



NC Spot Drill >>>

No Need To Choose, Nine9 Does It All!

NC Spot Drill with indexable carbide insert.
High efficiency! Long tool life! Cost saving!



- ▶ Various Inserts Can Fit On The Same Tool Holder.
- ▶ One Tool For Various Applications.

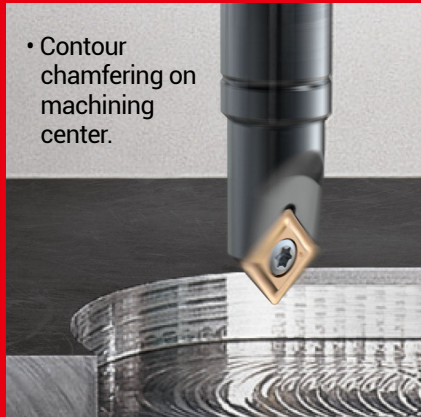


Features >>>

- ▶ Spotting Produces Better Hole Position And Geometrically Uniform Holes.
- ▶ Available Shank Diameter- $\varnothing 5$, $\varnothing 6$, $\varnothing 8$, $\varnothing 10$, $\varnothing 12$, $\varnothing 16$, $\varnothing 20$, $\varnothing 25$ mm, $\varnothing 3/8"$, $\varnothing 1/2"$, $\varnothing 5/8"$, $\varnothing 1/4"$, $\varnothing 3/4"$, $\varnothing 1"$, M5, M6 And M8.
- ▶ 60° / 82° / 90° / 100° / 142° / 145° Angle For Different Applications.
 - Suitable for spotting, chamfering, facing, grooving and engraving.
 - Each insert has 2 or 4 cutting edges.
 - Increase cutting speed with coated carbide inserts.



Applications



• Contour chamfering on machining center.



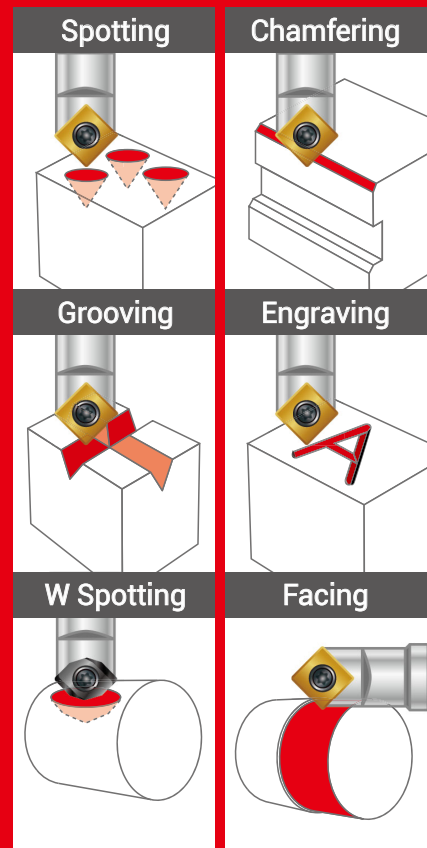
▼ CNC Lathes



◀ Machining Center ▶

- Engraving
- Grooving
- Spotting
- Chamfering

“ One tool will perform multiple applications. Suitable for spotting, chamfering, facing, grooving and engraving. ”



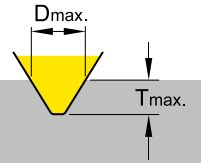
60° N9MT11T3P60



► Inserts >>

• Fully ground spotting insert, for 60 degree spotting and engraving.

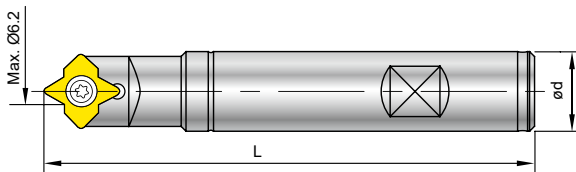
- NC40:**
- Universal grade for all unhardened steel and cast iron.
 - Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade	Diagram	Dimensions			Dmax.	Tmax.
					L	S	Re		
014204	N9MT11T3P60-NC40	TiN	P35		11	3.97	0.8	6.2	4

► Holder >>

- A single cutting edge design creates higher precision and position when spotting.
- Applications: For spotting, engraving, small grooving on milling machines, machining centers.



Code	Parts No.	Ød	L	Screw	Key
604002	00-99616-14-12	12	100	NS-35080 2.5 Nm	NK-T15
604004	00-99616-14	16	100		

2

NC Spot Drill

V9MT0802 / V9MT12T3

60°



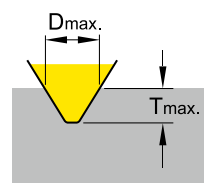
► Inserts >>

- 60 degree indexable spotting insert, Dmax 13mm.
- Special geometry with supporting edges for using in high speed machining.
- Excellent tool for grooving. Saving machining time!

NC5071: • For high alloy steel and cast iron.
• Each insert has 2 cutting edges.

NC2071: • For carbon steel, low alloy steel, stainless steel, non-ferrous and titanium.
• Each insert has 2 cutting edges.

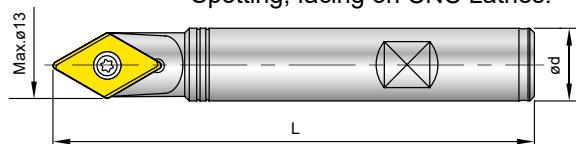
NC9076: • For non-ferrous material such as aluminum, al-alloy, titanium, brass, copper and long cutting chip metal.
• Produces excellent surface finish on non-ferrous metal.
• Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade	Diagram	Dimensions			Dmax.	Tmax.	
					L	S	Re			
019202	V9MT0802CT	NC5071	TiAlN & TiN		8	2.38	0.4	9	7.3	
019201		NC2071	TiN							K20F
019203		NC9076	DLC							
015204	V9MT12T3CT	NC5071	TiAlN & TiN		12.7	3.97	0.8	13	10.3	
015201		NC2071	TiN							K20F
015202		NC9076	DLC							

► Holder >>

- A single cutting edge creates higher precision and position when spotting.
- Applications:
 - Spotting, engraving, grooving and chamfering on milling machines, machining centers.
 - Spotting, facing on CNC Lathes.



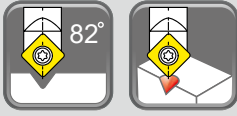
Code	Parts No.	Ød	L	Insert Type	Screw	Key
609001	00-99616-09V (Cylindrical shank)	8	60	V9MT08	*NS-25045 0.9 Nm	NK-T7
605001	00-99616-13V	16	100	V9MT12	NS-35080 2.5 Nm	NK-T15
615001	00-99616-13V-5/8	5/8"	100			

*Torque screwdriver is recommended.

2

NC Spot Drill

82° V0820802 / V08212T3



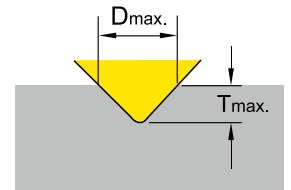
► Inserts >>

- 82 degree indexable spotting insert, Dmax. 14mm (0.551").
- Match the geometry of American standard flat head screw hole.
- Special geometry with supporting edges for high speed machining.

NC5071: • For high alloy steel and cast iron.
• Each insert has 2 cutting edges.

NC2071: • For carbon steel, low alloy steel, stainless steel, non-ferrous and titanium.
• Each insert has 2 cutting edges.

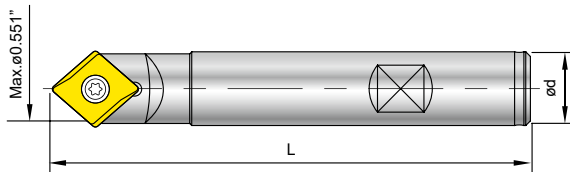
NC9076: • For non-ferrous material such as aluminum, al-alloy, titanium, brass, copper and long cutting chip metal.
• Produces excellent surface finish on non-ferrous metal.
• Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade	Image	Dimensions			Dmax.	Tmax.
					L	S	Re		
0108203	NC5071	TiAlN & TiN	K20F		8	2.38	0.4	9 (0.354")	4.8 (0.189")
0108201	V0820802	TiN							
0108202	NC9076	DLC							
0108213	NC5071	TiAlN & TiN	K20F		12.7	3.97	0.8	14 (0.551")	7.5 (0.295")
0108211	V08212T3	TiN							
0108212	NC9076	DLC							

► Holder >>

- Special cutting edge design gives higher precision and position when spotting.
- Applications : • Spotting, engraving, grooving and chamfering on milling machines, machining centers.
• Spotting, facing on CNC Lathes.



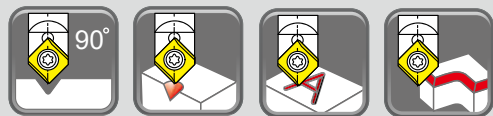
Code	Parts No.	Ød	L	Insert Type	Screw	Key
693001	00-99619-V082-3/8	3/8"	90	V0820802	NS-30055 2.0 Nm	NK-T8
693002	00-99619-V082-5/8	5/8"	100	V08212T3	NS-35080 2.5 Nm	NK-T15

2

NC Spot Drill

N9MT05T1 / N9MT0602

90°



► Inserts >>

- Mini spotting drill with indexable insert, low cutting power required.
- Especially good for Swiss type automatic lathes and CNC lathes.

NC5071: • For high alloy steel and cast iron.

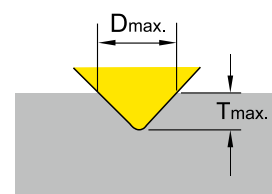
- Each insert has 2 cutting edges.

NC2071: • For carbon steel, low alloy steel, stainless steel, non-ferrous and titanium.

- Geometry with supporting edges to stabilize the cutting condition on low power machine.
- Each insert has 2 cutting edges.

NC9076: • For non-ferrous material such as aluminum, titanium, brass, copper and stainless steel.

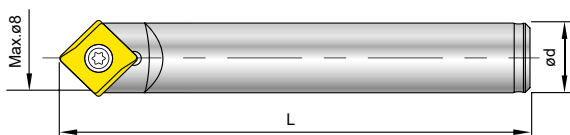
- Produces excellent surface finish on non-ferrous metal.
- Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade	Re	Dimensions			Dmax.	Tmax.	
					L	S	Re			
011209	NC5071	TiAlN & TiN	K20F		5	1.8	0.4	6	2.8	
011201	N9MT05T1CT	NC2071								TiN
011202	NC9076	DLC								
012204	NC5071	TiAlN & TiN	K20F		6.35	2.38	0.4	8	3.8	
012201	N9MT0602CT	NC2071								TiN
012202	NC9076	DLC								

► Holder >>

- Smallest indexable spotting drill holder.
- Single cutting edge design gives higher precision when spotting.
- Applications : • Spotting, engraving, and chamfering on milling machines, machining centers.
- Spotting, facing on CNC Lathes.



Code	Parts No.	Ød	L	Insert Type	Screw	Key
601001	00-99616-06-6	6	35	N9MT05	*NS-20036 0.6 Nm	NK-T6
601002	00-99616-06-5	5	35			
601003	00-99616-06-6L	6	60			
602001	00-99616-08-8	8	60	N9MT06	*NS-22044 0.9 Nm	NK-T7

Note:601003 is carbide shank holder.

*Torque screwdriver is recommended.

2

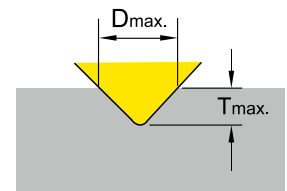
NC Spot Drill

90° N9MT0802



► Inserts >>

- NC40:**
 - General purpose, universal grade for all unhardened steel.
 - Each insert has 4 cutting edges.
- NC10:**
 - High positive angle and fully ground cutting edge and relief angle.
 - Universal grade for non-ferrous metal, cast iron and stainless steel.
 - Each insert has 4 cutting edges.
- H-NC5071:**
 - For carbon steel C>0.3%, high alloy steel C>0.3% and cast iron.
 - Each insert has 2 cutting edges.
- H-NC40:**
 - For carbon steel C<0.3%, low alloy steel C<0.3%, stainless steel, non-ferrous and titanium.
 - Each insert has 2 cutting edges.
- H-NC9076:**
 - High positive geometry and sharp edge.
 - For non-ferrous material such as aluminum, titanium, brass, copper and long cutting chip metal.
 - Produces excellent surface finish on non-ferrous metal.
 - Each insert has 2 cutting edges.

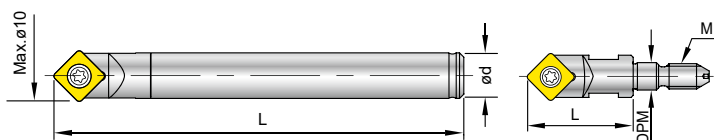


Code	Parts No.	Coating	Grade	Re	Dimensions			Dmax.	Tmax.
					L	S	Re		
013401	N9MT080208CT	NC40	TiN		8.31	2.38	10	4.5	0.8
013402	N9MT080204CT	NC40	TiN						0.4
013403		NC10	TiAlN						0.4
013206		H-NC5071	TiAlN & TiN						0.8
013201	N9MT0802CT2T	H-NC40	TiN						0.8
013202		H-NC9076	DLC						

* H type is with supporting edge.

► Holder >>

- Single cutting edge design gives higher precision when spotting.
- Applications :
 - Spotting, engraving, grooving and chamfering on milling machines, machining centers.
 - Spotting, facing, turning on CNC Lathes.



Code	Parts No.	Ød	L	M	DPM	Screw	Key
603001	00-99616-10	10	90	-	-		
603003	00-99616-10-SL10 (Weldon shank)	10	90	-	-		
613001	00-99616-3/8	3/8"	90	-	-	NS-30055 2.0 Nm	NK-T8
623001	00-99616-10-M5	-	25	M5xP0.8	5.5		
623002	00-99616-10-M6	-	25	M6xP1.0	6.5		

• Refer to Page 9-156 for extension bars.

N9MT0802

90°




► Single Set >>

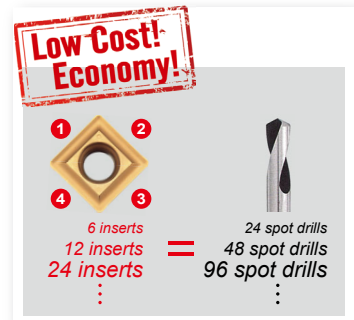
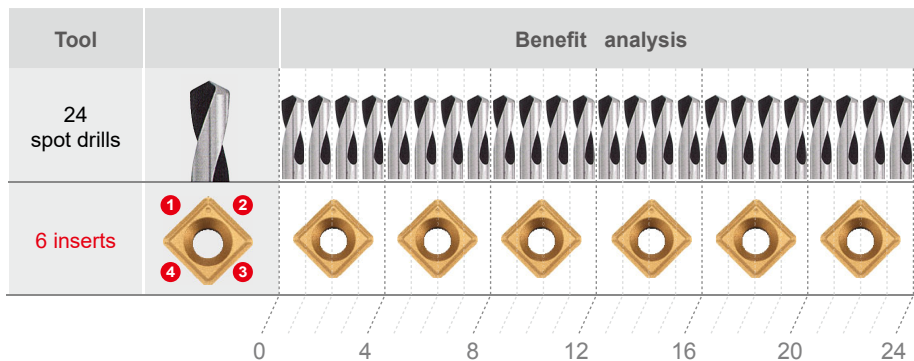
Code	Parts No.	Ød	Total Length	Insert fitted	Dmax.	Tmax.
603101-3401	00-99616-10-02S	10	90	N9MT080208CT-NC40	10	4.5
603101-3403	00-99616-10-02SAL	10	90	N9MT080204CT-NC10	10	4.5

► Starter Package >>

- Selected package for starter who wants to try NC Spot Drill.
- Included one insert on tool holder and five inserts in the pocket.
- Total 6 inserts are equal to 24 spot drills.

Code	Parts No.	Ød	Insert included	Content
603201-3401	00-99616-10-ME6	10	N9MT080208CT-NC40	1 tool holder + 6 inserts + 1 key 
603201-3403	00-99616-10-ME6AL	10	N9MT080204CT-NC10	
613201-3401	00-99616-10-IN6	3/8"	N9MT080208CT-NC40	
613201-3403	00-99616-10-IN6AL	3/8"	N9MT080204CT-NC10	

► Comparison >>



Note: N9MT080201W Engraving , see page 3-72.

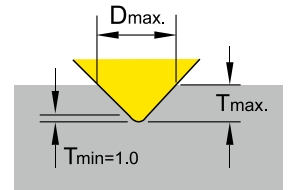


90° N9MT11T3

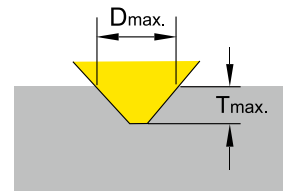


► Inserts >>

- NC40:** • Wiper design, universal grade for all unhardened steel.
• Each insert has 4 cutting edges.
- NC10:** • High positive angle and fully ground cutting edge and relief angle.
• Universal grade for non-ferrous metal, cast iron and stainless steel.
• Each insert has 4 cutting edges.
- NC60:** • Wiper design cermet insert, for hardened steel up to 56 HRC.
• Each insert has 4 cutting edges.
- H-NC5071:** • For carbon steel C>0.3%, high alloy steel C>0.3% and cast iron.
• Each insert has 2 cutting edges.
- H-NC40:** • For carbon steel C<0.3%, low alloy steel C<0.3%, stainless steel, non-ferrous and titanium.
• Each insert has 2 cutting edges.
- H-NC9076:** • High positive geometry and sharp edge.
• For non-ferrous material such as aluminum, titanium, brass, copper and long cutting chip metal.
• Produces excellent surface finish on non-ferrous metal.
• Each insert has 2 cutting edges.



NC40 / Wiper design / NC60



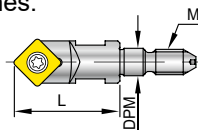
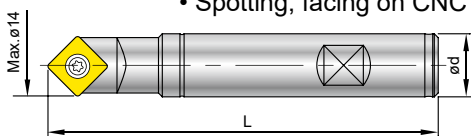
Other grade

Code	Parts No.	Coating	Grade	Re	Dimensions			Dmax.	Tmax.
					L	S	Re		
014401	NC40	TiN	P35		11.11	3.97	14	7	0.8
014402	NC10	TiAlN	K10F						(0.3)
014403	NC60	CERMET							0.8
014234	H-NC5071	TiAlN & TiN	K20F						0.8
014202	H-NC40	TiN	K20F						0.8
014203	H-NC9076	DLC	K20F						0.8

* H type is with supporting edge.

► Holder >>

- Single cutting edge design gives higher precision when spotting.
- Applications : • Spotting, engraving, grooving and chamfering on milling machines, machining centers.
• Spotting, facing on CNC Lathes.



Code	Parts No.	Ød	L	M	DPM	Screw	Key
604002	00-99616-14-12	12	100	-	-	NS-35080 2.5 Nm	NK-T15
604004	00-99616-14	16	100	-	-		
604007	00-99616-14-150L	16	150	-	-		
604009	00-99616-14-220L	20	220	-	-		
614001	00-99616-14-1/2	1/2"	100	-	-		
614002	00-99616-14-5/8	5/8"	100	-	-		
624001	00-99616-14-M8	-	30	M8xP1.25	8.5		

• Refer to Page 9-156 for extension bars.

2

NC Spot Drill

N9MT11T3

90°



► Single Set >>

Code	Parts No.	Ød	Total Length	Insert fitted	Dmax.	Tmax.
604104-4401	00-99616-14-02S	16	100	N9MT11T3CT-NC40	14	7
604104-4402	00-99616-14-02SAL			N9MT11T3CT-NC10	14	7
614102-4401	00-99616-14-5/8-02S	5/8"	100	N9MT11T3CT-NC40	0.551"	0.276"
614102-4402	00-99616-14-5/8-02SAL			N9MT11T3CT-NC10	0.551"	0.276"

2

NC Spot Drill

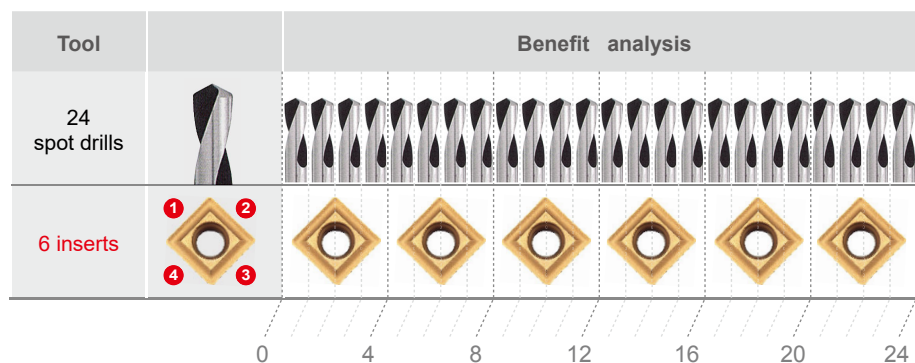
► Starter Package >>

- Selected package for starter who wants to try NC Spot Drill.
- Included one insert on tool holder and five inserts in the pocket.
- Total 6 inserts are equal to 24 spot drills.

Code	Parts No.	Ød	Insert included	Content
604204-4401	00-99616-14-ME6	16	N9MT11T3CT-NC40	1 tool holder + 6 inserts + 1 key
604204-4402	00-99616-14-ME6AL		N9MT11T3CT-NC10	
614202-4401	00-99616-14-IN6	5/8"	N9MT11T3CT-NC40	
614202-4402	00-99616-14-IN6AL		N9MT11T3CT-NC10	



► Comparison >>

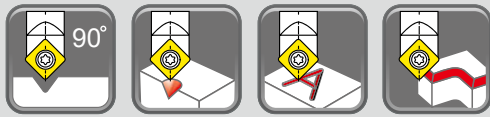


Low Cost! Economy!

6 inserts
12 inserts
24 inserts

24 spot drills
48 spot drills
96 spot drills

90° N9MT1704



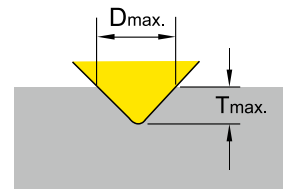
▶ Inserts >>

- 90 degree indexable spot drill insert, Dmax. 22mm.

- NC5071:**
- High positive geometry, fully ground cutting edge and relief angle.
 - For high alloy steel and cast iron.
 - Each insert has 2 cutting edges.

- NC9036:**
- For non-ferrous material such as aluminum, acrylic, brass, copper, titanium and long cutting chip materials.
 - High positive geometry and sharp edge produces excellent surface finish.
 - Each insert has 2 cutting edges.

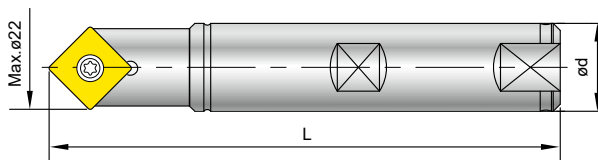
- NC2071:**
- For carbon steel, low alloy steel, stainless steel, non-ferrous and titanium.
 - Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade	Image	Dimensions			Dmax.	Tmax.
					L	S	Re		
016216	NC5071	TiAlN & TiN	K20F		17	4.76	1.2	22	10.4
016211	N9MT1704CT NC9036	DLC	K20F						
016201	NC2071	TiN	K20F						

▶ Holder >>

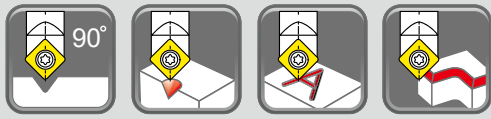
- Single cutting edge design gives high precision when spotting.
- Applications : • Spotting, engraving, grooving and chamfering on milling machines, machining centers.
- Spotting, facing on CNC Lathes.



Code	Parts No.	Ød	L	Screw	Key
606001	00-99616-22	20	100	NS-50125 5.5Nm	NK-T20
606002	00-99616-22-25	25	150		

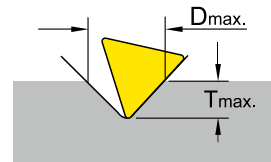
N9MT220408 / N9MT2506

90°



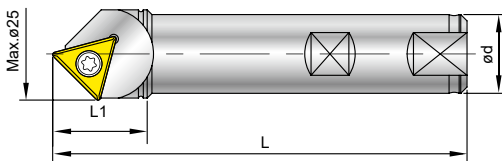
► N9MT220408

- NC40:**
- Universal grade for carbon steel, alloy steel and cast iron.
 - Each insert has 3 cutting edges.



Code	Parts No.	Coating	Grade		Dimensions			Dmax.	Tmax.
					L	S	Re		
017301	N9MT220408CT-NC40	TiN	P35		20.83	4.76	---	25	12.2

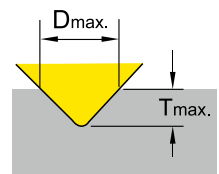
* 5 pcs per box.



Code	Parts No.	Ød	L	L1	Screw	Key
607001	00-99616-25-CT28	25	120	30	NS-40100 3.5 Nm	NK-T15
617001	00-99616-1-CT28	1"				

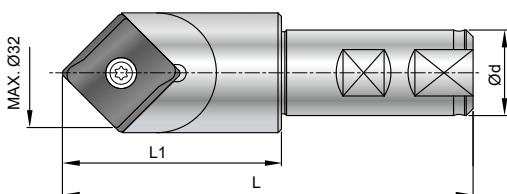
► N9MT2506 >>

- NC2033:**
- For carbon steel, alloy steel, high alloy steel, cast iron and hardened steel < 50 HRC.
 - Each insert has 2 cutting edges.
- XP9000:**
- High positive geometry and sharp edge produces excellent surface finish.
 - For non-ferrous material such as aluminum, titanium, brass, copper and long cutting chip metal.
 - Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade		Dimensions			Dmax.	Tmax.
					L	S	Re		
018201	N9MT2506CT	NC2033	TiAlN		25	6.35	1.2	32	15.4
018202		XP9000	Uncoated						

* 2 pcs per box.



Code	Parts No.	Ød	L	L1	Screw	Key
608001	00-99616-32-25	25	120	64	NS-60180 5.5 Nm	NK-UT25
618001	00-99616-32-1	1"				

100° N9MT11T3CT2T-H



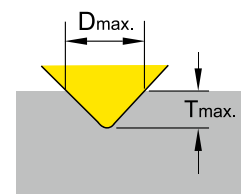
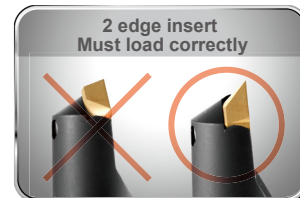
► Inserts >>

• For aircraft 100° normal rivet hole and screw hole.

H-NC5071: • For carbon steel C>0.3%, high alloy steel C>0.3% and cast iron.
• Each insert has 2 cutting edges.

H-NC40: • For carbon steel C<0.3%, low alloy steel C<0.3%, stainless steel, non-ferrous and titanium.
• Each insert has 2 cutting edges.

H-NC9076: • High positive geometry and sharp edge.
• For non-ferrous material such as aluminum, titanium, brass, copper and long cutting chip metal.
• Produces excellent surface finish when chamfering non-ferrous metal.
• Each insert has 2 cutting edges.

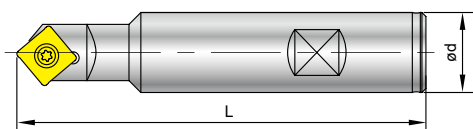


Code	Parts No.	Coating	Grade		Dimensions			Dmax.	Tmax.
					L	S	Re		
014234	H-NC5071	TiAlN & TiN							
014202	N9MT11T3CT2T H-NC40	TiN	K20F		11	3.97	0.8	16	6.3
014203	H-NC9076	DLC							

* H type is with supporting edge.

► Holder >>

• Spotting produces better hole position and geometrically uniform holes.
• Increase tool life of the next drilling operation.



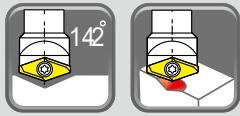
Code	Parts No.	Ød	L	Screw	Key
604011	00-99616-20-100	20	100	NS-35080 2.5 Nm	NK-T15

2

NC Spot Drill

V14208 / V14216

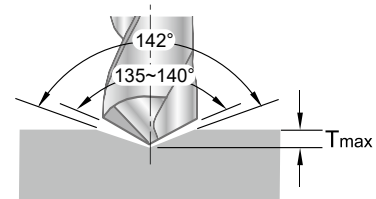
142°



► Inserts >>

- For spotting before drilling by 135° - 140° point angle high performance drill.
- 142 degree indexable spotting drills. Dmax. 32mm.

- NC2071:**
- High positive geometry, fully ground cutting edge and relief angle.
 - Universal grade for all unhardened steel and cast iron.
 - Each insert has 2 cutting edges.

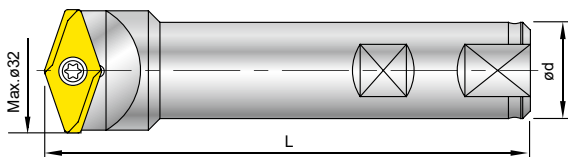


Code	Parts No.	Coating	Grade	Diagram	Dimensions			Dmax.	Tmax.
					L	S	Re		
0114201	V1420803-NC2071	TiN	K20F		8	2.38	0.8	16	2.8
0114211	V1421604-NC2071				14	4.76	1.2	32	5.5

The quantity of insert per box.:	V1420803	V1421604
	10	5

► Holder >>

- Spotting produces better hole position and geometrically uniform holes.
- Extend your drill life with 142° spotting. Reduce your drilling cost.
- Higher accuracy of positioning and diameter tolerance !



Code	Parts No.	Ød	L	Insert Type	Screw	Key
696001	00-99619-V142-16	16	100	V1420803	NS-30072 2.0 Nm	NK-T9
696002	00-99619-V142-32	25	120	V1421604	NS-50125 5.5 Nm	NK-T20

2

NC Spot Drill

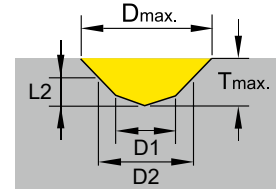
145°
+
90°

WSP Spotting New Geometry of Spotting Tool

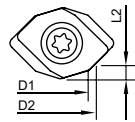


▶ Inserts >>

- NC2033:**
- Fully ground cutting edge and relief angle.
 - Universal grade for steel, cast iron and hardened steel < 50 HRC.
 - Each insert has 2 cutting edges.



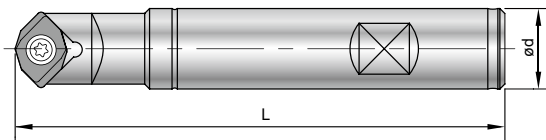
Code	Parts No.	Coating	Grade	Thread Size	Dimensions			Dmax.	Tmax.
					*D1±0.05	D2	L2		
013203	N9MT0802M04C-NC2033	TiAlN	K20F	M4x0.7	3.30	4.20	0.93	8	2.83
013204	N9MT0802M05C-NC2033			M5x0.8	4.20	5.25	1.14		2.52
013205	N9MT0802M06C-NC2033			M6x1.0	5.00	6.30	1.39		2.24
014219	N9MT11T3M08C-NC2033	TiAlN	K20F	M8x1.25	6.80	8.40	1.81	13	4.11
014220	N9MT11T3M10C-NC2033			M10x1.5	8.50	10.50	2.28		3.53
014221	N9MT11T3UNC25-NC2033	TiAlN	K20F	1/4-20 UNC	5.08	6.70	1.55	13	4.70
014222	N9MT11T3UNC31-NC2033			5/16-18 UNC	6.53	8.40	1.90		4.20
014223	N9MT11T3UNC38-NC2033			3/8-16 UNC	7.94	10.00	2.22		3.72
016205	N9MT1704M12C-NC2033	TiAlN	K20F	M12x1.75	10.25	12.60	2.91	20	6.61
016206	N9MT1704M14C-NC2033			M14x2.0	12.00	14.70	3.22		5.87
016207	N9MT1704M16C-NC2033			M16x2.0	14.00	16.80	3.51		5.11



Note: *D1 refer to the Tap Pre-drilling sizes. D2 : Thread size x 5%. L2 : Depth of D2., see page 2-35 for example.

▶ Holder >>

- Utilizes standard **NC Spot Drill** basic holder.
- Holders and inserts are interchangeable.



Code	Parts No.	Ød	L	Insert Type	Screw	Key
603001	00-99616-10	10	89.08±0.29	N9MT0802	NS-30055 2.0Nm	NK-T8
613001	00-99616-3/8	3/8"				
604004	00-99616-14	16	97.55±0.55	N9MT11T3	NS-35080 2.5Nm	NK-T15
614002	00-99616-14-5/8	5/8"				
606001	00-99616-22	20	96.24±0.64	N9MT1704	NS-50125 5.5Nm	NK-T20
616001	00-99616-22-3/4	3/4"				

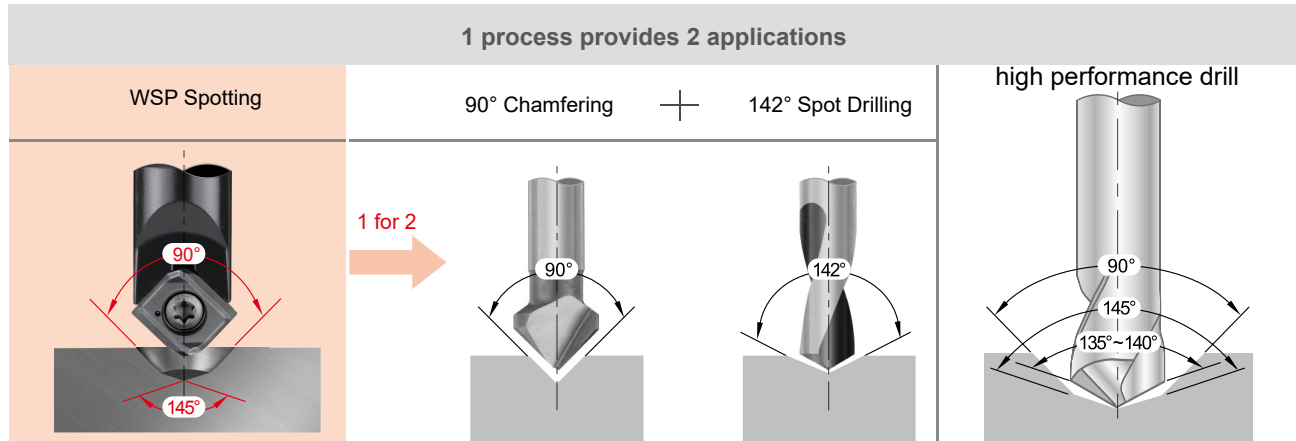
2

NC Spot Drill - WSP

Performance

► Combined spotting and chamfering 145° + 90° >>

- Reduces process to one operation. Shorten cycle time.
- Use to spot prior to drilling with high performance drills for higher accuracy of hole position.
- Good support spotting process for round parts.

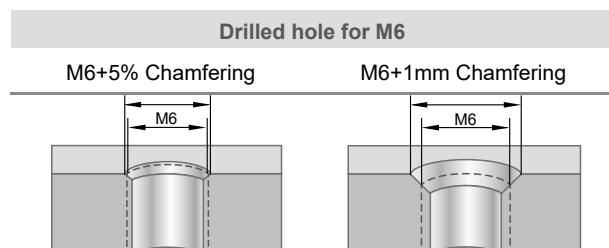


► Comparison >>

WSP Spotting + Drill	Drill + Spotting	Step Drill
<ul style="list-style-type: none"> • Shorter drilling time • Guided at the strongest corner of drill • Longer tool life • Good position accuracy 	<ul style="list-style-type: none"> • Longer drilling time • Guided at the weakest corner of drill • Shorter tool life 	<ul style="list-style-type: none"> • Tool cost is high • Shorter tool life • Can't drill directly from solid on round parts. • Bad position accuracy.

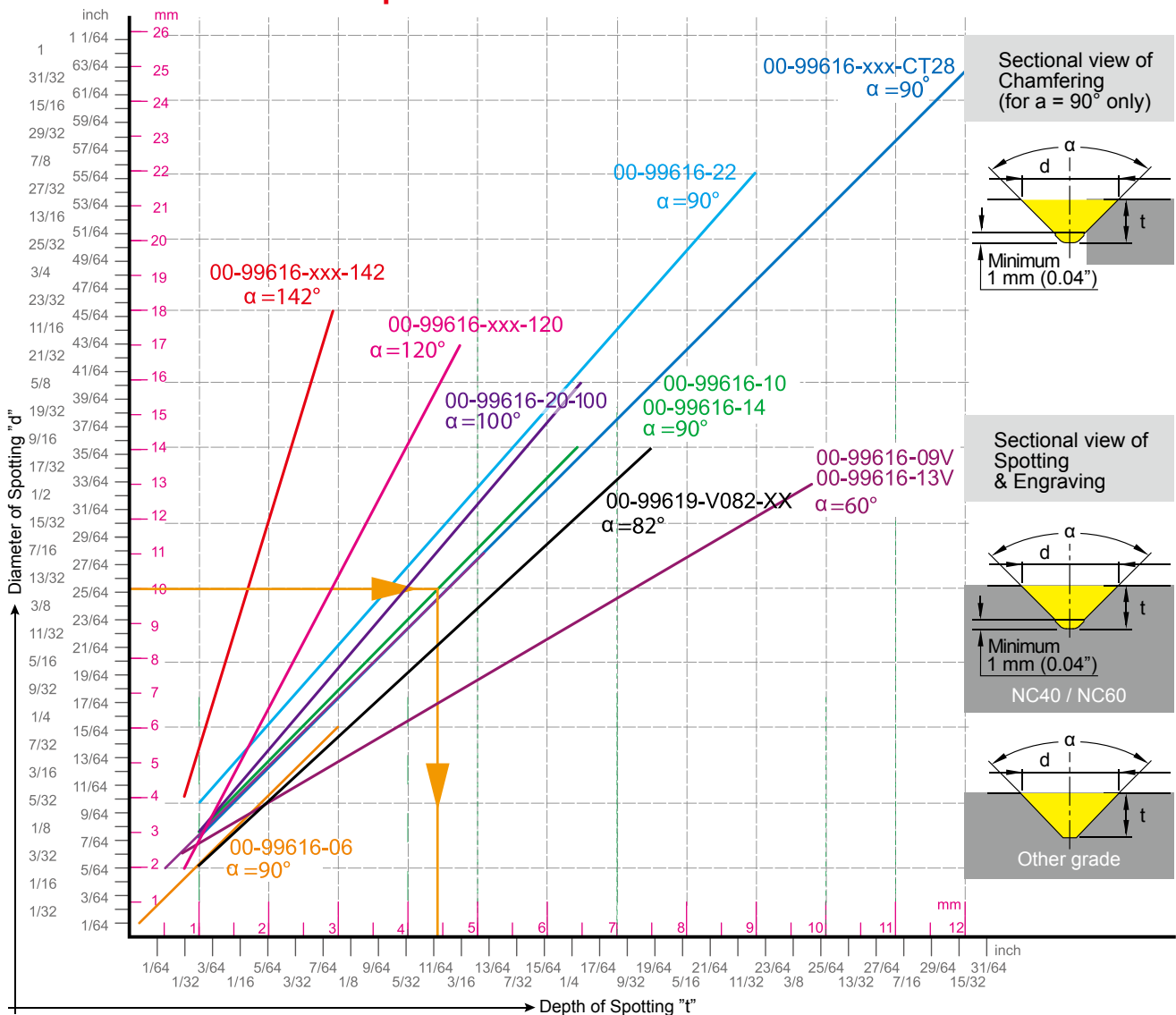
► Example >>

- The recommended chamfering is 5% of the nominal diameter of the thread, for example 6.3 mm for M6 thread.
- If you need larger chamfer, it can be calculated the required depth of spotting.



Cutting Data

► Diameter / Depth Chart and Speed / Feed Rate Calculation of NC Spot Drill



► Instruction >>

1. From Spot diameter "d" to get drill depth " t " .
2. Point angle "α" is determined by which tool holder you use.
3. From "d" draw a horizontal line to get intersection of the line by point angle "α".
4. From the intersection draw a vertical line to the bottom to have depth of spotting " t " . " t " is the drill depth of the NC program.
5. The sectional view of spotting will depend on the shape of insert, NC40 and other grades of inserts have different sectional view.
6. For chamfering, do not use tip of insert, 1mm(0.04'') minimum clearance is required for a smooth surface finish.

Metric	
$S = \frac{Vc \times 1000}{\pi \times d}$	d = diameter -mm S = Spindle Speed -r.p.m. Vc = Cutting Speed -m/min.
$F = S \times f$	f = mm/rev. F = mm/min.

Inch	
$S = \frac{(3.82 \times SFM)}{d}$	d = diameter-inch S = Spindle Speed-r.p.m. SFM = Surface Speed-ft./min.
$F = r.p.m. \times IPR$	f = IPR = inch/rev. F = inch/min.

2



NC Spot Drill

Cutting Data

Determine spindle speed and feed rate:

- Choose spotting depth to decide spotting diameter according to the Diameter/Depth chart on page 2-44.
- The spindle speed should be calculated by the maximum diameter of spotting, chamfering and grooving.



► For Insert V9MT0802CT / N9MT05T1CT / N9MT0602CT

	Workpiece material	Vc (m/min)	f (mm/rev.)		NC2071	NC5071	NC9076
			 Spotting / Grooving	 Chamfering			
P	Carbon Steel C<0.3%	150 ~ 320	0.03 ~ 0.07	0.05 ~ 0.15	●		
	Carbon Steel C>0.3%	100 ~ 250	0.02 ~ 0.06	0.03 ~ 0.12		●	
	Low Alloy Steel C<0.3%	100 ~ 250	0.02 ~ 0.06	0.04 ~ 0.12	●		
	High Alloy Steel C>0.3%	60 ~ 180	0.02 ~ 0.05	0.03 ~ 0.10		●	
M	Stainless Steel	65 ~ 125	0.02 ~ 0.04	0.03 ~ 0.08	●	○	◎
K	Cast iron	150 ~ 250	0.03 ~ 0.07	0.05 ~ 0.15	◎	●	
N	Non-Ferrous Metal (Al, Cu)	150 ~ 320	0.03 ~ 0.07	0.05 ~ 0.15	◎		●
S	Ti, Ti-alloy	40 ~ 80	0.02 ~ 0.06	0.02 ~ 0.06	●		◎
	Ni-alloy	30 ~ 60	-	0.03 ~ 0.07	○	◎	
H	Hardened steel HRC 40°~56°	30 ~ 60	0.02 ~ 0.06	0.02 ~ 0.06		○	

* For technical construction reasons, the insert is not located on the center of the holder.

● Best ◎ Suit ○ Possible

► For Insert N9MT0802 / N9MT11T3CT

	Workpiece material	Vc (m/min)	f (mm/rev.)		NC40	NC10	NC60	H-NC5071	H-NC40	H-NC9076
			 Spotting / Grooving	 Chamfering						
P	Carbon Steel C<0.3%	150 ~ 320	0.05 ~ 0.10	0.10 ~ 0.24	●				●	
	Carbon Steel C>0.3%	100 ~ 250	0.04 ~ 0.08	0.08 ~ 0.20				●		
	Low Alloy Steel C<0.3%	100 ~ 250	0.04 ~ 0.08	0.08 ~ 0.20	●		◎		●	
	High Alloy Steel C>0.3%	60 ~ 180	0.03 ~ 0.07	0.05 ~ 0.15			◎	●		
M	Stainless Steel	65 ~ 125	0.03 ~ 0.06	0.08 ~ 0.20	○	●		○	●	◎
K	Cast iron	150 ~ 250	0.05 ~ 0.10	0.10 ~ 0.25	●	●		●	◎	
N	Non-Ferrous Metal (Al, Cu)	150 ~ 320	0.05 ~ 0.10	0.10 ~ 0.25		◎			◎	●
S	Ti, Ti-alloy	40 ~ 80	0.03 ~ 0.08	0.03 ~ 0.08					●	◎
	Ni-alloy	30 ~ 60	-	0.05 ~ 0.10				◎	○	
H	Hardened steel HRC 40°~56°	30 ~ 60	0.03 ~ 0.08	0.03 ~ 0.08			●	○		

* For technical construction reasons, the insert is not located on the center of the holder.

● Best ◎ Suit ○ Possible

* H-NC5071, H-NC40 and H-NC9076 inserts with supporting edges can increase feed rate 50%.

2

NC Spot Drill

Cutting Data

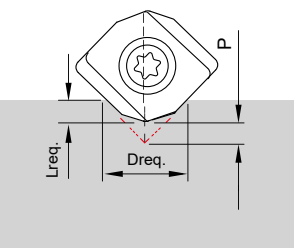
► For Insert V9MT12T3CT / V082... / N9MT1704CT / N9MT2204CT / N9MT2506CT / V142...

Workpiece material	Vc (m/min)	f (mm/rev.)		NC2071	NC5071	NC9076 (NC9036)	NC40	NC2033	XP9000
		Spotting / Grooving	Chamfering						
P Carbon Steel C<0.3%	150 ~ 320	0.05 ~ 0.10	0.10 ~ 0.24	●			●		
Carbon Steel C>0.3%	100 ~ 250	0.04 ~ 0.08	0.08 ~ 0.20		●			●	
Low Alloy Steel C<0.3%	100 ~ 250	0.04 ~ 0.08	0.08 ~ 0.20	●			●		
High Alloy Steel C>0.3%	60 ~ 180	0.03 ~ 0.07	0.05 ~ 0.15		●			●	
M Stainless Steel	65 ~ 125	0.03 ~ 0.06	0.08 ~ 0.20	●	○	⊙	○	○	
K Cast iron	150 ~ 250	0.05 ~ 0.10	0.10 ~ 0.25	⊙	●		⊙	●	
N Non-Ferrous Metal (Al, Cu)	150 ~ 320	0.05 ~ 0.10	0.10 ~ 0.25	⊙		●			●
S Ti, Ti-alloy	40 ~ 80	0.03 ~ 0.08	0.03 ~ 0.08	●		⊙			
Ni-alloy	30 ~ 60	-	0.05 ~ 0.10	○	⊙				
H Hardened steel HRC 40°~56°	30 ~ 60	0.03 ~ 0.08	0.03 ~ 0.08		○			⊙	

* For technical construction reasons, the insert is not located on the center of the holder.

● Best ⊙ Suit ○ Possible

► For Insert N9MT0802M.. / N9MT11T3M.. / N9MT11T3UNC.. N9MT1704M..

WSP spotting	Formula																						
	$P =$ distance of theoretical intersection point to tip of insert.																						
	$0.5 =$ fixed factor for calculation																						
	$L_{req.} =$ required drilling depth																						
	$D_{req.} =$ required diameter																						
	<table border="1"> <thead> <tr> <th>M4</th> <th>M5</th> <th>M6</th> <th>M8</th> <th>M10</th> <th>M12</th> <th>M14</th> <th>M16</th> <th>1/4-20 UNC</th> <th>5/16-18 UNC</th> <th>3/8-16 UNC</th> </tr> </thead> <tbody> <tr> <td>$P = 1.17$</td> <td>1.48</td> <td>1.76</td> <td>2.39</td> <td>2.97</td> <td>3.59</td> <td>4.19</td> <td>4.88</td> <td>1.80</td> <td>2.30</td> <td>2.78</td> </tr> </tbody> </table>	M4	M5	M6	M8	M10	M12	M14	M16	1/4-20 UNC	5/16-18 UNC	3/8-16 UNC	$P = 1.17$	1.48	1.76	2.39	2.97	3.59	4.19	4.88	1.80	2.30	2.78
M4	M5	M6	M8	M10	M12	M14	M16	1/4-20 UNC	5/16-18 UNC	3/8-16 UNC													
$P = 1.17$	1.48	1.76	2.39	2.97	3.59	4.19	4.88	1.80	2.30	2.78													

WSP spotting	Work Material	Vc (m/min)	f (mm/rev.)	Grade of Insert
P	Carbon steel	150 ~ 300	0.05 ~ 0.15	NC2033
	Alloy steel	120 ~ 250	0.05 ~ 0.10	NC2033
M	Stainless steel	80 ~ 150	0.04 ~ 0.08	NC2033
K	Casting iron	100 ~ 200	0.05 ~ 0.10	NC2033
H	Hardened steel up 50 HRC	30 ~ 60	0.03 ~ 0.08	NC2033

2

NC Spot Drill