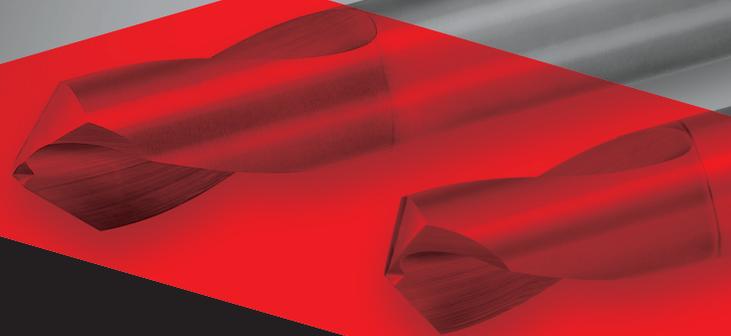


DLE

Leading Drill Series

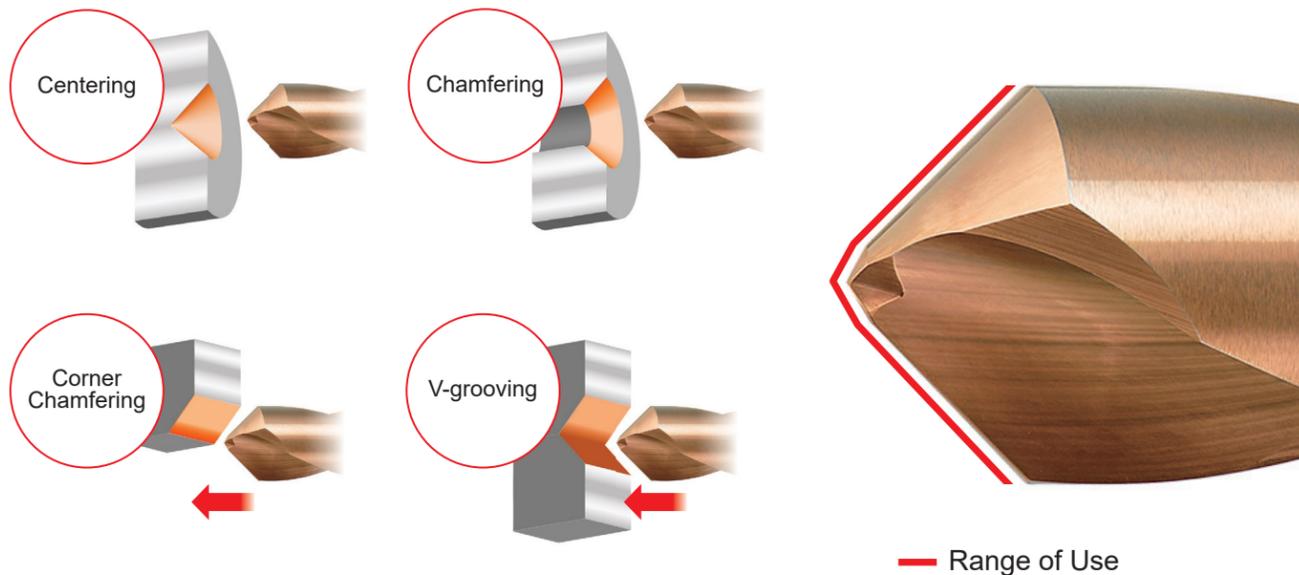
SOLID CARBIDE DRILLS FOR
CENTERING AND CHAMFERING



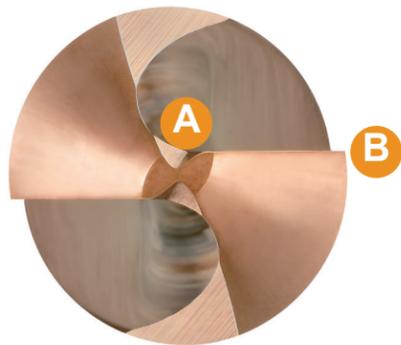
Solid Carbide Drills for Centering and Chamfering

Leading Drill Series **DLE**

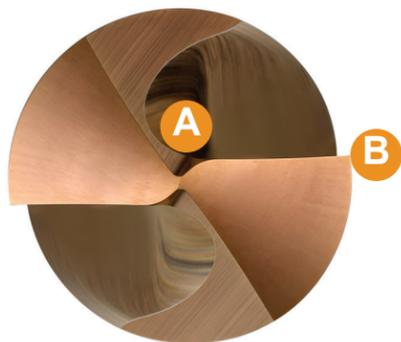
Completes strict standards for centering and chamfering.



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

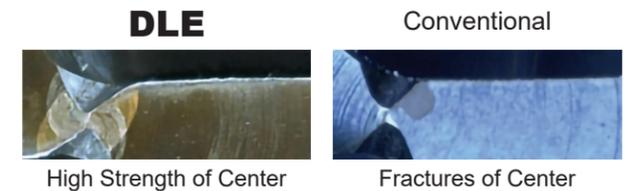


Conventional

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.



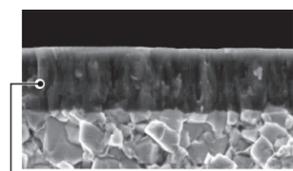
One-step Point Angles 120°, 145°

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

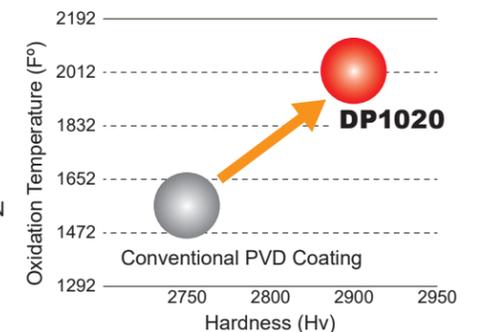


Coated Grade **DP1020**

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

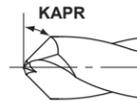
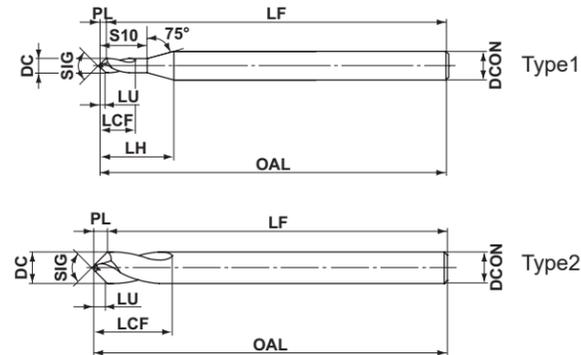
Solid Carbide Drills for Centering and Chamfering

DLE

Leading Drill Series

P M K N S H

External Coolant



		(mm)			
		DCON=3	3 < DCON ≤ 6	6 < DCON ≤ 10	10 < DCON ≤ 16
		0 -0.010	0 -0.012	0 -0.015	0 -0.018
		(inch)			
		DCON=.1181	.1181 < DCON ≤ .2362	.2362 < DCON ≤ .3937	.3937 < DCON ≤ .6299
		0 -.0004	0 -.0005	0 -.0006	0 -.0007

DC	SIG	Stock		Order Number	LU		LCF		LH		S10		OAL		LF		PL		KAPR	DCON		Fig.	
		DP1020	DP102A		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		(mm)	(inch)		
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.

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

● : USA Stock

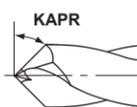
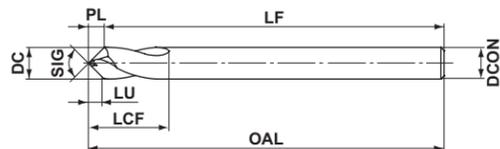
Solid Carbide Drills for Centering and Chamfering

DLE

Leading Drill Series

P M K N S H

External Coolant



(mm)				
DCON=3	3 < DCON ≤ 6	6 < DCON ≤ 10	10 < DCON ≤ 16	
0	0	0	0	
-0.010	-0.012	-0.015	-0.018	
(inch)				
DCON=.1181	.1181 < DCON ≤ .2362	.2362 < DCON ≤ .3937	.3937 < DCON ≤ .6299	
0	0	0	0	
-.0004	-.0005	-.0006	-.0007	

DC	SIG	DP1020	Order Number	LU		LCF		OAL		LF		PL		KAPR	DCON	
				(mm)	(inch)		(mm)	(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
NEW 10.0	.3937	145°	● DLE1000S100P145	1.4	.055	24	.945	84	3.307	82.4	3.244	1.6	.063	17.5°	10	.394
NEW 12.0	.4724	145°	● DLE1200S120P145	1.7	.067	28	1.102	95	3.740	93.1	3.665	1.9	.075	17.5°	12	.472

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.

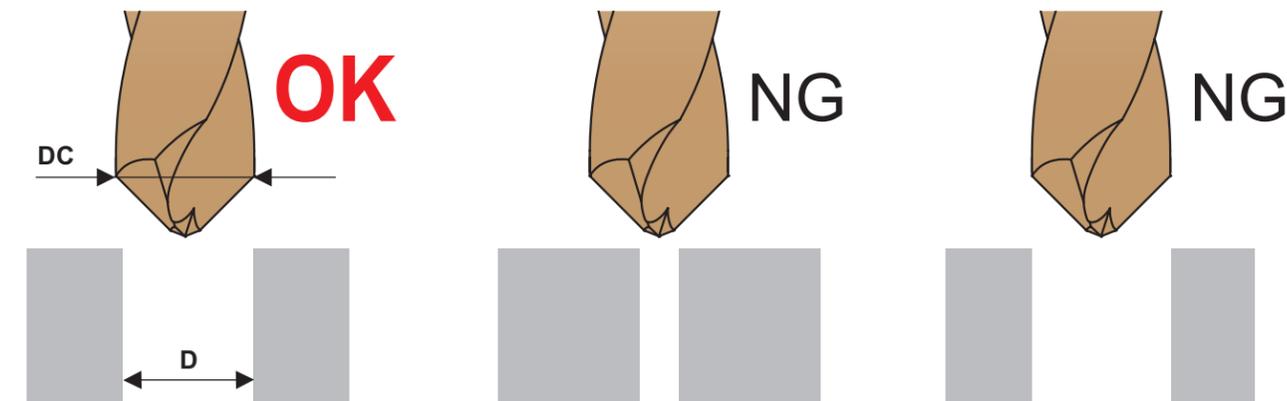
DC = Cutting Diameter **OAL** = Overall Length **DCON** = Connection Diameter
LU = Usable Length **LF** = Functional Length **SIG** = Point Angle
LCF = Length Chip Flute **PL** = Point Length

● : USA Stock

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 $D < DC < 2D$.



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 **2D**), chamfering cannot be performed.

If **DC** is a drill diameter equal to **D**:

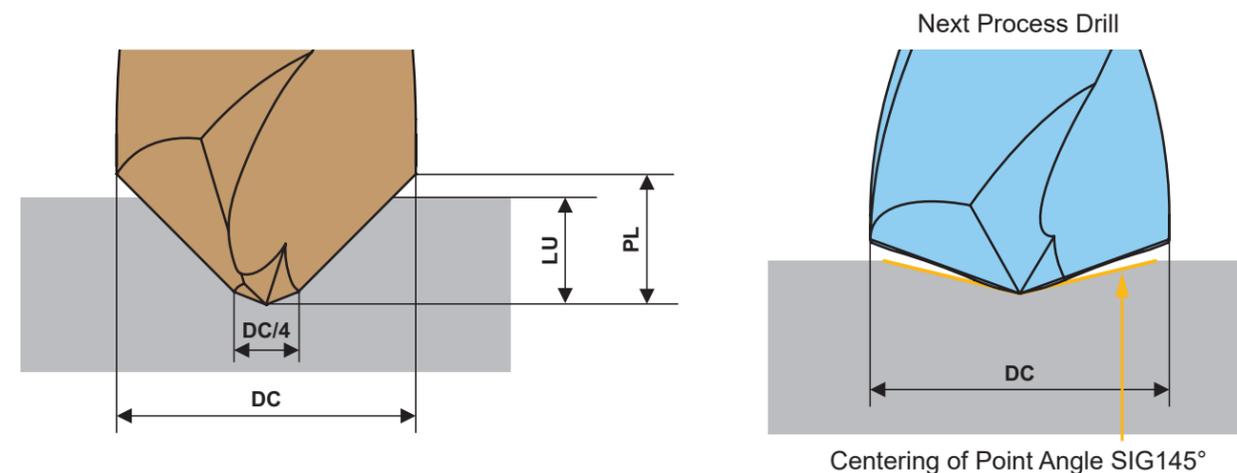
Chamfering cannot be performed if drill diameter **DC** is the same as guide hole diameter **D**.

When Centering

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

The central area of holes (approx 25% of the full diameter) formed by two step point angles will not have their respective 60° and 90° angles. Chamfering is also not possible in the center areas.

Select a centering drill with a larger point angle than the final hole drill if is desired to make initial contact with the center.

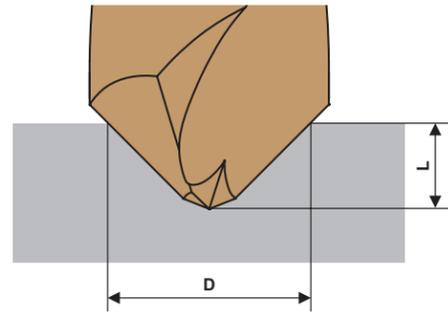


Centering of Point Angle SIG145°

Solid Carbide Drills for Centering and Chamfering

DLE

Drilling Depth (L) Chart by Tool Diameter



(inch)

DC		SIG 90°			
		Min.		Max.	
(mm)	(inch)	D	L	D	L
1.0	.0394	.020	.007	.031	.013
1.5	.0591	.031	.011	.051	.021
2.0	.0787	.039	.014	.075	.031
2.5	.0984	.051	.019	.094	.039
3.0	.1181	.059	.020	.110	.047
4.0	.1575	.079	.028	.150	.063
5.0	.1969	.098	.035	.185	.079
6.0	.2362	.118	.043	.224	.094
7.0	.2756	.138	.047	.260	.110
8.0	.3150	.157	.055	.299	.126
10.0	.3937	.197	.071	.382	.161
12.0	.4724	.236	.083	.457	.193
16.0	.6299	.315	.110	.610	.260

DC		SIG 60°				SIG 120°				SIG 145°			
		Min.		Max.		Min.		Max.		Min.		Max.	
(mm)	(inch)	D	L	D	L	D	L	D	L	D	L	D	L
3.0	.1181	.059	.031	.114	.079	.059	.016	.110	.031	.059	.008	.098	.016
4.0	.1575	.079	.043	.154	.106	.079	.024	.150	.043	.079	.012	.126	.020
5.0	.1969	.098	.051	.193	.134	.098	.028	.177	.051	.098	.016	.173	.028
6.0	.2362	.118	.063	.228	.157	.118	.035	.217	.063	.118	.020	.201	.031
7.0	.2756	.138	.075	.268	.185	.138	.039	.260	.075	.138	.024	.248	.039
8.0	.3150	.157	.083	.307	.213	.157	.047	.299	.087	.157	.024	.276	.043
10.0	.3937	.197	.106	.386	.268	.197	.055	.382	.110	.197	.031	.350	.055
12.0	.4724	.236	.126	.457	.319	.236	.067	.449	.130	.236	.035	.425	.067

Point Angle SIG 60°

Recommended Cutting Conditions

(inch)

Workpiece Material		Mild Steels (≤180HB)		Carbon Steels, Alloy Steels (180–280HB)		Carbon Steels, Alloy Steels (280–350HB)	
		AISI 1010 etc.		AISI 1045, 4140 etc.		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)		Gray Cast Irons (≤350MPa)		Ductile Cast Irons (≤450MPa)	
		AISI 304, 316 etc.		AISI No45B etc.		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 $D < DC < 2D$.
 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 NG If Bending Occurs OK Support the Workpiece	Coolant Method Coolant positions, at the end at the center are ideal.
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Solid Carbide Drills for Centering and Chamfering

Point Angle SIG 90°, 120° and 145°

Recommended Cutting Conditions (inch)							
Workpiece Material		Mild Steels (≤180HB)		Carbon Steels, Alloy Steels (180—280HB)		Carbon Steels, Alloy Steels (280—350HB)	
		AISI 1010 etc.		AISI 1045, 4140 etc.		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)

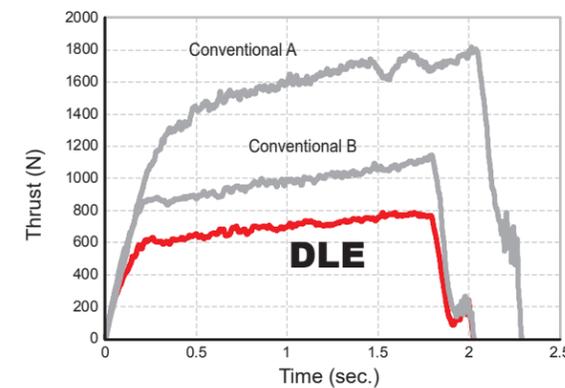
Workpiece Material		Austenitic Stainless Steels (≤200HB)		Gray Cast Irons (≤350MPa)		Ductile Cast Irons (≤450MPa)	
		AISI 304, 316 etc.		AISI No45B etc.		AISI 60-40-18 etc.	
DC		Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (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 $D < DC < 2D$.
- 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).

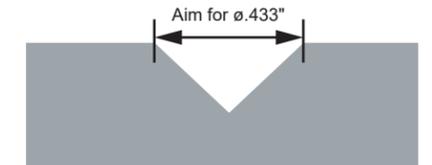
Cutting Performance

Comparison of Cutting Performance during Centering

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



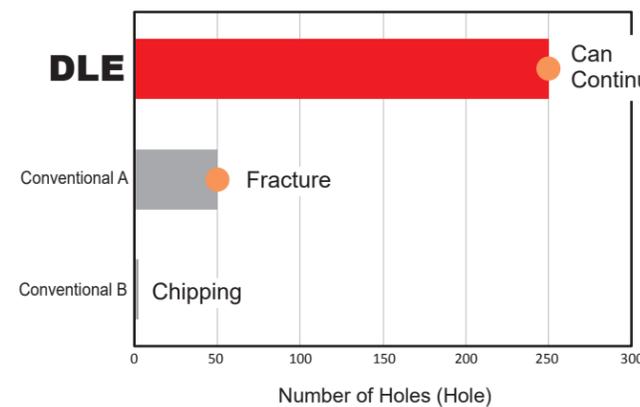
<Cutting Conditions>
 Workpiece : AISI 1045
 Material : DLE1200S120P090
 Drill : ø.472"
 Cutting Speed : vc = 195 SFM
 Feed per Rev. : fr = .0024 IPR
 Cutting Mode : Wet Cutting
 External Coolant (Chlorine Free Emulsion)
 Machine : Vertical MC



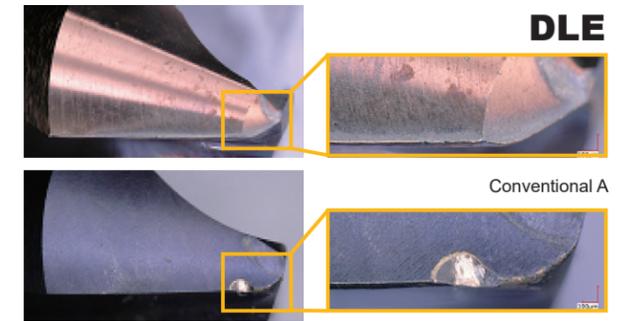
*Differences along the time axis are a result of differences in processing depth.

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.

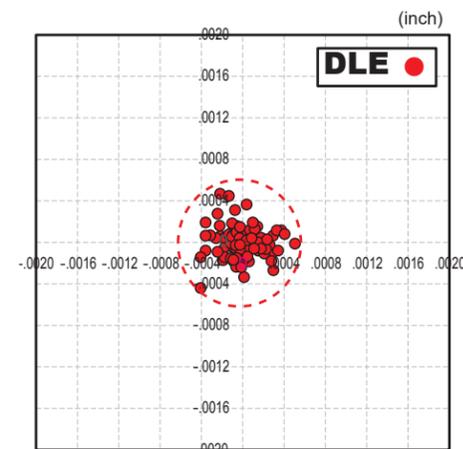


<Cutting Conditions>
 Workpiece : AISI 304
 Material : DLE0600S060P090
 Drill : ø.197"
 Cutting Speed : vc = 80 SFM
 Feed per Rev. : fr = .0024 IPR
 Hole Depth : Aim for hole dia. ø.197"
 Cutting Mode : Wet Cutting
 External Coolant (Water-insoluble Coolants)
 Machine : Small Automatic Lathes

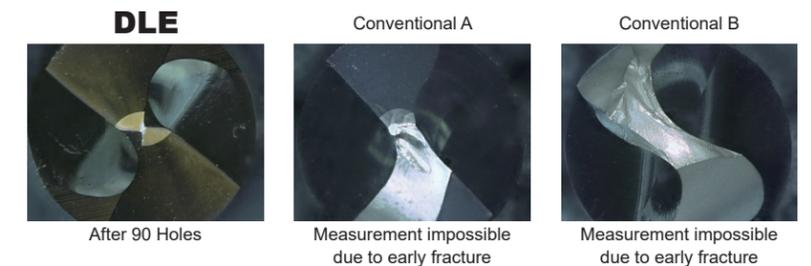


Centering Hole Position Precision for JIS SUS420J2

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.

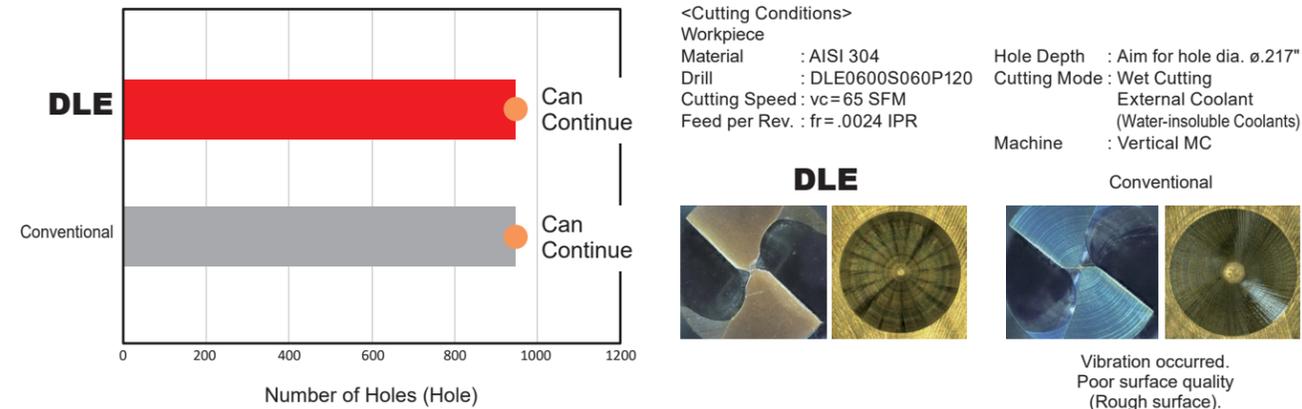


<Cutting Conditions>
 Workpiece : JIS SUS420J2
 Material : DLE0600S060P090
 Drill : ø.217"
 Cutting Speed : vc = 50 SFM
 Feed per Rev. : fr = .0016 IPR
 Hole Depth : Aim for hole dia. ø.217"
 Cutting Mode : Wet Cutting
 External Coolant (Chlorine Free Emulsion)
 Machine : Vertical MC

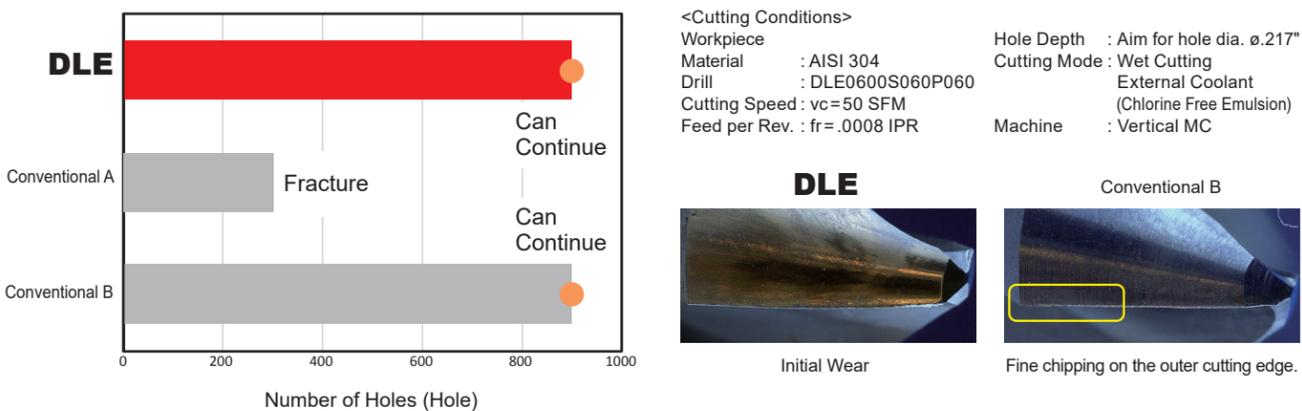


Cutting Performance

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

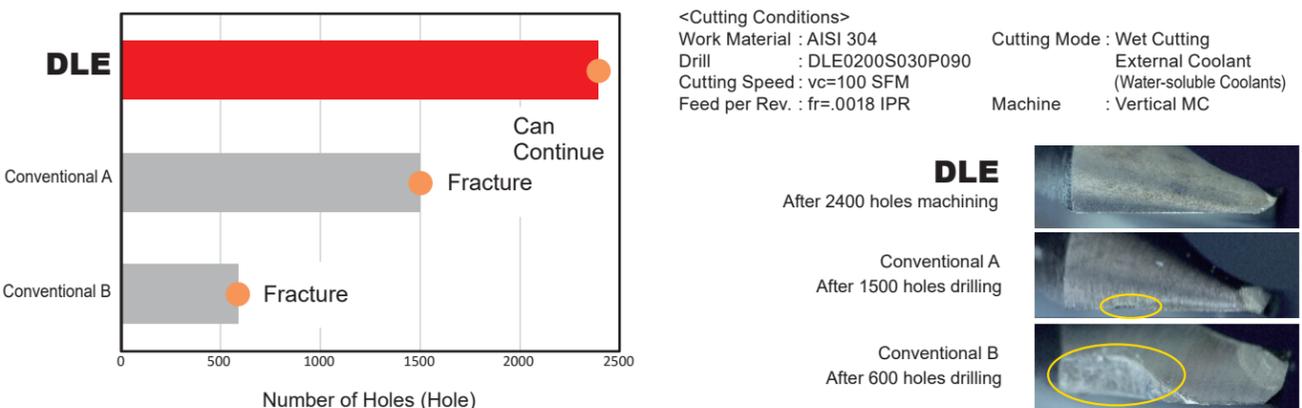


Comparison of Centering Life when Processing AISI 304 : Point Angle 60°

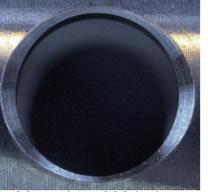


Comparison of Centering Life when Processing AISI 304 : Point Angle 90° (small-diameter $\phi.0787''$)

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



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)	$\phi.118$	$\phi.197$
Cutting Mode	Wet Cutting External Coolant (Chlorine Free Emulsion)	Wet Cutting External 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) Centering and Chamfering	AISI 303 (Engine Parts) Centering of $\phi.024''$ hole
Cutting Conditions		
Cutting Speed vc (SFM)	80	125
Feed per Rev. fr (IPR)	.0016	.0008
Guide Hole Dia. (inch)	$\phi.079$	$\phi.024$
Cutting Mode	Wet Cutting External Coolant (Water-insoluble) Curved Surface	Wet Cutting External Coolant (Water-insoluble)
Machine	CNC Automatic Lathe	CNC Automatic Lathe
Results	 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  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.



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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.

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Tools specifications subject to change without notice.

B223A-US-2021.4