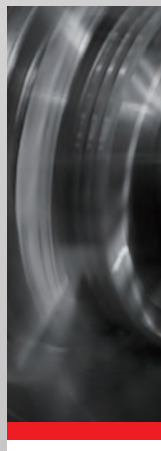
NC Spot Drill >>>

No Need To Choose, Nine9 Does It All!

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

P M K N S H

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

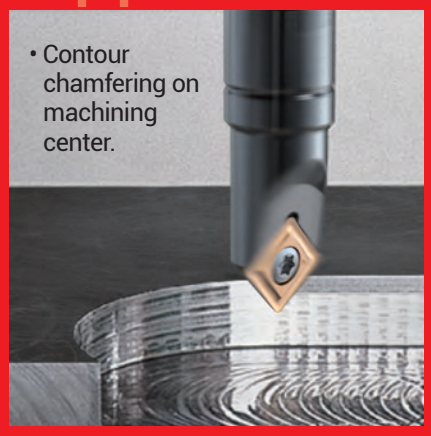


Features >>>

- Spotting Produces Better Hole Position And Geometrically Uniform Holes.
- Available Shank Diameter- Ø5, Ø6, Ø8, Ø10, Ø12, Ø16, Ø20, Ø25mm, Ø3/8", Ø1/2", Ø5/8", Ø1/4", Ø3/4", Ø1", 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

▼ CNC Lathes

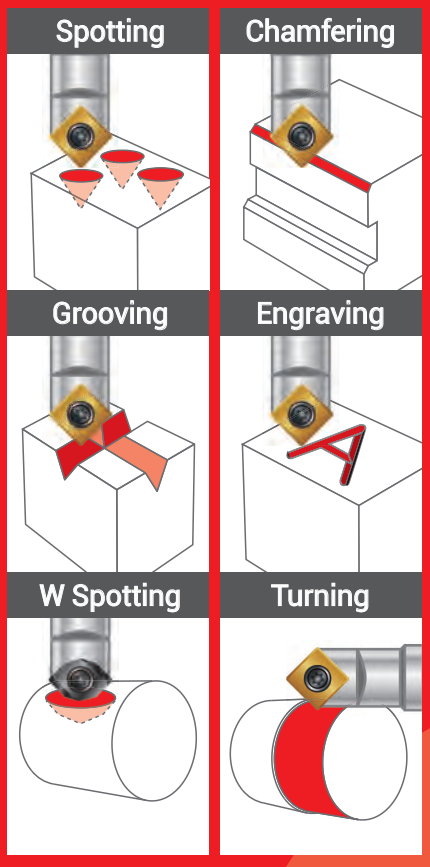


• Contour chamfering on machining center.

◀ Machining Center ▲

Engraving
Grooving
Spotting
Chamfering

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

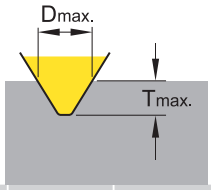


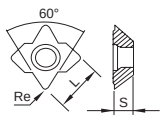
60° N9MT11T3P60

Inserts >>

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

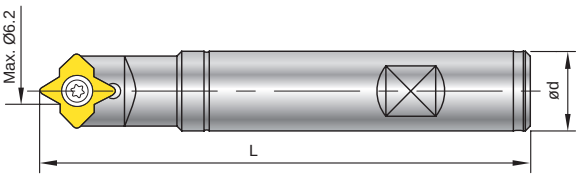
NC40: • Universal grade for all unhardened steel and cast iron.
• Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade		Dimensions			Dmax.	Tmax.
					L	S	Re		
014204	N9MT11T3P60-NC40	TiN	P35		11	3.97	0.8	5	3

Holder >>

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



Ø16

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		

V9MT0802 / V9MT12T3

60°

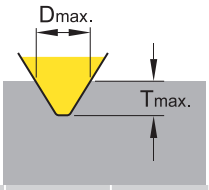
Inserts >>

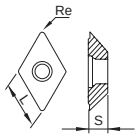
- 60 degree indexable spotting insert, Dmax 13mm.
- Special geometry with supporting edges for using in high speed machining.
- Excellent tool for grooving. Saving machining time!

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.

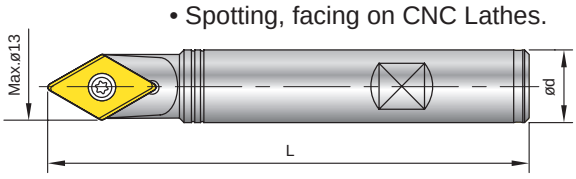
NC9076:
- For non-ferrous material such as aluminum, al-alloy, titanium, brass, copper and long cutting chip metal.
- Produces excellent surface finish on non-ferrous metal.
- Each insert has 2 cutting edges.



Code	Parts No.		Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	Dmax.	Tmax.
019202	V9MT0802CT	NC5071	TiAlN & TiN	K20F		8	2.38	0.4	9	7.2
019201		NC2071	TiN							
019203		NC9076	DLC							
015204	V9MT12T3CT	NC5071	TiAlN & TiN	K20F		12.7	3.97	0.8	13	10.1
015201		NC2071	TiN							
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.



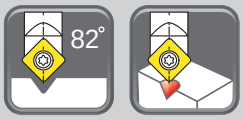
Ø8

Ø16

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.

82° V0820802 / V08212T3



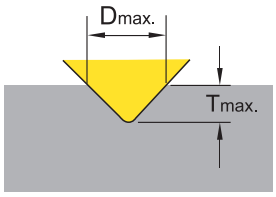
Inserts >>

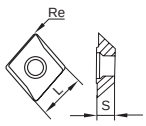
- 82 degree indexable spotting insert, Dmax. 14mm (0.551”).
- Match the geometry of Amercian standard flat head screw hole.
- Special geometry with supporting edges for high speed machining.

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.

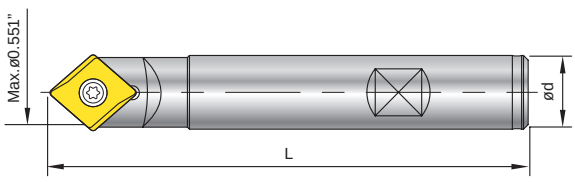
NC9076:
- For non-ferrous material such as aluminum, al-alloy, titanium, brass, copper and long cutting chip metal.
- Produces excellent surface finish on non-ferrous metal.
- Each insert has 2 cutting edges.



Code	Parts No.		Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	Dmax.	Tmax.
0108203	V0820802	NC5071	TiAlN & TiN	K20F		8	2.38	0.4	9 (0.354”)	4.7 (0.185”)
0108201		NC2071	TiN							
0108202		NC9076	DLC							
0108213	V08212T3	NC5071	TiAlN & TiN	K20F		12.7	3.97	0.8	14 (0.551”)	7.5 (0.295”)
0108211		NC2071	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.



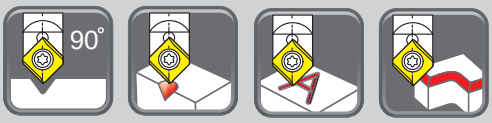
Ø3/8”

Ø5/8”

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

N9MT05T1 / N9MT0602

90°



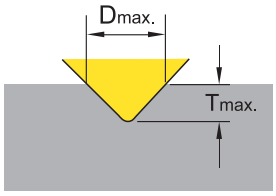
Inserts >>

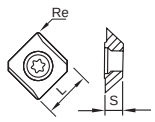
- Mini spotting drill with indexable insert, low cutting power required.
- Especially good for Swiss type automatic lathes and CNC lathes.

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.

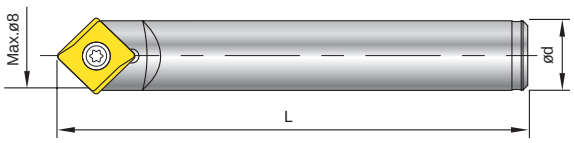
NC9076:
- For non-ferrous material such as aluminum, titanium, brass, copper and stainless steel.
- Produces excellent surface finish on non-ferrous metal.
- Each insert has 2 cutting edges.



Code	Parts No.		Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	Dmax.	Tmax.
011209	N9MT05T1CT	NC5071	TiAlN & TiN	K20F		5	1.8	0.4	5.5	2.4
011201		NC2071	TiN							
011202		NC9076	DLC							
012204	N9MT0602CT	NC5071	TiAlN & TiN	K20F		6.35	2.38	0.4	8	3.7
012201		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.

90° N9MT0802

Inserts >>

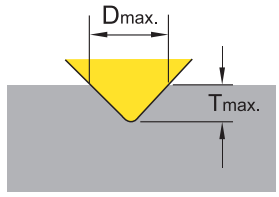
NC40: • General purpose, universal grade for all unhardened steel < HRC 48.
• Each insert has 4 cutting edges.

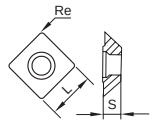
NC10: • High positive angle and fully ground cutting edge and relief angle.
• Universal grade for non-ferrous metal, cast iron and stainless steel.
• Each insert has 4 cutting edges.

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		Dimensions L	Dimensions S	Dimensions Re	Dmax.	Tmax.
013401	N9MT080208CT	NC40	TiN	K20F		8.31	2.38	0.8	10	4.5
013402	N9MT080204CT	NC40	TiN	K20F		8.31	2.38	0.4	10	4.7
013403		NC10	TiAlN							
013206	N9MT0802CT2T	H-NC5071	TiAlN & TiN	K20F		8.31	2.38	0.8		
013201		H-NC40	TiN							
013202		H-NC9076	DLC							

* H type is with supporting edge.

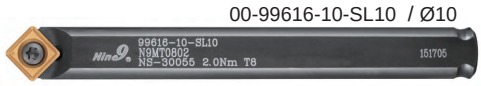
Holder >>

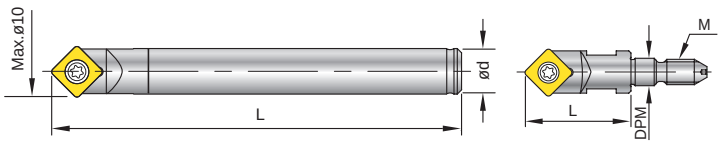
• Single cutting edge design gives higher precision when spotting.
• Applications : • Spotting, engraving, grooving and chamfering on milling machines, machining centers.
• Spotting, facing, turning on CNC Lathes.

M5, M6

00-99616-10 / Ø10, Ø3/8”

00-99616-10-SL10 / Ø10





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

• Refer to Page 164 for extension bars.

N9MT0802

90°

Single Set >>

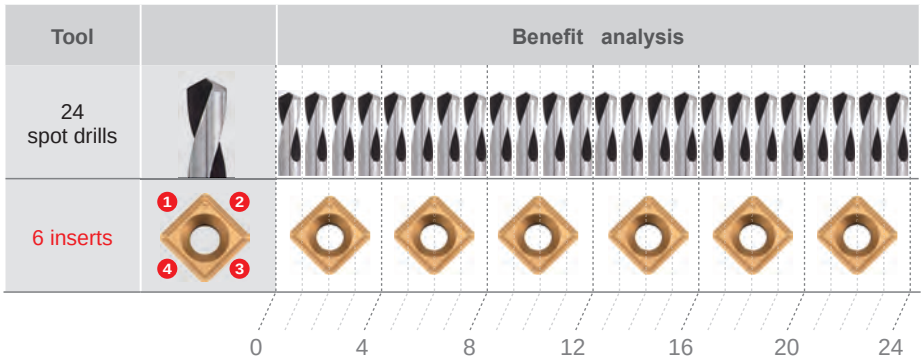
Code	Parts No.	Ød	Total Length	Insert fitted	Dmax.	Tmax.
603101-3401	00-99616-10-02S	10	90	N9MT080208CT-NC40	10	4.5
603101-3403	00-99616-10-02SAL	10	90	N9MT080204CT-NC10	10	4.7

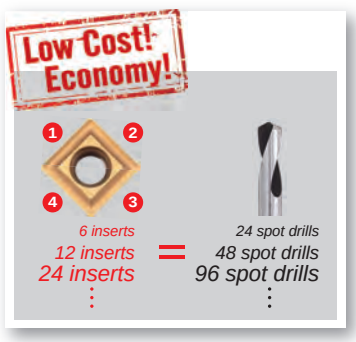
Starter Package >>

- 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 78.

90° N9MT11T3

Inserts >>

NC40: • Wiper design, universal grade for all unhardened steel.
• Each insert has 4 cutting edges.

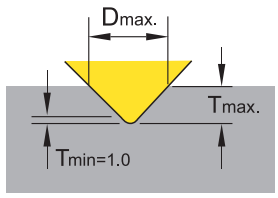
NC10: • High positive angle and fully ground cutting edge and relief angle.
• Universal grade for non-ferrous metal, cast iron and stainless steel.
• Each insert has 4 cutting edges.

NC60: • Wiper design cermet insert, for hardened steel up to HRC 56.
• Each insert has 4 cutting edges.

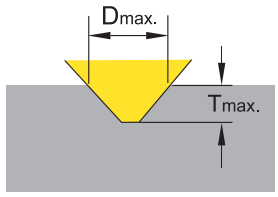
H-NC5071: • For carbon steel C>0.3%, high alloy steel C>0.3% and cast iron.
• Each insert has 2 cutting edges.

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.

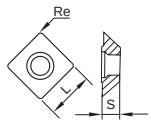
H-NC9076: • High positive geometry and sharp edge.
• For non-ferrous material such as aluminum, titanium, brass, copper and long cutting chip metal.
• Produces excellent surface finish on non-ferrous metal.
• Each insert has 2 cutting edges.



NC40 / Wiper design / NC60



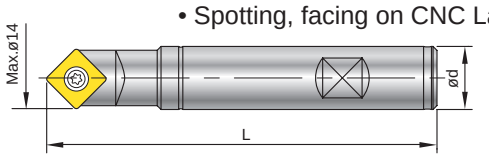
Other grade

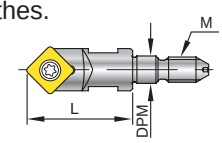
Code	Parts No.		Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	Dmax.	Tmax.
014401	N9MT11T3CT	NC40	TiN	P35		11.11	3.97	0.8	14	6.3
014402		NC10	TiAlN	K10F				(0.3)		
014403		NC60	CERMET					0.8		
014234	N9MT11T3CT2T	H-NC5071	TiAlN & TiN	K20F				0.8		
014202		H-NC40	TiN	K20F				0.8		
014203		H-NC9076	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.



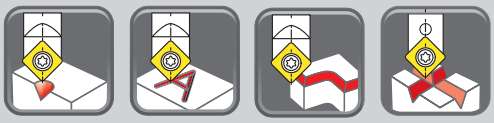


Code	Parts No.	Ød	L	M	DPM	Screw	Key
604002	00-99616-14-12	12	100	-	-	NS-35080 2.5 Nm	NK-T15
604004	00-99616-14	16	100	-	-		
604007	00-99616-14-150L	16	150	-	-		
604009	00-99616-14-220L	20	220	-	-		
614001	00-99616-14-1/2	1/2”	100	-	-		
614002	00-99616-14-5/8	5/8”	100	-	-		
624001	00-99616-14-M8	-	30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

• Refer to Page 164 for extension bars.

N9MT11T3

90°



Single Set >>

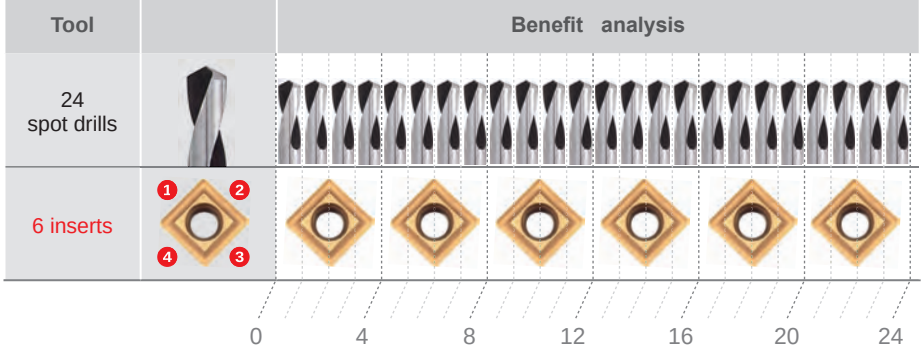
Code	Parts No.	Ød	Total Length	Insert fitted	Dmax.	Tmax.
604104-4401	00-99616-14-02S	16	100	N9MT11T3CT-NC40	14	6.3
604104-4402	00-99616-14-02SAL			N9MT11T3CT-NC10	14	6.3
614102-4401	00-99616-14-5/8-02S	5/8”	100	N9MT11T3CT-NC40	0.551”	0.248”
614102-4402	00-99616-14-5/8-02SAL			N9MT11T3CT-NC10	0.551”	0.248”

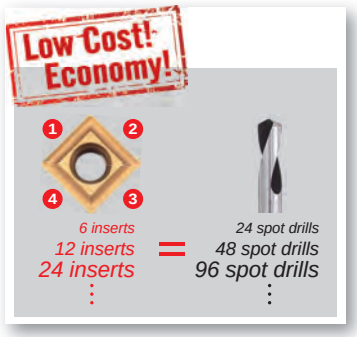
Starter Package >>

- 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.

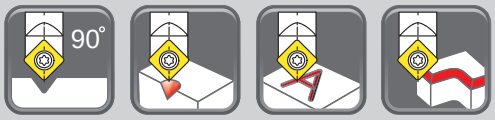
Code	Parts No.	Ød	Insert included	Content
604204-4401	00-99616-14-ME6	16	N9MT11T3CT-NC40	1 tool holder + 6 inserts + 1 key
604204-4402	00-99616-14-ME6AL		N9MT11T3CT-NC10	
614202-4401	00-99616-14-IN6	5/8”	N9MT11T3CT-NC40	
614202-4402	00-99616-14-IN6AL		N9MT11T3CT-NC10	

Comparison >>

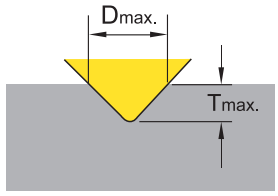




90° N9MT1704



Inserts >>

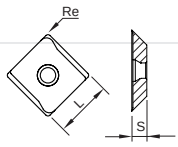


• 90 degree indexable spot drill insert, Dmax. 22mm.

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.

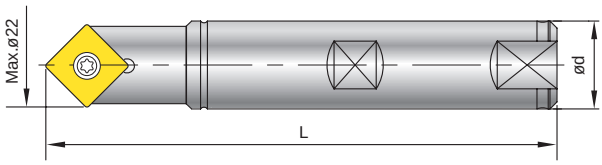
NC2071: • For carbon steel, low alloy steel, stainless steel, non-ferrous and titanium.
• Each insert has 2 cutting edges.

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

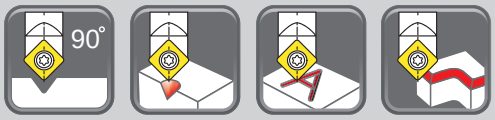
Ø20



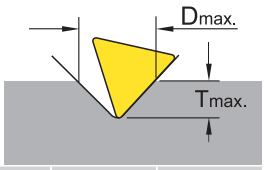
Ø25

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

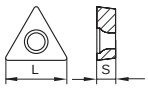
N9MT220408 / N9MT2506



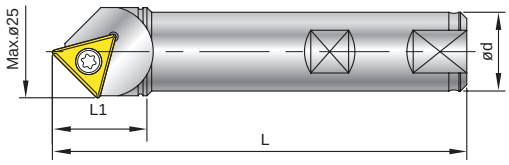
N9MT220408



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

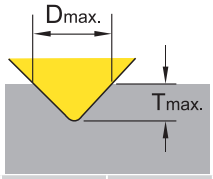
Code	Parts No.	Coating	Grade		Dimensions			Dmax.	Tmax.
					L	S	Re		
017301	N9MT220408CT-NC40	TiN	P35		20.83	4.76	---	25	11.3

* 5 pcs per box.



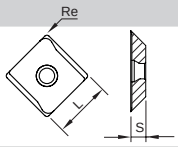
Code	Parts No.	Ød	L	L1	Screw	Key
607001	00-99616-25-CT28	25	120	30	NS-40100 3.5 Nm	NK-T15
617001	00-99616-1-CT28	1”				

N9MT2506 >>

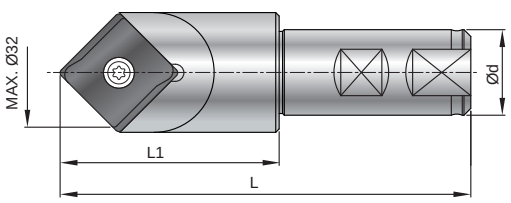


NC2033: • For carbon steel, alloy steel, high alloy steel, cast iron and hardened steel < HRC 50.
• Each insert has 2 cutting edges.

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	K20F		25	6.35	1.2	32	15.4
018202		XP9000	Uncoated							

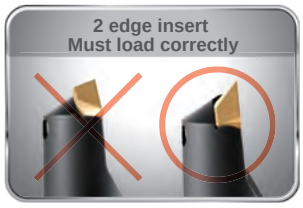
* 2 pcs per box.



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 >>

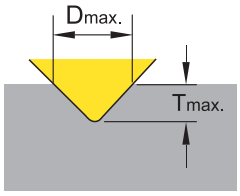


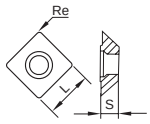
• For aircraft 100° normal rivet hole and screw hole.

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.

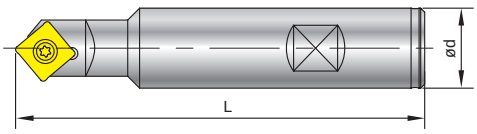


Code	Parts No.		Coating	Grade		Dimensions			Dmax.	Tmax.
						L	S	Re		
014234	N9MT11T3CT2T	H-NC5071	TiAlN & TiN	K20F		11	3.97	0.8	16	6.2
014202		H-NC40	TiN							
014203		H-NC9076	DLC							

* 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

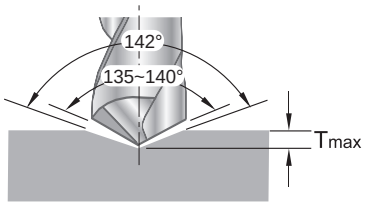
V14208 / V14216

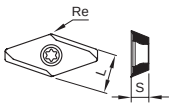
142°

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		Dimensions			Dmax.	Tmax.
					L	S	Re		
0114201	V1420803-NC2071	TiN	K20F		8	3.18	0.8	15	2.5
0114211	V1421604-NC2071				14	4.76	1.2	30	5.0

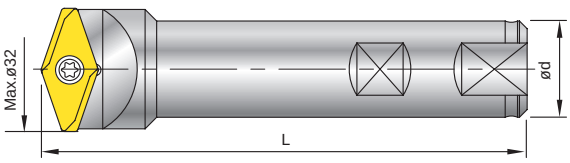
The quantity of insert per box.:	V1420803	V1421604
	10	5

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 !

Ø16

Ø25

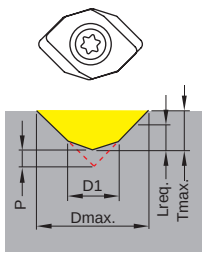


Code	Parts No.	Ød	L	Insert Type	Screw	Key
696001	00-99619-V142-16	16	100	V1420803	NS-30072 2.0 Nm	NK-T9
696002	00-99619-V142-32	25	120	V1421604	NS-50125 5.5 Nm	NK-T20

WSP Spotting New Geometry of Spotting Tool

Inserts >>

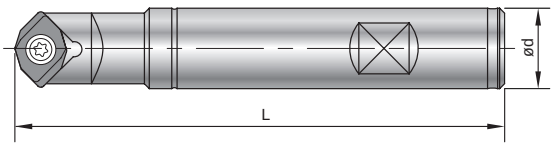
NC2033:
- Fully ground cutting edge and relief angle.
- Universal grade for steel, cast iron and hardened steel < HRC 50.
- Each insert has 2 cutting edges.

Code	Parts No.	Coating	Grade		Thread Size	*D1±0.05	P	Dmax.	Tmax.
013203	N9MT0802M04C-NC2033	TiAlN	K20F		M4x0.7	3.30	1.17	8	2.8
013204	N9MT0802M05C-NC2033				M5x0.8	4.20	1.48		2.5
013205	N9MT0802M06C-NC2033				M6x1.0	5.00	1.76		2.2
014219	N9MT11T3M08C-NC2033	TiAlN	K20F		M8x1.25	6.80	2.39	13	4.1
014220	N9MT11T3M10C-NC2033				M10x1.5	8.50	2.97		3.5
014221	N9MT11T3UNC25-NC2033	TiAlN	K20F		1/4-20 UNC	5.08	1.80	13	4.6
014222	N9MT11T3UNC31-NC2033				5/16-18 UNC	6.53	2.30		4.2
014223	N9MT11T3UNC38-NC2033				3/8-16 UNC	7.94	2.78		3.7
016205	N9MT1704M12C-NC2033	TiAlN	K20F		M12x1.75	10.25	3.59	20	6.4
016206	N9MT1704M14C-NC2033				M14x2.0	12.00	4.19		5.8
016207	N9MT1704M16C-NC2033				M16x2.0	14.00	4.88		5.1

Note: *D1 refer to the Tap Pre-drilling sizes. / Lreq : please see page 52 for details.

Holder >>

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



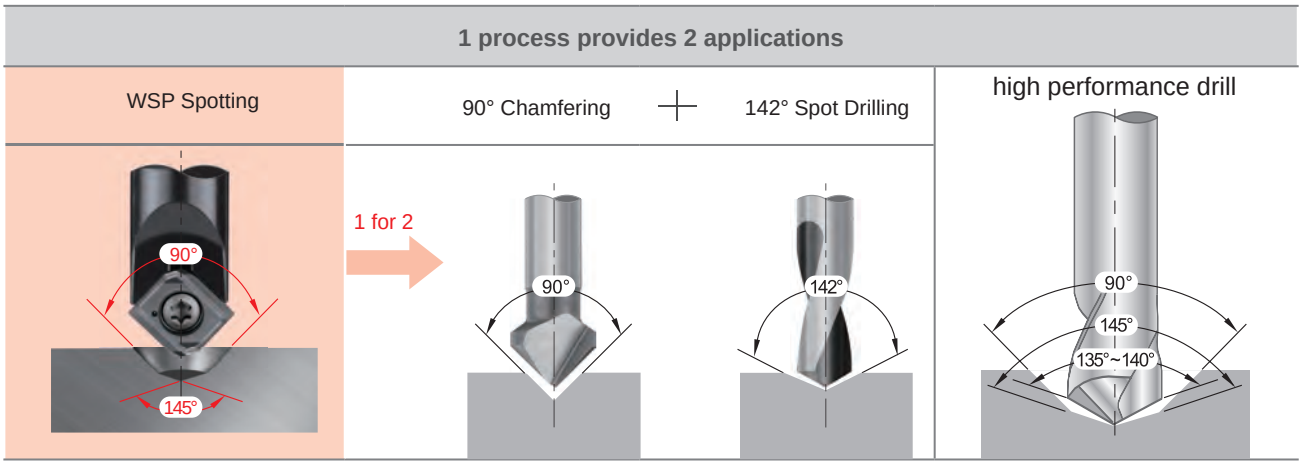
Code	Parts No.	Ød	L	Insert Type	Screw	Key
603001	00-99616-10	10	89.08±0.29	N9MT0802	NS-30055 2.0Nm	NK-T8
613001	00-99616-3/8	3/8”				
604004	00-99616-14	16	97.55±0.55	N9MT11T3	NS-35080 2.5Nm	NK-T15
614002	00-99616-14-5/8	5/8”				
606001	00-99616-22	20	96.24±0.64	N9MT1704	NS-50125 5.5Nm	NK-T20
616001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

WSP Spotting New Geometry of Spotting Tool

Combined spotting and chamfering 145° + 90° >>

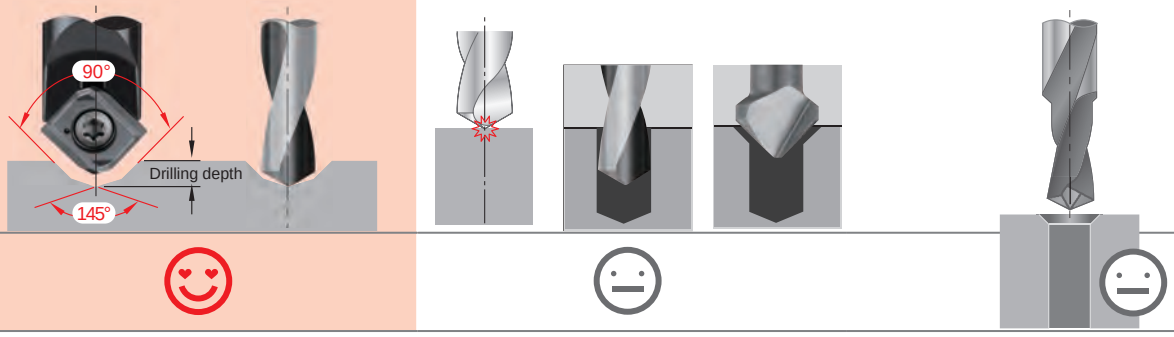
- Reduces process to one operation. Shorten cycle time.
- Use to spot prior to drilling with high performance drills for higher accuracy of hole position.
- Good support spotting process for round parts.

Concept >>



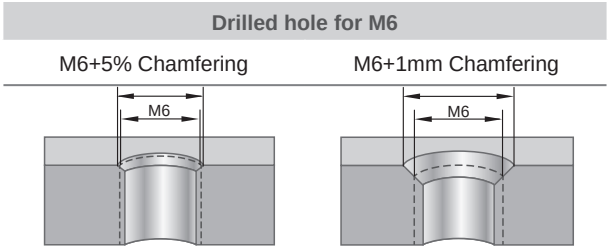
Comparison >>

WSP Spotting + Drill	Drill + Spotting	Step Drill
• Shorter drilling time • Guided at the strongest corner of drill • Longer tool life • Good position accuracy	• Longer drilling time • Guided at the weakest corner of drill • Shorter tool life	• Tool cost is high • Shorter tool life • Can't drill directly from solid on round parts. • Bad position accuracy.



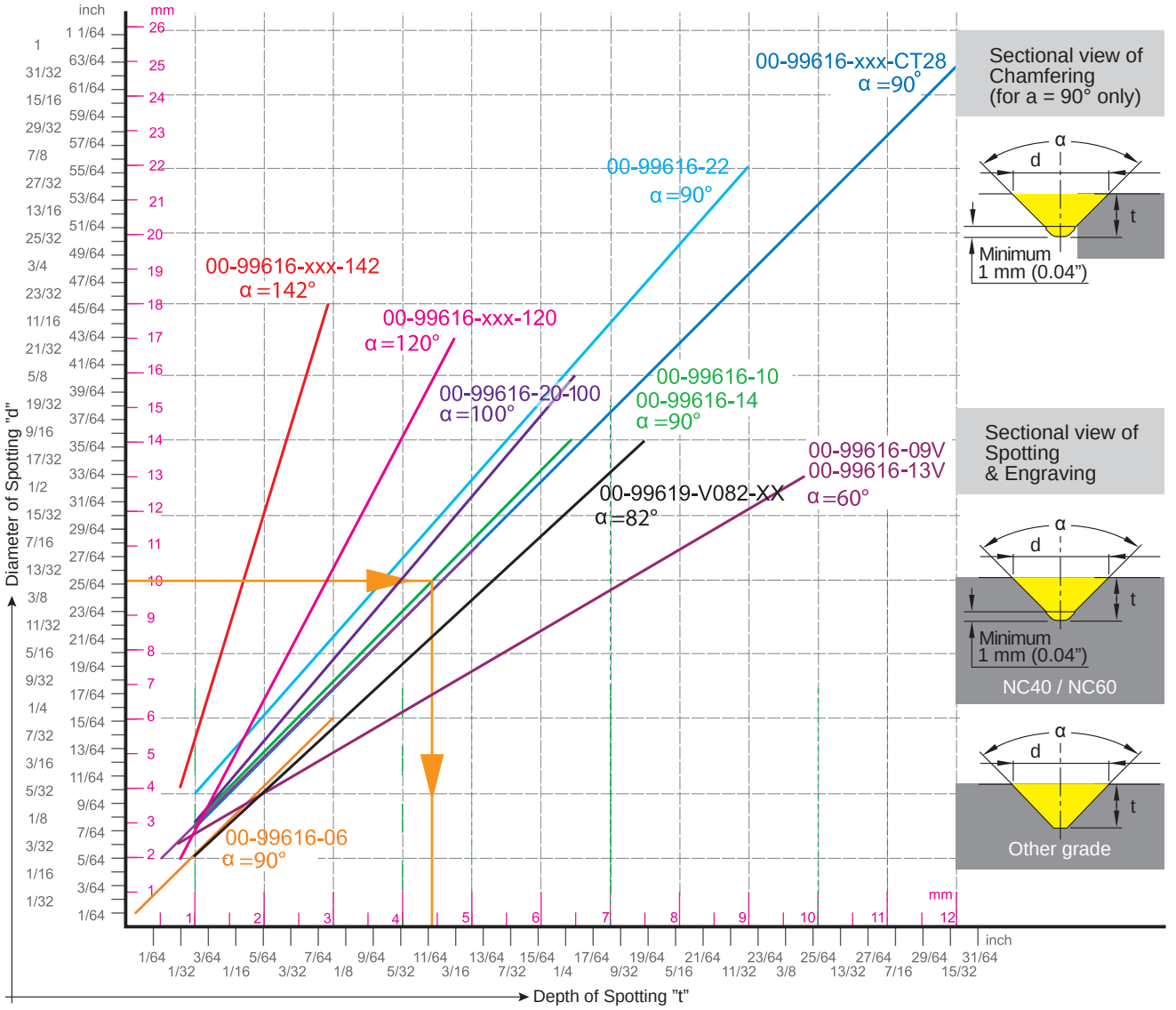
Example >>

- 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.

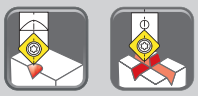
Metric		Inch	
$S = \frac{Vc \times 1000}{\pi \times d}$	**d =** diameter -mm	$S = \frac{(3.82 \times SFM)}{d}$	**d =** diameter-inch
	S = Spindle Speed -r.p.m.		**S =** Spindle Speed-r.p.m.
	Vc = Cutting Speed -m/min.	**SFM = Vc (m/min.) x 3.28**	**SFM =** Surface Speed-ft./min.
F = S x f	**f =** mm/rev.	**F = r.p.m. x IPR**	**f = IPR =** inch/rev.
	F = mm/min.		**F =** inch/min.

Cutting Data

Determine spindle speed and feed rate:

- Choose spotting depth to decide spotting diameter according to the Diameter/Depth chart on page 50.
- 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	●		
P	Carbon steel C>0.3%	100 ~ 250	0.02 ~ 0.06	0.03 ~ 0.12		●	
P	Low alloy steel C<0.3%	100 ~ 250	0.02 ~ 0.06	0.04 ~ 0.12	●		
P	High alloy steel	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	150 ~ 320	0.03 ~ 0.07	0.05 ~ 0.15	◎		●
S	Ti, Ti-alloy	40 ~ 80	0.02 ~ 0.06	0.02 ~ 0.06	●		◎
S	Heat resistant alloy	30 ~ 60	-	0.03 ~ 0.07	○	◎	
H	Hardened steel < HRC50	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	●				●	
P	Carbon Steel C>0.3%	100 ~250	0.04 ~ 0.08	0.08 ~ 0.20				●		
P	Low Alloy Steel C<0.3%	100 ~ 250	0.04 ~ 0.08	0.08 ~ 0.20	●		◎		●	
P	High Alloy Steel	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	150 ~ 320	0.05 ~ 0.10	0.10 ~ 0.25		◎			◎	●
S	Ti, Ti-alloy	40 ~ 80	0.03 ~ 0.08	0.03 ~ 0.08					●	◎
S	Heat resistant alloy	30 ~ 60	-	0.05 ~ 0.10				◎	○	
H	Hardened steel < HRC56	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.
* H-NC5071, H-NC40 and H-NC9076 inserts with supporting edges can increase feed rate 50%.

● Best ◎ Suit ○ Possible

Cutting Data

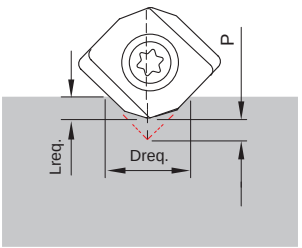
For Insert V9MT12T3CT / V082... / N9MT1704CT / N9MT2204CT / N9MT2506CT / V142...

	Workpiece material	Vc (m/min)	f (mm/rev.) Spotting / Grooving	f (mm/rev.) Chamfering	NC2071	NC5071	NC9076 (NC9036)	NC40	NC2033	XP9000
P	Carbon Steel C<0.3%	150 ~ 320	0.05 ~ 0.10	0.10 ~ 0.24	●			●		
P	Carbon Steel C>0.3%	100 ~ 250	0.04 ~ 0.08	0.08 ~ 0.20		●			●	
P	Low Alloy Steel C<0.3%	100 ~ 250	0.04 ~ 0.08	0.08 ~ 0.20	●			●		
P	High Alloy Steel	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	150 ~ 320	0.05 ~ 0.10	0.10 ~ 0.25	◎		●			●
S	Ti, Ti-alloy	40 ~ 80	0.03 ~ 0.08	0.03 ~ 0.08	●		◎			
S	Heat resistant alloy	30 ~ 60	-	0.05 ~ 0.10	○	◎				
H	Hardened steel < HRC50	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
	**Lreq. = Dreq. x 0.5 - P**

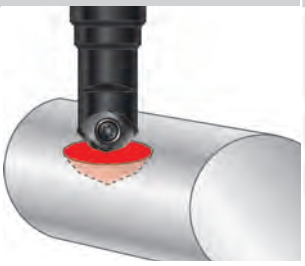
P = distance of theoretical intersection point to tip of insert.

0.5 = fixed factor for calculation

Lreq. = required drilling depth

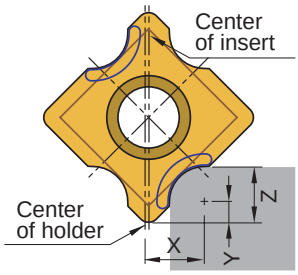
Dreq. = required diameter

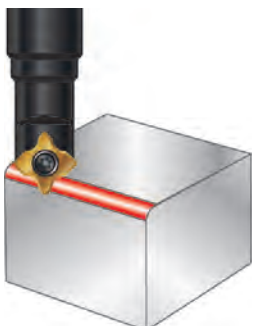
	M4	M5	M6	M8	M10	M12	M14	M16	1/4-20 UNC	5/16-18 UNC	3/8-16 UNC
P =	1.17	1.48	1.76	2.39	2.97	3.59	4.19	4.88	1.80	2.30	2.78

WSP spotting		Work Material	Vc (m/min)	f (mm/rev.)	Grade of Insert
	P	Carbon steel	150 ~ 300	0.05 ~ 0.15	NC2033
	P	Alloy steel	120 ~ 250	0.05 ~ 0.10	NC2033
	M	Stainless steel	80 ~ 150	0.04 ~ 0.08	NC2033
	K	Cast Iron	100 ~ 200	0.05 ~ 0.10	NC2033
	H	Hardened steel < HRC50	30 ~ 60	0.03 ~ 0.08	NC2033

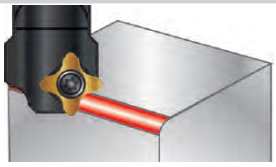
Cutting Data

For Insert N9MT05T1RC / N9MT11T3RC / N9MT1704RC / N9MT2506RC

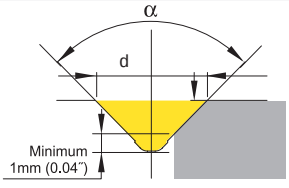
Corner Rounding	Calculate spindle speed	
	$d = 2 \times X$ mm	d = diameter of the tool
	$S = \frac{Vc \times 1000}{d \times \pi}$ r.p.m.	X = tool radius offset
		Vc = Cutting Speed -m/min.
		S = Spindle Speed -r.p.m.
	$F = S \times f$ mm/min.	F = mm/min.
		f = mm/rev.
	Calculate tool length offest on machining center	
	X, Y & Z ref. to insert's spec	X = tool radius offset
		Y = distance to the center of radius.
		Z = distance of cut

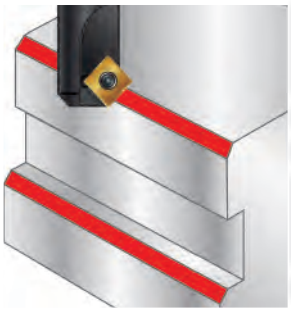
RC Insert		Work Material	Vc (m/min)	f (mm/rev.)	Grade of Insert
	P	Carbon steel	150~320	0.05~0.10	NC40, NC2071, NC2033
	P	Alloy steel	100~250	0.05~0.10	NC40, NC2071, NC2033
	P	High alloy steel	80~150	0.04~0.08	NC40, NC2071, NC2033
	M	Stainless steel	65~125	0.03~0.08	NC9036
	K	Cast Iron	150~250	0.05~0.10	NC40, NC2071, NC2033
	N	Al, Al-alloys(Si<12%)	150~320	0.05~0.10	NC9036, XP9000
	N	Casting Al-alloys(Si>12%)	100~300	0.05~0.10	NC9036, XP9000
	N	Cu, Cu-alloy, casting cu-alloy	150~250	0.05~0.10	NC9036, XP9000
	S	Ti, Ti-alloy	40-80	0.03~0.08	NC9036
	H	Hardened steel < HRC50	30~60	0.03~0.08	NC2033

For N9MT-R Insert >> Corner Rounding (4 cutting edges)

R Insert		Work Material	Vc (m/min)	f (mm/rev.)	Grade of Insert
	P	Carbon steel	150~320	0.05~0.10	NC2071
	P	Alloy steel	100~250	0.04~0.08	NC2071
	P	High alloy steel	60~80	0.03~0.06	NC2071
	K	Cast Iron	150~250	0.05~0.10	NC2071

For LA Insert >> 45° Chamfering

45° Chamfering	Formula	
	$S = \frac{Vc \times 1000}{d \times \pi}$ r.p.m.	α = point angle 90°
		d = effective diameter
		Vc = cutting speed-m/min.or ft/min.
	$F = S \times f$ mm/min.	S = Spindle speed
		f = feed per rev.-mm/rev.

45° Chamfering		Work Material	Vc (m/min)	f (mm/rev.)	Grade of Insert
	P	Carbon steel	150-320	0.05~0.10	NC40
	P	Alloy steel	100-250	0.04~0.08	NC40
	P	High alloy steel	60-80	0.03~0.06	NC40
	M	Stainless steel	65-125	0.03~0.06	NC10
	K	Cast Iron	150-250	0.05~0.10	NC10, NC40
	N	Al, Al-alloys(Si<12%)	150-320	0.05~0.10	NC10
	N	Casting Al-alloys(Si>12%)	100-300	0.05~0.10	NC10
	N	Cu, Cu-alloy, casting Cu-alloy	150-250	0.05~0.10	NC10
	H	Hardened steel < HRC56	60-80	0.05~0.10	NC60