



# CUTTING TOOLS & TOOL HOLDERS

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2013



W Spotting  
for Taps

Engraving Tool

NC Spot Drill

i-Center

Accessories

Super Drill

Chamfer mill

Boring Tool



## W Spotting for Taps

P. 02

### 1 process provides 2 applications

- 145° Spot Drilling + 90° Chamfering
- Reduces process to one operation. Shortens cycle time.
- Use to spot prior to drilling with high performance drills for higher accuracy of hole position.
- Utilizes standard NC Spot Drill holders -- 99616-10 & 99616-14 series holders.



Re 0.1mm  
99619-V060-04

## Indexable Engraving 45°/ 60°

P. 03

### A revolutionary new concept engraving tools with indexable carbide inserts

- Excellent repeatability.
- Multi-side grinding, without burrs.
- High speed, high feed rate.
- Reduces engraving cycle time.
- Long tool life.



P. 24  
P. 25

## Accessories

### Adjusting sleeve for i-Center.

- Designed for adjusting Center Height of center drills, NC spot drills, reamers and taps on the CNC lathes.

### Extension Bar.

- DC Slim Chuck
- Solid Carbide Extension Bar



## Super Drills (3xD)

P. 26

### 4 cutting edges per insert.

- Smallest indexable drill starting at 10mm.
- Same insert for outer and inner pockets.



Re 0.4mm  
99616-09V

P. 04  
}  
P. 20

## NC Spot Drill

**NC spot drill with patented indexable carbide insert.**

- CNC lathes, CNC turning centers and machining centers.
- One tool will perform multiple applications.
- Long tool life.
- Suitable for spotting, chamfering, grooving and engraving.
- 45° / 60° / 82° / 90° / 100° / 120° / 142° angles for different applications.



P. 21  
}  
P. 23

## Indexable Center Drill

**First "Indexable" center drill in the world.**

- High speed, high feed rate.
- Easy tool length setting.
- Excellent repeatability.
- Extended tool life.



mini chamfer  
99616-C02

P. 27  
}  
P. 30

## Indexable Chamfer Tool

**New Nine9 chamfer mill is designed for chamfering and countersinking with an indexable insert.**

- Smallest indexable counter sink, diameter  $\varnothing$  7mm.
- Optimized number of teeth on the holder to achieve high feed rates.
- For front and back chamfering.
- Eliminates 2nd operation or de-burring time.



## Quick Change High Speed Boring Tools

P. 31  
}  
P. 39

**Change the boring bar in just one minute.**

- $\varnothing$ 5mm~ $\varnothing$ 50mm boring bars are interchangeable.
- G6.3 10000 r.p.m. pre-balanced. All sizes are guaranteed.
- Low cost for machining small holes.
- Simple yet accurate.

### ● Engraving Tool Kit Package



Parts No.	Angle	Insert included	Content	Page
99619-V045-03K-71	45°	V04506T1W06-2071	1 x 6mm holder + 3 inserts + 1 key	P. 3
99619-V045-03K-32		V04506T1W06-2032		
99619-V060-03K-71	60°	V06006T1W06-2071		
99619-V060-03K-32		V06006T1W06-2032		

### ● NC Spot Drill Kit Package



Parts No.	Ød	Content	Page
99616-3/8 PACK	3/8"	5 x tool holders + 1 key	P. 9
99616-14-5/8 PACK	5/8"	5 x tool holders + 1 key	P. 10

### ● Super Drill Kit Package



Parts No.	Drills Diameter	Content		Page
		Holder	Insert / Screw / Key	
99313-10.0-KIT	10.0	99313-10.0	N9GX04T002-NC2032 NS-18037 NK-T6 Torque: 0.6Nm	P. 26
99313-10.3-KIT	10.3	99313-10.3		
99313-10.5-KIT	10.5	99313-10.5		
99313-11.0-KIT	11.0	99313-11.0		
99313-11.5-KIT	11.5	99313-11.5		
99313-12.0-KIT	12.0	99313-12.0		
99313-12.5-KIT	12.5	99313-12.5		

### ● Chamfering Kit Package



Fig	Part No.	Insert included	Holder included	Content	Page
1	99616-C1020-32	N9GX04T002-NC2032	99616-C10 + 99616-C20	2 x holders + 10 inserts + 1 key	P. 27
	99616-C1020-71	N9GX04T002-NC9071			
2	99616-C3040-32	N9GX060204-NC2032	99616-C30 + 99616-C40		
	99616-C3040-71	N9GX060204-NC9071			
3	99616-C5052-32	N9GX090308-NC2032	99616-C50 + 99616-C52		
	99616-C5052-71	N9GX090308-NC9071			

### ● High Speed boring Kit Package



Part No.	Content	Page
99146-32HB-05SET	SB32-146-01 Weldon Shank	P. 31
99146-BT30-05SET	BT30H Boring head shank	
99146-BT40-05SET	BT40H Boring head shank	
99146-BT50-05SET	BT50H Boring head shank	
99146-CAT40-05SET	CAT40H Boring head shank	
99146-SK40-05SET	SK40H Boring head shank	
99146-HSK63A-05SET	HSK63A Boring head shank	

Boring head shank: 1pc  
Boring bar: any 5 pcs  
Key: 3~5 pcs  
Plastic box: 1pc

## ● Engraving Tools

Fig.	Parts No.	Angle	Insert included	Content	Page
2	99616-10.08W-60 NC40 KIT	60°	N9MT080201W60-NC40	1 x 10mm holder + 2 inserts + 1 key	P. 4
	99616-10.08W NC40 KIT	90°	N9MT080201W-NC40		
	99616-10.08W NC10 KIT		N9MT080201W-NC10		
	99616-3/8.08W-60 NC40 KIT	60°	N9MT080201W60-NC40	1 x 3/8" holder + 2 inserts + 1 key	P. 4
	99616-3/8.08W NC40 KIT	90°	N9MT080201W-NC40		
	99616-3/8.08W NC10 KIT		N9MT080201W-NC10		

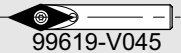

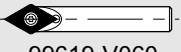


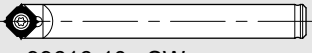

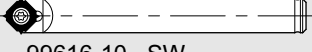


## ● NC Spot Drill-CT 60° / 82° / 90° / 100° / 120° / 142°

Fig.	Parts No.	Angle	Insert	Content	Page
3	99616-13V-5/8.12 2071 KIT	60°	V9MT12T3CT-NC2071	1 x 5/8" holder + 3 inserts + 1 key	P. 6
4	99619-V82-5/8.12 2071 KIT	82°	V08212T3-NC2071	1 x 5/8" holder + 3 inserts + 1 key	P. 7
5	99616-06-1/4.05 2071 KIT	90°	N9MT05T1CT-NC2071	1 x 1/4" holder + 6 inserts + 1 key	P. 8
	99616-3/8.08 NC40 KIT		N9MT080208CT-NC40	1 x 3/8" holder + 6 inserts + 1 key	P. 9
	99616-3/8.08 NC10 KIT		N9MT080204CT-NC10		
	99616-14-1/2.11 NC40 KIT		N9MT11T3CT-NC40	1 x 1/2" holder + 6 inserts + 1 key	P. 10
	99616-14-1/2.11 NC10 KIT		N9MT11T3CT-NC10		P. 10
	99616-14-1/2.11 NC60 KIT		N9MT11T3CT-NC60	P. 10	
	99616-14-5/8.11 NC40 KIT		N9MT11T3CT-NC40	1 x 5/8" holder + 6 inserts + 1 key	P. 10
	99616-14-5/8.11 NC10 KIT		N9MT11T3CT-NC10		P. 10
	99616-14-5/8.11 NC60 KIT		N9MT11T3CT-NC60		P. 10
	6		99616-22-3/4.17 2071 KIT	90°	N9MT1704CT-NC2071
5	99616-3/4-100.11 NC40 KIT	100°	N9MT11T3CT2T-H-NC40	1 x 3/4" holder + 6 inserts + 1 key	P. 13
	99616-3/4-120.11 NC40 KIT	120°			
	99616-3/4-142.11 NC40 KIT	142°			
7	99619-142-5/8.08 2071 KIT	142°	V1420803-NC2071	1 x 5/8" holder + 3 inserts + 1 key	P. 14



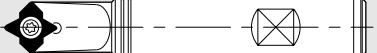

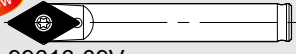

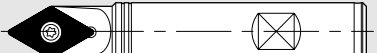





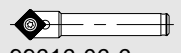



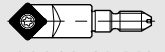

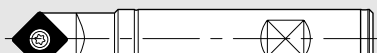



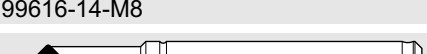





## Engraving Tools

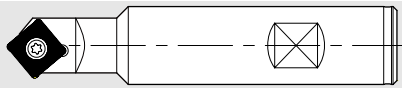



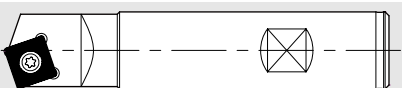

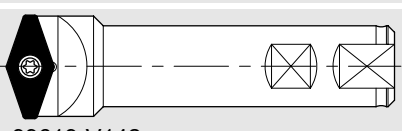

Angle	Holder	Inserts	D min.	D max.	Spotting	Chamfering	Grooving	Engraving	Drilling	Page
45°	 99619-V045	 V04506T1W	0.45 (0.018")	2.1 (0.083")	○			●		3
60°	 99619-V060	 V06006T1W	0.45 (0.018")	2.7 (0.106")	○			●		3
		<b>new</b>  V06006T1W03	0.25 (0.010")	1.1 (0.043")	○			●		3
60°	 99616-10...SW	 N9MT080201W-60	0.25 (0.010")	1.1 (0.043")	○			●		4
90°	 99616-10...SW	 N9MT080201W	0.25 (0.010")	2.0 (0.079")	○			●		4
		 N9MT05T1	1 (0.039")	6 (0.236")	●			●		8

\*Open circle = suitable application, Filled circle = preferred application.

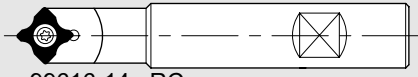

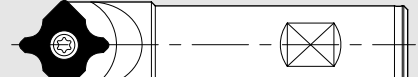

## NC Spot Drill

60°	 99616-14...P60	 N9MT11T3P60	2 (0.079")	6.2 (0.244")	●	●		●		5
	<b>new</b>  99616-09V	 V9MT0802	1 (0.039")	9 (0.354")	●	●	●	●		6
	 99616-13V	 V9MT12T3	2 (0.079")	13 (0.512")	●	●	●	●		6
82°	 99619-V082-3/8	 V0820802	2 (0.079")	9 (0.354")	●	●	●	●		7
	 99619-V082-5/8	 V08212T3	2 (0.079")	14 (0.551")	●	●	●	●		7
90°	 99616-06-6	 N9MT05T1	1 (0.039")	6 (0.236")	●	●		●		8
	 99616-3/8	 N9MT0802	2 (0.079")	10 (0.394")	●	●	●	●		9
	 99616-10-M6	<b>new</b>  WSP	1/4-20 UNC	10 (0.315")	●	●	●			2
	 99616-14...	 N9MT11T3	3 (0.118")	14 (0.551")	●	●	●	●		10
	 99616-14-M8	<b>new</b>  WSP	5/16-18 UNC 3/8-16 UNC	13 (0.512")	●	●	●			2
	 99616-22	 N9MT1704	3 (0.118")	22 (0.866")	●	●	●			11
	 99616-25-CT28	 N9MT2204	4 (0.157")	25 (0.984")	●	●				12

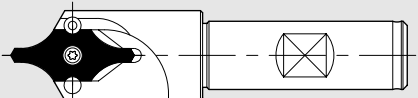

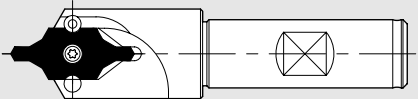

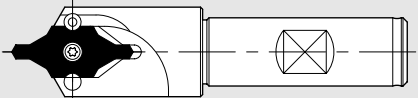

## NC Spot Drill

Angle	Holder	Inserts	D min.	D max.	Spotting	Chamfering	Grooving	Engraving	Drilling	Page
100°	 99616-3/4		4 (0.157")	16 (0.630")	●	●				13
		N9MT11T3CT2T-H								
120°	 99616-3/4		4 (0.157")	17 (0.669")	●	●				13
		N9MT11T3CT2T-H								
142°	 99616-3/4		4 (0.157")	18.5 (0.728")	●	●				13
		N9MT11T3CT2T-H								
142°	 99619-V142		2 (0.079")	32 (1.260")	●	●				14
		V1421604								

## Corner Rounding

 99616-14...RC		R 1.0 (R 1/64")	R 3.0 (R 1/8")		●					15
	N9MT11T3RC (2 cutting edges)									
 99616-22...RC		R 4.0 (R 1/4")	R 6.0 (R 3/16")		●					16
	N9MT1704RC (2 cutting edges)									

## Center Drilling

 99616-IC		1	10					●		21
	DIN332 Form R									
 99616-IC		1	10					●		21
	DIN332 Form A+B									
 99616-IC		5/64"	3/8"					●		21
	ANSI 60°									



# Various Applications of NC Spot Drill ALL IN ONE!

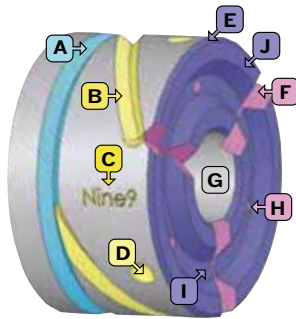


## NC Spot Drill with patented indexable carbide insert.

**High Efficiency! Low Cost! Long tool life! Position accuracy!**

- One tool will perform multiple applications.
- Suitable for spotting, chamfering, grooving and engraving.
- 45° / 60° / 82° / 90° / 100° / 120° / 142° angle for different applications.
- Increased cutting speed with coated carbide inserts.

### Turning Center



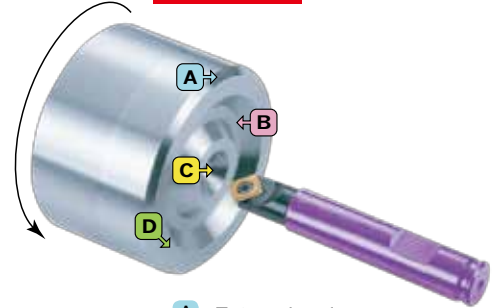
- A Grooving
- B Helical groove milling
- C Engraving
- D Spot drilling
- E Chamfer turning
- F Face groove milling
- G Internal turning
- H Spot drilling on end surface
- I Internal chamfering
- J Face grooving

### Machining Center



- A Engraving
- B Chamfering
- C Profile chamfering
- D Spotting

### CNC Lathes



- A External and internal chamfering
- B Grooving
- C Spotting
- D Facing

NC Spot Drill

1

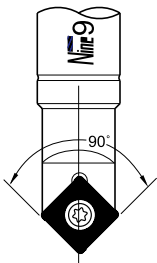
## A New Drilling Concept !

### • 0.5xD of spotting.

Many drill manufacturers and suppliers state that their drills start drilling on the solid material. You can look forward to the following benefits when using the NC Spot Drill to drill a spot that is half of the drilling diameter.

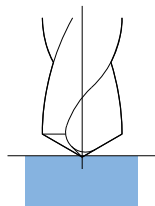
### • Drill Benefits:

- Higher feed rate.  
Why? Because the drill is guided at the strongest part of cutting edge.
- Better center position.  
Why? Because the spotting is done by a single cutting edge which is out of center, and similar to boring operation.
- Increased tool life.



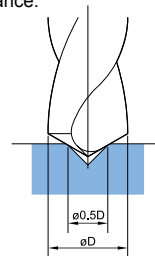
#### Without Spotting

Drill has less position accuracy and diameter tolerance.



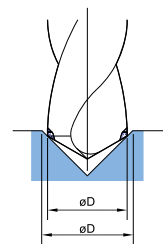
#### 0.5xD Spotting

Best result!  
Higher speed and feed rate.  
Better position accuracy and diameter tolerance.



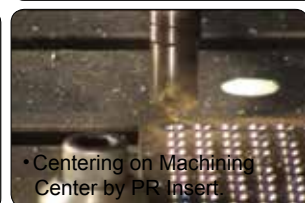
#### Larger Spotting

Longer spotting time!  
Guided at the weakest corner of drill.  
Shorter tool life.



### ■ Application Example

- Available shank diameter-  
Ø5, Ø6, Ø10, Ø12, Ø16, Ø20mm,  
Ø25mm, Ø1/4", Ø3/8", Ø1/2", Ø5/8",  
Ø3/4", Ø1"
- Inserts perform multiple operations.  
Each insert has two or four cutting edges.







# W Spotting for Taps

**NEW**

145° Spotting +  
90° Chamfering



Shank  
Ø10  
Ø3/8"

Shank  
Ø1/2"  
Ø5/8"

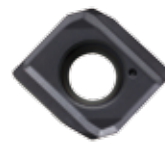
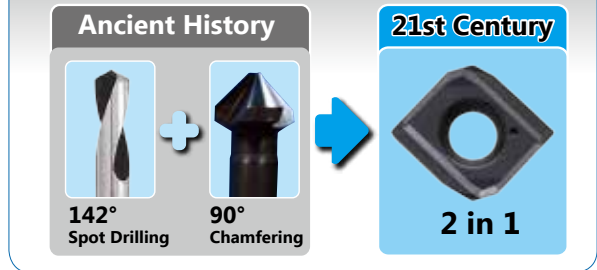
## Inserts >>

### Features:

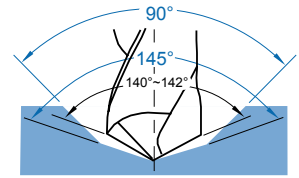
- Reduces process to one operation. Shortens cycle time.
- Use to spot prior to drilling with high performance drills for higher accuracy of hole position.
- **Utilizes standard NC Spot Drill holders --** 99616-10 & 99616-14 series holders.

- NC2033:**
- K20F grade, TiAlN coated, fully ground cutting edge and relief angle.
  - Universal grade for steel and cast iron.
  - Each insert has 2 cutting edges.

## 1 process provides 2 applications



N9MT11T3



Parts No.	Grade	Coating		Thread Size	D1±0.05	D2	L2	Dmax.	Tmax.
N9MT0802M04C-NC2033	K20F	TiAlN		M4	3.30 (0.130")	4.20 (0.165")	0.93 (0.037")	8 (0.315")	2.83 (0.111")
N9MT0802M05C-NC2033				M5	4.20 (0.165")	5.25 (0.207")	1.14 (0.045")		2.52 (0.099")
N9MT0802M06C-NC2033				M6	5.00 (0.197")	6.30 (0.248")	1.39 (0.055")		2.24 (0.088")
N9MT11T3M08C-NC2033	K20F	TiAlN		M8	6.80 (0.266")	8.40 (0.331")	1.81 (0.071")	13 (0.512")	4.11 (0.162")
N9MT11T3M10C-NC2033				M10	8.50 (0.335")	10.50 (0.413")	2.28 (0.090")		3.53 (0.139")
N9MT11T3UNC25-NC2033	K20F	TiAlN		1/4	5.08 (0.200")	6.70 (0.264")	1.55 (0.061")	13 (0.512")	4.70 (0.185")
N9MT11T3UNC31-NC2033				5/16	6.53 (0.257")	8.40 (0.331")	1.90 (0.075")		4.20 (0.165")
N9MT11T3UNC38-NC2033				3/8	7.94 (0.312")	10.00 (0.394")	2.22 (0.087")		3.72 (0.146")

## Holder >>

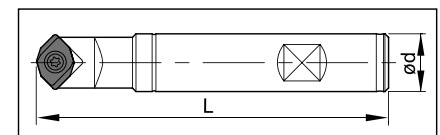
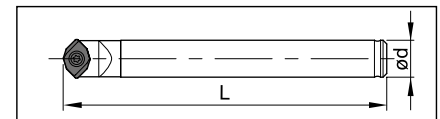
### Features:

- Indexable insert spotting drill holder.
- Holders and inserts are interchangeable.

### Applications:

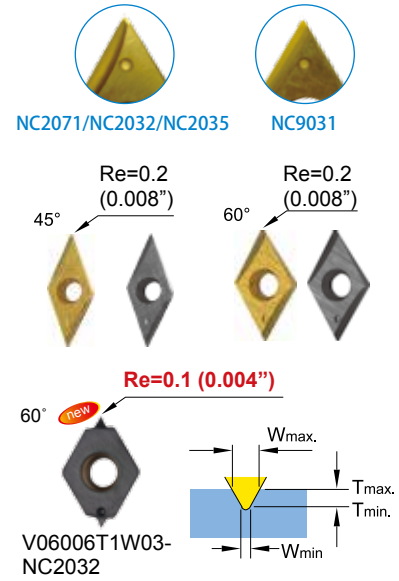
- Spotting, grooving and chamfering.

Parts No.	ød	Insert Type	Thread Size	L	Screw	Key
99616-10	10 (0.394")	N9MT0802	M4~M6	88.9 ±0.3 (3.5" ± 0.012")	NS-30055 2.0Nm	NK-T8
99616-3/8	3/8"					
99616-14-1/2	1/2"	N9MT11T3	M8~M10 1/4~3/8	97.5 ±0.6 (3.839" ± 0.024")	NS-35080 2.5Nm	NK-T15
99616-14-5/8	5/8"					



# Indexable Engraving Tool

# 45°, 60°



## Inserts >>

### Feature:

- NC2071:** • TiN coated. Good for low carbon steel, stainless steel, non-ferrous metal, and any kind of steel **> HRC30°**.
  - Strong edge on chip groove best suited for min. DOC .008" (Tmin ≥ 0.2 mm)
- NC9031:** • TiN coated. Good for low carbon steel, stainless steel, non-ferrous metal, soft material and plastic, and any kind of steel **< HRC30°**.
  - Fully positive ground rake angle, very sharp edge apply for thin engraving.
- NC2032:** • TiAlN coated. Good for medium and high carbon steel, high alloy steel, cast iron, and any kind of steel **30° < HRC < 48°**.
- NC2035:** • TiAlN coated. Good for all kinds of hardened steel, chilled cast iron, and any kind of steel **45° < HRC < 56°**.
- V06006T1W03-NC2032:** • TiAlN coated. Good for steel **< 30° HRC** and cast iron.

new

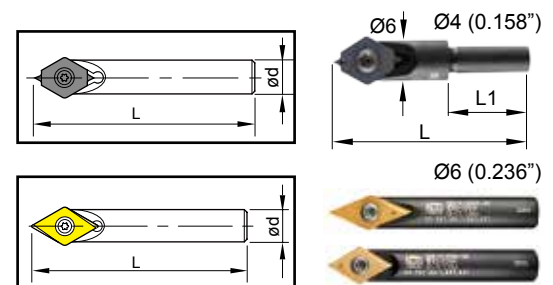
Part No.	Angle	Grade	Coating		Dimensions			Wmin.	Wmax.	Tmax.
					L	S	Re			
V04506T1W06-NC2071	45°	K20F	TiN		6.35 (0.250")	2.0 (0.079")	0.2 (0.008")	0.65 (0.026")	2.1 (0.083")	2.0 (0.079")
V04506T1W06-NC2032			TiAlN					0.65 (0.026")		
V04506T1W06-NC9031			TiN					0.45 (0.018")		
V06006T1W06-NC2071	60°	K20F	TiN		6.35 (0.250")	2.0 (0.079")	0.2 (0.008")	0.65 (0.026")	2.7 (0.106")	2.0 (0.079")
V06006T1W06-NC2032			TiAlN					0.65 (0.026")		
V06006T1W06-NC2035			TiAlN					0.65 (0.026")		
V06006T1W06-NC9031			TiN					0.45 (0.018")		
V06006T1W03-NC2032			TiAlN					0.25 (0.010")		

Other sizes also available upon request

## Holder >>

- Tool steel shank holders.
- Ø4mm holder is designed and used on Engraving Machine.

Parts No.	Ød	L	L1	Screw / Key
<span style="color: red; font-weight: bold;">new</span> 99619-V060-04	4 (0.158")	30 (1.181")	12 (0.472")	NS-22044 1.0Nm
99619-V045-06	6 (0.236")	40 (1.575")	-	
99619-V060-06	6 (0.236")	40 (1.575")	-	NK-T7



- Carbide shank holders designed for shrink-fit holder, engraving machines, high speed cutting.
- XL (100mm length) is only for Al, Al-alloy cutting.

Parts No.	Ød	L	Screw / Key
99619-V045-06L	6 (0.236")	60 (2.462")	NS-22044 1.0Nm
99619-V045-06XL	6 (0.236")	100 (3.937")	
99619-V060-06L	6 (0.236")	60 (2.462")	NK-T7
99619-V060-06XL	6 (0.236")	100 (3.937")	



Other sizes also available upon request.



Shank  
Ø10  
(0.394")

Shank  
Ø3/8"

## Inserts >>

### Features:

- 90° indexable engraving insert with 4 cutting edges.
- No resharpener required.
- For marking all types of work pieces.

### N9MT080201W-NC10:

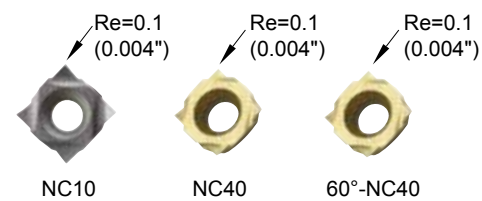
- Submicron carbide insert, TiAlN coated, for Al, Al-alloy, hardened steel 40-50°, stainless steel.

### N9MT080201W-NC40:

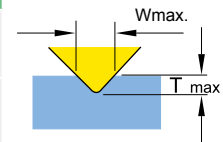
- Submicron carbide insert, TiN coated, for all unhardened steel and cast iron, general purpose.

### N9MT080201W-60-NC40:

- Submicron carbide insert, TiN coated, very positive angle for 60° engraving for all kinds of steel and cast iron.

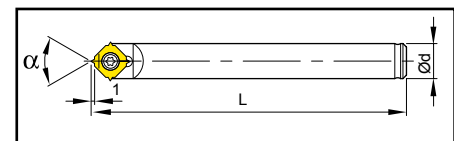


Parts No.	$\alpha$	Grade	Coating		Dimensions			Wmax.	Tmax.
					L	S	Re		
N9MT080201W-60-NC40	60°	K20F	TiN					1.1 (0.043")	0.8 (0.031")
N9MT080201W-NC40	90°	K20F	TiN		8 (0.315")	2.38 (0.094")	0.1 (0.004")	2.0 (0.079")	0.9 (0.035")
N9MT080201W-NC10	90°	K20F	TiAlN					2.0 (0.079")	0.9 (0.035")



## Holder >>

Parts No.	ød	L	Screw	key
99616-10	10 (0.394")	90 (3.543")	NS-30055 2.0 Nm	NK-T8
99616-3/8	3/8"	90 (3.543")		



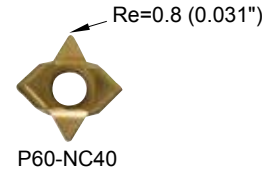


## Inserts >>

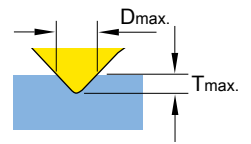
### Feature:

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

- NC40:**
- P35 grade, TiN coated
  - Each insert has 2 cutting edges.



Parts No.	Grade	Coating	60° Re L S	Dimensions			Dmax. (0.244")	Tmax. (0.157")
				L (0.433")	S (0.156")	Re (0.031")		
N9MT11T3P60-NC40	P35	TiN		11 (0.433")	3.97 (0.156")	0.8 (0.031")	6.2 (0.244")	4 (0.157")



NC Spot Drill

5

## Holder >>

### Features:

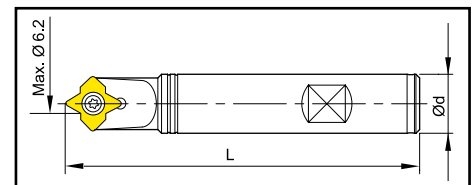
- 60 degree spotting drill with indexable insert.
- Using standard NC Spot Drill shank.**
- A single cutting edge design creates higher precision and position when spotting.

### Applications:

- For spotting, engraving, small grooving on milling machines, machining centers.
- For carbon steel, alloy steel and cast iron, general purpose.



Parts No.	ød	L	Screw	key
99616-14-1/2	1/2"	4"	NS-35080 2.5 Nm	NK-T15
99616-14-5/8	5/8"	4"		





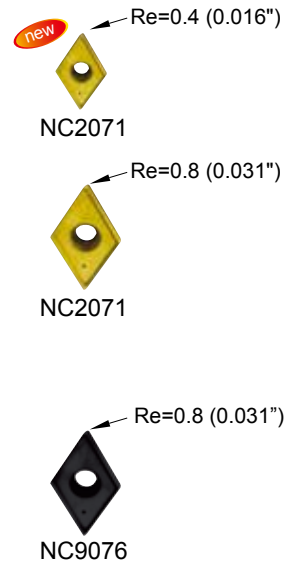
## Inserts >>

### Feature:

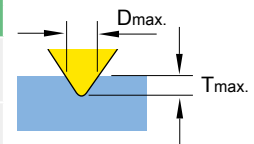
- 60 degree indexable spotting insert, Dmax 0.512".
- Special geometry with supporting edges for use in high speed machining.
- Excellent tool for grooving and saving machining time!

**NC2071:** • K20F grade, TiN coated, high positive ground cutting edge and relief angle.  
 • Universal grade for carbon steel, alloy steel and cast iron.  
 • Each insert has 2 cutting edges.

**NC9076:** • High positive geometry and sharpen edge.  
 • DLC coating performs very well for AL, AL-alloy, copper, brass and bronze.  
 • Excellent performance on non-ferrous metal.  
 • Each insert has 2 cutting edges.



Parts No.	Grade	Coating	Re	Dimensions			Dmax.	Tmax.
				L	S	Re		
<b>new</b> V9MT0802CT-NC2071	K20F	TiN		8 (0.315")	2.38 (0.094")	0.4 (0.016")	9 (0.354")	7.3 (0.287")
V9MT12T3CT-NC2071	K20F	TiN		12.7 (0.5")	3.97 (0.156")	0.8 (0.031")	13 (0.512")	10.3 (0.405")
V9MT12T3CT-NC9076	K20F	DLC						



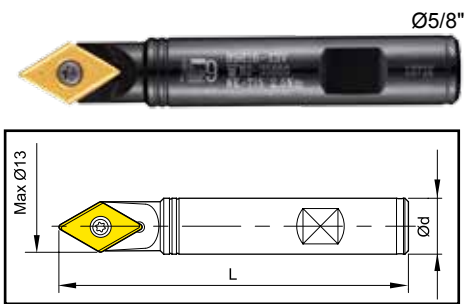
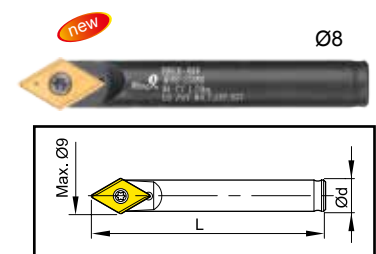
## Holder >>

### Feature:

- 60° degree spotting drill with indexable insert.
- 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.

Parts No.	ød	L	Screw	Key
<b>new</b> 99616-09V	8 (0.315")	60 (2.362")	NS-25045 1.2Nm	NK-T7
99616-13V-5/8	5/8"	4"	NS-35080 2.5 Nm	NK-T15







## Inserts >>

**Feature:**

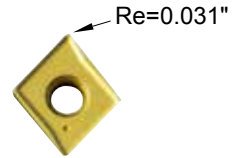
- 82 degree indexable spotting insert.
- Match the geometry of American standard flat head screw hole.
- Special geometry with supporting edges for use in high speed machining.

**NC2071:**

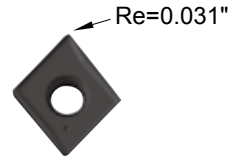
- K20F grade, TiN coated, high positive ground cutting edge and relief angle.
- Universal grade for carbon steel, alloy steel and cast iron.
- Each insert has 2 cutting edges.

**NC9076:**

- High positive geometry and sharp edge.
- DLC coated, super good for Al, Al-alloy, copper, brass and bronze.
- Produces excellent surface finish on non-ferrous metal.
- Each insert has 2 cutting edges.

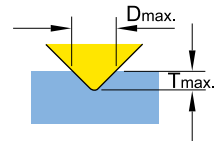


NC2071



NC9076

Parts No.	Grade	Coating	Diagram	Dimensions			Dmax.	Tmax.
				L	S	Re		
V0820802-NC2071	K20F	TiN		8 (0.315")	2.38 (0.094")	0.4 (0.016")	9 (0.354")	4.8 (0.189")
V0820802-NC9076	K20F	DLC						
V08212T3-NC2071	K20F	TiN		12.7 (0.5")	3.97 (0.156")	0.8 (0.031")	14 (0.551")	7.5 (0.295")
V08212T3-NC9076	K20F	DLC						



## Holder >>

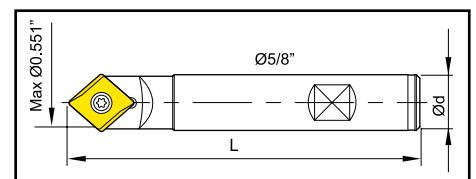
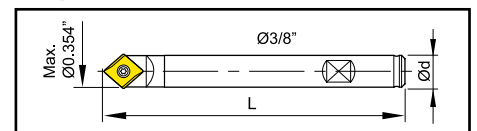
**Features:**

- 82 degree spotting drill with indexable insert.
- 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.

Parts No.	Insert type	ød	L	Screw	Key
99619-V082-3/8	V0820802	3/8"	3.5"	NS-30055 2.0 Nm	NK-T8
99619-V082-5/8	V08212T3	5/8"	4"	NS-35080 2.5 Nm	NK-T15



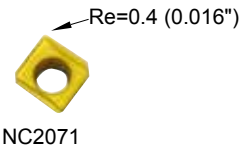


### ▣ Inserts >>

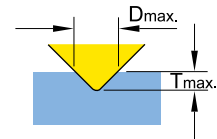
**Features:** Mini spotting drill with indexable insert, low cutting power required. Especially good for **Swiss type automatic lathes and CNC lathes.**

- NC2071:**
- K20F grade, TiN coated, fully ground cutting edge and relief angle.
  - Geometry with supporting edges to stabilize the cutting condition on low power machine.
  - Each insert has 2 cutting edges, for carbon steel, alloy steel and cast iron.

- NC9076:**
- High positive geometry and sharp edge.
  - DLC coated, super good for Al, Al-alloy, copper, brass and bronze.
  - Produces an excellent surface finish on non-ferrous metal.
  - Each insert has 2 cutting edges.



Parts No.	Grade	Coating		Dimensions			Dmax.	Tmax.
				L	S	Re		
N9MT05T1CT-NC2071	K20F	TiN		5 (0.197")	1.8 (0.071")	0.4 (0.016")	6 (0.236")	2.8 (0.110")
N9MT05T1CT-NC9076	K20F	DLC						



### ▣ Holder >>

**Features:**

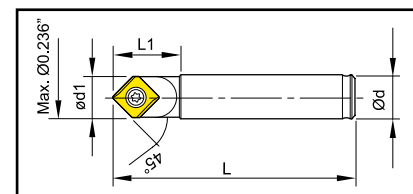
- Smallest indexable spotting drill holder.
- Spotting produces better hole positioning and geometrically uniform holes.

**Applications:**

- Spotting, engraving, and chamfering on milling machines, machining centers.
- Spotting, facing on CNC Lathes.

Parts No.	ød	L	L1	Screw	key
99616-06-6	6 (0.236")				
99616-06-5	5 (0.197")	35 (1.378")	10 (0.394")	NS-20036 0.8 Nm	NK-T6
99616-06-1/4	1/4"				

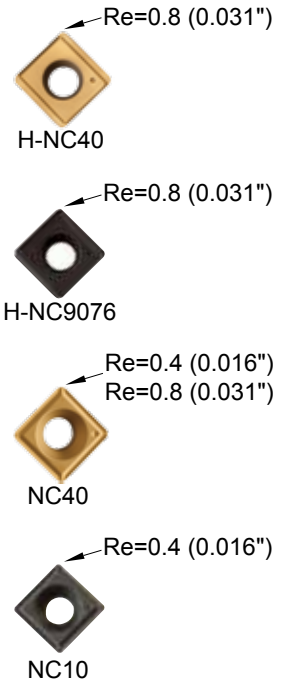
Ø5 (0.236")  
Ø6 (0.197")  
Ø1/4"



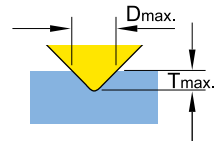


### Inserts >>

- H-NC40:**
- Best choice for spotting application.
  - Special geometry with supporting edges for use in high speed machining.
  - Sharp edge good for long cutting chip metals, such as low carbon steel, stainless steel and Ti, Ti-alloy.
  - Each insert has 2 cutting edges.
- H-NC9076:**
- High positive geometry and sharp edge.
  - DLC coated, super good for Al, Al-alloy, copper, brass and bronze.
  - Produces excellent surface finish when chamfering non-ferrous metal.
  - Each insert has 2 cutting edges.
- NC40:**
- General purpose, universal grade for all unhardened steel and cast iron.
  - Each insert has 4 cutting edges.
  - Refer to page 33 for actual insert profile for slotting.
- NC10:**
- High positive angle and fully ground cutting edge and relief angle.
  - Universal grade for Al, Al-alloy, non-ferrous metal and stainless steel.
  - Each insert has 4 cutting edges.



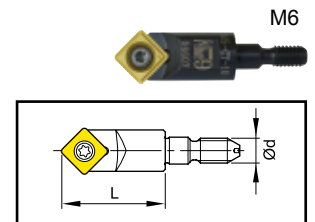
Parts No.	Grade	Coating	Re	Dimensions			Dmax.	Tmax.
				L	S	Re		
N9MT0802CT2T-H-NC40	K20F	TiN		8.31 (0.327")	2.38 (0.094")	0.8 (0.031")	10 (0.394")	4.5 (0.177")
N9MT0802CT2T-H-NC9076	K20F	DLC		8.31 (0.327")	2.38 (0.094")	0.4 (0.016")		
N9MT080208CT-NC40	K20F	TiN						
N9MT080204CT-NC40	K20F	TiN						
N9MT080204CT-NC10	K20F	TiAlN						



### Holder >>

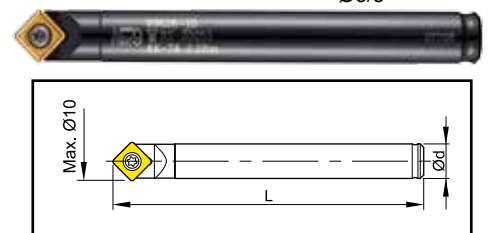
- Features:**
- Indexable spotting drill holder.
  - Single cutting edge design gives higher precision when spotting.

- Applications:**
- Spotting, engraving, grooving and chamfering on milling machines, machining centers.
  - Spotting, facing on CNC Lathes.



Ø10 (0.394")  
Ø3/8"

Parts No.	Ød	L	Screw	Key
99616-10	10 (0.394")	90 (3.543")	NS-30055 2.0 Nm	NK-T8
99616-3/8	3/8"	90 (3.543")		
99616-10-M6	M6	25 (0.984")		

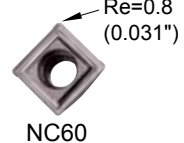
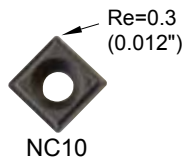
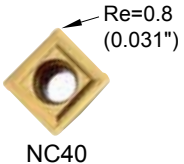
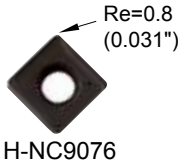
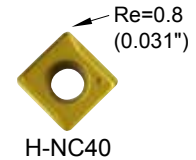


Note: • Nine9 extension bar for M6 screw fit holder, see page 25.

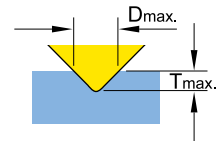


## Inserts >>

- H-NC40:**
- Best choice for spotting application.
  - Special geometry with supporting edges for use in high speed machining.
  - Sharp edge good for long cutting chip metals, such as low carbon steel, stainless steel and Ti, Ti-alloy.
  - Each insert has 2 cutting edges.
- H-NC9076:**
- High positive geometry and sharp edge same as grade H-NC40. DLC coated, super good for Al, Al-alloy, copper, brass and bronze.
  - Produces excellent surface finish when chamfering non-ferrous metal.
  - Each insert has 2 cutting edges.
- NC40:**
- General purpose, universal grade for all unhardened steel and cast iron.
  - Each insert has 4 cutting edges.
  - Refer to page 33 for actual insert profile for slotting.
- NC10:**
- High positive angle and fully ground cutting edge and relief angle.
  - Universal grade for Al, Al-alloy, non-ferrous metal and stainless steel.
  - Each insert has 4 cutting edges.
- NC60:**
- Cermet insert, fully ground cutting and relief angle, for hardened steel up to HRC55 .
  - Each insert has 4 cutting edges..



Parts No.	Grade	Coating	Re	Dimensions			Dmax.	Tmax.
				L	S	Re		
N9MT11T3CT2T-H-NC40	K20F	TiN		11 (0.433")	3.97 (0.156")	0.8 (0.031")	14 (0.551")	7 (0.276")
N9MT11T3CT2T-H-NC9076	K20F	DLC						
N9MT11T3CT-NC40	P35	TiN						
N9MT11T3CT-NC10	K10F	TiAIN						
N9MT11T3CT-NC60	CERMET							



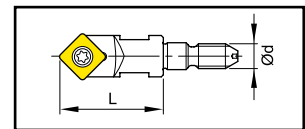
## Holder >>

- Features:**
- Indexable insert spotting drill holder.
  - The most wide range application of spotting drill for milling and turning operation.
  - Holders and inserts are interchangeable.

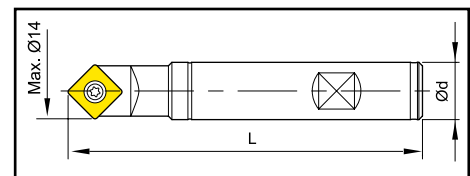
- Applications:**
- Spotting, engraving, grooving and chamfering on milling machines, machining centers.
  - Spotting, facing, turning on CNC Lathes.

Parts No.	ød	L	Screw	Key
99616-14-150L	16	150 (5.906")	NS-35080 2.0Nm	NK-T15
99616-14-220L	20	220 (8.661")		
99616-14-1/2	1/2"	4"		
99616-14-5/8	5/8"	4"		
99616-14-M8	M8	30 (1.181")		

Note: • Nine9 extension bar for M8 screw fit holder, see page 25.



Ø1/2", Ø5/8"

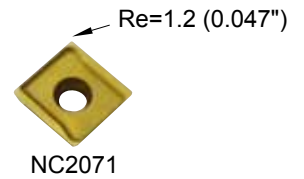




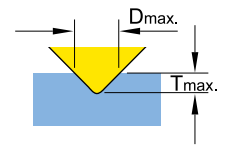
### Inserts >>

**Feature:** • 90 degree indexable spot drill insert, Dmax 0.87 inch.

- NC2071:**
- K20F grade, TiN coated, high positive geometry, fully ground cutting edge and relief angle.
  - Each insert has 2 cutting edges.
  - Universal grade for all unhardened steel and cast iron.



Parts No.	Grade	Coating	Diagram	Dimensions			Dmax.	Tmax.
				L	S	Re		
N9MT1704CT-NC2071	K20F	TiN		17 (0.669")	4.76 (0.187")	1.2 (0.047")	22 (0.866")	10.4 (0.409")

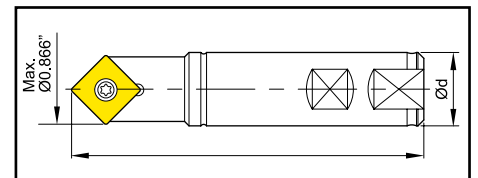
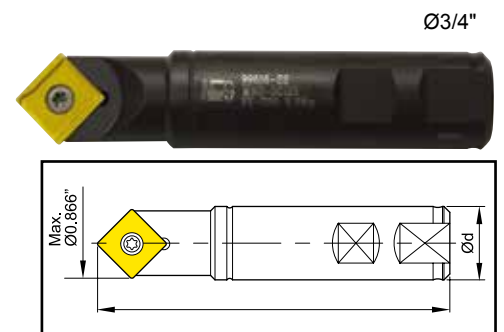


### Holder >>

- Features:**
- 90 degree spotting drill with indexable insert.
  - Spotting produces better hole positioning and geometrically uniform holes.

- Applications:**
- Spotting, engraving, grooving and chamfering on milling machines, machining centers.
  - Spotting, facing on CNC Lathes.

Parts No.	ød	L	Screw	Key
99616-22-3/4	3/4"	4"	NS-50125 5.5 Nm	NK-T20
99616-22-1	1"	6"		







Shank  
Ø1"

### Inserts >>

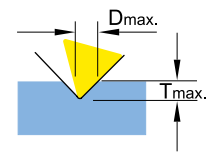
- Feature:**
- For spotting diameter up to 1 Inch.
  - Fully ground cutting edge and relief angle.



NC40

- NC40:**
- P35, TiN coated.
  - Universal grade for carbon steel, alloy steel and cast iron.
  - Each insert has 3 cutting edges.

Parts No.	Grade	Coating	Diagram	Dimensions		Dmax.	Tmax.
				L	S		
N9MT220408CT-NC40	P35	TiN		20.83 (0.820")	4.76 (0.187")	25 (0.984")	12.2 (0.480")



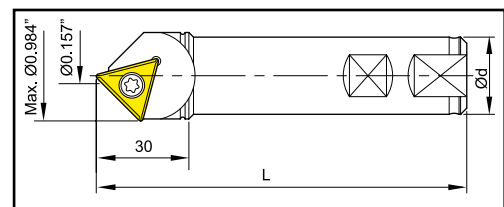
### Holder >>

- Features:**
- Large spotting diameter with indexable insert.
  - Spotting produces better hole positioning and geometrically uniform holes.

- Applications:**
- Spotting, and chamfering on milling machine, machining centers.

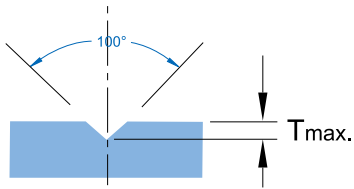


Parts No.	ød	L	Screw	Key
99616-1-CT28	1"	4.72"	NS-40100 3.8Nm	NK-T15

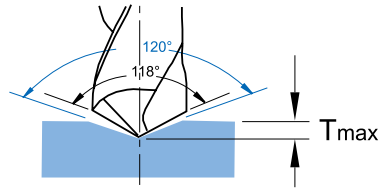




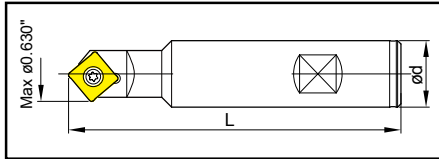
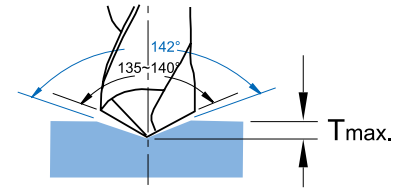
### • 100 degree



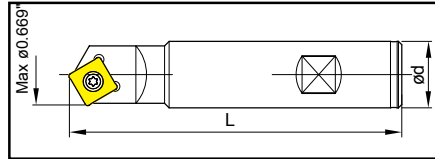
### • 120 degree



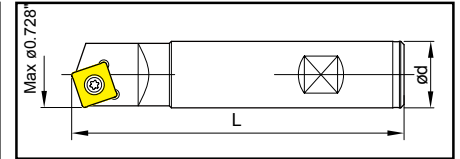
### • 142 degree



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



- For spotting before drilling by 118° point angle drill.
- 60° chamfering.



- For spotting before drilling by 135~140° point angle high performance drilling.

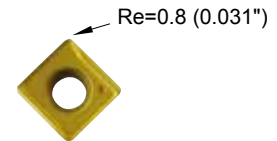
## Inserts >>



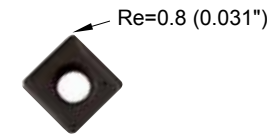
**Feature:** • Special geometry with supporting edges to reduce the vibration in high speed machining.

- H-NC40:**
- K20F grade, TiN coated.
  - General purpose for all kinds of steel and cast iron.
  - Each insert has 2 cutting edges.

- H-NC9076:**
- High positive geometry and sharp edge.
  - DLC coated, specially developed for Al, Al-alloy, copper, brass and bronze.
  - Produces excellent surface finish when chamfering non-ferrous metal.
  - Each insert has 2 cutting edges.

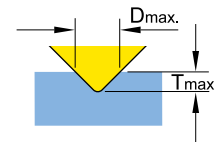


H-NC40



H-NC9076

Parts No.	Grade	Coating	Re	Dimensions		
				L	S	Re
N9MT11T3CT2T-H-NC40	K20F	TiN		11.11 (0.437")	3.97 (0.156")	0.8 (0.031")
N9MT11T3CT2T-H-NC9076	K20F	DLC				



## • Holders - 100°/120°/142° >>

**Features:**

- Indexable insert spotting drill holders for 100°/120°/142° spotting.
- Reduces spotting time. Increases tool life and position accuracy of the next drilling operation.

Parts No.	Angle	ød	L	Screw	Key	Dmax.	Tmax.
99616-3/4-100	100°					16 (0.630")	6.3 (0.248")
99616-3/4-120	120°	3/4"	4"	NS-35080 2.5Nm	NK-T15	17 (0.669")	4.76 (0.187")
99616-3/4-142	142°					18.5 (0.728")	3.16 (0.124")



Ø3/4"

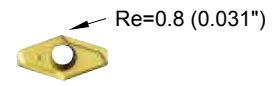


## Inserts >>

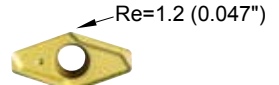
### Feature:

- For spotting before drilling by 135° - 140° point angle high performance drill.
- 142 degree indexable spotting drills. Maximum diameter up to 1.26".

- NC2071:**
- K20F grade, TiN coated, high positive geometry, fully ground cutting edge and relief angle.
  - Each insert has 2 cutting edges.
  - Universal grade for all unhardened steel and cast iron.

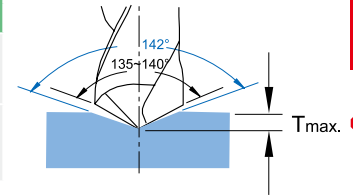


V1420803-NC2071



V1421604-NC2071

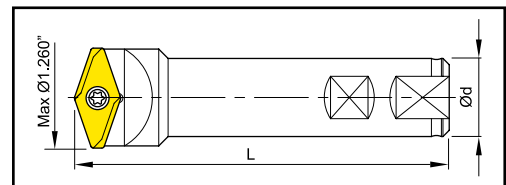
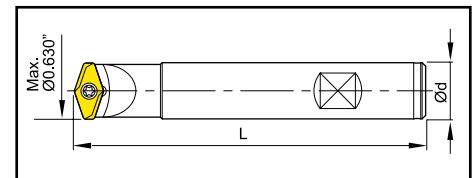
Parts No.	Grade	Coating		Dimensions			Dmax.	Tmax.
				L	S	Re		
V1420803-NC2071	K20F	TiN		8 (0.315")	2.38 (0.094")	0.8 (0.031")	16 (0.630")	2.8 (0.110")
V1421604-NC2071	K20F	TiN		14 (0.551")	4.76 (0.187")	1.2 (0.047")	32 (1.260")	5.5 (0.217")



## Holder >>

### Feature:

- Using spotting first may increase higher speed and feed rate of the after drills.
- Save total machining time!
- Extend your drill life with 142 degree spotting. Reduce your drilling costs!
- Higher accuracy of positioning and diameter tolerance!



Parts No.	Insert Type	ød	L	Screw	Key
99619-V142-5/8	V1420803-NC2071	5/8"	4"	NS-30072	NK-T9
99619-V142-1.000	V1421604-NC2071	1"	4.75"	NS-50125	NK-T20

## Single Set >>

Parts No.	Total Length	Insert fitted	Dmax.	Tmax.
99619-V142-1-02S	4.75"	V1421604-NC2071	1.260"	0.217"



Shank  
Ø1/2"

Shank  
Ø5/8"

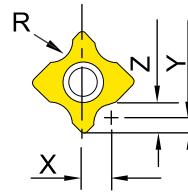
## Inserts >>

### Features:

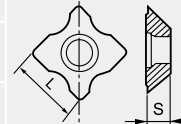
- Higher cutting speed and feed rate.
- Various corner radius inserts can fit on same holder.
- **Combination corner rounding and 45° chamfering application on same insert.**
- Carbide insert provides for long tool life.

### N9MT11T3RCXX-NC40:

- Submicron carbide insert, K20F, TiN coated, universal design for all kinds of materials.
- Inserts are CNC ground for precision radius location.
- Each insert has two cutting edges.



Parts No.	Grade	Coating	Corner radius(R)	offset			Dimensions	
				X	Y	Z	L	S
N9MT11T3RC10-NC40	K20F	TiN	1.0	2.75 (0.108")	1.5 (0.059")	2.5 (0.098")	11.11 (0.433")	3.97 (0.156")
N9MT11T3RC15-NC40	K20F	TiN	1.5	3.25 (0.128")	1.5 (0.059")	3 (0.118")	11.11 (0.433")	3.97 (0.156")
N9MT11T3RC20-NC40	K20F	TiN	2.0	3.75 (0.148")	1.5 (0.059")	3.5 (0.138")	11.11 (0.433")	3.97 (0.156")
N9MT11T3RC25-NC40	K20F	TiN	2.5	4.25 (0.167")	1.5 (0.059")	4 (0.157")	11.11 (0.433")	3.97 (0.156")
N9MT11T3RC30-NC40	K20F	TiN	3.0	4.75 (0.187")	1.4 (0.055")	4.4 (0.173")	11.11 (0.433")	3.97 (0.156")
N9MT11T3RC1/64-NC40	K20F	TiN	1/64	0.086"	0.059"	0.0747"	0.437"	0.156"
N9MT11T3RC1/32-NC40	K20F	TiN	1/32	0.101"	0.059"	0.090"	0.437"	0.156"
N9MT11T3RC1/16-NC40	K20F	TiN	1/16	0.133"	0.059"	0.122"	0.437"	0.156"
N9MT11T3RC3/32-NC40	K20F	TiN	3/32	0.164"	0.059"	0.153"	0.437"	0.156"
N9MT11T3RC 1/8-NC40	K20F	TiN	1/8	0.199"	0.055"	0.180"	0.437"	0.156"



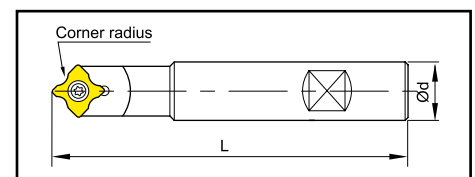
## Holders >>

### Features:

- **For corner rounding using NC Spot Drill shank.**
- Good for small work pieces.
- Same insert can also be used to produce a 45 degree edge chamfer.



Parts No.	ød	L	Screw	Key
99616-14-1/2	1/2"	4"	NS-35080 2.5 Nm	NK-T15
99616-14-5/8	5/8"	4"		





Shank  
Ø3/4"

Shank  
Ø1"

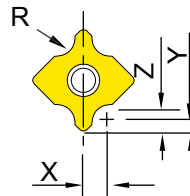
## ▣ Inserts >>

### Features:

- Higher cutting speed and feed rate.
- Various corner radius inserts can fit on same holder.
- **Combination corner rounding and 45° chamfering application on same insert.**
- Carbide insert provides for long tool life.

### N9MT1704RCXX-NC2071:

- Submicron carbide insert, K20F, TiN coated, universal design for all kinds of materials.
- Inserts are CNC ground for precision radius location.
- Each insert has two cutting edges.



Parts No.	Grade	Coating	Corner radius(R)	offset			Dimensions
				X	Y	Z	
N9MT1704RC40-NC2071	K20F	TiN	4.0	6.15 (0.242")	2 (0.079")	6 (0.236")	L: 17 S: 4.76
N9MT1704RC50-NC2071	K20F	TiN	5.0	7.10 (0.280")	2 (0.079")	7 (0.276")	L: 17 S: 4.76
N9MT1704RC60-NC2071	K20F	TiN	6.0	8.10 (0.319")	2 (0.079")	8 (0.315")	L: 17 S: 4.76
N9MT1704RC3/16-NC2071	K20F	TiN	3/16	0.270"	0.078"	0.268"	L: 0.669" S: 0.187"
N9MT1704RC1/4-NC2071	K20F	TiN	1/4	0.333"	0.078"	0.330"	L: 0.669" S: 0.187"

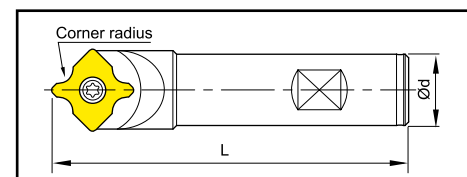
## ▣ Holders >>

### Features:

- **For corner rounding using NC Spot Drill shank.**
- Good for small work pieces, which need large corner rounding.
- 45 degree chamfering is available by using straight position of cutting edge.



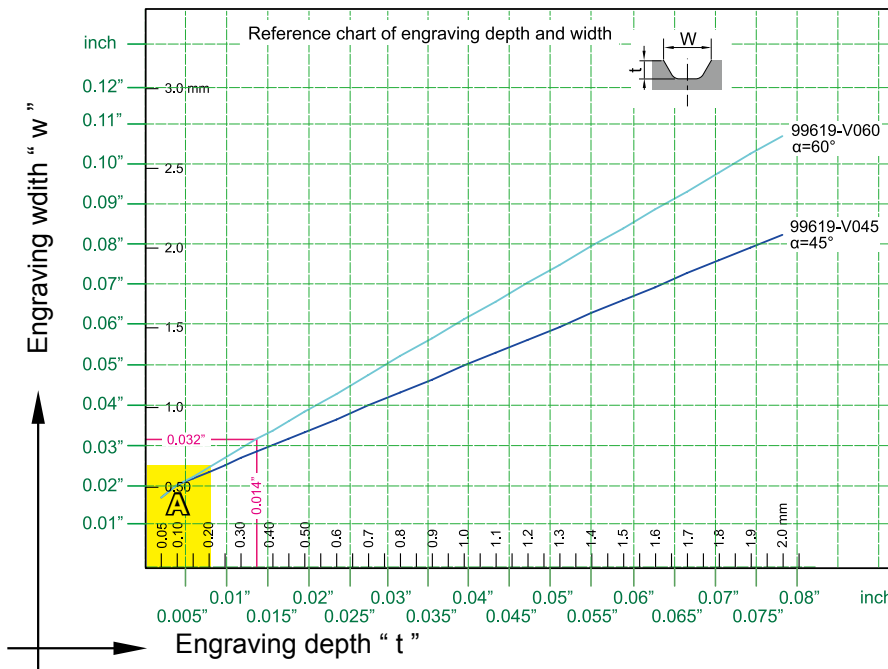
Parts No.	ød	L	Screw	Key
99616-22-3/4	3/4"	4"	NS-50125 5.5 Nm	NK-T20
99616-22-1	1"	6"		



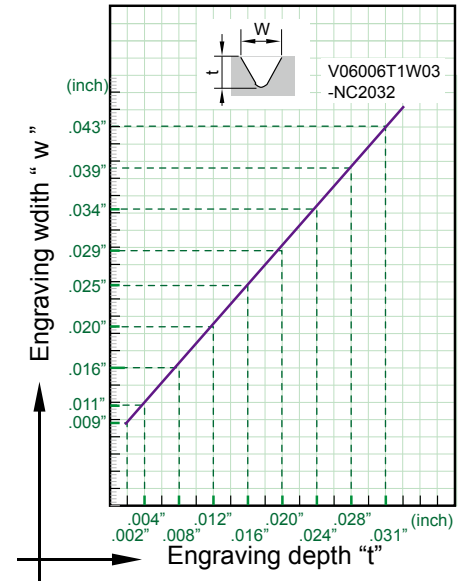
- Other sizes also available upon request.



\* Based on cutting parameters we recommend starting in/rev at low recommendation if tool chipping occurs.



• Reference chart of engraving depth and width for **V06006T1W03-NC2032**



- To use the engraving chart, select your engraving width (w) on the vertical axis. Select your engraving insert angle (45° or 60°), and follow the horizontal line from the (w) axis to the intersection with the insert angle. Follow the vertical line from this intersection point to the engraving depth (t) axis to determine the engraving depth.
- Grade NC2071 insert is not applicable on area "A".

### ▣ Cutting Data >>

Work Material		S RPM	f (in/rev.)	Grade of insert
Steel	< 30°HRC	5000~20000	0.0004~0.0020	NC2071
	30°- 48°HRC		0.0002~0.0004	W03-NC2032
	46°- 56°HRC		0.0004~0.0008	NC2032
			0.0004~0.0008	NC2035
Carbon steel C<0.3%	0.0002~0.0004		W03-NC2032	
Carbon steel C>0.3%	0.0002~0.0006		W03-NC2032	
Low alloy steel C<0.3%	0.0002~0.0004		W03-NC2032	
High alloy steel C>0.3%	0.0002~0.0004		W03-NC2032	
Stainless steel	0.0004~0.0020		NC2071,NC9031	
Cast iron			0.0008~0.0020	NC2032
		0.0002~0.0006	W03-NC2032	
Aluminum, non-ferrous metal			0.0004~0.0030	NC2071,NC9031
PMMA, POM (Plastic)			0.0004~0.0030	NC9031

### ▣ Depth of cut recommendations >>

Material	Ap	1st	2nd	3rd	4th	5th	6th	~	Fine finishing
Carbon steel C<0.3%	0.024"	0.016"	0.012"	0.008"	0.008"	0.004"	0.004"	0.004"	0.004"
Carbon steel C>0.3%	0.031"	0.024"	0.012"	0.008"	0.004"			~	0.004"
Low alloy steel C<0.3%	0.020"	0.016"	0.012"	0.012"	0.008"	0.008"	0.004"	0.004"	0.004"
High alloy steel C>0.3%	0.012"	0.012"	0.008"	0.008"	0.006"	0.006"	0.004"	0.004"	0.020"
Alloy steel ≥HRC40°	0.008"	0.008"	0.006"	0.006"	0.004"	0.004"	0.004"	0.004"	0.002"
Stainless steel	0.020"	0.016"	0.012"	0.012"	0.008"	0.008"	0.004"	0.004"	0.002"
Cast iron	0.040"	0.024"	0.012"	0.004"	0.004"			~	0.004"
Non-ferrous metal	0.079"	0.040"	0.008"					~	0.004"

### ▣ Depth of cut recommendations for V06006T1W03-NC2032>>

Material	Ap	1st	2nd	3rd	4th	5th	~	Finishing
Carbon steel C<0.3%	0.012"	0.008"	0.004"	0.004"	0.004"	0.002"	0.002"	0.001"
Carbon steel C>0.3%	0.012"	0.008"	0.004"	0.004"	0.004"	0.002"	0.002"	0.001"
Low alloy steel C<0.3%	0.012"	0.004"	0.004"	0.004"	0.002"	0.002"	0.002"	0.001"
High alloy steel C>0.3%	0.008"	0.004"	0.004"	0.002"	0.002"	0.002"	0.002"	0.001"
Steel <HRC30°	0.008"	0.004"	0.004"	0.002"	0.002"	0.002"	0.002"	0.001"
Cast Iron	0.012"	0.008"	0.004"	0.004"	0.004"	0.002"	0.002"	0.001"

### 1. Selecting the speed and feed rate:

Select the spindle speed and feed rate according to the selected material's cutting data. The downward feed rate of the Z-axis should be reduced to **50-70%** of the table feed rate. (NC9031)

### 2. Cutting fluid and cooling condition:

Elmusion is recommended for engraving on steel, stainless steel, Al and Al-alloy. Blown cooled air is recommended for engraving on cast iron and plastic.

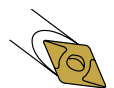
### ▣ Attention >>

#### 1. Setting-up the tool holder:

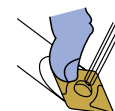
The engraving tool shank runout should be below 0.02 mm (0.0008"). Shrink fit chucks, hydraulic chucks and high precision spring collet chucks are recommended. Pre-balance the tool holder: G6.3/10,000 R.P.M. is recommended.

#### 2. Clamping the engraving insert:

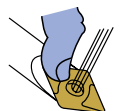
Place and hold the insert in the insert pocket against the positioning side. See illustration right:



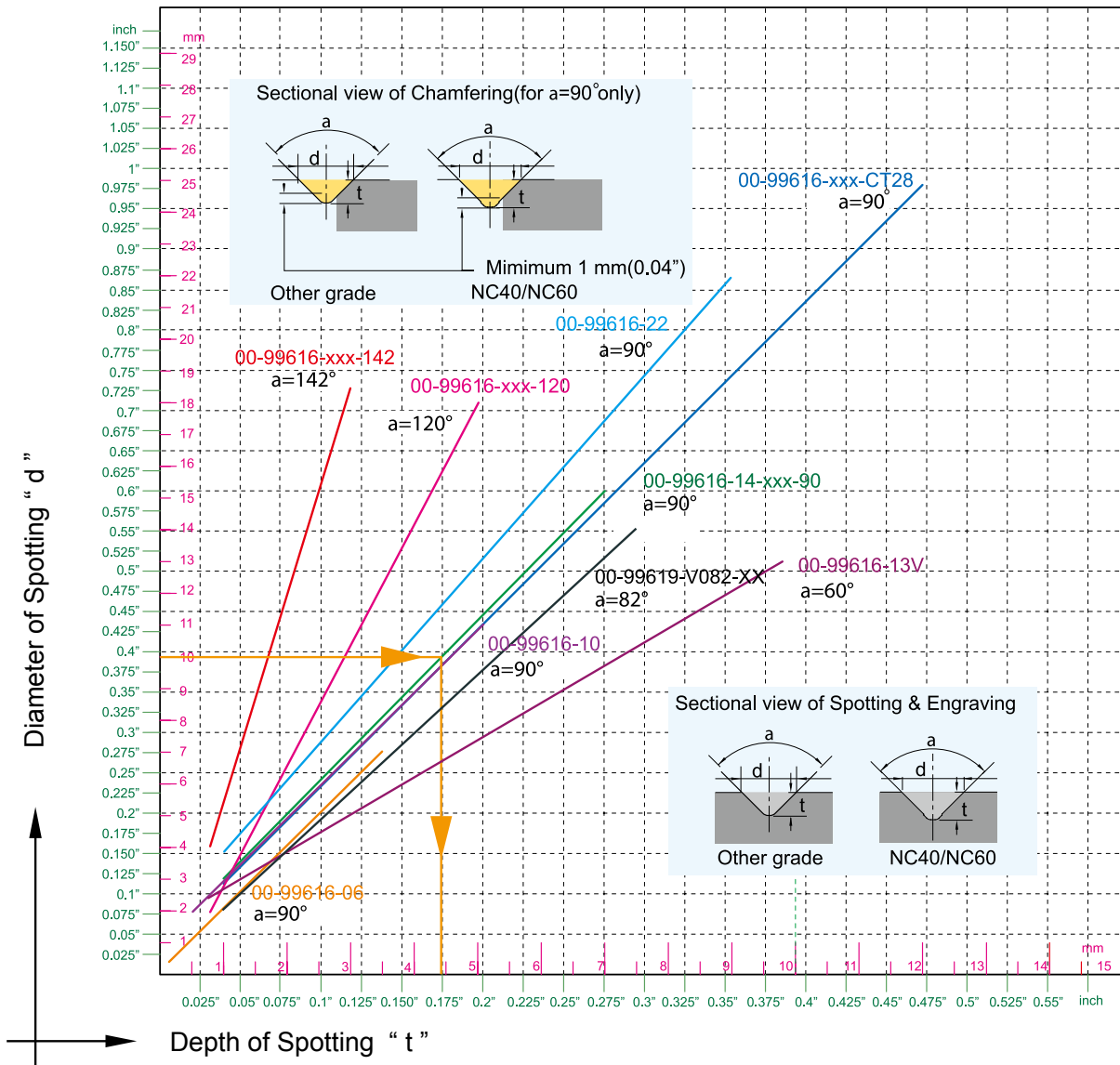
Step 1: Place the insert in the insert pocket.



Step 2: Push insert against the insert pocket and insert the screw.



Step 3: Tighten the insert screw.



### ■ Use Instructions >>

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 grade 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.

### ■ Calculate Spindle Speed >>

1. Using your "d" value and cutting speed Vc(SFM) from the data sheet (reference page 19), calculate spindle speed "S"(RPM).
2. Feed rate per minute F=f x S=RPMxIPR

inch

$$S = \frac{\text{SFM} \times 3.82}{D}$$

$$F = f \times S$$

D= Diameter -inch  
 S= Spindle speed -r.p.m.  
 SFM= Cutting Speed -ft./min.  
 f = inch/rev. =IPR  
 F= inch/min.

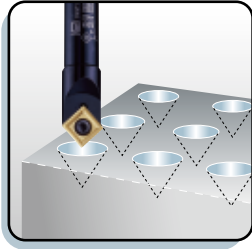
## N9MT-CT Insert

## Multi-function Insert

### Determine spindle speed and feed rate:

- Choose spotting depth to decide spotting diameter according to the Diameter/Depth chart of page 18.
- The spindle speed should be calculated by the maximum diameter of spotting, chamfering and grooving.

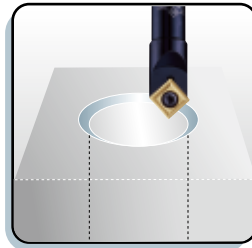
### Spotting



Work Material	SFM	IPR (inch/rev.)	Grade of Insert
Carbon Steel	500~820	0.0020~0.0040	NC40, H-NC40, NC2071
Alloy Steel	330~660	0.0016~0.0024	NC40, H-NC40, NC2071
Stainless Steel	210~410	0.0010~0.0024	NC10, NC60, H-NC40, NC2071
Cast Iron	260~500	0.0020~0.0040	NC40, NC10, NC2071
Non-Ferrous Metal (Al, copper)	500~1050	0.0020~0.0040	NC10, H-NC9076
Ti, Ti-alloy	200~260	0.0012~0.0024	H-NC40

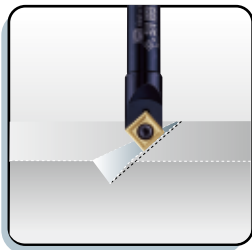
- \* For technical construction reasons, the insert is not located on the center of the holder.
- \* Inserts with supporting edges can increase feed rate 50%. (ex:NC2071, NC9076, H-NC40 type)

### Chamfering



Work Material	SFM	IPR (inch/rev.)	Grade of Insert
Carbon Steel	500~1050	0.0020~0.0040	NC40, H-NC40, NC2071
Alloy Steel	330~820	0.0016~0.0024	NC40, H-NC40, NC2071
Stainless Steel	210~410	0.0010~0.0024	NC10, NC60, H-NC40, NC2071
Cast Iron	500~820	0.0020~0.0040	NC40, NC10, NC2071
Non-Ferrous Metal (Al, copper)	500~1050	0.0020~0.0040	NC10, H-NC9076
Ti, Ti-alloy	200~260	0.0012~0.0024	H-NC40

### Grooving



- \* NC2071, NC9076, H-NC40 type can increase feed rate 20%.

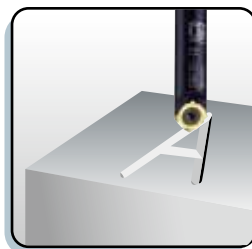
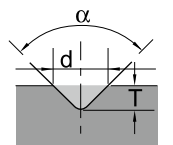
Work Material	SFM	IPR (inch/rev.)	Grade of Insert
Carbon Steel	500~820	0.0020~0.0040	NC40, H-NC40, NC2071
Alloy Steel	330~660	0.0016~0.0024	NC40, H-NC40, NC2071
Stainless Steel	210~410	0.0010~0.0024	NC10, NC60, H-NC40, NC2071
Cast Iron	260~500	0.0020~0.0040	NC40, NC10, NC2071
Non-Ferrous Metal (Al, copper)	500~1050	0.0020~0.0040	NC10, H-NC9076
Ti, Ti-alloy	200~260	0.0012~0.0024	H-NC40

## N9MT-W Insert

## Engraving Insert

Engraving : Width of engraving=diameter of cutting="d"  
Depth of engraving=depth of cutting="T"

- For  $\alpha = 90^\circ$  insert,  $d=2xT$
- For  $\alpha = 60^\circ$  insert,  $d=1.73xT$



Work Material	SFM	IPR (inch/rev.)	Grade of Insert
All Kinds of Steel, Unhardened, Cast Iron	66~260	0.0004~0.0008	NC40
Non-Ferrous Metal	66~310	0.0004~0.0008	NC10
Hardened Steel HRC 40-50°	66~260	0.0004~0.0008	NC10

Attention: The calculated result "d" is only for calculation of spindle speed.

## N9MT-RC Insert

### Determine spindle speed and feed:

To decide running speed of the tools and feed rate, please calculate spindle speed and feed rate according to the following formula and cutting data:

### Calculate spindle speed

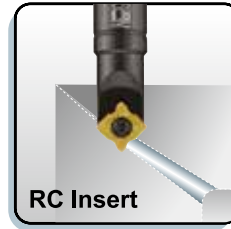
$$d = 2 \times X \quad \text{inch}$$

$$d = 2 \times r \quad \text{inch}$$

$$S = \frac{\text{SFM} \times 3.82}{d} \quad \text{r.p.m.}$$

$$F = S \times f \quad \text{inch.}$$

$d$  = diameter of the tool for calculation purpose  
 $X$  = tool radius offset (ref. page 15~16 for RC inserts)  
 $r$  = tool radius offset  
 SFM = cutting speed ft/min.  
 $S$  = Spindle speed  
 $F$  = Feed rate  
 $f$  = inch/rev.

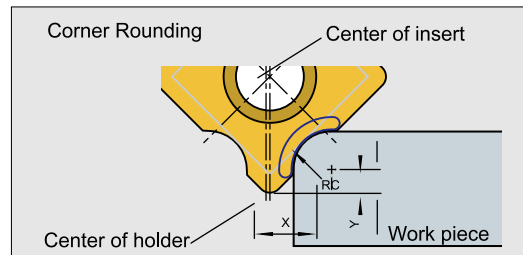


### Calculate tool length offset on machining center

$$TL = TL' - Y,$$

$$H = X \text{ or } r$$

$X$  = tool radius offset (ref. page 15~16 for RC inserts)  
 $r$  = tool radius offset  
 $Y$  = distance to the center of radius. (page 15~16 for RC inserts)  
 $TL'$  = tool length  
 $TL$  = tool length offset  
 $H$  = tool radius offset



NC Spot Drill

20

### Recommended cutting speed for different materials:

#### Corner Rounding RC Insert

Workpiece material	SFM	IPR(inch/rev.)	Grade of insert
Carbon steel	500~1050	0.0020~0.0040	NC2071
Alloy steel	330~820	0.0020~0.0040	NC2071
High alloy steel	260~500	0.0016~0.0040	NC2071
Stainless steel	210~410	0.0020~0.0040	NC2071
Gray cast iron	500~820	0.0020~0.0040	NC2071
Aluminum, Al-alloy Si < 12%	500~1050	0.0020~0.0040	NC2071
Al-alloy Si > 12%	330~1050	0.0020~0.0040	NC2071
Copper	600~820	0.0020~0.0040	NC2071
Brass and bronze	500~80	0.0020~0.0040	NC2071
Hardened steel <HRC40°	200~260	0.0016~0.0040	NC2071

## N9MT- W SP

### TECH. >>

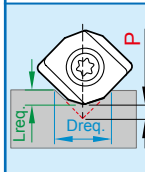


$$L_{req.} = D_{req.} \times 0.5 - P$$

$P$  = distance of theoretical intersection point to tip of insert.  
 $0.5$  = fixed factor for calculation  
 $L_{req.}$  = required drilling depth  
 $D_{req.}$  = required diameter

Work Material	SFM	IPR (inch/rev.)
Carbon Steel	150 ~ 300 (500 ~ 1050 SFM)	0.05 ~ 0.15 (0.0020 ~ 0.0060 IPR)
Alloy Steel	120 ~ 250 (410 ~ 820 SFM)	0.05 ~ 0.10 (0.0020 ~ 0.0040 IPR)
Stainless Steel	80 ~ 150 (260 ~ 500 SFM)	0.04 ~ 0.08 (0.0015 ~ 0.0031 IPR)
Cast Iron	100 ~ 200 (330 ~ 660 SFM)	0.05 ~ 0.10 (0.0020 ~ 0.0040 IPR)

	M4	M5	M6	M8	M10	1/4-20 UNC	5/16-18 UNC	3/8-16 UNC
$P=$	$P=$	$P=$	$P=$	$P=$	$P=$	$P=$	$P=$	$P=$
$L_{req.}$	1.17 (0.046")	1.48 (0.058")	1.76 (0.069")	2.39 (0.094")	2.97 (0.117")	1.80 (0.071")	2.30 (0.091")	2.78 (0.109")





# Indexable Center Drill

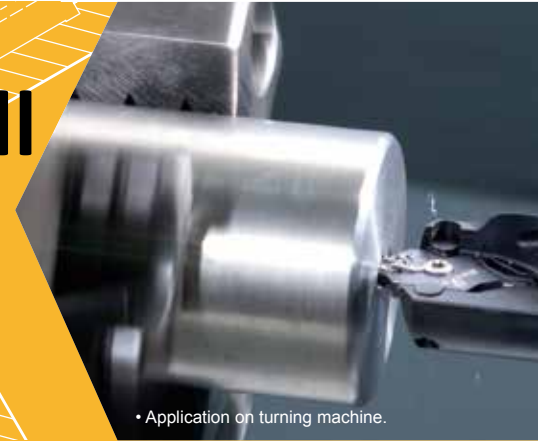
i-Center indexable center drill (patented)

World's first indexable center drill

Shortens set up and center drilling time

Increases tool life and reduces tooling costs

Special forms are possible



• Application on turning machine.

## • High Speed, High Feed Rate

The special ground insert and rigid holder design facilitate high performance speed and feed rates. For example, drilling alloy steel at 6000 rpm and feed rate of 24"/min. (.004"/rev.)

## • Easy Tool Length Setting

The axial position accuracy of the insert is 0.05 mm (.002"). It is not necessary to reset the tool length when changing the insert or cutting edge.

## • Excellent Repeatability

The insert is positioned by two fixed pins and clamped by one insert screw at the center. The positioning repeatability of the insert is within 0.02 mm (.0008") in radial direction, thus ensuring conformity to any national standards.

## • Extended Tool Life

Coolant can be supplied through the center of the holder to increase performance and extend tool life. Insert geometry, grades and coating process are specifically engineered for centering applications.

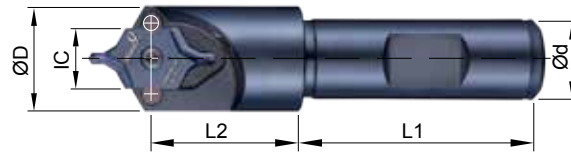


• High pressure coolant can be supplied through center directly to tip of center drill insert.



### Feature:

- Made of high alloy steel and hardened.
- Shank is ground to h6 tolerance.
- Special holders are available on request.



Order No.	Part No.	IC	Ød	L1	L2	ØD±0.02	Screw	Key
99616-IC08-10	BC10-IC08	08	10	30	18.5	12	NS-25060 / 1.2Nm	NK-T7
99616-IC12-16	SB16-IC12	12	16	48	30.5	21	NS-30072 / 2.0 Nm	NK-T9
99616-IC16-16	SB16-IC16	16	16	48	37	27	NS-35080 / 2.5 Nm	NK-T15
99616-IC20-20	SB20-IC20	20	20	50	51	32	NS-50125 / 5.5 Nm	NK-T20
99616-IC25-25	SB25-IC25	25	25	56	56	43	NS-50125 / 5.5 Nm	NK-T20

Order No.	Part No.	IC	Ød	L1	L2	ØD±0.02	Screw	Key
99616-IC08-3/8	BC3/8"-IC08	08	3/8"	30	18.5	12	NS-25060 / 1.2Nm	NK-T7
99616-IC12-5/8	SB5/8"-IC12	12	5/8"	48	30.5	21	NS-30072 / 2.0 Nm	NK-T9
99616-IC16-5/8	SB5/8"-IC16	16	5/8"	48	37	27	NS-35080 / 2.5 Nm	NK-T15
99616-IC20-3/4	SB3/4"-IC20	20	3/4"	50	51	32	NS-50125 / 5.5 Nm	NK-T20
99616-IC25-1	SB1"-IC25	25	1"	56	56	43	NS-50125 / 5.5 Nm	NK-T20



## ▣ Inserts >>

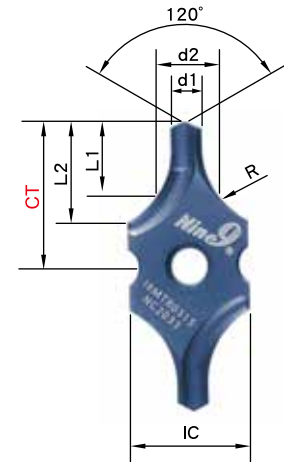
- NC2033: K20F grade carbide insert and TiAlN coated for carbon steel, alloy steel, high alloy steel, cast iron and Al, Al-alloy, Cu, Cu-alloy.
- 2 cutting edges, high performance for center drilling.
- Inch sizes: ANSI (BS) #2~10

### • DIN332 Form R



2 cutting flutes

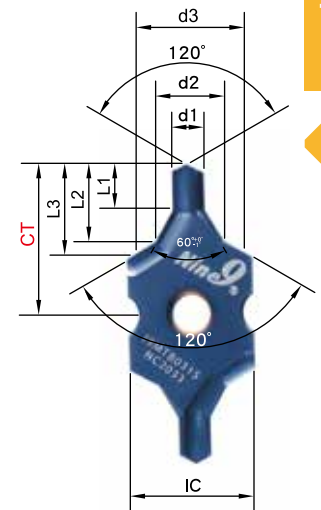
Part No.	d1	d2	L1	L2	R	CT ±0.025	IC
I9MT08T1R0100-NC2033	1.00	2.12	2.16	4.14	2.80	7.55	08 Mini i-Center
I9MT08T1R0125-NC2033	1.25	2.65	2.74	4.64	3.50	7.90	
I9MT08T1R0160-NC2033	1.60	3.35	3.45	5.13	4.50	8.40	
I9MT08T1R0200-NC2033	2.00	4.25	4.45	6.08	5.65	9.10	
I9MT12T2R0200-NC2033	2.00	4.25	4.45	6.64	5.50	11.73	12
I9MT12T2R0250-NC2033	2.50	5.30	5.59	8.11	7.15	13.0	
I9MT12T2R0315-NC2033	3.15	6.70	7.21	9.63	9.00	14.0	16
I9MT1603R0400-NC2033	4.00	8.50	9.06	12.23	11.0	19.4	
I9MT1603R0500-NC2033	5.00	10.6	11.45	14.2	14.0	19.4	
I9MT2004R0630-NC2033	6.30	13.2	14.63	18.2	18.0	28.4	20
I9MT2004R0800-NC2033	8.00	17.0	18.63	20.44	22.5	28.3	
I9MT2506R1000-NC2033	10.00	21.2	23.51	25.8	28.0	34.2	25



### • DIN332 Form A+B



Part No.	d1	d2	d3	L1	L2	L3	CT ±0.025	IC
I9MT08T1B0100-NC2033	1.00	2.12	3.15	1.3	2.21	2.51	7.55	08 Mini i-Center
I9MT08T1B0125-NC2033	1.25	2.65	4.0	1.6	2.75	3.14	7.90	
I9MT08T1B0160-NC2033	1.60	3.35	5.0	2.0	3.46	3.93	8.4	
I9MT08T1B0200-NC2033	2.00	4.25	6.3	2.5	4.39	4.98	9.1	
I9MT12T2B0200-NC2033	2.00	4.25	6.3	2.5	4.39	4.98	11.73	12
I9MT12T2B0250-NC2033	2.50	5.3	8.0	3.1	5.53	6.28	13.0	
I9MT12T2B0315-NC2033	3.15	6.7	10.0	3.9	6.90	7.85	14.0	16
I9MT1603B0400-NC2033	4.00	8.5	12.5	5.0	8.9	10.03	19.4	
I9MT1603B0500-NC2033	5.00	10.6	16.0	6.3	11.15	12.68	19.4	
I9MT2004B0630-NC2033	6.30	13.2	18.0	8.0	13.98	15.33	28.4	20
I9MT2004B0800-NC2033	8.00	17.0	20	10.1	17.89	18.73	28.3	
I9MT2506B1000-NC2033	10.00	21.2	25	12.8	22.5	23.57	34.2	25



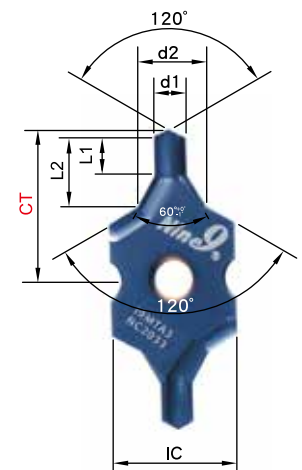
i-Center

22

### • ANSI 60°



Part No.	Size	d1		d2		L1		L2		CT ±0.025	IC
			mm		mm		mm		mm		
I9MT12T2A2-NC2033	#2	5/64	1.98	3/16	4.76	5/64	1.98	4.4	12.6	12	
I9MT12T2A3-NC2033	#3	7/64	2.78	1/4	6.35	7/64	2.78	5.9	13.85		
I9MT12T2A4-NC2033	#4	1/8	3.18	5/16	7.94	1/8	3.18	7.3	14.25		
I9MT1603A5-NC2033	#5	3/16	4.76	7/16	11.11	3/16	4.76	10.3	20.0	16	
I9MT2004A6-NC2033	#6	7/32	5.56	1/2	12.70	7/32	5.56	11.8	27.75		
I9MT2004A7-NC2033	#7	1/4	6.35	5/8	15.88	1/4	6.35	14.6	28.5	20	
I9MT2004A8-NC2033	#8	5/16	7.94	3/4	19.05	5/16	7.94	17.6	29.0		
I9MT2506A10-NC2033	#10	3/8	9.53	0.98"	25.00	3/8	9.53	22.9	34.9		



#10 size only provides for 60 degree form.



## Attention:

- For  $d1 < 4$  mm or size #5, the center misalignment must be less than 0.055mm.
- If the CNC lathe turret center's misalignment is above 0.15mm, please use the Center Height Adjusting Sleeve. (See page 24.)
- For low spindle speed special purpose machines or lathes, lower spindle speed is allowed but the feed rate should be maintained.

### • #2~#5

Work piece material		S=speed (sfm)	F=feed(ipr)					Cutting fluid
Material Group	Sample code (AISI)		IC 08		IC 12			
			Ø1~1.25 mm	Ø1.6~2 (#2) mm	#2 (.079")	#3 (.098")	#4 (.124")	
Carbon steel C<0.3%	1015	200~260	.0008~.0020	.0012~.0024	.0016~.0031	.0024~.0039	.0031~.0047	emulsion
Carbon steel C>0.3%	1050	165~230	.0008~.0020	.0012~.0020	.0012~.0020	.0024~.0039	.0031~.0047	emulsion
Low alloy steel C<0.3%	4130	150~215	.0004~.0016	.0008~.0020	.0008~.0020	.0016~.0031	.0024~.0039	emulsion
High alloy steel C>0.3%	D2	130~200	.0004~.0008	.0004~.0016	.0004~.0016	.0008~.0024	.0016~.0031	emulsion
Stainless steel	304	15~65	-----	-----	.0004~.0008	.0004~.0012	.0008~.0020	emulsion internal $\geq 5$ bar
Grey cast iron	35	165~230	.0004~.0016	.0008~.0024	.0008~.0024	.0016~.0031	.0024~.0039	dry
Al & non ferrous mat'l	6061	325~650	.0004~.0012	.0004~.0016	.0004~.0016	.0008~.0020	.0008~.0024	emulsion

### • #6~#10

Work piece material		S=speed (sfm)	F=feed(ipr)					Cutting fluid
Material Group	Sample code (AISI)		IC 16		IC 20		IC 25	
			#5 (.157")	#6 (.197")	#7 (.248")	#8 (.315")	#10 (.394")	
Carbon steel C<0.3%	1015	200~260	.0031~.0055	.0039~.0063	.0039~.0063	.0047~.0071	.0055~.0079	emulsion
Carbon steel C>0.3%	1050	165~230	.0031~.0055	.0039~.0063	.0039~.0063	.0047~.0071	.0055~.0079	emulsion
Low alloy steel C<0.3%	4130	150~215	.0024~.0039	.0031~.0047	.0031~.0055	.0039~.0063	.0047~.0079	emulsion
High alloy steel C>0.3%	D2	130~200	.0016~.0031	.0024~.0039	.0031~.0047	.0039~.0063	.0039~.0063	emulsion
Stainless steel	304	15~65	.0008~.0024	.0008~.0024	.0016~.0031	.0016~.0031	.0020~.0039	emulsion internal $\geq 5$ bar
Grey cast iron	35	165~230	.0024~.0039	.0031~.0047	.0031~.0055	.0039~.0063	.0047~.0071	dry
Al & non ferrous mat'l	6061	325~650	.0008~.0024	.0016~.0031	.0016~.0031	.0024~.0039	.0024~.0039	emulsion

## Insert removal

### Step-1

Loosen the screw



### Step-2

Hole in the back



### Step-3

Push out insert

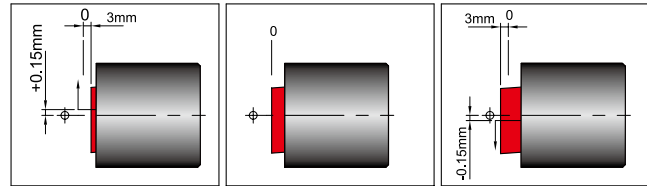


### Center Height Adjusting Sleeve with coolant hole >>

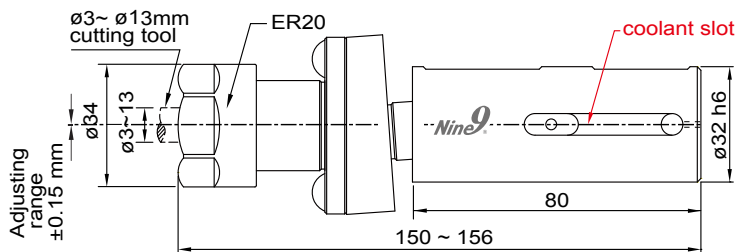
#### Principle

Designed for adjusting **Center Height** of center drills, NC spot drills, reamers and taps on the CNC lathes. The main body is made from two sleeves. The inner sleeve is to hold and lock the cutting tool. Its center is inclined to the outer sleeve.

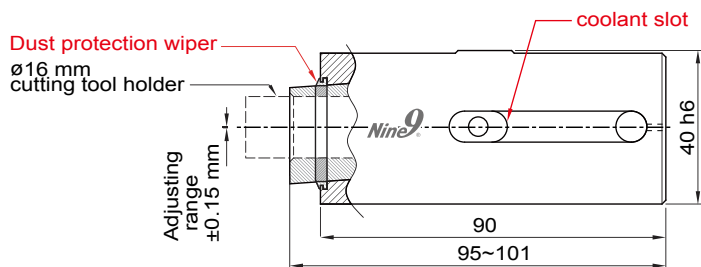
When the inner sleeve is pushed or pulled, the cutting tool's center height is adjusted to lower or higher position.



Ordering Code: 00-99600-320H  
Part Number: SB32-IDER20

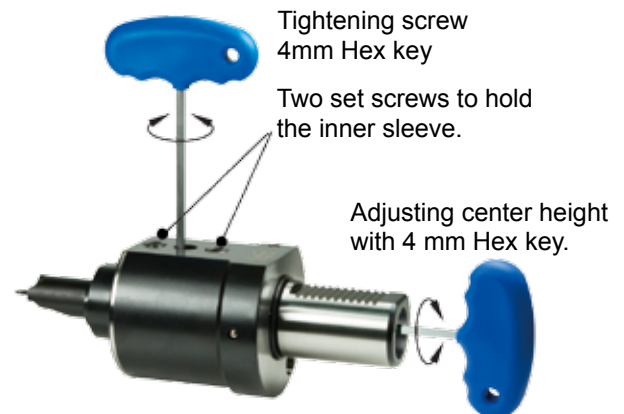


Ordering Code: 00-99600-400H  
Part Number: SB40-ID16

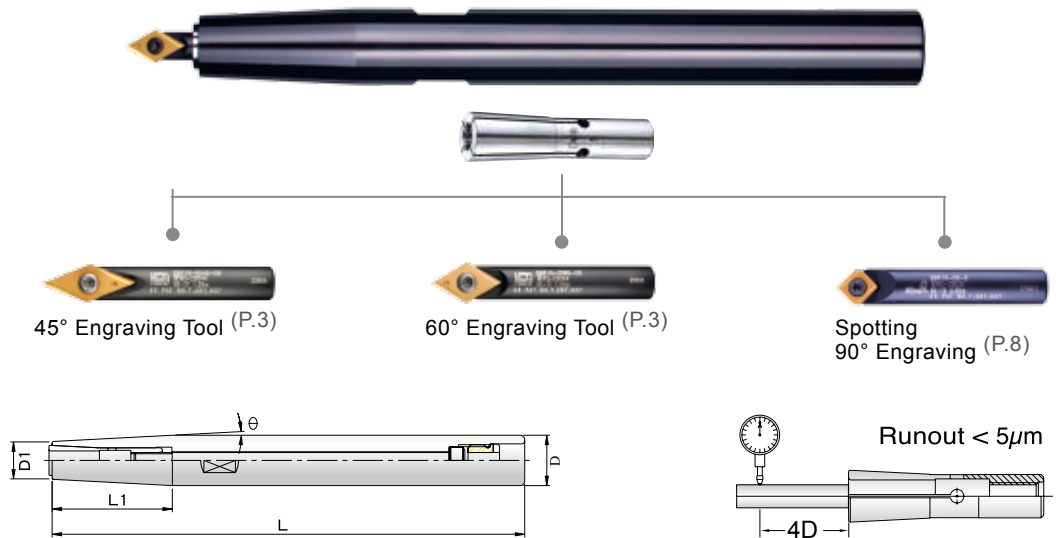


#### Application

- Used when the CNC lathes need to adjust the center height.
- This sleeve can be clamped by VDI 40, VDI 50 E2 tool holders, and other types of internal turning tool holders.
- Center height adjusting range:  $\pm 0.15\text{ mm}$  (.006").
- Total axial movement is 6mm (.236").



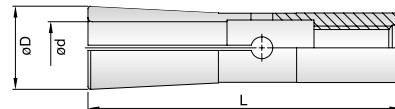
### DC Slim Chuck >>



Ordering Code	Type of Holder	d	L	L1	$\varnothing D$	D1	$\theta$	Collet	Hexagon Key	Back Screw	Stop Screw	Stop Nut
0-329090-212	ST12-DC6-120	2~6	120	40	12	13	--	DC6		M5 * L95	--	TP-M12
-222	ST16-DC6-150	2~6	150	38	16	13	3°	DC6	0-301940 - 642	M5 * L100	OP-M10	--
-232	ST20-DC6-200	2~6	200	70	20	13	3°	DC6		M5 * L100	OP-M10	--
-242	ST25-DC6-250	2~6	250	115	25	13	3°	DC6	0-301940 - 643	M5 * L100	OP-M10	--

DC6-E	
Ordering Code	Size (mm)
0-300090-203	3.0
0-300090-204	4.0
0-300090-206	6.0

Type	DC6
D	9.6
L	36



### Solid Carbide Extension Bar >>

• TiN coated to identify max OHL.



NC Spot Drill  
99616-10-M6 (P.9)  
99616-14-M8 (P.10)

Order No.	Part No.	$\varnothing D$	T	L	M
99801-12W	BC12-100M06W	12	60	100	M6xP1.0
99801-16W	BC16-150M08W	16	80	150	M8xP1.25

# Super Drills

**Smallest indexable drill starting at 10mm.  
4 cutting edges per insert.  
Same insert for outside and inside pockets.**



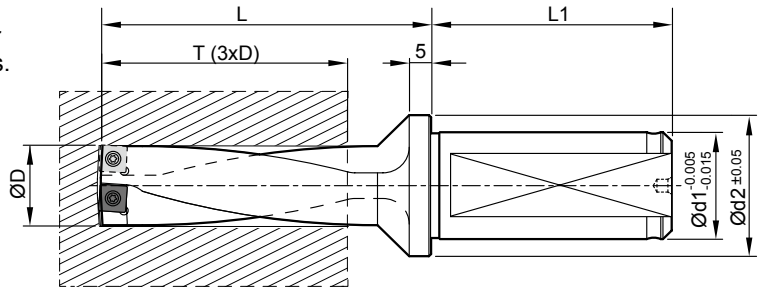
- **Kit Package >>**
- Introductory kits for easy ordering.
  - Two extra spare screws included.



◀ **NC2032**  
AlTiN coated  
Universal grade for  
almost all materials.

◀ **Contents**

- One super drill
- 10 inserts
- Two spare insert screws
- One screw key
- One plastic case  
(packaging subject to change)



Ordering Code	Drills Diameter	T	L	d1	d2	L1	Radial Adjustment	D max.	Kit Contents	
									Holder	Insert / Screw / Key
99313-10.0-KIT	10.0	30.0	49	20	27	49	0.25	10.5	99313-10.0	N9GX04T002-NC2032 NS-18037 NK-T6 Torque: 0.6Nm
99313-10.3-KIT	10.3	30.9	52	20	27	49	0.25	10.8	99313-10.3	
99313-10.5-KIT	10.5	31.5	52	20	27	49	0.25	11.0	99313-10.5	
99313-11.0-KIT	11.0	33.0	52	20	27	49	0.20	11.4	99313-11.0	
99313-11.5-KIT	11.5	34.5	55	20	27	49	0.20	11.9	99313-11.5	
99313-12.0-KIT	12.0	36.0	55	20	27	49	0.15	12.3	99313-12.0	
99313-12.5-KIT	12.5	37.5	58	20	27	49	0.15	12.8	99313-12.5	

\* 3/4" shank available upon request.

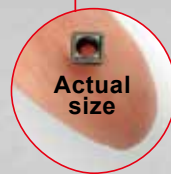
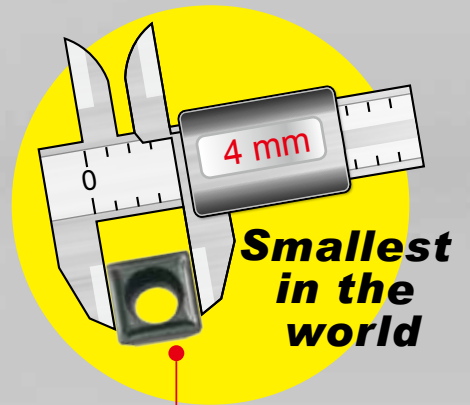
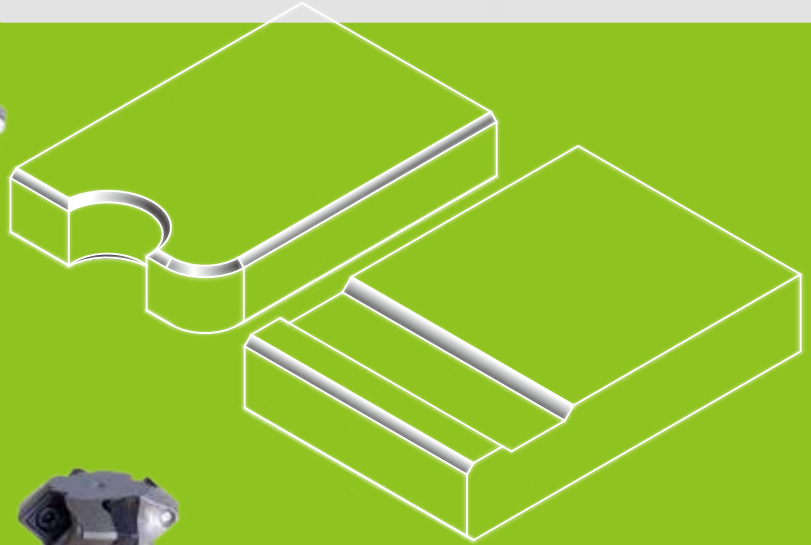
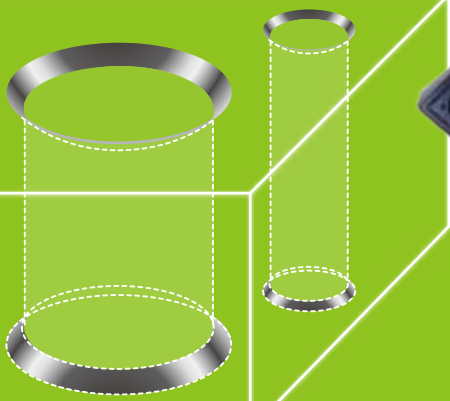
■ **Application & TECH. >>**

Application	Regular Surface 100%	Cross Holes 80%	Stack Drilling 80%~70%	Round Work Piece Offset Drilling 80%~60%	Plunge Drilling 80%	Concave Surfaces 80%	Angled Surfaces 80%~70%	Cone Work Piece Offset Drilling 80%~70%
Work Piece Shape								
Work Material	SFM				IPR (inch / rev.)			
Carbon Steel	200~985				0.0010 ~ 0.0030			
Stainless Steel	200~500				0.0010 ~ 0.0020			
Cast Iron	265~400				0.0020 ~ 0.0030			
Hardened Steel	200~330				0.0010 ~ 0.0020			

\* Adjust speed and feed percentage by applications.



# 45° indexable chamfer mill



Chamfer mill





## 45° indexable chamfering mill

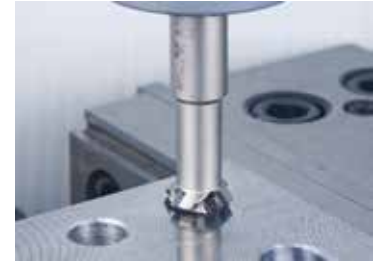
is designed for chamfering and countersinking with an indexable insert. The insert is specifically designed for use in high speed machining; the multiple flutes provide for increased feed rate, optimizing performance and reducing cutting time.

### Features

- Smallest insert in the world for chamfering mill.
- **Smallest indexable countersink, diameter  $\varnothing$  7mm.**
- The insert is dual-relief angle, special edge honing and optimize coating for high cutting speed.
- Optimize the number of teeth on the holder to achieve higher feed rate.
- For front and back chamfering. Eliminates 2nd operation or de-burring time.

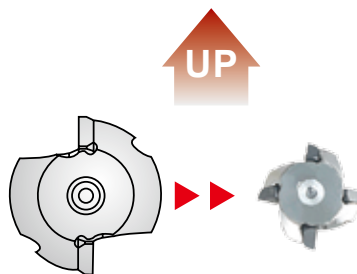
### Applications

- 90° counter sink and 45° chamfering.
- For countersink, circular chamfering, contour chamfering and face milling.



### ■ Comparison with other manufacturers chamfer tool with larger insert(Sxxx1204) and Nine9 N9GX04 insert.

	Other makers with Large insert	Nine9 chamfer mills
chamfering	1mm	1mm
Feed rate mm/rev	0.1	0.1
Dia. of cutter	32mm	11mm
Teeth of cutter	2	4
Vc m/min.	200	300
R.P.M	1990	8685
F mm/min	398	3474



**Feed Rate** = Feed per Tooth x Spindle Speed x **No. of Flute** mm/min.

$$\text{UP Spindle Speed} = \frac{\text{Cutting Speed} \times 1000}{\pi \times \text{Cmin.}}$$



## ■ Cylindrical Shank Holders >>

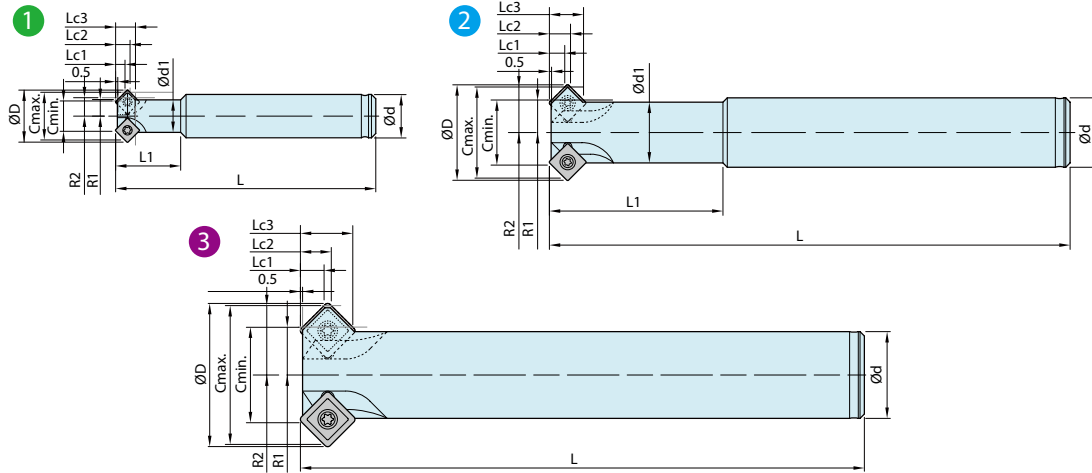
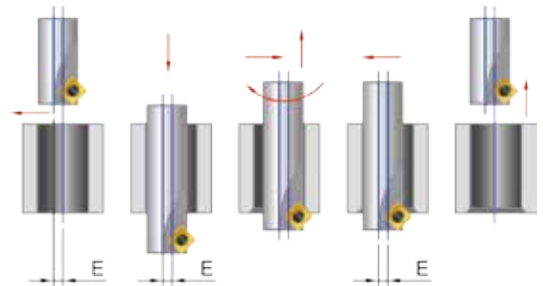
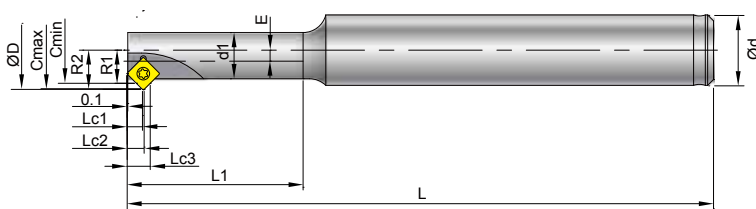


Fig	Part No.	Type	Cmin Ø	Cmax Ø	Ød	Ød1	ØD	R1	R2	L	L1	Lc1	Lc2	Lc3	Z	Insert Screw / Key
1	99616-C10	BC10-C07-60	7	11	10	7.5	12	3.8	4.3	60	15	2.2	3.3	4.6	2	N9GX04T002 NS-18037 / NK-T6
2	99616-C20	BC12-C11-100	11	16	12	9.6	16.2	5.9	8	100	25	2.6	2.9	5.0	4	
2	99616-C30	BC16-C15-120	15	21	16	14	22	7.5	11.5	120	40	3.5	4.9	7.9	4	N9GX060204 NS-22055 / NK-T7
2	99616-C40	BC20-C19-130	19	25	20	18	26	9.5	12.5	130	50	3.5	4.9	7.9	4	
3	99616-C50	BC20-C22-130	22	32	20	-	33	11	16	130	-	5.5	7.1	12.1	4	N9GX090308 NS-30072 / NK-T9
2	99616-C52	BC25-C22-180	22	32	25	20	33	11	16	180	80	5.5	7.1	12.1	4	

### Features:

- Elliptical necked bar to optimize the tool strength.
- Tool body is made of hot working steel and hardened.
- Front or back hole chamfering in one pass.
- Designed to chamfer for taps M8, M10, M12 & 1/2-13UNC.



Parts No.	Thread Size	Cmin.	Cmax.	Ød	d1	ØD	R1	R2	L	L1	Lc1	Lc2	Lc3	E	Insert Screw/ Key
99616-C02	M8	6.8	8.8	10	5.25	9	3.4	4.4	80	20	2.56	2.93	3.93	1.25	N9GX04T002 NS-18037 NK-T6
99616-C04	M10	8.5	10.8	12	6.45	11.1	4.25	5.4	100	25	2.51	2.98	4.13	1.55	
99616-C06	M12 1/2	10.26	13.2	12	7.88	13.5	5.13	6.4	100	30	2.51	2.98	4.45	1.88	

## Inserts >>

### Features:

- Thanks to the patented specially ground dual-relief insert and optimized coating, higher feed rates and cutting speeds can be achieved on chamfering operations.
- Each insert has 4 cutting edges, reducing cost of inserts.
- Fine edge honning cutting edge, good chip breaking condition and long tool life.

**NC2032:** • K20F grade, AlTiN coated. The 1st choice for high carbon, high alloy and hardened steels as well as cast iron.

**NC9071:** • K20F grade, TiN coated, high positive rake angle and honed sharp edge. The best choice for low carbon steel, low carbon alloy steel, stainless steel, Al, Al-alloy, Brass, Bronze and most of the non-ferrous metal.



NC2032



NC9071

Ordering Code			Dimensions			
Code of insert	Grade		L	S	re	Screw / Key
N9GX04T002	NC2032 NC9071		4.0	1.8	0.2	NS-18037 / NK-T6
N9GX060204			6.35	2.38	0.4	NS-22055 / NK-T7
N9GX090308			9.52	3.18	0.8	NS-30072 / NK-T9

## TECH. of 99616-C02, C04, C06 >>

Work Piece Material		Grade of insert	Cutting Speed SFM feet / min.	Feed Rate inch / tooth
Material Group	Sample Code (AISI)			
Carbon steel C<0.3%	1050	NC9071	200-260-390	0.0007" ~ 0.0030"
Carbon steel C>0.3%	1050	NC2032	200-260-390	0.0007" ~ 0.0030"
Low alloy steel C<0.3%	4130	NC9071	200-260-390	0.0004" ~ 0.0020"
High alloy steel C<0.3%	D2	NC2032	200-260-390	0.0007" ~ 0.0030"
Stainless steel	304	NC9071	100-200-330	0.0004" ~ 0.0020"
Cast iron	A48 35B / No 35B	NC2032	200-260-390	0.0007" ~ 0.0023"
Al, and non-ferrous metal	6061	NC9071	260-330-500	0.0011" ~ 0.0040"

## TECH. of 99616-C10~99616-C52 >>

Work piece material		Grade of insert	Cutting Speed SFM feet / min.	Feed Rate inch / tooth		
Material Group	Sample Code (AISI)			N9GX04T002	N9GX060204	N9GX090308
				Max. Chamfering 0.059 inch	Max. Chamfering 0.098 inch	Max. Chamfering 0.157 inch
Carbon steel C<0.3%	1050	NC9071	500-820-1150	0.002"~0.005"	0.004"~0.010"	0.004"~0.010"
Carbon steel C>0.3%	1050	NC2032	660-1050-1310	0.002"~0.004"	0.004"~0.008"	0.004"~0.010"
Low alloy steel C<0.3%	4130	NC9071	590-790-860	0.002"~0.004"	0.004"~0.008"	0.004"~0.008"
High alloy steel C<0.3%	D2	NC2032	390-500-660	0.002"~0.004"	0.004"~0.006"	0.004"~0.006"
Stainless steel	304	NC9071	390-500-590	0.002"~0.004"	0.002"~0.006"	0.004"~0.008"
Cast iron	A48 35B / No 35B	NC2032	390-500-590	0.002"~0.004"	0.004"~0.006"	0.004"~0.008"
Al, and non-ferrous metal	6061	NC9071	660-1310-1970	0.002"~0.006"	0.004"~0.010"	0.004"~0.010"
Hardened steel<HRC50°	H13	NC2032	265-300-330	0.002"~0.004"	0.002"~0.005"	0.004"~0.006"

\* Do not recommend to use on hand handling machine and hand holding power tool



# 99146 Quick Change High Speed Boring Tools

## Easy Handling:

- Dimensions are easy to read. They are indicated on the tools and are easily adjustable on a tool presetter or in machining center.
- No backlash.
- Change the boring bar and set the boring dimension on the tool presetter in just one minute.



## Interchangeable Boring Bars from Diameters of 5 mm to 50 mm

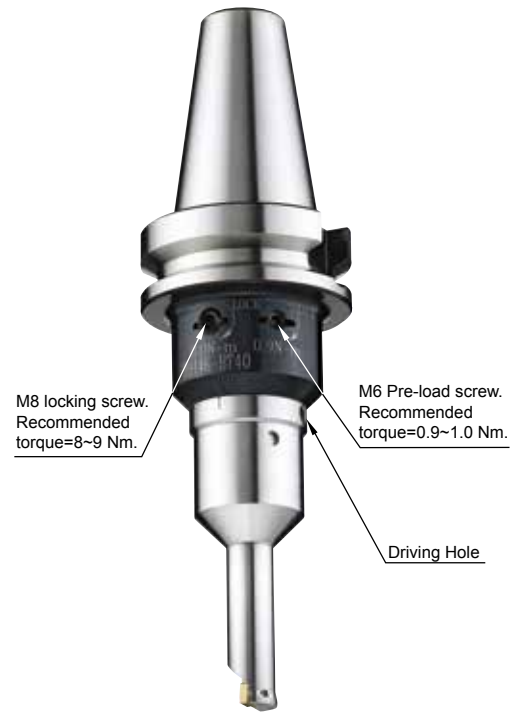
- This simple boring tool has minimal components.
- In minutes, the boring bar may be changed and the boring dimension set on the tool presetter.

## Low Cost for Machining Small Holes

- The cost of this product is low compared to other micro adjustable boring heads.

## High Speed

- Boring bar design ensures accurate high speed boring. Grade balance is G6.3 10000 r.p.m., all sizes are guaranteed.
- Surface speeds of carbide inserts up to 700 m/min.
- Combination bore / chamfer / facing tools can be ordered on request.

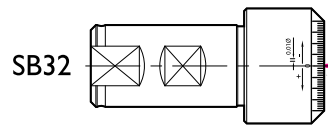
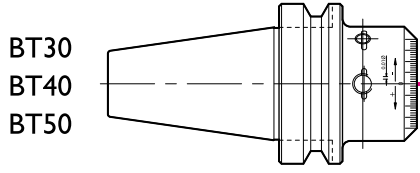
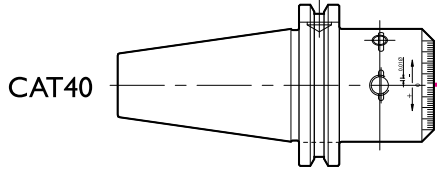
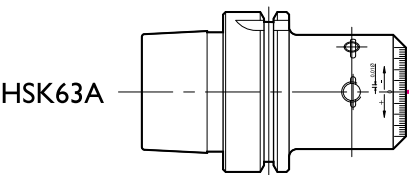
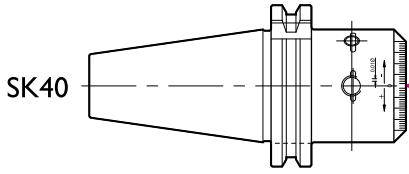


## Procedures for assembly

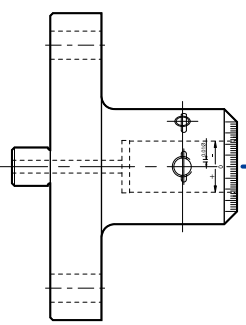
1. Use 4 mm allen-key to **loosen locking screw M8**, take care not to remove the screw.
2. Use 3 mm allen-key to **loosen pre-load screw M6**, take care not to remove the screw.
3. Remove the original boring bar and insert the new boring bar.
4. **Tighten the M6 pre-load screw** using the torque screwdriver with hex head key. (**Recommended torque = 0.9~1.0 Nm**)
5. Ensure the boring head and boring bar fit together securely.
6. Measure the boring diameter of the boring bar using tool presetter and adjust it to the required diameter.
7. **Tighten the M8 locking screw** using the torque screwdriver with hex head key (**Recommended torque = 8~9Nm**)



All Interchangeable !!

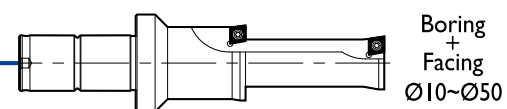
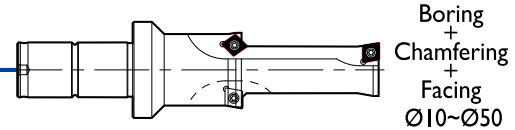
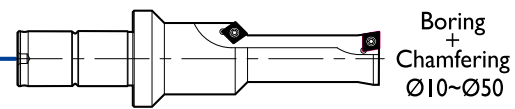
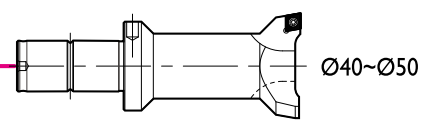
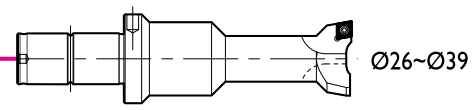
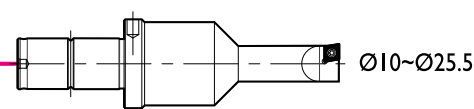
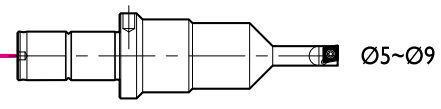
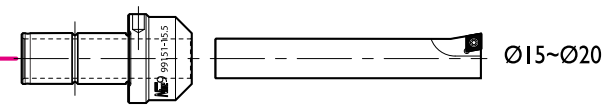
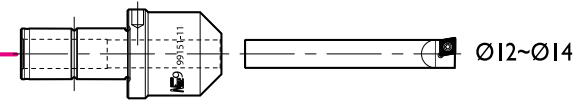
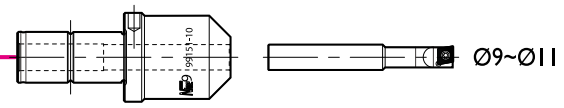
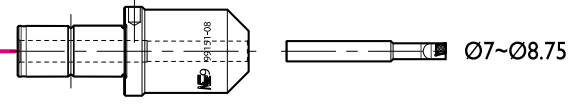
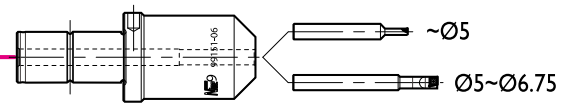


Any type of flange and side-lock shank on request



Standard

Extended Options

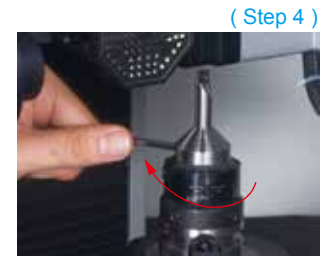
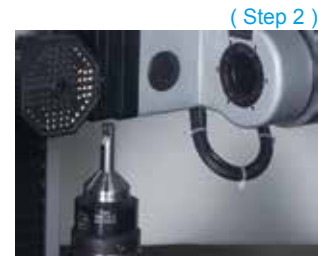


## Featuring Improved:

- Cycle time ● Position Accuracy ● Roughness ● True Roundness

### On Tool Presetter

1. Loosen M8 locking screw.
2. Set the boring bar at the neutral position. ( Step 1 )
3. Measure the boring diameter using the tool presetter and compare with the required diameter. ( Step 2 )
4. If boring diameter is too big or too small, please put an allen-key into the adjusting driving hole. Turn to “ + ” to increase and turn to “ - ” to reduce boring diameter. ( Step 3 and 4 )
5. Tighten M8 locking screw.

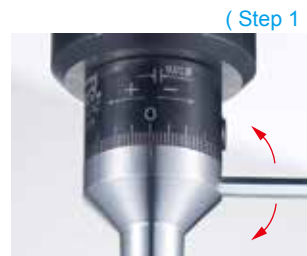


To Increase Diameter

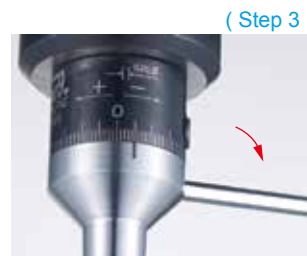
To Reduce Diameter

### On Milling Machine And Machining Centers

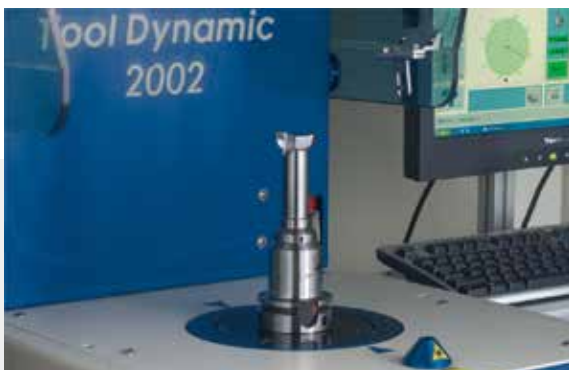
1. Set the boring bar at the neutral position. ( Step 1 )
2. Tighten M8 locking screw.
3. Test cut on work piece, about 3-5mm deep on the machine.
4. Measuring boring diameter of workpiece and compare with required diameter.
5. If boring diameter is too big or too small, loosen M8 locking screw, please put an allen-key into the adjusting driving hole. Turn to “ + ” to increase and turn to “ - ” to reduce boring diameter. ( Step 2 and 3 )
6. Tighten M8 locking screw. ( Step 4 )



To Increase Diameter



To Reduce Diameter



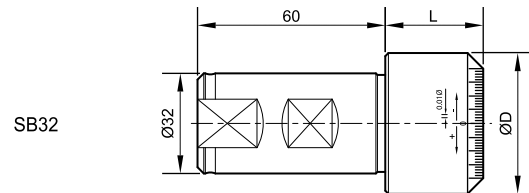
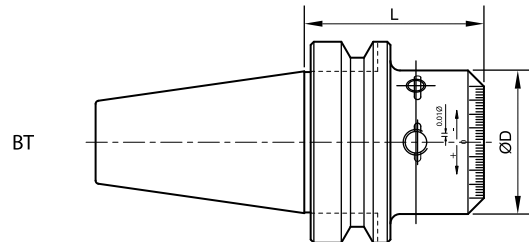
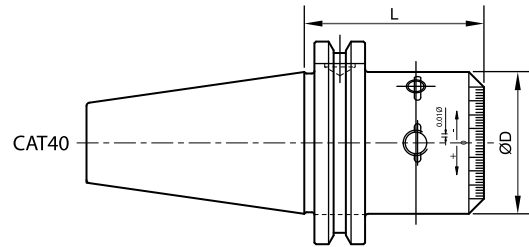
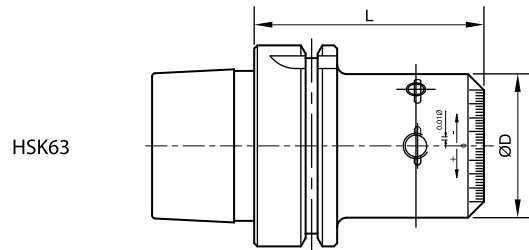
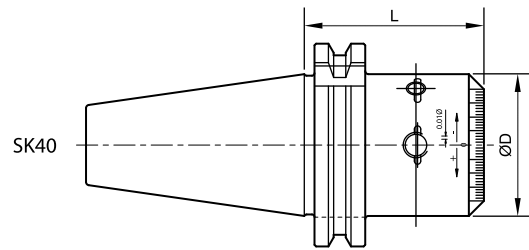
99146-xx  
Interchangeable boring bar  
Standard balanced grade  
10000 r.p.m. G6.3  
both of shank and bar.



USA Patent ▶

## Boring Head Shank

- Adjustable range: +0.12 /-0.13 mm.
- Each adjustment division is 0.01 mm.
- Balance grade : G6.3 10000 r.p.m.



Part No.	ØD	L
SB32-146-31	45	31.3
BT30-146-51	45	51.3
BT40-146-56	45	56.3
BT50-146-77	45	77.3
CAT40-146-56	45	56.3
HSK63A-146-72	45	72
SK40-146-56	45	56.3



## Adapter

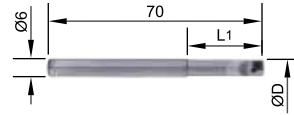
- Economical solution of small dia. boring bar.



Part No.	ØD	L
C20-ID06	6	52
C20-ID08	8	49
C20-ID10	10	21.5
C20-ID11	11	21.5
C20-ID15.5	15.5	21.5

## Ø4.87~Ø6.87mm

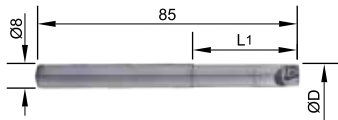
- Solid Carbide Shank
- Boring Depth : L1, 4~6xD



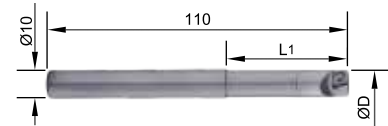
Part No.	ØD	L1	Insert
C06-0500-20L	4.87~5.12	20.00	CCGT030102-NC30 Screw: NS-16030 Key: NK-T6
C06-0525-20L	5.12~5.37	20.00	
C06-0550-22L	5.37~5.62	22.00	
C06-0575-22L	5.62~5.87	22.00	
C06-0600-24L	5.87~6.12	24.00	
C06-0625-24L	6.12~6.37	24.00	
C06-0650-26L	6.37~6.62	26.00	
C06-0675-26L	6.62~6.87	26.00	

## Ø6.87~Ø11.12mm

- Solid Carbide Shank
- Boring Depth : L1, 4~6xD



Part No.	ØD	L1	Insert
C08-0700-28L	6.87~7.12	28.00	CCGT040102-NC30 Screw: NS-20036 Key: NK-T6
C08-0725-28L	7.12~7.37	28.00	
C08-0750-30L	7.37~7.62	30.00	
C08-0775-30L	7.62~7.87	30.00	
C08-0800-32L	7.87~8.12	32.00	
C08-0825-32L	8.12~8.37	32.00	
C08-0850-34L	8.37~8.62	34.00	
C08-0875-34L	8.62~8.87	34.00	



Part No.	ØD	L1	Insert
C10-0900-36L	8.87~9.12	36.00	CCGT060204 CCFT060204 Screw: NS-25045 Key: NK-T7
C10-0925-36L	9.12~9.37	36.00	
C10-0950-38L	9.37~9.62	38.00	
C10-0975-38L	9.62~9.87	38.00	
C10-1000-40L	9.87~10.12	40.00	
C10-1025-40L	10.12~10.37	40.00	
C10-1050-42L	10.37~10.62	42.00	
C10-1075-42L	10.62~10.87	42.00	
C10-1100-44L	10.87~11.12	44.00	

## Ø11.87~Ø20.12mm

- Solid Carbide Shank
- Boring Depth : L1, 4~6xD

Fig. 1

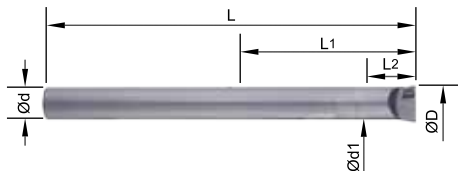
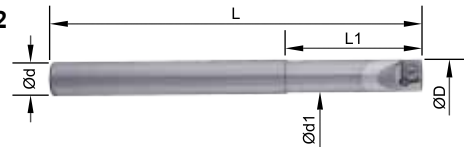


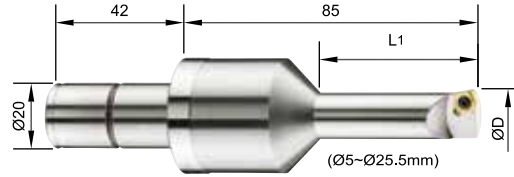
Fig. 2



Part No.	ØD	Ød	Ød1	L1	L2	L	Fig.	Insert
C11-1200-150L	11.87~12.12	11	11	70	20	150	1	CCGT060204 CCFT060204
C11-1300-150L	12.87~13.12	11	-	70	-	150		
C11-1400-150L	13.87~14.12	11	-	70	-	150		
C15.5-1500-90L	14.87~15.12	15.5	14	90	90	180	2	Screw: NS-25045 Key: NK-T7
C15.5-1600-180L	15.87~16.12	15.5	15	90	90	180		
C15.5-1700-180L	16.87~17.12	15.5	-	100	-	180	1	CCGT060204 CCFT060204 Screw: NS-25060 Key: NK-T7
C15.5-1800-180L	17.87~18.12	15.5	-	100	-	180		
C15.5-1900-180L	18.87~19.12	15.5	-	100	-	180		
C15.5-2000-180L	19.87~20.12	15.5	-	100	-	180		

## Ø5~Ø25mm

- Alloy Steel Shank
- Boring Depth : L1, 2~3xD



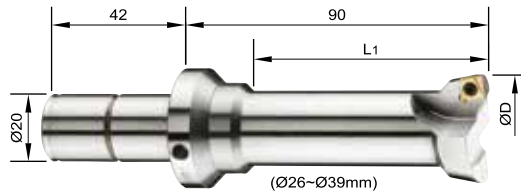
\* H type with internal coolant can be ordered on request from Dia. 10mm.  
Ordering example: C20-0800-16LH.

Part No.	ØD	L1	Insert	
C20-0500-10L	4.87~5.12	10.00	CCGT030102-NC30 NS-16030, NK-T6	
C20-0600-12L	5.87~6.12	12.00		
C20-0700-14L	6.87~7.12	14.00	CCGT040102-NC30 NS-20036, NK-T6	
C20-0800-16L	7.87~8.12	16.00		
C20-0900-18L	8.87~9.12	18.00	CCGT060204 CCFT060204	
C20-1000-25L	9.87~10.12	25.00		
C20-1025-25L	10.12~10.37	25.00		
C20-1050-26L	10.37~10.62	26.25		
C20-1075-26L	10.62~10.87	26.25		
C20-1100-27L	10.87~11.12	27.50		
C20-1125-27L	11.12~11.37	27.50		
C20-1150-28L	11.37~11.62	28.75		
C20-1175-28L	11.62~11.87	28.75		
C20-1200-30L	11.87~12.12	30.00		
C20-1225-30L	12.12~12.37	30.00		
C20-1250-31L	12.37~12.62	31.25		
C20-1275-31L	12.62~12.87	31.25		
C20-1300-32L	12.87~13.12	32.50		Screw: NS-25045 Key: NK-T7
C20-1325-32L	13.12~13.37	32.50		
C20-1350-33L	13.37~13.62	33.75	CCGT060204 CCFT060204	
C20-1375-33L	13.62~13.87	33.75		
C20-1400-35L	13.87~14.12	35.00		
C20-1425-35L	14.12~14.37	35.00		
C20-1450-36L	14.37~14.62	36.25		
C20-1475-36L	14.62~14.87	36.25		
C20-1500-37L	14.87~15.12	37.50		
C20-1525-37L	15.12~15.37	37.50		
C20-1550-38L	15.37~15.62	38.75		
C20-1575-38L	15.62~15.87	38.75		
C20-1600-40L	15.87~16.12	40.00		
C20-1625-40L	16.12~16.37	40.00		
C20-1650-41L	16.37~16.62	41.25		Screw: NS-25060 Key: NK-T7
C20-1675-41L	16.62~16.87	41.25		
C20-1700-42L	16.87~17.12	42.50		

Part No.	ØD	L1	Insert	
C20-1725-42L	17.12~17.37	42.50	CCGT060204 CCFT060204	
C20-1750-43L	17.37~17.62	43.75		
C20-1775-43L	17.62~17.87	43.75		
C20-1800-45L	17.87~18.12	45.00		Screw: NS-25060 Key: NK-T7
C20-1825-45L	18.12~18.37	45.00		
C20-1850-46L	18.37~18.62	46.25		
C20-1875-46L	18.62~18.87	46.25		
C20-1900-47L	18.87~19.12	47.50		
C20-1925-47L	19.12~19.37	47.50		
C20-1950-48L	19.37~19.62	48.75		
C20-1975-48L	19.62~19.87	48.75		
C20-2000-50L	19.87~20.12	50.00		
C20-2025-50L	20.12~20.37	50.00		
C20-2050-50L	20.37~20.62	50.00		
C20-2075-50L	20.62~20.87	50.00		
C20-2100-50L	20.87~21.12	50.00		
C20-2125-50L	21.12~21.37	50.00		
C20-2150-50L	21.37~21.62	50.00		
C20-2175-50L	21.62~21.87	50.00		
C20-2200-50L	21.87~22.12	50.00		
C20-2225-50L	22.12~22.37	50.00		
C20-2250-50L	22.37~22.62	50.00		
C20-2275-50L	22.62~22.87	50.00		
C20-2300-50L	22.87~23.12	50.00		
C20-2325-50L	23.12~23.37	50.00		
C20-2350-50L	23.37~23.62	50.00		
C20-2375-50L	23.62~23.87	50.00		
C20-2400-50L	23.87~24.12	50.00		
C20-2425-50L	24.12~24.37	50.00		
C20-2450-50L	24.37~24.62	50.00		
C20-2475-50L	24.62~24.87	50.00		
C20-2500-50L	24.87~25.12	50.00		
C20-2525-50L	25.12~25.37	50.00		
C20-2550-50L	25.37~25.62	50.00		

## Ø26~Ø39mm

- Alloy Steel Shank
- Boring Depth : L1, 2~3xD

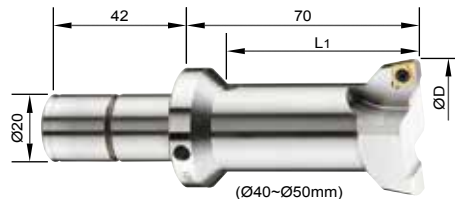


\* H type with internal coolant can be ordered on request.  
Ordering example: C20-3600-70LH.

Part No.	ØD	L1	Insert
C20-2600-50L	25.87~26.12	50.00	CCGT060204 CCFT060204  Screw: NS-25060 Key: NK-T7
C20-2700-50L	26.87~27.12	50.00	
C20-2800-50L	27.87~28.12	50.00	
C20-2900-50L	28.87~29.12	50.00	
C20-3000-50L	29.87~30.12	50.00	
C20-3100-70L	30.87~31.12	70.00	
C20-3200-70L	31.87~32.12	70.00	
C20-3300-70L	32.87~33.12	70.00	
C20-3400-70L	33.87~34.12	70.00	
C20-3500-70L	34.87~35.12	70.00	
C20-3600-70L	35.87~36.12	70.00	
C20-3700-70L	36.87~37.12	70.00	
C20-3800-70L	37.87~38.12	70.00	
C20-3900-70L	38.87~39.12	70.00	

## Ø40~Ø50mm

- Alloy Steel Shank
- Boring Depth : L1, 2~3xD



\* H type with internal coolant can be ordered on request.  
Ordering example: C20-4700-70LH.

Part No.	ØD	L1	Insert
C20-4000-70L	39.87~40.12	70.00	CCGT060204 CCFT060204  Screw: NS-25060 Key: NK-T7
C20-4100-70L	40.87~41.12	70.00	
C20-4200-70L	41.87~42.12	70.00	
C20-4300-70L	42.87~43.12	70.00	
C20-4400-70L	43.87~44.12	70.00	
C20-4500-70L	44.87~45.12	70.00	
C20-4600-70L	45.87~46.12	70.00	
C20-4700-70L	46.87~47.12	70.00	
C20-4800-70L	47.87~48.12	70.00	
C20-4900-70L	48.87~49.12	70.00	
C20-5000-70L	49.87~50.12	70.00	

## High Speed boring bar kit

Part No.	Contents
99146-32HB-05SET	SB32-146-01 Weldon Shank
99146-BT30-05SET	BT30H Boring head shank
99146-BT40-05SET	BT40H Boring head shank
99146-BT50-05SET	BT50H Boring head shank
99146-CAT40-05SET	CAT40H Boring head shank
99146-SK40-05SET	SK40H Boring head shank
99146-HSK63A-05SET	HSK63A Boring head shank

Boring head shank: 1pc  
Boring bar: any 5 pcs  
Key: 3~5 pcs  
Plastic box: 1pc



(Insert is not included, please order separately)

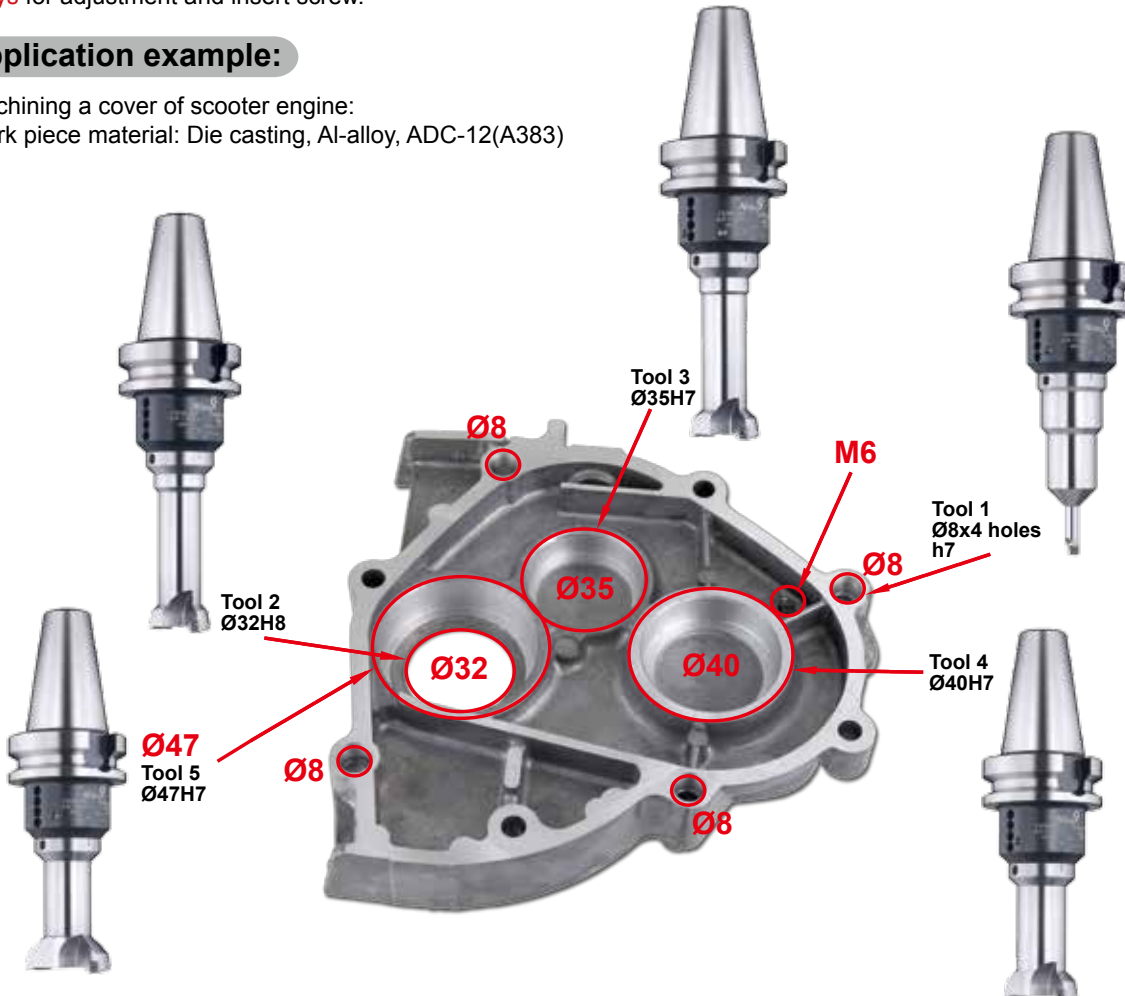
- Note: BT50 boring head shank is packed in a separate box.

### Each package include:

- One handsome carrying case.
- One of SB32 / BT30 / BT40 / BT50 / CAT40 / SK40 / HSK63A Micro adjustable boring head shank.
- Select any Five boring bars from standard S and A type, Ø5~Ø50mm diameter.
- Keys for adjustment and insert screw.

### Application example:

- Machining a cover of scooter engine:  
Work piece material: Die casting, Al-alloy, ADC-12(A383)



TOOL LIST by Nine9 Boring Bar 99146-series, Spindle Size: BT40

No.	Part No.	Grade of insert	Dia. mm	Depth	r.p.m.	F = mm/min.	Machining time
1	99146-08A	CCGT040102 NC30	Ø8H7	8 mm	8000	400	1.2 sec.
2	99146-32A	CCGT060202HP NC9031	Ø32H8	8 mm	2985	209	2.3 sec.
3	99146-35A	CCGT060202HP NC9031	Ø35H7	12 mm	2730	191	3.8 sec.
4	99146-40A	CCGT060202HP NC9031	Ø40H7	15 mm	2400	168	5.4 sec.
5	99146-47A	CCGT060202HP NC9031	Ø47H7	15 mm	2030	142	6.4 sec.

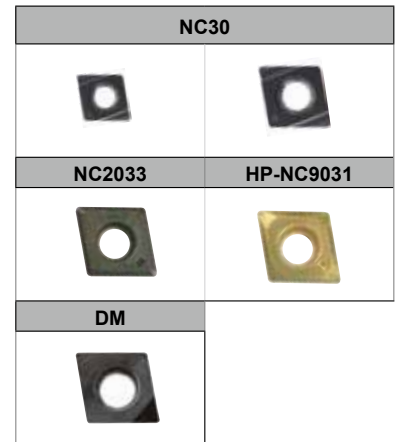
## Precisely ground Inserts

### -CCGT030102, CCGT040102

- **NC30** : K20F carbide insert, TiAlN coated, universal grade for cast iron, carbon steel, alloy steel, stainless steel.

### -CC040102, CC060204

- **NC2033** : K20F carbide insert, TiAlN coated, good for carbon steel, alloy steel, stainless steel.
- **HP-NC9031**: K20F carbide insert, TiN coated, good for Al, Al-alloy, copper and non ferrous metal.
- **DM** : PCD brazed tipped insert with a polished and honed cutting edge for fine surface finished and longer tool life.



## Inserts

Inserts	NC30	DM	NC2033	NC9031		Dimensions		
						lc	S	rE
CCGT030102	•					3.5	1.4	0.2
CCGT040102	•					4.3	1.8	0.2
CCFT060204			•			6.35	2.38	0.4
CCFT060204HP				•		6.35	2.38	0.4
CCMW060204		•				6.35	2.38	0.4

## Cutting Data

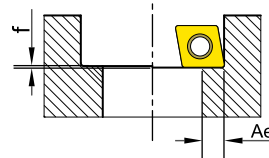
- Note: Super fine finishing insert **DM** with special specified cutting width **0.006inch**.(Radius) (see table below)

**Spindle speed and feed rate formulas:**

inch

$$RPM = \frac{SFM \times 3.82}{D}$$

$$IPM = RPM \times IPR$$



Material	Cutting conditions or surface finishes	Grade of insert	Ae Max. inch	SFM	IPR (inch/rev.)
Carbon Steel	Regular cutting	NC2033	.020	394 ~ 656	.002 ~ .004
	Interrupted cutting	NC30	.012	328 ~ 459	.002 ~ .003
Alloy Steel	Regular cutting	NC2033	.020	328 ~ 459	.002 ~ .004
	Interrupted cutting	NC30	.012	262 ~ 394	.002 ~ .003
Stainless Steel	Regular cutting	NC2033	.020	262 ~ 394	.002 ~ .004
	Interrupted cutting	NC30	.012	230 ~ 328	.002 ~ .004
Cast Iron	Regular cutting	NC30	.020	262 ~ 394	.002 ~ .004
Brass, Bronze and Al-alloy Si >6%	Regular cutting	NC9031	.020	492 ~ 984	.002 ~ .004
Al, Al-alloy, non-ferrous metal	Regular cutting	NC9031	.020	492 ~ 984	.002 ~ .004
	Super finished	DM	.012	1640 ~ 6560	.002 ~ .004
Hardened Steel <HRC 50	Regular cutting	NC30	.012	262 ~ 394	.002 ~ .004

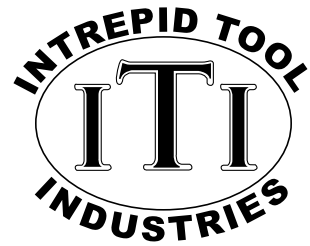


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