45°	3	.118	1
NEW 1.5	.0591	90°		●	**DLE0150S030P090**	0.55	.022	3	.118	7.3	.287		4.5	.177	45	1.772	44.4	1.748	0.6	.024	45°	3	.118	1
NEW 2.0	.0787	90°		●	**DLE0200S030P090**	0.80	.031	4	.157	7.9	.311		6.1	.240	45	1.772	44.1	1.736	0.9	.035	45°	3	.118	1
NEW 2.5	.0984	90°		●	**DLE0250S030P090**	1.00	.039	5	.197	7.9	.311		7.1	.280	45	1.772	43.9	1.728	1.1	.043	45°	3	.118	1
3.0	.1181	90°	●		**DLE0300S030P090**	1.2	.047	9	.354	—	—		—	—	45	1.772	43.7	1.720	1.3	.051	45°	3	.118	2
4.0	.1575	90°	●		**DLE0400S040P090**	1.6	.063	12	.472	—	—		—	—	50	1.969	48.3	1.902	1.7	.067	45°	4	.157	2
5.0	.1969	90°	●		**DLE0500S050P090**	2.0	.079	14	.551	—	—		—	—	60	2.362	57.9	2.280	2.1	.083	45°	5	.197	2
6.0	.2362	90°	●		**DLE0600S060P090**	2.4	.094	15	.591	—	—		—	—	66	2.598	63.4	2.496	2.6	.102	45°	6	.236	2
7.0	.2756	90°	●		**DLE0700S070P090**	2.8	.110	18	.709	—	—		—	—	74	2.913	71.0	2.795	3.0	.118	45°	7	.276	2
8.0	.3150	90°	●		**DLE0800S080P090**	3.2	.126	20	.787	—	—		—	—	74	2.913	70.6	2.780	3.4	.134	45°	8	.315	2
10.0	.3937	90°	●		**DLE1000S100P090**	4.1	.161	24	.945	—	—		—	—	84	3.307	79.7	3.138	4.3	.169	45°	10	.394	2
12.0	.4724	90°	●		**DLE1200S120P090**	4.9	.193	28	1.102	—	—		—	—	95	3.740	89.9	3.539	5.1	.201	45°	12	.472	2
16.0	.6299	90°	●		**DLE1600S160P090**	6.6	.260	35	1.378	—	—		—	—	113	4.449	106.2	4.181	6.8	.268	45°	16	.630	2

Note 1) In the region of roughly **DC**/4, which is the region of the two-step point angles, the central area will not have a 60°, 90° bottom hole angle. Chamfering will also not be possible in this region.

Note 2) The centering diameter should be less than the drill diameter (processing diameter) **DC** and the usable length **LU** should be referred to as a guideline.

● : **USA Stock**

DC = Cutting Diameter
LU = Usable Length
LCF = Length Chip Flute
LH = Neck Length
OAL = Overall Length
LF = Functional Length
PL = Point Length
DCON = Connection Diameter
SIG = Point Angle

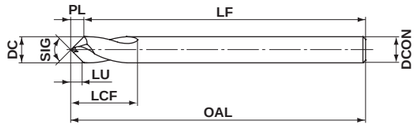
Solid Carbide Drills for Centering and Chamfering

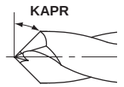
DLE

Leading Drill Series

P M K N S H

External Coolant





(mm)

h7	DCON=3	3 < DCON ≤ 6	6 < DCON ≤ 10	10 < DCON ≤ 16
	0 −0.010	0 −0.012	0 −0.015	0 −0.018

(inch)

h7	DCON=.1181	.1181 < DCON ≤ .2362	.2362 < DCON ≤ .3937	.3937 < DCON ≤ .6299
	0 −.0004	0 −.0005	0 −.0006	0 −.0007

DC (mm)	DC (inch)	SIG	DP1020	Order Number	LU (mm)	LU (inch)	LCF (mm)	LCF (inch)	OAL (mm)	OAL (inch)	LF (mm)	LF (inch)	PL (mm)	PL (inch)	KAPR	DCON (mm)	DCON (inch)
3.0	.1181	120°	●	**DLE0300S030P120**	0.8	.031	9	.354	45	1.772	44.1	1.736	0.9	.035	30°	3	.118
4.0	.1575	120°	●	**DLE0400S040P120**	1.1	.043	12	.472	50	1.969	48.8	1.921	1.2	.047	30°	4	.157
5.0	.1969	120°	●	**DLE0500S050P120**	1.3	.051	14	.551	60	2.362	58.6	2.307	1.4	.055	30°	5	.197
6.0	.2362	120°	●	**DLE0600S060P120**	1.6	.063	15	.591	66	2.598	64.3	2.531	1.7	.067	30°	6	.236
7.0	.2756	120°	●	**DLE0700S070P120**	1.9	.075	18	.709	74	2.913	72.0	2.835	2.0	.079	30°	7	.276
8.0	.3150	120°	●	**DLE0800S080P120**	2.2	.087	20	.787	74	2.913	71.7	2.823	2.3	.091	30°	8	.315
10.0	.3937	120°	●	**DLE1000S100P120**	2.8	.110	24	.945	84	3.307	81.1	3.193	2.9	.114	30°	10	.394
12.0	.4724	120°	●	**DLE1200S120P120**	3.3	.130	28	1.102	95	3.740	91.5	3.602	3.5	.138	30°	12	.472
3.0	.1181	145°	●	**DLE0300S030P145**	0.4	.016	9	.354	45	1.772	44.5	1.752	0.5	.020	17.5°	3	.118
4.0	.1575	145°	●	**DLE0400S040P145**	0.5	.020	12	.472	50	1.969	49.4	1.945	0.6	.024	17.5°	4	.157
5.0	.1969	145°	●	**DLE0500S050P145**	0.7	.028	14	.551	60	2.362	59.2	2.331	0.8	.031	17.5°	5	.197
6.0	.2362	145°	●	**DLE0600S060P145**	0.8	.031	15	.591	66	2.598	65.1	2.563	0.9	.035	17.5°	6	.236
7.0	.2756	145°	●	**DLE0700S070P145**	1.0	.039	18	.709	74	2.913	72.9	2.870	1.1	.043	17.5°	7	.276
8.0	.3150	145°	●	**DLE0800S080P145**	1.1	.043	20	.787	74	2.913	72.7	2.862	1.3	.051	17.5°	8	.315

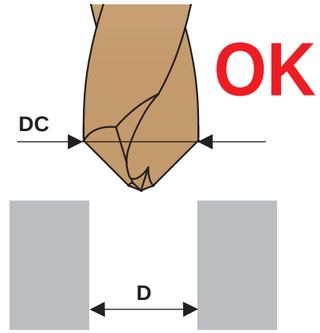
Note 1) The centering diameter should be less than the drill diameter (processing diameter) **DC** and the usable length **LU** should be referred to as a guideline.

DC = Cutting Diameter
LU = Usable Length
LCF = Length Chip Flute
OAL = Overall Length
LF = Functional Length
PL = Point Length
DCON = Connection Diameter
SIG = Point Angle

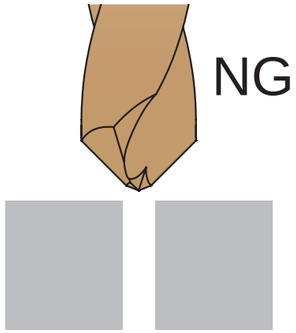
Drill Diameter Selection

When Chamfering

With respect to guide hole diameter **D**, select the drill diameter (cutting diameter) **DC** to be within the range of **D** < **DC** < 2**D**.

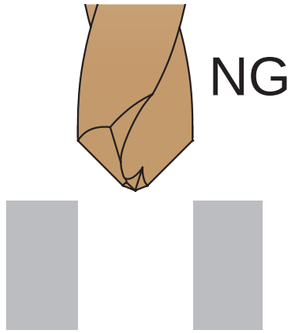


Example) If guide hole diameter **D** is .197": Drill diameter **DC** should be equal to or greater than .236" but less than .394". Select a **DC** of .236", .276", or .315".



If DC is equal to or greater than 2D:

If drill diameter **DC** is too large compared to guide hole diameter **D** (equal to or greater than 2**D**), chamfering cannot be performed.

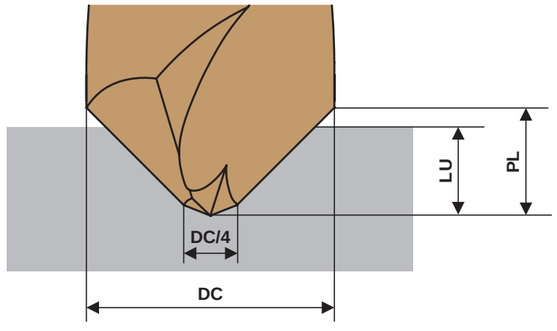


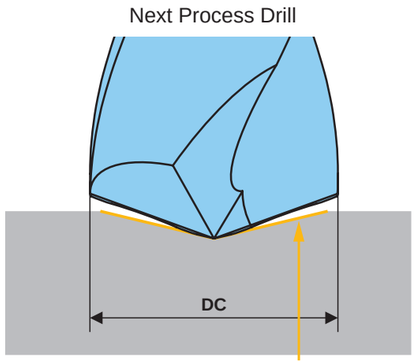
If DC is a drill diameter equal to D:

Chamfering cannot be performed if drill diameter **DC** is the same as guide hole diameter **D**.

When Centering

The tool cannot be used for processing if the centering diameter has the same guide hole diameter as drill diameter **DC**. Refer to the usable length **LU** (page 3,4) as a guideline.
In the region of roughly **DC**/4, which is the region of the two-step point angles, the central area will not have a 90° hole bottom.
Select a leading drill with a point angle larger than that of the next process drill, if it is desired to make drills required in next processes bite from the center.





Centering of Point Angle SIG145°

Point Angle SIG 60°

Recommended Cutting Conditions

(inch)

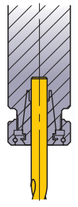
Workpiece Material		Mild Steels (≤180HB) AISI 1010 etc.		Carbon Steels, Alloy Steels (180—280HB) AISI 1045, 4140 etc.		Carbon Steels, Alloy Steels (280—350HB) AISI 4340 etc.	
DC		Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)
(mm)	(inch)						
3	.1181	245	.0020 (.0012—.0028)	210	.0020 (.0012—.0028)	195	.0016 (.0008—.0024)
4	.1575	245	.0020 (.0012—.0028)	210	.0020 (.0012—.0028)	195	.0016 (.0008—.0024)
5	.1969	260	.0024 (.0016—.0031)	230	.0024 (.0016—.0031)	210	.0020 (.0012—.0028)
6	.2362	260	.0024 (.0016—.0031)	230	.0024 (.0016—.0031)	210	.0020 (.0012—.0028)
7	.2756	260	.0028 (.0016—.0035)	230	.0028 (.0016—.0035)	210	.0020 (.0012—.0028)
8	.3150	260	.0028 (.0016—.0035)	230	.0028 (.0016—.0035)	210	.0020 (.0012—.0028)
10	.3937	280	.0031 (.0016—.0039)	245	.0031 (.0016—.0039)	230	.0024 (.0012—.0031)
12	.4724	280	.0031 (.0016—.0039)	245	.0031 (.0016—.0039)	230	.0024 (.0012—.0031)

Workpiece Material		Austenitic Stainless Steels (≤200HB) AISI 304, 316 etc.		Gray Cast Irons (≤350MPa) AISI No45B etc.		Ductile Cast Irons (≤450MPa) AISI 60-40-18 etc.	
DC		Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)
(mm)	(inch)						
3	.1181	50	.0012 (.0004—.0020)	245	.0020 (.0012—.0028)	180	.0020 (.0012—.0028)
4	.1575	50	.0012 (.0004—.0020)	245	.0020 (.0012—.0028)	180	.0020 (.0012—.0028)
5	.1969	65	.0016 (.0008—.0024)	260	.0024 (.0016—.0031)	195	.0024 (.0016—.0031)
6	.2362	65	.0016 (.0008—.0024)	260	.0024 (.0016—.0031)	195	.0024 (.0016—.0031)
7	.2756	65	.0016 (.0008—.0024)	260	.0028 (.0016—.0035)	195	.0024 (.0016—.0031)
8	.3150	65	.0016 (.0008—.0024)	260	.0028 (.0016—.0035)	195	.0024 (.0016—.0031)
10	.3937	65	.0016 (.0008—.0024)	280	.0031 (.0016—.0039)	195	.0028 (.0016—.0035)
12	.4724	65	.0016 (.0008—.0024)	280	.0031 (.0016—.0039)	195	.0028 (.0016—.0035)

Note 1) When chamfering a circumference of a guide hole, make sure that the tool diameter(**DC**) is **D** <**DC** <2**D**.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When V-grooving and chamfering, please reduce cutting conditions.
Note 4) When chatter vibration or abnormal noise is generated, please shorten the time of dwell program or lower the rotation speed.
Note 5) When centering, please do not exceed the **LU** (usable length).

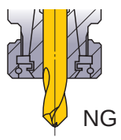
■ Operational Guidance

Drill Holding



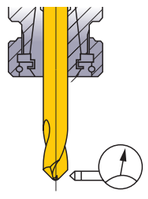
Collet chuck holds the drill securely.

Drill Installation



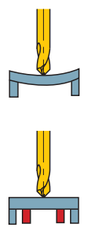
Do not clamp on the flutes.

Installation Tolerance

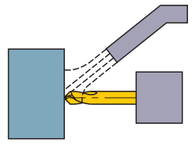


Run-out ≤ .001 inch

Thin Workpiece



Coolant Method



Coolant positions,at the end at the center are ideal.

Point Angle SIG 90°, 120° and 145°

Recommended Cutting Conditions

(inch)

Workpiece Material		Mild Steels (≤180HB) AISI 1010 etc.		Carbon Steels, Alloy Steels (180—280HB) AISI 1045, 4140 etc.		Carbon Steels, Alloy Steels (280—350HB) AISI 4340 etc.	
DC		Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)
(mm)	(inch)						
1.0	.0394	100	.0008 (.0004—.0012)	65	.0008 (.0004—.0012)	15	.0008 (.0004—.0012)
1.5	.0591	150	.0008 (.0004—.0012)	115	.0008 (.0004—.0012)	30	.0008 (.0004—.0012)
2.0	.0787	195	.0016 (.0012—.0020)	165	.0016 (.0012—.0020)	45	.0016 (.0012—.0020)
2.5	.0984	245	.0016 (.0012—.0020)	210	.0016 (.0012—.0020)	195	.0016 (.0012—.0020)
3.0	.1181	245	.0024 (.0016—.0031)	210	.0024 (.0016—.0031)	195	.0020 (.0012—.0028)
4.0	.1575	245	.0024 (.0016—.0031)	210	.0024 (.0016—.0031)	195	.0020 (.0012—.0028)
5.0	.1969	260	.0028 (.0020—.0035)	230	.0028 (.0020—.0035)	210	.0024 (.0016—.0031)
6.0	.2362	260	.0028 (.0020—.0035)	230	.0028 (.0020—.0035)	210	.0024 (.0016—.0031)
7.0	.2756	260	.0031 (.0020—.0039)	230	.0031 (.0020—.0039)	210	.0024 (.0016—.0031)
8.0	.3150	260	.0031 (.0020—.0039)	230	.0031 (.0020—.0039)	210	.0024 (.0016—.0031)
10.0	.3937	280	.0035 (.0020—.0043)	245	.0035 (.0020—.0043)	230	.0028 (.0016—.0035)
12.0	.4724	280	.0035 (.0020—.0043)	245	.0035 (.0020—.0043)	230	.0028 (.0016—.0035)
16.0	.6299	295	.0047 (.0039—.0055)	260	.0047 (.0039—.0055)	245	.0031 (.0024—.0039)

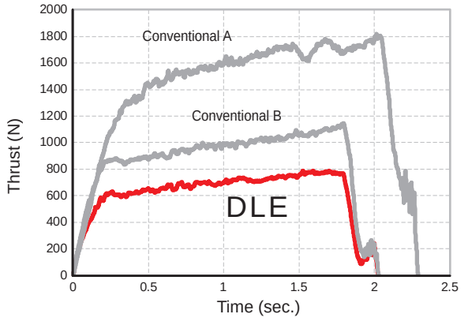
Workpiece Material		Austenitic Stainless Steels (≤200HB) AISI 304, 316 etc.		Gray Cast Irons (≤350MPa) AISI No45B etc.		Ductile Cast Irons (≤450MPa) AISI 60-40-18 etc.	
DC		Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)
(mm)	(inch)						
1.0	.0394	65	.0004 (.0002—.0006)	100	.0008 (.0004—.0012)	30	.0008 (.0004—.0012)
1.5	.0591	65	.0004 (.0002—.0006)	150	.0008 (.0004—.0012)	80	.0008 (.0004—.0012)
2.0	.0787	65	.0016 (.0012—.0020)	195	.0016 (.0012—.0020)	130	.0016 (.0012—.0020)
2.5	.0984	65	.0016 (.0012—.0020)	245	.0016 (.0012—.0020)	180	.0016 (.0012—.0020)
3.0	.1181	65	.0016 (.0008—.0024)	245	.0024 (.0016—.0031)	180	.0024 (.0016—.0031)
4.0	.1575	65	.0016 (.0008—.0024)	245	.0024 (.0016—.0031)	180	.0024 (.0016—.0031)
5.0	.1969	65	.0024 (.0016—.0031)	260	.0028 (.0020—.0035)	195	.0028 (.0020—.0035)
6.0	.2362	65	.0024 (.0016—.0031)	260	.0028 (.0020—.0035)	195	.0028 (.0020—.0035)
7.0	.2756	65	.0024 (.0016—.0031)	260	.0031 (.0020—.0039)	195	.0028 (.0020—.0035)
8.0	.3150	65	.0024 (.0016—.0031)	260	.0031 (.0020—.0039)	195	.0028 (.0020—.0035)
10.0	.3937	65	.0024 (.0016—.0031)	280	.0035 (.0020—.0043)	195	.0031 (.0020—.0039)
12.0	.4724	65	.0024 (.0016—.0031)	280	.0035 (.0020—.0043)	195	.0031 (.0020—.0039)
16.0	.6299	65	.0031 (.0024—.0039)	295	.0047 (.0039—.0055)	195	.0043 (.0035—.0051)

Note 1) When chamfering a circumference of a guide hole, make sure that the tool diameter(**DC**) is **D** <**DC** <2**D**.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When V-grooving and chamfering, please reduce cutting conditions.
Note 4) When chatter vibration or abnormal noise is generated, please shorten the time of dwell program or lower the rotation speed.
Note 5) When centering, please do not exceed the **LU** (usable length).

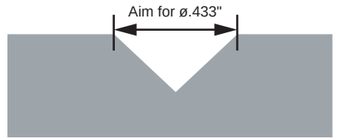
Cutting Performance

Comparison of Cutting Performance during Centering

Ideal for processing at low power, when compared to conventional products.



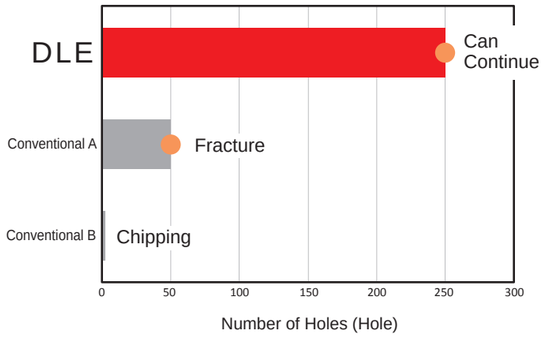
<Cutting Conditions>
Workpiece
Material : AISI 1045
Drill : DLE1200S120P090 ø.472"
Cutting Speed : vc = 195 SFM
Feed per Rev. : fr = .0024 IPR
Cutting Mode : Wet Cutting External Coolant (Chlorine Free Emulsion)
Machine : Vertical MC



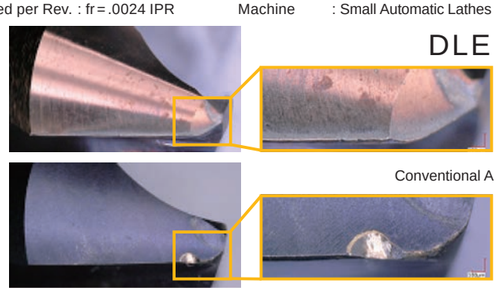
*Differences along the time axis are a result of differences in processing depth.

Comparison of Centering Life when Processing AISI 304

The two-step point angles, together with the negative cutting edge shape and cutting edge treatment of the thinning pocket, provide outstandings excellent with no abnormal damage.

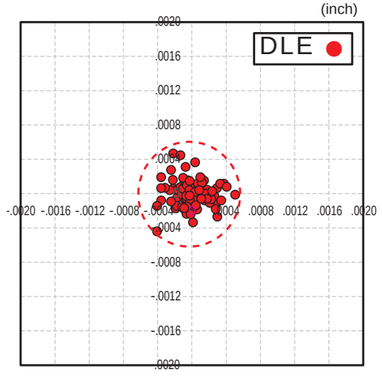


<Cutting Conditions>
Workpiece
Material : AISI 304
Drill : DLE0600S060P090
Cutting Speed : vc = 80 SFM
Feed per Rev. : fr = .0024 IPR
Hole Depth : Aim for hole dia. ø.197"
Cutting Mode : Wet Cutting External Coolant (Water-insoluble Coolants)
Machine : Small Automatic Lathes

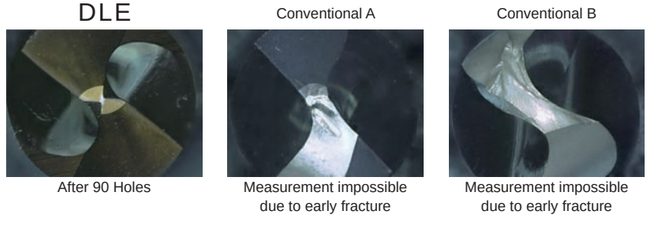


Centering Hole Position Precision for JIS SUS420J2

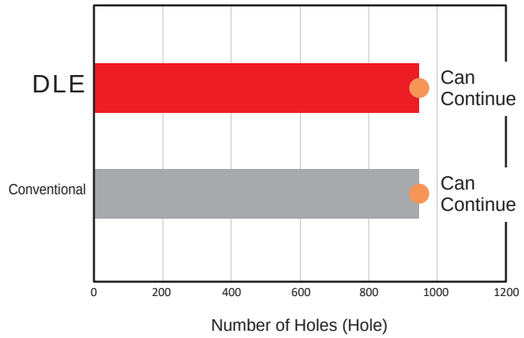
Stainless steels are likely to experience abnormal damage from build-up edge. Compared to conventional products which often suffered early fractures, the DLE has longer tool life.



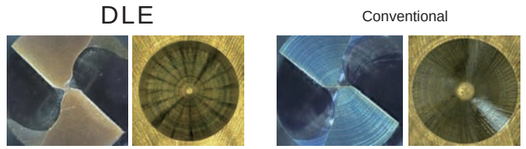
<Cutting Conditions>
Workpiece
Material : JIS SUS420J2
Drill : DLE0600S060P090
Cutting Speed : vc = 50 SFM
Feed per Rev. : fr = .0016 IPR
Hole Depth : Aim for hole dia. ø.217"
Cutting Mode : Wet Cutting External Coolant (Chlorine Free Emulsion)
Machine : Vertical MC



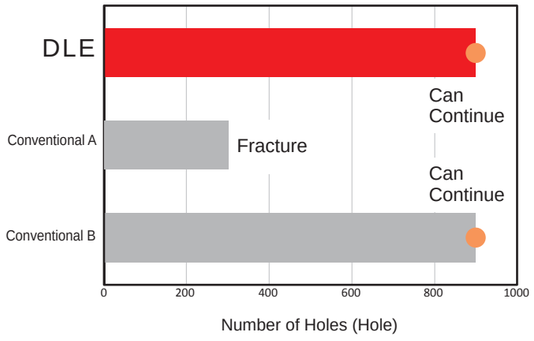
Comparison of Centering Life when Processing AISI 304 : Point Angle 120°



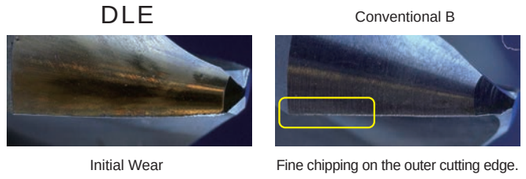
<Cutting Conditions>
Workpiece
Material : AISI 304
Drill : DLE0600S060P120
Cutting Speed : vc = 65 SFM
Feed per Rev. : fr = .0024 IPR
Hole Depth : Aim for hole dia. ø.217"
Cutting Mode : Wet Cutting External Coolant (Water-insoluble Coolants)
Machine : Vertical MC



Comparison of Centering Life when Processing AISI 304 : Point Angle 60°

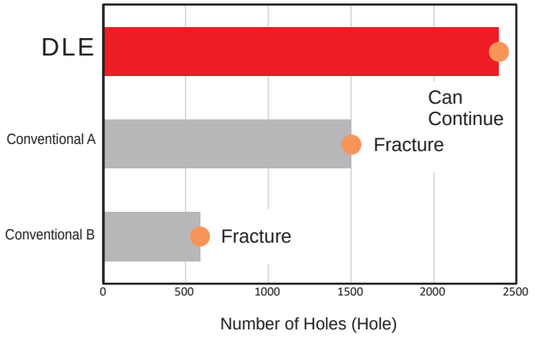


<Cutting Conditions>
Workpiece
Material : AISI 304
Drill : DLE0600S060P060
Cutting Speed : vc = 50 SFM
Feed per Rev. : fr = .0008 IPR
Hole Depth : Aim for hole dia. ø.217"
Cutting Mode : Wet Cutting External Coolant (Chlorine Free Emulsion)
Machine : Vertical MC

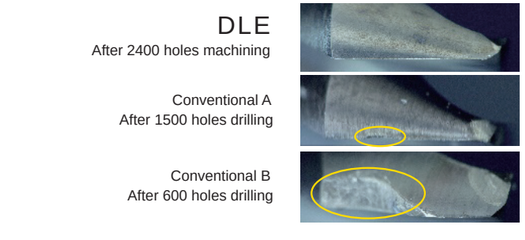


Comparison of Centering Life when Processing AISI 304 : Point Angle 90° (small-diameter ø.0787”)

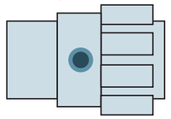
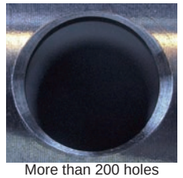
When processing stainless steel, DLE drills can realize longer tool life with outstanding heat resistance, and wear resistance for boundary wear.

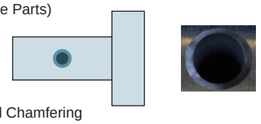
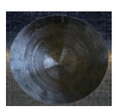
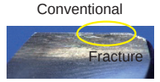


<Cutting Conditions>
Work Material : AISI 304
Drill : DLE0200S030P090
Cutting Speed : vc=100 SFM
Feed per Rev. : fr=.0018 IPR
Cutting Mode : Wet Cutting External Coolant (Water-soluble Coolants)
Machine : Vertical MC



Application Example

Drill		DLE0400S040P090	DLE0600S060P090
Workpiece		AISI 1010 (Equipment Parts) Centering and Chamfering 	AISI 304 (Machine Parts)  Centering and Chamfering
Cutting Conditions	Cutting Speed **vc** (SFM)	100	80
	Feed per Rev. **fr** (IPR)	.0018	.0020
	Guide Hole Dia. (inch)	ø.118	ø.197
Cutting Mode		Wet Cutting Extarnal Coolant (Chlorine Free Emulsion)	Wet Cutting Extarnal Coolant (Water-insoluble)
Machine		NC Lathe, Tool Rotation	CNC Automatic Lathe
Results		 Burrs are suppressed Compared to conventional product, the DLE has smaller burrs and a longer expected life.	 More than 200 holes Good surface finishes and no tool damage While conventional product often caused chipping to occur, the DLE is more stable and has been used to complete drilling of 200 holes with no damage on the cutting edge.

Drill		DLE0300S030P090	DLE0200S030P090
Workpiece		AISI 303 (Engine Parts)  Centerring and Chamfering	AISI 303 (Engine Parts)  Centering of ø.024" hole
Cutting Conditions	Cutting Speed **vc** (SFM)	80	125
	Feed per Rev. **fr** (IPR)	.0016	.0008
	Guide Hole Dia. (inch)	ø.079	ø.024
Cutting Mode		Wet Cutting Extarnal Coolant (Water-insoluble) Curved Surface	Wet Cutting Extarnal Coolant (Water-insoluble)
Machine		CNC Automatic Lathe	CNC Automatic Lathe
Results		DLE  Conventional  After 60 Holes After 1 Hole While the conventional product generated burrs after drilling 1 hole, DLE achieve good surface quality with no sudden fractures even after drilling 60 holes.	Comparison of Rake Faces after centering DLE Conventional   Fracture 60000 holes 30000 holes DLE had a tool life twice as long as the conventional product, and was able to carry out cutting with no fractures.

The above application examples are customer's applications, so it can be different from the recommended conditions.

Memo

DIA EDGE

MITSUBISHI MATERIALS U.S.A. CORPORATION

California Office (Headquarters)

3535 Hyland Avenue, Suite 200
Costa Mesa, CA 92626
Customer Service: 800.523.0800
Technical Service: 800.486.2341

North Carolina-MTEC (Marketing & Technical Center)

105 Corporate Center Drive, Suite A
Mooresville, NC 28117
Main: 980.312.3100
Fax: 704.746.9292

Chicago Office (Engineering)

1314B North Plum Grove Road
Schaumburg, IL 60173
Main: 847.252.6300
Fax: 847.519.1732

Toronto Office (Canada Branch)

3535 Laird Road
Units 15 & 16
Mississauga, Ontario, Canada L5L 5Y7
Main: 905.814.0240
Fax: 905.814.0245

MMC Metal de Mexico, S.A. DE C.V.

Av. La Cañada No.16,
Parque Industrial Bernardo
Quintana, El Marques,
Queretaro C.P. 76246 MEXICO
Main: +52.442.221.61.36
Fax: +52.442.221.61.34

Detroit Office (Moldino CS)

41700 Gardenbrook Road, Suite 120
Novi, MI 48375
Main: 248.308.2620
Fax: 248.308.2627

For Your Safety

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

MITSUBISHI MATERIALS U.S.A.

Product Brands Crafted by Mitsubishi Materials U.S.A.

DIA EDGE MOLDINO

www.DIAEDGE.MMUS.com
www.mmus-carbide.com

Tools specifications subject to change without notice.

B223A-US-2020.11