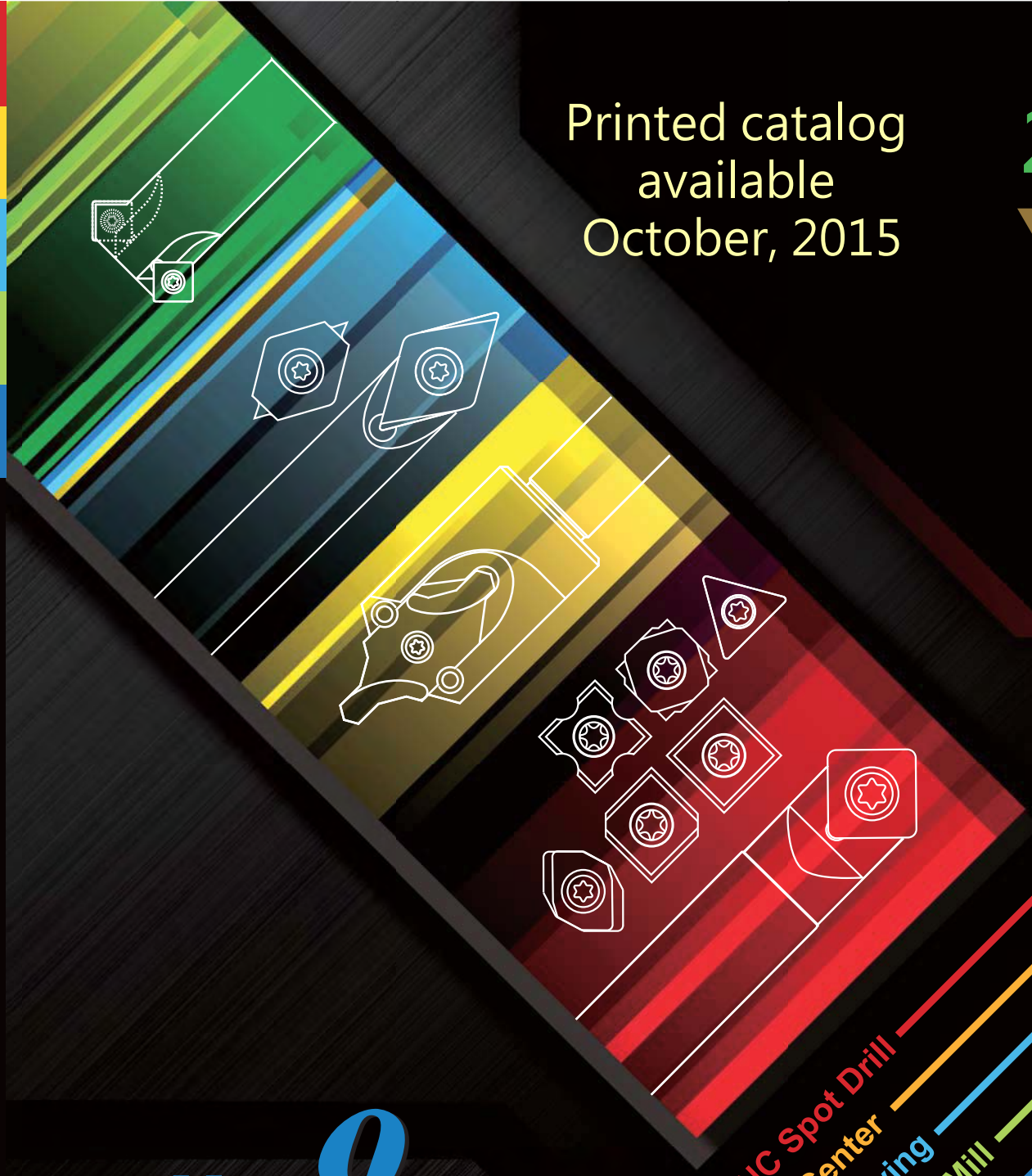
Printed catalog
available
October, 2015

2016

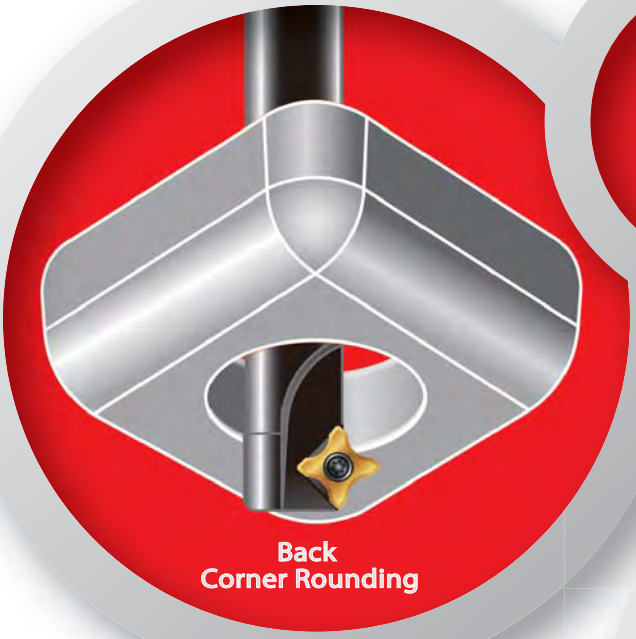


NC Spot Drill
i - Center
Engraving
Chamfer Mill
Super Drill
Boring Tool

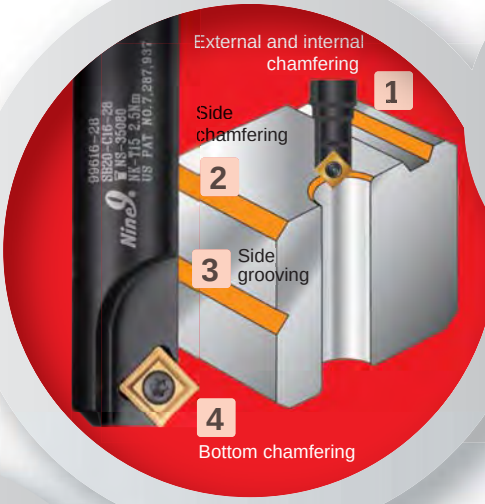
Nine9®

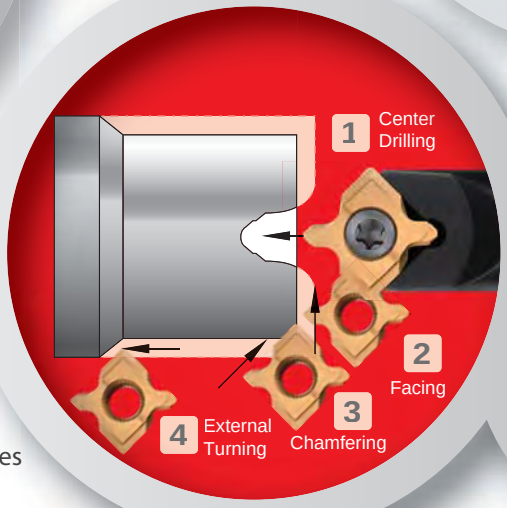
CUTTING TOOLS & TOOL HOLDERS

You will be interested to know that we have just introduced our new items.



Corner Rounding - Type R
25
Page





Radius Center Drilling
27
Page

Corner Rounding- Type R

- Precision ground universal grade carbide inserts that provides long tool life, accurate indexability with 4 cutting edges.
- Metric holder program only - h6 tolerance shanks for use in precision holders or collet chucks.
- Radii available: 1.0, 1.5, 2.0, 2.5, 3.0 mm.

45° Chamfering Tool

- For front and back chamfer and side groove milling.
- Metric holder program only - h6 tolerance shanks for use in precision holders or collet chucks.
- Three grades to choose from.

Radius Center Drilling

- Sizes available: 2.0, 2.5 and 3.0mm. Should it really say 60 degree center holes or can replace 60 degree centering operations.
- Provides better drill entry geometry.
- Increase hole positioning and hole roundness.

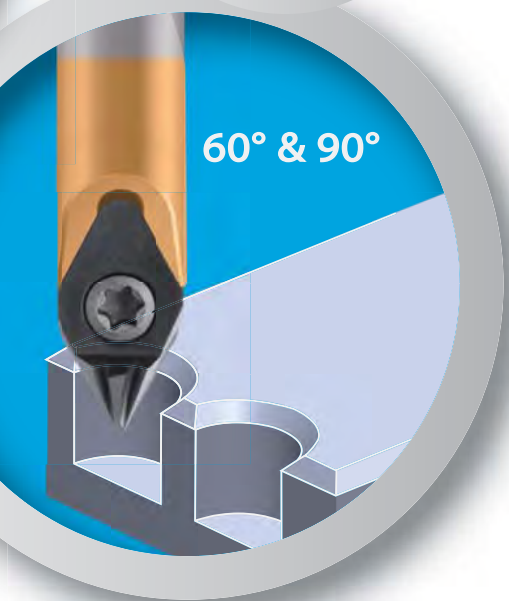
NC Deburring

- Insert has 6 flutes available 60 and 90 degree.
- Smallest countersink 0.5mm (0.019")
- High feed rate for high speed deburing on CNC machines
- Indexable - =± .02 (.0008")

Contents >>

45° Chamfering Tool 26 Page

NC Deburring 48 Page



Economy pack for larger end users. Do not miss it!

STARTER KITS

• 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. 42
99619-V045-03K-32		V04506T1W06-2032		
99619-V045-03K-31		V04506T1W06-9031		
99619-V060-03K-71	60°	V06006T1W06-2071		
99619-V060-03K-32		V06006T1W06-2032		
99619-V060-03K-35		V06006T1W06-2035		
99619-V060-03K-31		V06006T1W06-9031		

• NC Deburring Kit Package

Parts No.	Angle	Insert included	Content	Page
99619-X060-DB60-02K-32	60°	X060A60T6-NC2032	1 x Holder 1 x T7 Key 2 x inserts	P. 48
99619-X060-DB90-02K-32	90°	X060A90T6-NC2032		

• Super Drill Kit Package

* 3/4" shank kits available upon request.

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. 49
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	Parts 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. 51
	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

Parts No.	Content		Page
99146-32HB-05SET	SB32-146-01 Weldon Shank	Boring head shank: 1pc Boring bar: any 5 pcs Key: 3~5 pcs Plastic box: 1pc	P. 55
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		

STARTER KITS

• Engraving Tools

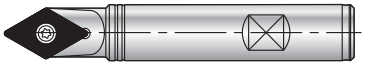
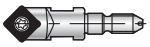
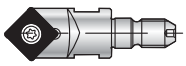
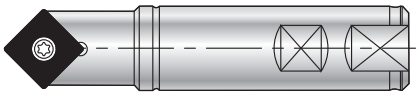
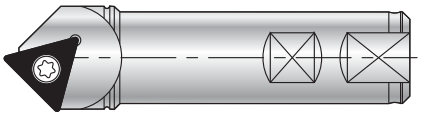
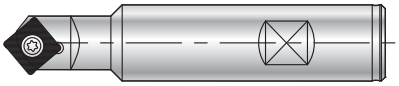
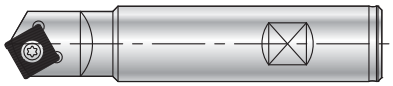
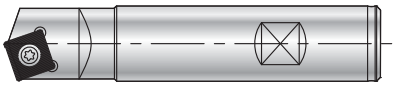
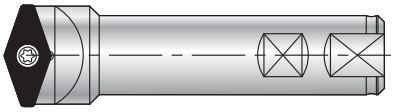
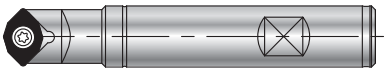
Fig.	Parts No.	Angle	Insert included	Content	Page
1	99616-3/8.08W-60 NC40 KIT	60°	N9MT080201W60-NC40	1 x 3/8" holder + 2 inserts + 1 key	P. 10
	99616-3/8.08W NC40 KIT	90°	N9MT080201W-NC40		
	99616-3/8.08W NC10 KIT		N9MT080201W-NC10		

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

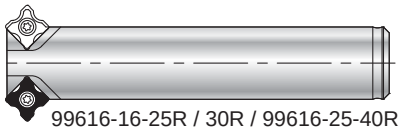
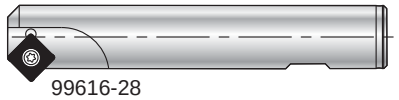
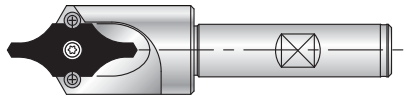
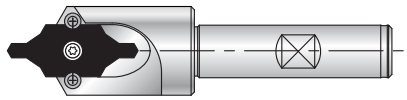
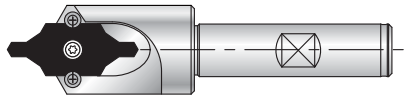
Fig.	Parts No.	Angle	Insert	Content	Page
2	99616-13V-5/8.12 2071 KIT	60°	V9MT12T3CT-NC2071	1 x 5/8" holder + 3 inserts + 1 key	P. 12
3	99619-V82-5/8.12 2071 KIT	82°	V08212T3-NC2071	1 x 5/8" holder + 3 inserts + 1 key	P. 13
4	99616-06-1/4.05 2071 KIT	90°	N9MT05T1CT-NC2071	1 x 1/4" holder + 6 inserts + 1 key	P. 14
	99616-3/8.08 NC40 KIT		N9MT080208CT-NC40	1 x 3/8" holder + 6 inserts + 1 key	P. 15
	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. 16
	99616-14-1/2.11 NC10 KIT		N9MT11T3CT-NC10		
	99616-14-1/2.11 NC60 KIT		N9MT11T3CT-NC60		
	99616-14-5/8.11 NC40 KIT		N9MT11T3CT-NC40	1 x 5/8" holder + 6 inserts + 1 key	P. 16
	99616-14-5/8.11 NC10 KIT		N9MT11T3CT-NC10		
	99616-14-5/8.11 NC60 KIT		N9MT11T3CT-NC60		
5	99616-22-3/4.17 2071 KIT	90°	N9MT1704CT-NC2071	1 x 3/4" holder + 3 inserts + 1 key	P. 17
6	99619-142-5/8.08 2071 KIT	142°	V1420803-NC2071	1 x 5/8" holder + 3 inserts + 1 key	P. 20

• NC Spot Drill Kit Package

Fig.	Parts No.	Ød	Content	Page
7	99616-3/8 PACK	3/8"	5 x tool holders + 1 key	P. 15
	99616-14-5/8 PACK	5/8"	5 x tool holders + 1 key	P. 16

Angle	Holder	Inserts	D min.	D max.	Spotting	Chamfering	Grooving	Engraving	Drilling	Page
NC Spot Drill										
60°	 99616-14...P60	 N9MT11T3P60	2 (0.079")	6.2 (0.244")	●	●		●		11
	 99616-09V	 V9MT0802	1 (0.039")	9 (0.354")	●	●	●	● Tmin=0.1 (0.004")		12
	 99616-13V	 V9MT12T3	2 (0.079")	13 (0.512")	●	●	●	● Tmin=0.1 (0.004")		12
82°	 99619-V082-3/8	 V0820802	2 (0.079")	9 (0.354")	●	●	●	● Tmin=0.1 (0.004")		13
	 99619-V082-5/8	 V08212T3	2 (0.079")	14 (0.551")	●	●	●	● Tmin=0.1 (0.004")		13
90°	 99616-06-6...	 N9MT05T1	1 (0.039")	6 (0.236")	●	●		● Tmin=0.1 (0.004")		14
	 99616-3/8  99616-10-M6	 N9MT0802	2 (0.079")	10 (0.394")	●	●	●	● Tmin=0.1 (0.004")		15
	 99616-14...  99616-14-M8	 N9MT11T3	3 (0.118")	14 (0.551")	●	●	●	● Tmin=0.1 (0.004") (2 Cutting edges) ● Tmin=0.1 (0.004") (4 Cutting edges)		16
	 99616-22	 N9MT1704	3 (0.118")	22 (0.866")	●	●	●			17
	 99616-25-CT28	 N9MT2204	4 (0.157")	25 (0.984")	●	●				18
100°	 99616-3/4-100	 N9MT11T3	3 (0.118")	16 (0.630")	●	●				19
120°	 99616-3/4-120		3 (0.118")	17 (0.669")	●	●				
142°	 99616-3/4-142		3 (0.118")	18 (0.728")	●	●				
	 99619-V142...	 V1421604	2 (0.079")	32 (1.260")	●					20
145° + 90°	 99616-10 / 14 / 22 ...	 WSP / M4~3/8-16 UNC	3.3 (0.130")	13 (0.512")	●	●	●			9

New

Angle	Holder	Inserts	D min.	D max.	Spotting	Chamfering	Grooving	Engraving	Drilling	Page
Corner Rounding										
New	 99616-06 /14...RC	 N9MT05/N9MT11..RC (2 Cutting edges)	R 0.5 R 1/64”	R 1.0 R 1/8”		•				22 23
New	 99616-22...RC	 N9MT1704RC (2 Cutting edges)	R 1/4”	R 3/16”		•				24
New	 99616-16-25R / 30R / 99616-25-40R	 N9MT11T3R (4 Cutting edges)	R1.0	R3.0		•				25
Large 45° Chamfering										
New	 99616-18	 N9MT11T308LA	6 (0.236”)	18 (0.709”)		•				26
45° New	 99616-28					•	*Side grooving			
Center Drilling / i-Center										
New	 99616-14...PR	 N9MT11T3PR	2.0 (0.079”)	3.15 (0.124”)					•	27
	 99616-IC...	 DIN332 Form R	1.0 (0.039”)	10 (0.394”)					•	32
60° + 120°	 99616-IC...	 DIN332 Form A+B	1.0 (0.039”)	10 (0.394”)					•	
60°	 99616-IC...	 ANSI 60°	5/64”	3/8”					•	
	* Similar to DIN 332 Form R									
Engraving Tools										
45°	 99619-V045...	 V04506T1W	0.45 (0.018”)	2.1 (0.083”)	•			•		43
60°	 99619-V060...	 V06006T1W	0.25 (0.010”)	2.7 (0.106”)	•			•		44
60°	 99616-10...SW	 N9MT0802	0.25 (0.010”)	1.1 (0.043”)	•			•		10
90°	 99616-10...SW	 N9MT0802	0.25 (0.010”)	2.0 (0.079”)	•			•		10
	 99616-06-6	 N9MT05T1	1 (0.039”)	6 (0.236”)	•	•		•		14
New **NC Deburring**										
60°	 99619-X060...	 X060A60T6	0.1 (0.004”)	1.0 (0.039”)		•				48
90°	 99619-X060...	 X060A90T6	0.1 (0.004”)	1.2 (0.047”)		•				

Inserts >> Quick Pick

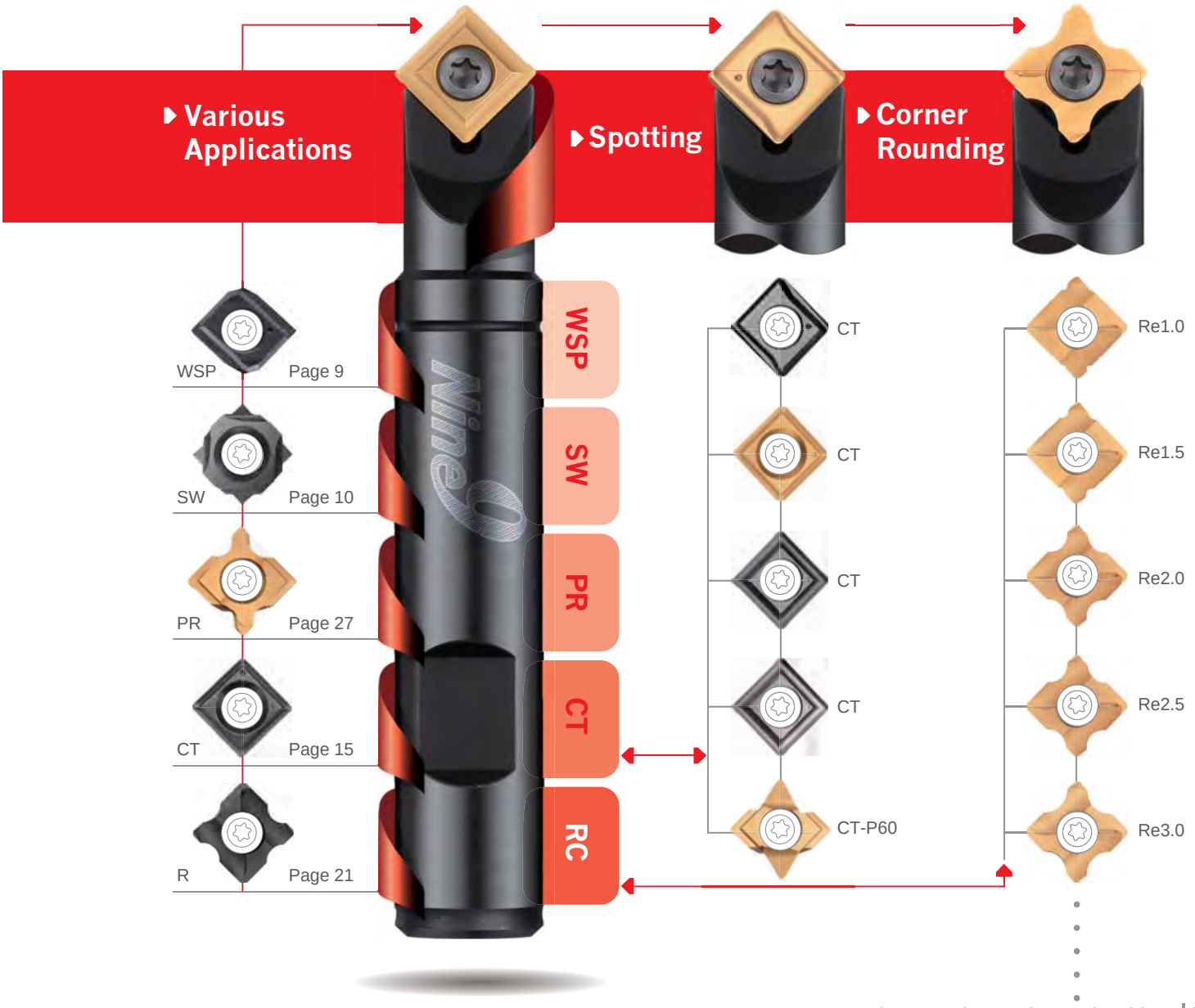
Nine9 inserts are designed to be used in today's modern machining practices providing patented unique highly productive solutions. Nine9 focuses on bringing indexable solutions utilizing today's latest carbide grades and coatings that reduce set-up time, tool change time and extend tool life. Nine9 - your productivity partner.

Products	Grade		Coating	P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous	H Hardened Steel Up to 56 HRC	S Titanium
NC Spot Drill	 NC10	K10F	TiAlN		●	●	◎		
	 NC40	K20F P35	TiN	●	○	◎			
	 NC2071	K20F	TiN	●	◎	○	◎		
	 NC9076	K20F	DLC		◎		●		◎
	 NC60	-	Cermet	◎				●	
Corner Rounding	 NC2071	K20F	TiN	●	○	●			
	 NC9036	K20F	DLC		●		●		◎
i-Center	 NC2033	K20F	TiAlN	●	○	●		○	
Engraving	 NC2032	K20F	TiAlN	●	○	●			
	 NC2071	K20F	TiN	◎	●		◎		
	 NC9031	K20F	TiN		◎		●		
	 NC2035	K20F	ALDURA	◎		○		●	
	 NC9036	K20F	DLC		◎		●		◎
Chamfer Mill	 NC2032	K20F	TiAlN	●	○	●		◎	
	 NC9071	K20F	TiN	○	●		●		

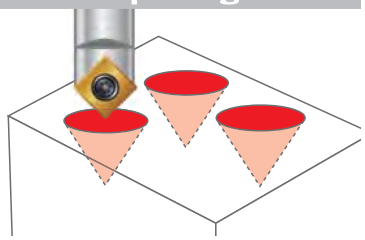
● Best ◎ Better ○ Good

No Need To Choose Nine9 Does It All! >>

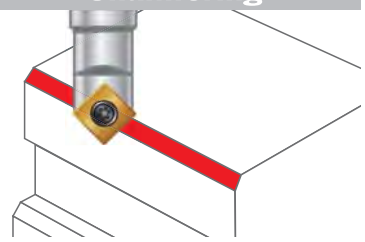
Cost Saving | Time Saving | Highly Efficient | Long Tool Life



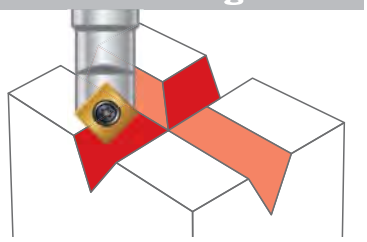
Spotting



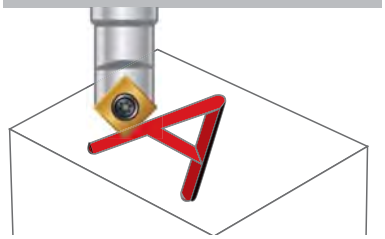
Chamfering



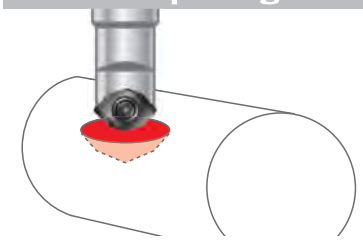
Grooving



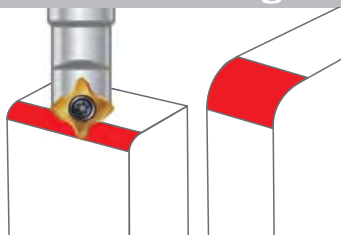
Engraving



W Spotting



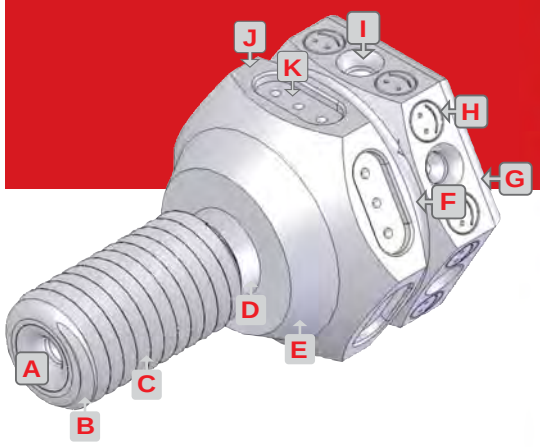
Corner Rounding



NC Spot Drill >>

NC Spot Drill with indexable carbide insert.
High efficiency! Low cost!
CNC lathes, CNC turning centers and machining centers.

- **Spotting produces better hole position and geometrically uniform holes**
- **Available shank diameter-Ø5, Ø6, Ø10, Ø12, Ø16, Ø20mm, Ø25mm, Ø3/8'', Ø1/2'', Ø5/8'', Ø3/4'', Ø1/4'', M5, M6, M8**
- **One tool will perform multiple applications**
  - Long tool life.
  - Each insert has 2 or 4 cutting edges.
  - Suitable for spotting, chamfering, grooving and engraving.
  - 45° / 60° / 82° / 90° / 100° / 120° / 142° angle for different applications.
  - Increase cutting speed with coated carbide inserts.



A I	Center Drilling	B G	Corner rounding
C	Thread turning	D	Gooving
E	Taper turning	F	V-grooving
H	Engraving	J	Face milling
K	Drilling & milling a groove		

* Some features produced with a special insert

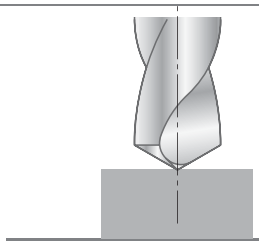
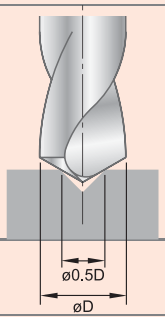
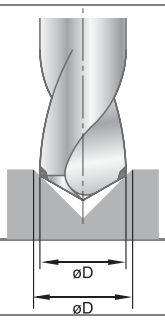
A New Drilling Concept!

0.5xD of spotting >>

Although today's drill manufacturers may not recommend spot drilling 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.**

NC Spot Drill	Without Spotting	0.5xD Spotting	Larger Spotting
• Better center position! • Longer tool life!	• Drill has less position accuracy and diameter tolerance.	• Best result! • Higher speed and feed rate. • Better position accuracy and diameter tolerance.	• Longer spotting time! • Guided at the weakest corner of drill. • Shorter tool life
	 Unstable tool life		
			

Various Applications of NC Spot Drill >>

Use on CNC lathes, CNC turning centers, Machining centers, Milling machines, SPM machines.....

Turning Center

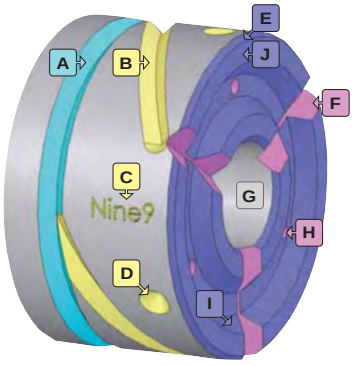


Fig	Applications
A	Grooving
B	Helical groove milling
C	Engraving
D	Spot drilling
E	Chamfer turning
F	Face groove milling
G	Internal turning
H	Spot drilling on end surface
I	Internal Chamfering
J	Facing grooveing

Machining Center

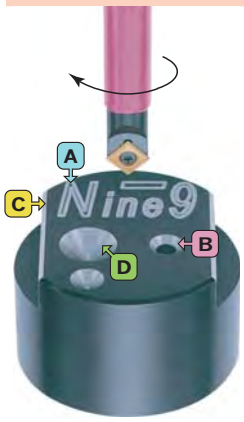
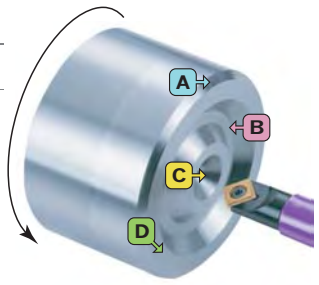


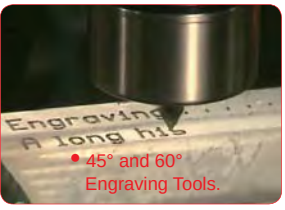
Fig	Applications
A	Engraving
B	Chamfering
C	Profile chamfering
D	Spotting

CNC Lathes



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

Application Example >>

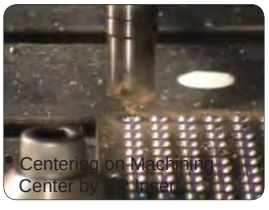


• 45° and 60° Engraving Tools.


• Spotting, Grooving, Engraving on Machining Center.


• Turning, Chamfering, Facing on CNC Lathes.

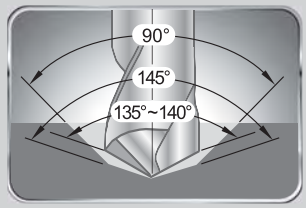

• Cut a Serrated Workpiece.
• Single Pass Each Direction.


• Centering on Machining Center by


• Contour Chamfering on Machining Center.

W Spotting New Geometry of Spotting Tool

NEW



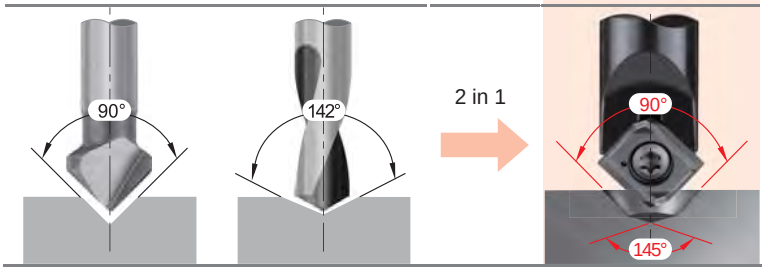
NC2033

Combined spotting and chamfering 145° + 90° >>

- 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.***

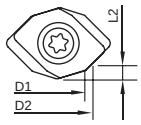
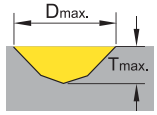
1 process provides 2 applications

90° Chamfering + 142°Spot Drilling = W Spotting



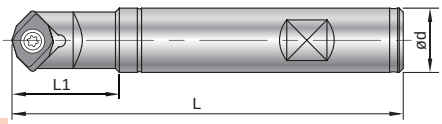
Inserts >>

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

Parts No.	Coating	Grade		Thread Size	*D1±0.05 (±0.002")	D2	L2	Dmax.	Tmax.
N9MT0802M04C-NC2033	TiAlN	K20F		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	TiAlN	K20F		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	TiAlN	K20F		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 (0.313")	10.00(0.394")	2.22 (0.087")		3.72 (0.146")
New N9MT1704M12C-NC2033	TiAlN	K20F		M12	10.25(0.404")	12.60(0.496")	2.91(0.115")	20 (0.787")	6.61(0.260")
New N9MT1704M14C-NC2033				M14	12.00(0.472")	14.70(0.579")	3.22(0.127")		5.87(0.231")
New N9MT1704M16C-NC2033				M16	14.00(0.551")	16.80(0.661")	3.51(0.138")		5.11(0.201")

Holder >>

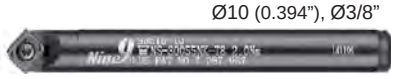
- Holders and inserts are interchangeable.
- Applications: Spotting, grooving and chamfering.



Parts No.	Ød	Insert Type	Thread Size	L	L1	Screw	Key
99616-10	10 (0.394")	N9MT0802	M4~M6	89.08±0.29 (3.507" ±0.011")	16.95±0.29 (0.667" ±0.011")	NS-30055 2.0Nm	NK-T8
99616-3/8	3/8"						
99616-14-1/2	1/2"	N9MT11T3	M8~M10	97.55±0.55 (3.839" ±0.021")	26.73±0.55 (1.052" ±0.021")	NS-35080 2.5Nm	NK-T15
99616-14-5/8	5/8"		1/4~3/8				
New 99616-22-3/4	3/4"	N9MT1704	M12~M16	96.24±0.64 (3.780" ±0.025")	31.4±0.64 (1.236" ±0.025")	NS-50125 5.5Nm	NK-T20

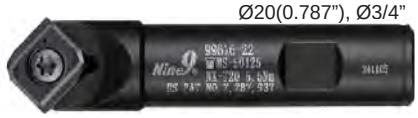
Note: * D1 refer to the Tap Pre-drilling sizes. * Technical information, please refer to page 30.

Ø10 (0.394"), Ø3/8"

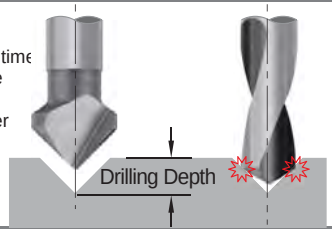
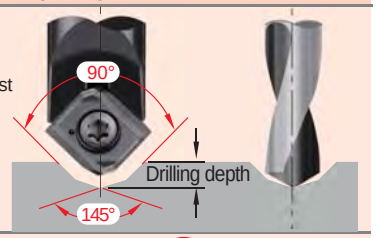


Ø1/2", Ø5/8"

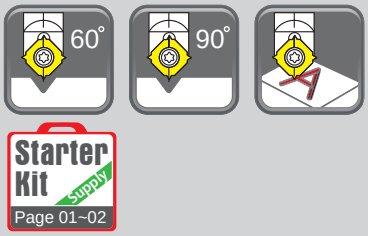
Ø20(0.787"), Ø3/4"

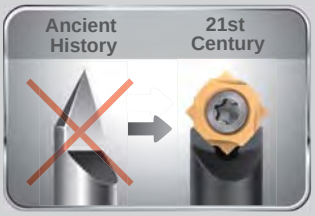


Comparison >>

Carbide Step Drill	Spotting + Drill	W Spotting + Drill
• Tool cost is high. Shorter tool life. • Can't drill directly from solid on round parts. Bad position accuracy.	• Longer drilling time Shorter tool life • Guided at the weakest corner of drill.	• Shorter drilling time. Longer tool life. • Guided at the strongest corner of drill. • Also for chamfering or grooving application.
		
		

N9MT080201W Engraving





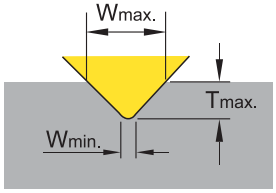
Inserts >>

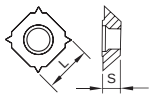
- 90° indexable engraving insert with 4 cutting edges.
- No resharpening required.
- For marking all types of workpieces.

NC10: • Submicron carbide insert, TiAlN coated,
for Al, Al-alloy, hardened steel 40-50°, stainless steel.

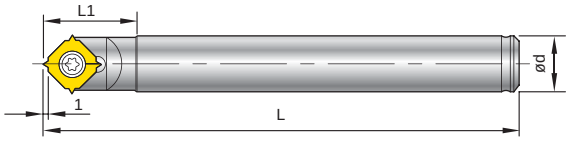
NC40: • Submicron carbide insert, TiN coated,
for all unhardened steel and cast iron, general purpose.

60-NC40: • Submicron carbide insert, TiN coated,
very positive angle for 60° engraving for all kinds of steel and cast iron.

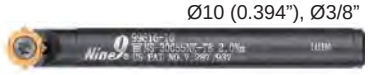


Parts No.		Angle	Coating	Grade		Dimensions L	Dimensions S	Wmin.	Wmax.	Tmax.
N9MT080201W	60-NC40	60°	TiN	K20F		8 (0.315")	2.38 (0.094")	0.1 (0.004")	1.1 (0.043")	0.8 (0.031")
	NC40	90°	TiN	K20F		8 (0.315")	2.38 (0.094")	0.1 (0.004")	2.0 (0.079")	0.9 (0.035")
	NC10	90°	TiAlN	K20F		8 (0.315")	2.38 (0.094")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

Holder >>



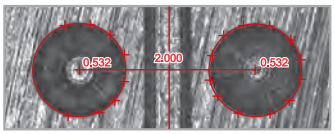
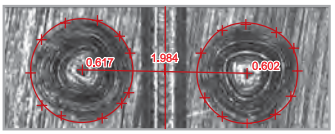
Ø10 (0.394"), Ø3/8"



Parts No.	Ød	L	L1	Screw	Key
99616-10	10 (0.394")	90 (3.543")	18 (0.709")	 NS-30055 2.0 Nm	 NK-T8
99616-3/8	3/8"	90 (3.543")			

Mini Spotting >>

- Engraving inserts can be used for small diameter spotting.
  - ⋆Best positioning accuracy!
  - ⋆Better surface with spotting by NC Spot Drill in advance.

Tool / Insert	Spindle Speed / Feed Rate		With Spotting	Without Spotting
99616-10 + N9MT080201W NC40	S 3,000 ~ 25,000	r.p.m.		
	f 0.01 ~ 0.02	mm/rev.		

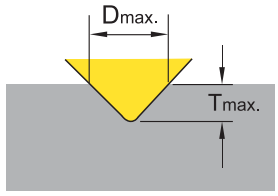
N9MT11T3P60

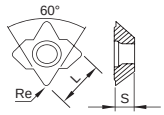
P60-NC40

Inserts >>

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

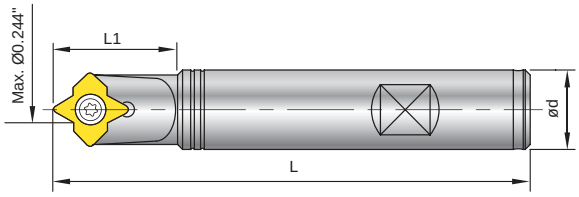
NC40:
- Universal grade for all unhardened steel and cast iron.
- P35 grade, TiN coated.
- Each insert has 2 cutting edges.



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

Holder >>

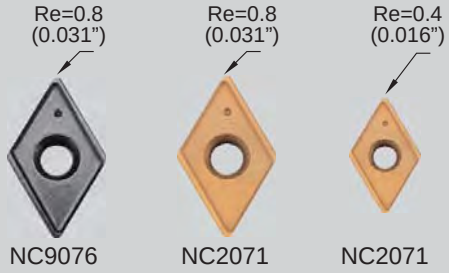
- 60 degree spotting drill with indexable insert.
- ***Using standard NC Spot Drill shank.***
- A single cutting edge design creates higher precision and position when spotting.
- Applications:
  - For spotting, engraving, small grooving on milling machines, machining centers.
  - For carbon steel, alloy steel and cast iron, general purpose.



Parts No.	Ød	L	L1	Screw	Key
99616-14-1/2	1/2"	4"	28.03 (1.103")	 NS-35080 2.5 Nm	 NK-T15
99616-14-5/8	5/8"	4"			

V9MT0802 / V9MT12T3

Starter Kit Supply Page 01~02

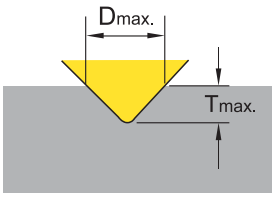


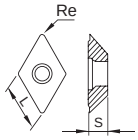
Inserts >>

- 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!

NC9076: • High positive geometry and sharp 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.

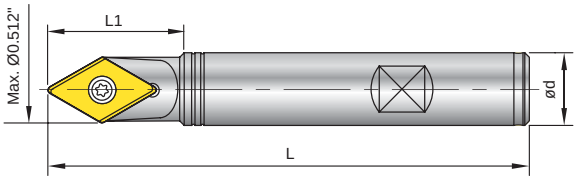
NC2071: • K20F grade, TiN coated, high positive ground cutting edge and relief angle.
- Universal grade for carbon steel, alloy steel and cast iron.
- Each insert has 2 cutting edges.



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

Holder >>

- 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.

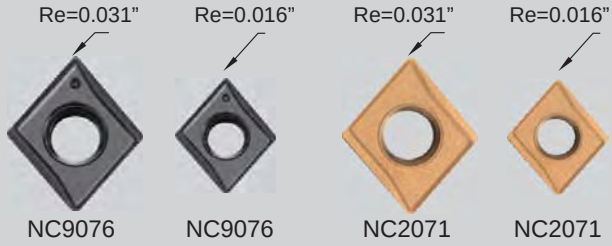


Ø8 (0.315")

Ø5/8"

Parts No.	Insert Type	Ød	L	L1	Screw	Key
99616-09V	V9MT08	8 (0.315")	60 (2.362")	-	NS-25045 1.2Nm	NK-T7
99616-13V-5/8	V9MT12	5/8"	4"	30 (1.181")	NS-35080 2.5Nm	NK-T15

V0820802 / V08212T3

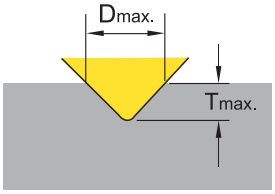


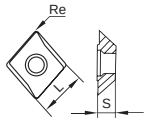
Inserts >>

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

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.

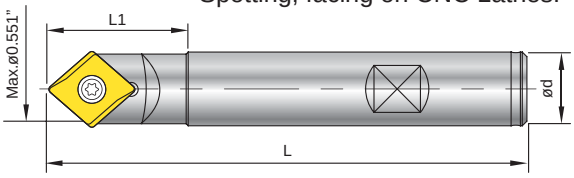
NC2071:
- K20F grade, TiN coated, high positive ground cutting edge and relief angle.
- Universal grade for carbon steel, alloy steel and cast iron.
- Each insert has 2 cutting edges.



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

Holder >>

- 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.

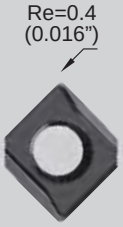


Ø3/8”

Ø5/8”

Parts No.	Insert Type	Ød	L	L1	Screw	Key
99619-V082-3/8	V0820802	3/8”	3.5”	28 (0.102”)	NS-30055 2.0 Nm	NK-T8
99619-V082-5/8	V08212T3	5/8”	4”	30 (1.181”)	NS-35080 2.5 Nm	NK-T15

N9MT05T1



NC9076

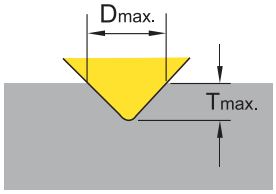
NC2071

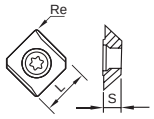
Inserts >>

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

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.

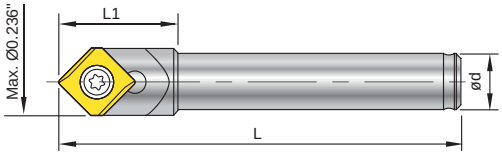
NC2071:
- K20F grade, TiN coated, fully ground cutting edge and relief angle.
- Geometry with supporting edges to stabilize the cutting condition on low power machine.
- Each insert has 2 cutting edges, for carbon steel, alloy steel and cast iron.



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

Holder >>

- 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.



Ø5 (0.197")

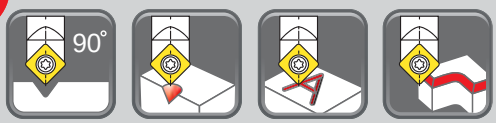
Ø6 (0.236")

Ø6 (0.236")

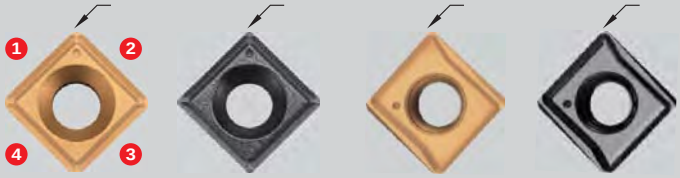
Parts No.	Ød	L	L1	Screw	Key
99616-06-5	5 (0.197")	35 (1.378")	10 (0.394")	 NS-20036 0.8 Nm	 NK-T6
99616-06-6	6 (0.236")	35 (1.378")	--		
99616-06-1/4	1/4"	35 (1.378")	--		
New 99616-06-6L	6 (0.236")	60 (2.362")	--		

Note: 99616-06-6L is carbide shank holder.

N9MT0802



Starter Kit SUPPLY
Page 01~02



NC40 NC10 H-NC40 H-NC9076

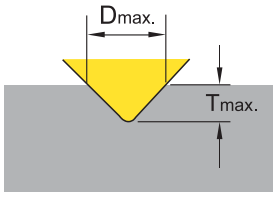
Inserts >>

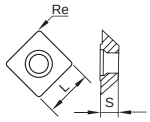
NC40:
- General purpose, universal grade for all unhardened steel and cast iron.
- Each insert has 4 cutting edges.

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.

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.

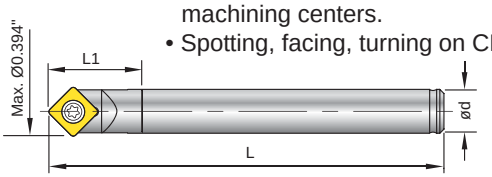
H-NC9076:
- High positive geometry and sharp edge. DLC coated, super good for Al, Al-alloy, copper, brass and bronze.
- Produces excellent surface finish when chamfering non-ferrous metal.
- Each insert has 2 cutting edges.

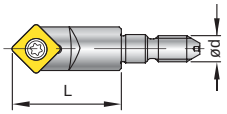


Parts No.		Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	Dmax.	Tmax.
N9MT080208CT	NC40	TiN	K20F		8.31 (0.327")	2.38 (0.094")	0.8 (0.031")	10 (0.394")	4.5 (0.177")
N9MT080204CT	NC40	TiN	K20F				0.4 (0.016")		
	NC10	TiAlN							
N9MT0802CT2T	H-NC40	TiN	K20F				0.8 (0.031")		
	H-NC9076	DLC							

Holder >>

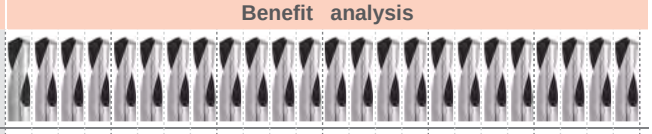
- Single cutting edge design gives higher precision when spotting.
- Applications : • Spotting, engraving, grooving and chamfering on milling machines, machining centers.
  • Spotting, facing, turning on CNC Lathes.

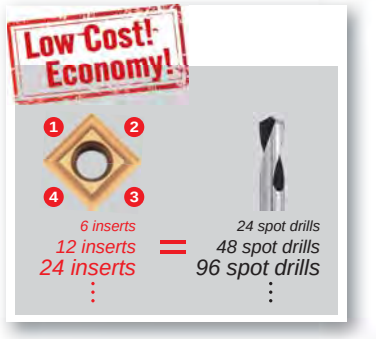




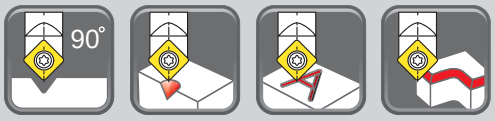
Parts No.	Ød	L	L1	Screw	Key
99616-10	10 (0.394")	90 (3.543")	18.31 (0.720")	NS-30055 2.0 Nm	NK-T8
99616-3/8	3/8"	90 (3.543")			
99616-10-M6	M6	25 (0.984")	-		

Comparison >>

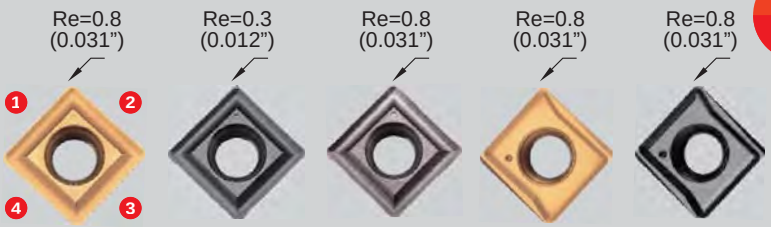
Tool		Benefit analysis
24 spot drills		
6 inserts		



N9MT11T3



Starter Kit Supply
Page 01~02



NC40 NC10 NC60 H-NC40 H-NC9076

Inserts >>

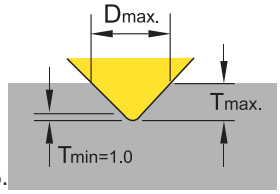
NC40: • General purpose, universal grade for all unhardened steel and cast iron.
• Each insert has 4 cutting edges.

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.

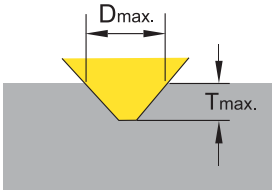
NC60: • Cermet insert, fully ground cutting and relief angle, for hardened steel up to HRC55.
• Each insert has 4 cutting edges.

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.

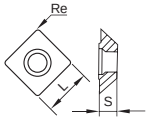
H-NC9076: • High positive geometry and sharp edge same as grade H-NC40. DLC coated, super good for Al, Al-alloy, copper, brass and bronze.
• Produces excellent surface finish when chamfering non-ferrous metal.
• Each insert has 2 cutting edges.



NC40 / NC10 / NC60

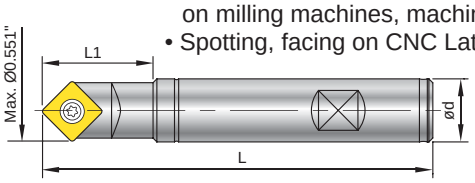


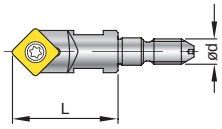
Other grade

Parts No.		Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	Dmax.	Tmax.
N9MT11T3CT	NC40	TiN	P35		11.11 (0.433")	3.97 (0.156")	0.8 (0.031")	14 (0.551")	7 (0.276")
	NC10	TiAlN	K10F				0.3 (0.012")		
	NC60	CERMET					0.8 (0.031")		
N9MT11T3CT2T	H-NC40	TiN	K20F				0.8 (0.031")		
	H-NC9076	DLC	K20F				0.8 (0.031")		

Holder >>

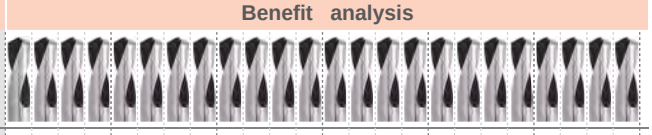
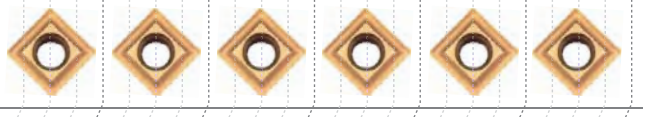
• The widest range of inserts for spot drilling, milling and turning see page 6.
• Applications : • Spotting, engraving, grooving and chamfering on milling machines, machining centers.
• Spotting, facing on CNC Lathes.

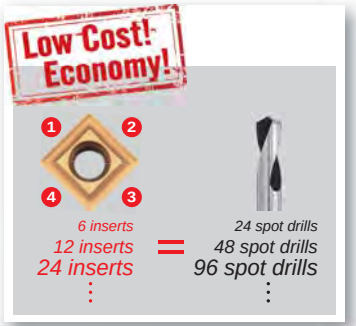




Parts No.	Ød	L	L1	Screw	Key
99616-14-150L	16 (0.630")	150 (5.906")	29.03 (1.143")	NS-35080 2.5 Nm	NK-T15
99616-14-220L	20 (0.787")	220 (8.661")	28.03 (1.103")		
99616-14-1/2	1/2"	4"	28.03 (1.103")		
99616-14-5/8	5/8"	4"	28.03 (1.103")		
99616-14-M8	M8	30 (1.181")	-		

Comparison >>

Tool		Benefit analysis
24 spot drills		
6 inserts		



N9MT1704

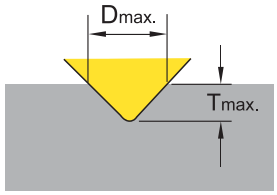
Re=1.2 (0.047")

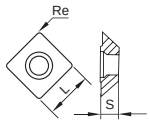
NC2071

Inserts >>

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

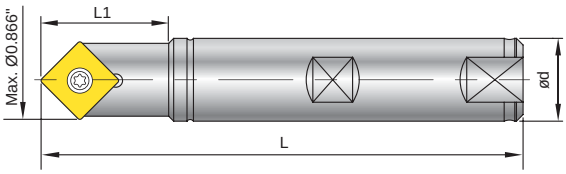
NC2071 : • K20F grade, TiN coated, high positive geometry, fully ground cutting edge and relief angle.
• Each insert has 2 cutting edges.
• Universal grade for all unhardened steel and cast iron.



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

Holder >>

• 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.



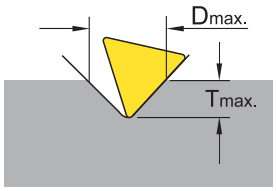
Ø3/4"

Parts No.	Ød	L	L1	Screw	Key
99616-22-3/4	3/4"	4"	35 (1.378")	 NS-50125 5.5 Nm	 NK-T20
99616-22-1	1"	6"	34 (1.339")		

N9MT220408

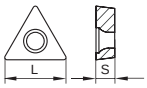
NC40

Inserts >>



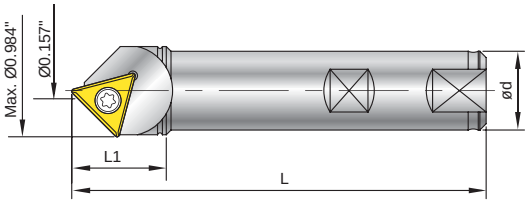
- For spotting diameter up to 1 Inch.
- Fully ground cutting edge and relief angle.

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

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

Holder >>

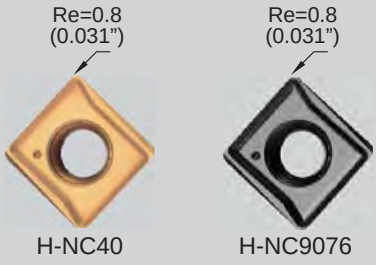
- Large spotting diameter with indexable insert.
- Spotting produces better hole positioning and geometrically uniform holes.
- Applications : • Spotting and chamfering on milling machine, machining centers.

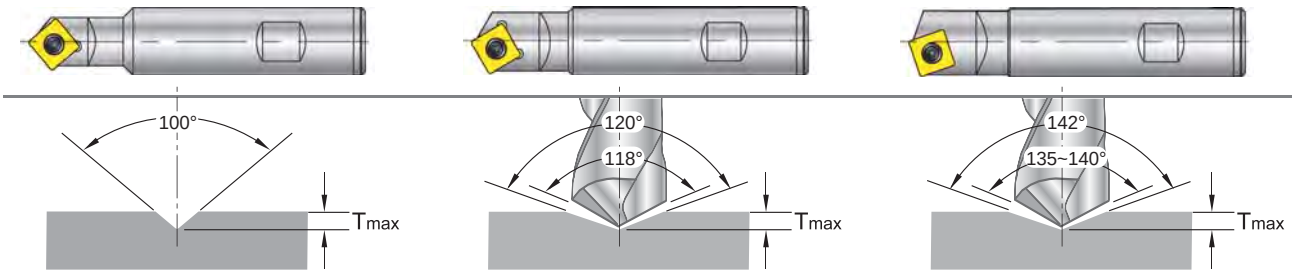


Ø1"

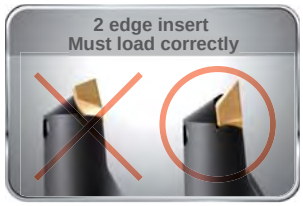
Parts No.	Ød	L	L1	Screw	Key
99616-1-CT28	1"	4.72"	30 (1.181")	 NS-40100 3.5Nm	 NK-T15

N9MT11T3CT2T-H



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 drill.

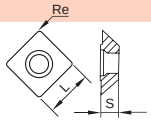
Inserts >>



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

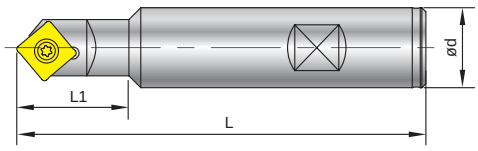
H-NC40:
- K20F grade, TiN coated.
- General purpose for all kinds of steel and cast iron.
- Each insert has 2 cutting edges.

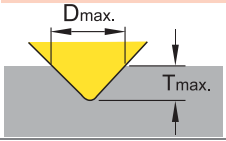
H-NC9076:
- High positive geometry and sharp edge.
- DLC coated, specially developed for Al, Al-alloy, copper, brass and bronze.
- Produces excellent surface finish when chamfering non-ferrous metal.
- Each insert has 2 cutting edges.

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

Holder >>

• 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	L1	Screw / Key	Dmax.	Tmax.	
99616-3/4-100	100°	3/4"	4"	31 (1.220")	 NS-35080 2.5 Nm	16 (0.630")	6.3 (0.248")	
99616-3/4-120	120°			30 (1.181")	 NK-T15	17 (0.669")	4.76 (0.187")	
99616-3/4-142	142°			30 (1.181")		18.5 (0.728")	3.16 (0.124")	

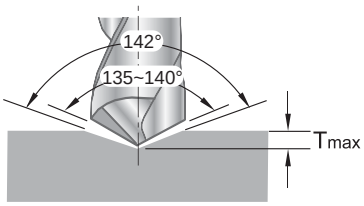
V14208 / V14216

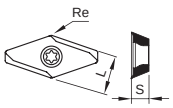
V1420803-NC2071 V1421604-NC2071

Inserts >>

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

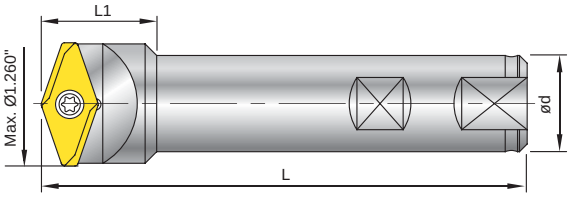
NC2071:
- K20F grade, TiN coated, high positive geometry, fully ground cutting edge and relief angle.
- Each insert has 2 cutting edges.
- Universal grade for all unhardened steel and cast iron.



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

Holder >>

- Spot drilling prior to drilling may allow for higher drill rates.
- Save total machining time!
- Extend your drill life with 142 degree spotting. Reduce your drilling costs!
- Higher accuracy of positioning and diameter tolerance!

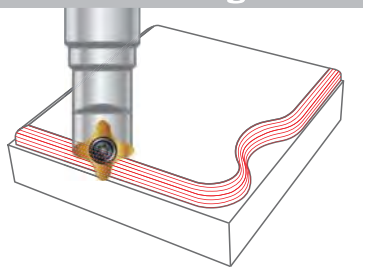


Ø5/8"

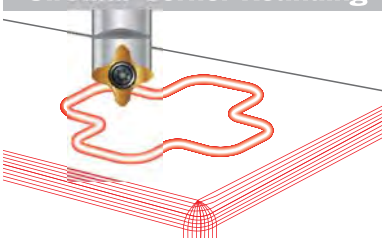
Ø1"

Parts No.	Insert Type	Ød	L	L1	Screw	Key
99619-V142-5/8	V1420803-NC2071	5/8"	4"	25 (0.984")	NS-30072 2.0 Nm	NK-T9
99619-V142-1.000	V1421604-NC2071	1"	4.75"	30 (1.181")	NS-50125 5.5 Nm	NK-T20

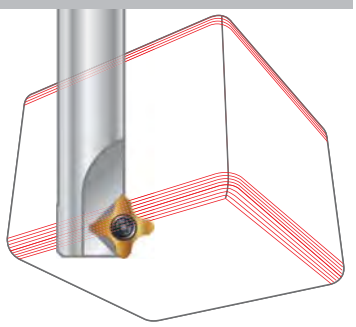
RC
Corner Rounding



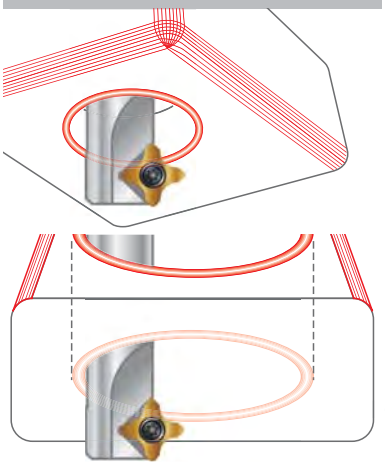
RC
Circular Corner Rounding



R
Front & Back
Corner Rounding



R
Back
Circular Corner Rounding



Corner Rounding >>

Various corner radius inserts can fit on same holder
Carbide insert can stand very long tool life
Produces smooth and excellent surface finish on workpiece.

Features

Type RC

- Each insert has 2 cutting edges.
- Combination corner rounding and 45° chamfering application on same insert.
- Higher cutting speed and feed rate.
- Very small X offset, good for contour chamfering.
- Utilizes standard NC Spot Drill holders 99616-06, 99616-14 & 99616-22.

Type R

- Each insert has 4 cutting edges.
- R1.0 ~ R3.0 inserts are interchangeable on same holder.
- For front and back chamfering.
- Tool offset can be set after measuring tool length by tool presetter or Z-Zero Setter.

▲ Applications
a Radius 0.5
b Radius 1.0
c Radius 2.0

N9MT05T1RC

RC0.5~RC1.0
All are interchangeable
on same holder

mini


NC2071

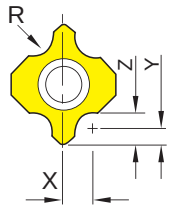

NC9036

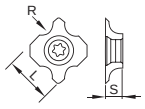
Inserts >>

- Various corner radius inserts can fit on same holder.
- Very small X offset 1.25mm for radius 0.5, the small x offset allows for profiling in small corners.

New NC2071:
- Universal grade for all unhardened steel and cast iron.
- Inserts are CNC ground for precision radius location.
- Each insert has 2 cutting edges.

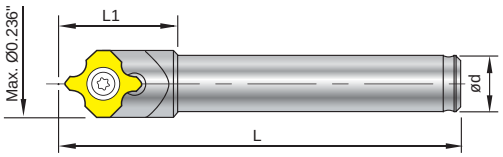
New NC9036:
- For non-ferrous material such as aluminum, acrylic, titanium, brass, copper and stainless steel.
- High positive geometry and sharp edge produces excellent surface finish.
- Each insert has 2 cutting edges.



Insert Radius	Parts No.		Coating	Grade	offset X	offset Y	offset Z		Dimensions L	Dimensions S
New 0.5	N9MT05T1RC05	NC2071	TiN	K20F	1.25 (0.05")	0.75 (0.03")	1.25 (0.05")		5 (0.197")	1.8 (0.070")
		NC9036	DLC							
New 0.75	N9MT05T1RC075	NC2071	TiN	K20F	1.50 (0.059")		1.50 (0.059")			
		NC9036	DLC							
New 1.0	N9MT05T1RC10	NC2071	TiN	K20F	1.75 (0.069")		1.75 (0.069")			
		NC9036	DLC							

Holder >>

- For corner rounding using ***NC Spot Drill*** shank.



Ø5 (0.197")

Ø6 (0.236")

Ø6(0.236")

Parts No.	Ød	L	L1	Screw	Key
99616-06-5	5 (0.197")	35 (1.378")	10 (0.394")	 NS-20036 0.8 Nm	 NK-T6
99616-06-6	6 (0.236")	35 (1.378")	-		
99616-06-1/4	1/4"	35 (1.378")	-		
New 99616-06-6L	6 (0.236")	60 (2.362")	-		

* 99616-06-6L is carbide shank holder

RC

N9MT11T3RC

NEW

RC1.0~RC3.0
All are interchangeable
on same holder

NC40

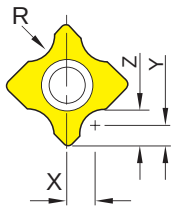
NC9036

Inserts >>

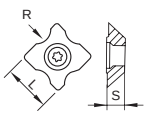
- Higher cutting speed and feed rate.
- Combination corner rounding and 45° chamfering application on same insert.
- Various corner radius inserts can fit on same holder.
- Carbide insert provides for long tool life.

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 2 cutting edges.

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



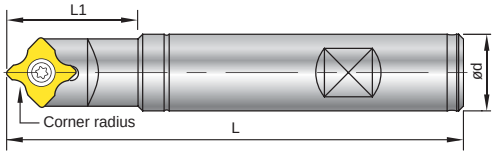
Insert Radius	Parts No.		Coating	Grade	offset X	offset Y	offset Z		Dimensions L	Dimensions S
1.0	N9MT11T3RC10	NC40	TiN	K20F	2.75 (0.108")	1.5 (0.059")	2.5 (0.098")		11.11 (0.433")	3.97 (0.156")
		NC9036	DLC							
1.5	N9MT11T3RC15	NC40	TiN	K20F	3.25 (0.128")	1.5 (0.059")	3 (0.118")			
		NC9036	DLC							
2.0	N9MT11T3RC20	NC40	TiN	K20F	3.75 (0.148")	1.5 (0.059")	3.5 (0.138")			
		NC9036	DLC							
2.5	N9MT11T3RC25	NC40	TiN	K20F	4.25 (0.167")	1.5 (0.059")	4 (0.157")			
		NC9036	DLC							
3.0	N9MT11T3RC30	NC40	TiN	K20F	4.75 (0.187")	1.4 (0.055")	4.4 (0.173")			
		NC9036	DLC							
1/64	N9MT11T3RC1/64	NC40	TiN	K20F	0.086"	0.059"	0.0747"		0.437"	0.156"
		NC9036	DLC							
1/32	N9MT11T3RC1/32	NC40	TiN	K20F	0.101"	0.059"	0.090"			
		NC9036	DLC							
1/16	N9MT11T3RC1/16	NC40	TiN	K20F	0.133"	0.059"	0.122"			
		NC9036	DLC							
3/32	N9MT11T3RC3/32	NC40	TiN	K20F	0.164"	0.059"	0.153"			
		NC9036	DLC							
1/8	N9MT11T3RC 1/8	NC40	TiN	K20F	0.199"	0.055"	0.180"			
		NC9036	DLC							



Holder >>

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

Parts No.	Ød	L	L1	Screw	Key
99616-14-1/2	1/2"	4"	28.03 (1.103")	NS-35080 2.5 Nm	NK-T15
99616-14-5/8	5/8"				



Ø1/2", Ø5/8"

* additional holder found on page 16.

N9MT1704RC

RC4.0~RC6.0
All are interchangeable
on same holder


NC2071

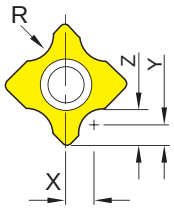

NC9036

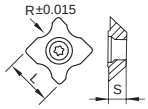
Inserts >>

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

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 2 cutting edges.

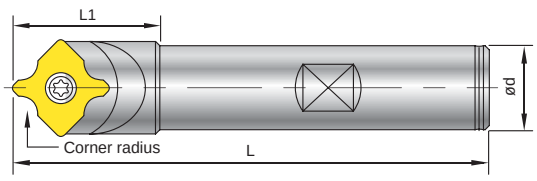
New NC9036:
- For non-ferrous material such as aluminum, acrylic, titanium, brass, copper and stainless steel.
- High positive geometry and sharp edge produces excellent surface finish.
- Each insert has 2 cutting edges.



Corner radius(R)	Parts No.		Coating	Grade	offset				Dimensions	
					X	Y	Z		L	S
4.0	N9MT1704RC40	NC2071	TiN	K20F	6.15 (0.242")	2 (0.079")	6 (0.236")		17 (0.669")	4.76 (0.187")
		NC9036	DLC							
5.0	N9MT1704RC50	NC2071	TiN	K20F	7.10 (0.280")	2 (0.079")	7 (0.276")			
		NC9036	DLC							
6.0	N9MT1704RC60	NC2071	TiN	K20F	8.10 (0.319")	2 (0.079")	8 (0.315")			
		NC9036	DLC							
3/16	N9MT1704RC3/16	NC2071	TiN	K20F	0.270"	0.078"	0.268"		0.669"	0.187"
		NC9036	DLC							
1/4	N9MT1704RC1/4	NC2071	TiN	K20F	0.333"	0.078"	0.330"			
		NC9036	DLC							

Holder >>

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



Ø3/4", Ø1"

Parts No.	Ød	L	L1	Screw	Key
99616-22-3/4	3/4"	4"	34 (1.339")	 NS-50125 5.5 Nm	 NK-T20
99616-22-1	1"	6"			

N9MT11T3R

NEW

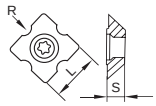
R1.0~R3.0
All are interchangeable
on same holder

R1.0 R1.5 R2.0 R2.5 R3.0

Inserts >>

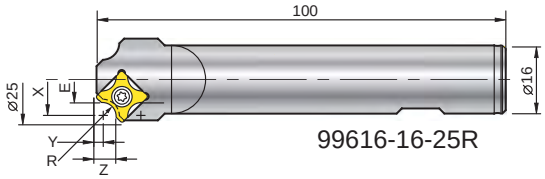
- For front and back corner rounding.
- Carbide insert can stand very long tool life.
- Each insert has 4 cutting edges.

NC2071: • Universal grade for all unhardened steel and cast iron.
• Inserts are CNC ground for precision radius location.

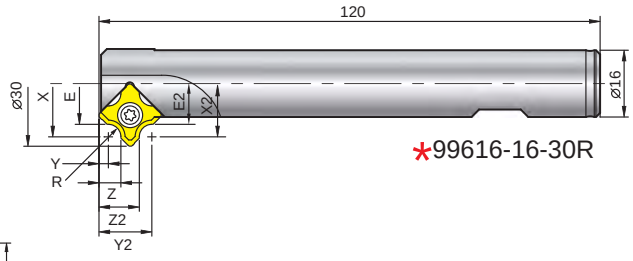
Corner radius(R)	Parts No.	Coating	Grade		Dimensions L	Dimensions S
1.0	N9MT11T3R10-NC2071	TiN	P35		11.11 (0.433")	3.97 (0.156")
1.5	N9MT11T3R15-NC2071					
2.0	N9MT11T3R20-NC2071					
2.5	N9MT11T3R25-NC2071					
3.0	N9MT11T3R30-NC2071					

Holder >>

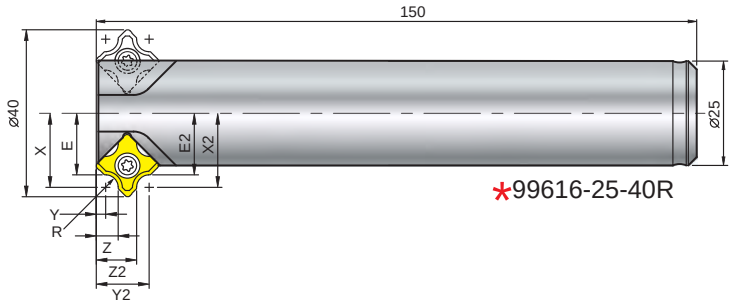
- Center of radius of each tool is dedicated.
- Tool offset can be set after measuring tool length by tool presetter or Z-Zero Setter.



99616-16-25R



*99616-16-30R



*99616-25-40R

99616-16-30R & 99616-25-40R
*For front and back corner rounding.
*Eliminates 2nd operation or deburring time.

Insert Radius	Holder	Ød	Front Chamfering E	Front Chamfering X	Front Chamfering Y	Front Chamfering Z	Back Chamfering E2	Back Chamfering X2	Back Chamfering Y2	Back Chamfering Z2	Z	Screw / Key
R1.0	99616-16-25R	16 (0.630")	8.25 (0.325")	9.25 (0.364")	3.25 (0.128")	4.25 (0.167")	----	----	----	----	1	
	99616-16-30R		10.75 (0.423")	11.75 (0.463")			10.75 (0.423")	11.75 (0.463")	11.65 (0.459")	10.65 (0.419")	1	
	99616-25-40R	25 (0.984")	15.75 (0.620")	16.75 (0.659")			15.75 (0.620")	16.75 (0.659")			4	
R1.5	99616-16-25R	16 (0.630")	8 (0.315")	9.5 (0.374")	3 (0.118")	4.5 (0.177")	----	----	----	----	1	
	99616-16-30R		10.5 (0.413")	12 (0.472")			10.5 (0.413")	12 (0.472")	11.9 (0.469")	10.4 (0.409")	1	NS-35080 2.5 Nm
	99616-25-40R	25 (0.984")	15.5 (0.610")	17 (0.670")			15.5 (0.610")	17 (0.670")			4	
R2.0	99616-16-25R	16 (0.630")	7.75 (0.305")	9.75 (0.384")	2.75 (0.108")	4.75 (0.187")	----	----	----	----	1	
	99616-16-30R		10.25 (0.404")	12.25 (0.482")			10.25 (0.404")	12.25 (0.482")	12.15 (0.478")	10.15 (0.400")	1	
	99616-25-40R	25 (0.984")	15.25 (0.600")	17.25 (0.680")			15.25 (0.600")	17.25 (0.680")			4	
R2.5	99616-16-25R	16 (0.630")	7.5 (0.295")	10 (0.394")	2.5 (0.098")	5 (0.197")	----	----	----	----	1	
	99616-16-30R		10 (0.394")	12.5 (0.492")			10 (0.394")	12.5 (0.492")	12.4 (0.488")	9.9 (0.390")	1	NK-T15
	99616-25-40R	25 (0.984")	15 (0.590")	17.5 (0.689")			15 (0.590")	17.5 (0.689")			4	
R3.0	99616-16-25R	16 (0.630")	7.25 (0.285")	10.25 (0.404")	2.25 (0.09")	5.25 (0.207")	----	----	----	----	1	
	99616-16-30R		9.75 (0.384")	12.75 (0.502")			9.75 (0.384")	12.75 (0.502")	12.65 (0.498")	9.65 (0.380")	1	
	99616-25-40R	25 (0.984")	14.75 (0.580")	17.75 (0.699")			14.75 (0.580")	17.75 (0.699")			4	

* Also can fit with N9MT11T308LA inserts for front and back chamfering. (Please see page 26)

NEW

N9MT11T308LA 45° Chamfering Tool

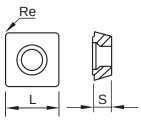
NC40 NC10 NC60

Inserts >>

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

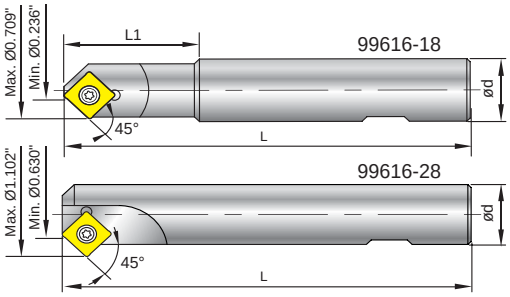
NC10: • High positive angle and fully ground cutting edge and relief angle.
• Universal grade for Al, Al-alloy, non-ferrous metal, cast iron and stainless steel.
• Each insert has 4 cutting edges.

NC60: • Cermet insert, for hardened steel up to HRC56 .
• Each insert has 4 cutting edges.

Parts No.		Coating	Grade		Dimensions L	Dimensions S	Dimensions Re
N9MT11T308LA	NC40	TiN	P35		11.11 (0.433")	3.97 (0.156")	0.8 (0.031")
	NC10	TiAN	K10F				
	NC60	Cermet					

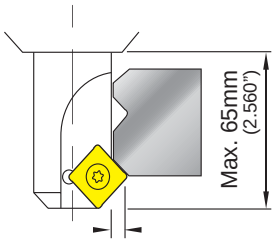
Holder >>

• 99616-28 can be applied for machining back chamfering and side grooving.

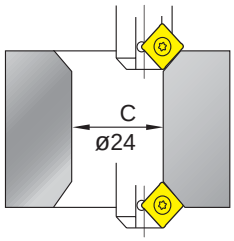


Parts No.	Insert type	Chamfering	Ød	L	L1	Z	Screw / Key
99616-18	N9MT11T308LA	Ø6-Ø18 (Ø0.246" ~ Ø0.709")	20 (0.787")	120 (4.724")	40 (1.632")	1	NS-35080 2.5 Nm
99616-28		Ø16-Ø28 (Ø0.630" ~ Ø1.102")				1	NK-T15

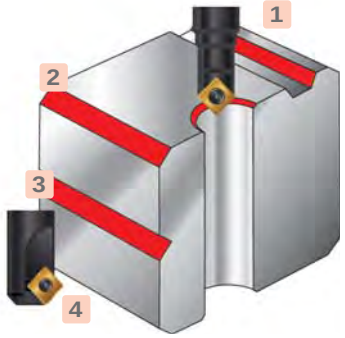
Example >>



For back chamfering
Max. 2mm (0.079")
CØ16-Ø28
(0.630" ~1.102")



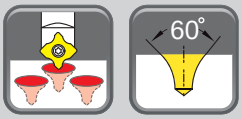
Min.diameter for shift
Ø24mm. (0.945")



Action	
1	External and internal chamfering
2	Side chamfering
3	Side grooving
4	Back chamfering

N9MT11T3PR Radius Center Drilling

NEW

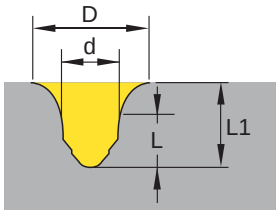


NC40

Inserts >>

- Create 60° center holes SIMILAR to DIN 332 Form R, radius 2.0 / 2.5 / 3.15mm
- Carbide insert can stand very long tool life.
- Easy tool length setting, saving tool changing time.

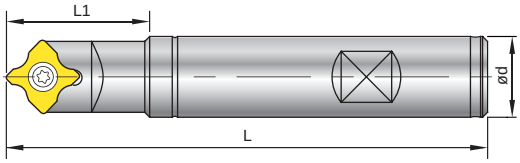
NC40:
- Universal grade for all unhardened steel and cast iron.
- Radius curve eliminates the sharp transition from drill point to countersink angle.
- The risk of breakage is reduced.
- Each insert has 2 cutting edges.



Parts No.	Coating	Grade	Dimensions			
			d	D	L	L1
N9MT11T3PR20-NC40	TiN	P35	2.0 (0.078")	5.4 (0.213")	2.7 (0.106")	3.3 (0.130")
N9MT11T3PR25-NC40			2.5 (0.098")	5.9 (0.232")	3.0 (0.118")	3.7 (0.146")
N9MT11T3PR30-NC40			3.0 (0.118")	6.4 (0.252")	3.3 (0.130")	4.0 (0.157")

Holder >>

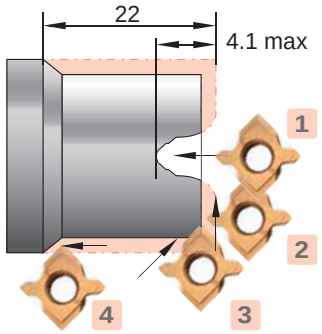
- PR holder has small offset value.
- Also apply as a 90° spotting drill while fitted with N9MT11T3CT2T-H insert (page 16).



Parts No.	Ød	L	L1	Screw	Key
99616-14-PR	16 (0.630")	100 (3.94")	30 (1.224")	NS-35080 2.5 Nm	NK-T15

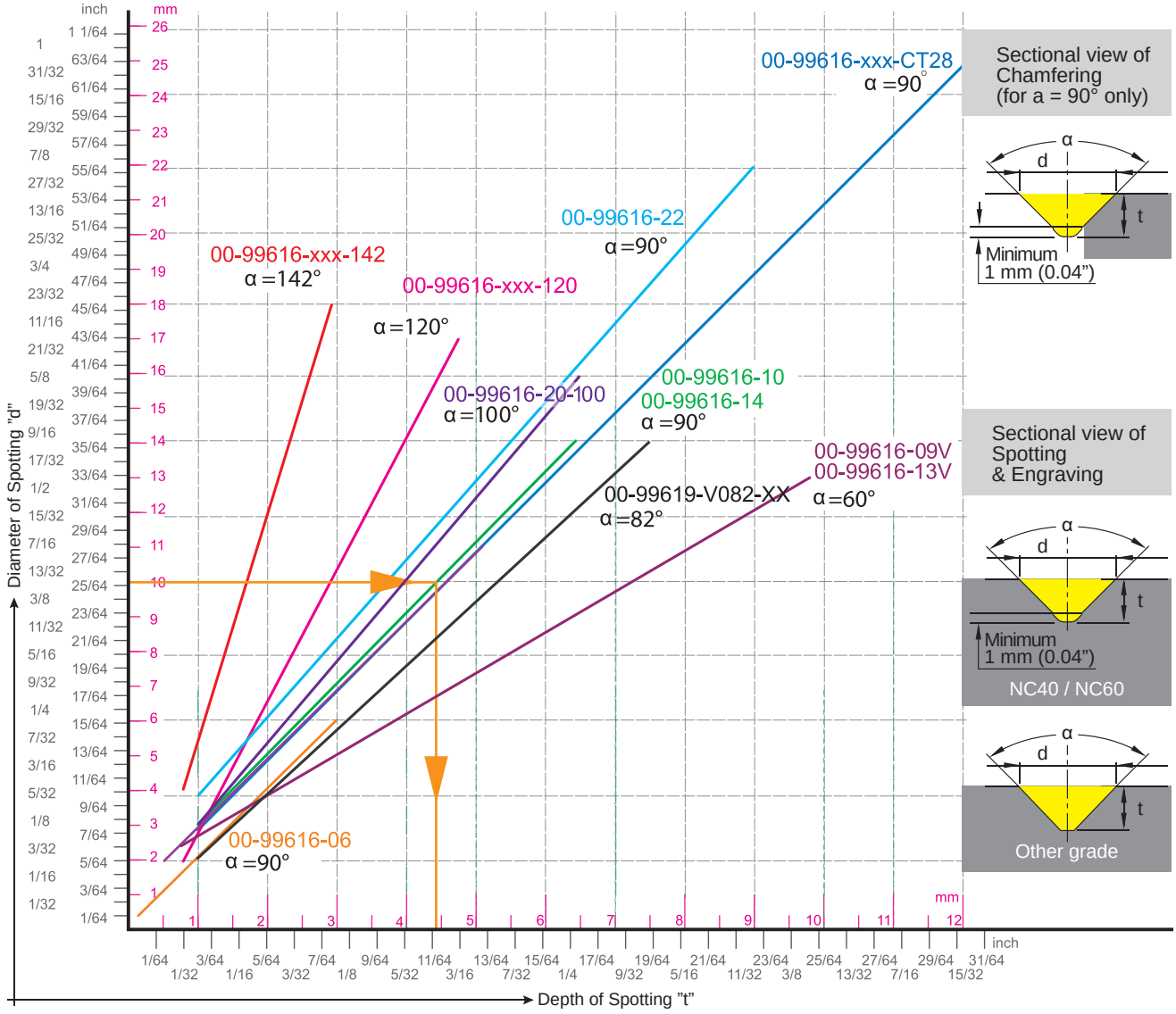
Turning and Centering Capacity on CNC Lathes

	Action
1	Center Drilling
2	Facing
3	Chamfering
4	External Turning



Cutting Data

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



Instruction of Using >>

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

Calculate spindle speed and feed rate >>

1. Using your "d" value and cutting speed Vc from the data sheet, calculate spindle speed "S"(RPM).
2. " F" feed rate per minute F = f x S = RPM x IPR

Inch

$$S = \frac{(3.82 \times SFM)}{d}$$

$$F = f \times S$$

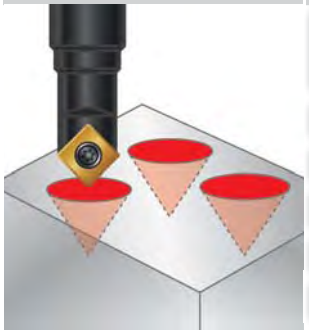
d =	diameter-inch	**f = IPR =**	inch/rev.
S =	Spindle Speed-r.p.m.	**F =**	inch/min.
SFM =	Surface Speed-ft./min. Vc (m/min.) x 3.28		

Cutting Data

N9MT-CT >> Insert Multi-function

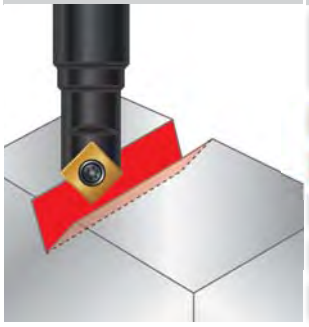
Determine spindle speed and feed rate:

- Choose spotting depth to decide spotting diameter according to the Diameter/Depth chart on page 28.
- 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, NC2071
	Alloy Steel	330~660	0.0016~0.0024	NC40, NC2071
	Stainless Steel	210~410	0.0010~0.0024	NC10, NC60, NC40, NC2071
	Cast iron	260~500	0.0020~0.0040	NC40, NC10, NC2071
	Non-Ferrous Metal (Al, Cu)	500~1050	0.0020~0.0040	NC10, NC9076, NC2071
	Ti, Ti-alloy	200~260	0.0012~0.0024	NC9076
	Hardened steel HRC 40°~56°	100~200	0.0012~0.0031	NC60

* For technical construction reasons, the insert is not located on the center of the holder.
* Inserts with supporting edges can increase feed rate 50%.

Chamfering	Work Material	SFM	IPR (inch/rev.)	Grade of Insert
	Carbon Steel	500~1050	0.0020~0.0040	NC40, NC2071
	Alloy Steel	330~820	0.0016`0.0024	NC40, NC2071
	Stainless Steel	210~410	0.0010~0.0024	NC10, NC60, NC40, NC2071
	Cast iron	500~820	0.0020~0.0040	NC40, NC10, NC2071
	Non-Ferrous Metal (Al, Cu)	500~1050	0.0020~0.0040	NC10, NC9076, NC2071
	Ti, Ti-alloy	200~260	0.0012~0.0024	NC9076
	Hardened steel HRC 40°~56°	100~200	0.0012~0.0031	NC60

Grooving	Work Material	SFM	IPR (inch/rev.)	Grade of Insert
	Carbon Steel	500~820	0.0020~0.0040	NC40, NC2071
	Alloy Steel	330~660	0.0016~0.0024	NC40, NC2071
	Stainless Steel	210~410	0.0010~0.0024	NC10, NC60, NC40, NC2071
	Cast iron	260~500	0.0020~0.0040	NC40, NC10, NC2071
	Non-Ferrous Metal (Al, Cu)	500~1050	0.0020~0.0040	NC10, NC9076, NC2071
	Ti, Ti-alloy	200~260	0.0012~0.0024	NC9076
	Hardened steel HRC 40°~56°	100~200	0.0012~0.0031	NC60

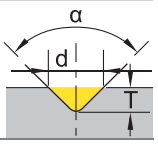
N9MT-W Insert / Engraving Insert

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

- Tool shank runout should be below 0.01mm (0.0004”)

Engraving

- For α = 90° insert, d=2xT
- For α = 60° insert, d=1.73xT



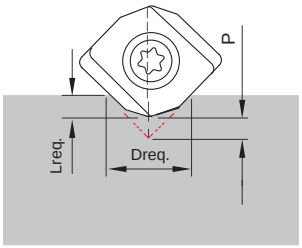
Mini spotting	Work Material	SFM	IPR (inch/rev.)	Grade of Insert	Depth of cut 1st	2nd	3th	Finishing
	All kinds of Steel, unhardened, Cast iron	66~260	0.0004~0.0008	NC40	0.3 (0.011”)	0.2 (0.008”)	0.2 (0.008”)	0.1 (0.004”)
	Non-Ferrous Metal (Al, Cu)	66~310	0.0004~0.0008	NC10				

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

Cutting Data

W Spotting >>

W spotting	Formula



Lreq. = Dreq. x 0.5 - P

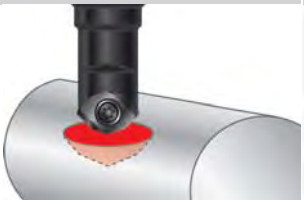
P = distance of theoretical intersection point to tip of insert.

0.5 = fixed factor for calculation

Lreq. = required drilling depth

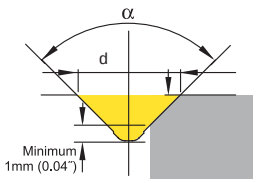
Dreq. = required diameter

	M4	M5	M6	M8	M10	M12	M14	M16	1/4-20 UNC	5/16-18 UNC	3/8-16 UNC
P =	1.17 (0.046")	1.48 (0.058")	1.76 (0.069")	2.39 (0.094")	2.97 (0.117")	3.59 (0.141")	4.19 (0.165")	4.88 (0.192")	1.80 (0.071")	2.30 (0.091")	2.78 (0.109")

W spotting	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)

LA Insert >> 45° Chamfering

45° Chamfering	Formula



$$S = \frac{Vc \times 1000}{d \times \pi} \text{ r.p.m.}$$

F = S x f **mm/min.**

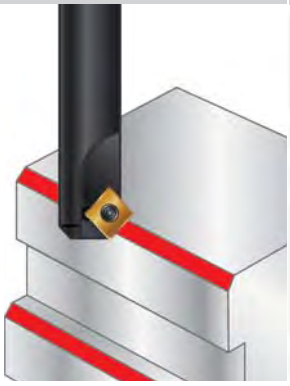
α = point angle 90°

d = effective diameter

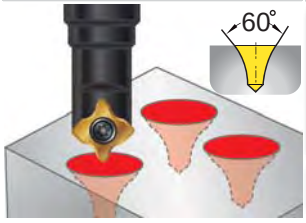
Vc = cutting speed m/min.or ft./min.

S = Spindle speed

f = feed per rev. mm/rev.

45° Chamfering	Work Material	SFM	IPR (inch/rev.)	Grade of Insert
	Carbon Steel	500~1050	0.0020~0.0040	NC40
	Alloy Steel	330~820	0.0016~0.0031	NC40
	High alloy steel	200~260	0.0012~0.0023	NC40
	Stainless Steel	210~410	0.0012~0.0023	NC10
	Gray cast iron	500~820	0.0020~0.0040	NC10, NC40
	Aluminum, Al-alloy Si < 12%	500~1050	0.0020~0.0040	NC10
	Al-alloy Si >12%	330~1050	0.0020~0.0040	NC10
	Copper	600~820	0.0020~0.0040	NC10
	Brass and Bronze	500~80	0.0020~0.0040	NC10
	Hardened steel HRC 40~°56°	200~260	0.0020~0.0040	NC60

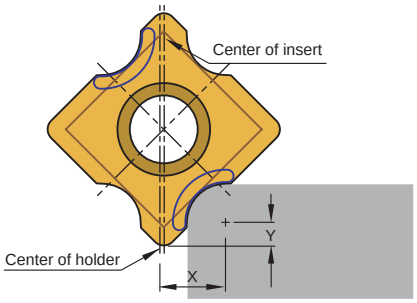
PR Insert >> Radius Center Drilling

Center Drilling	Work Material	SFM	IPR (inch/rev.)	Grade of Insert
	Carbon Steel	260 ~ 500	0.0020~0.0040	NC40
	Alloy steel	260 ~ 500	0.0020~0.0040	
	High alloy steel	260 ~ 500	0.0020~0.0040	
	Cast iron	260 ~ 500	0.0020~0.0040	

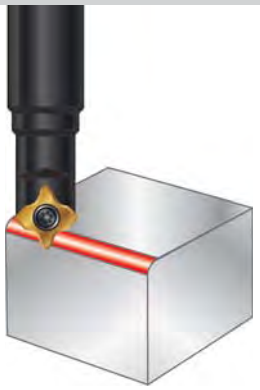
Cutting Data

N9MT-RC Insert >> Corner Rounding

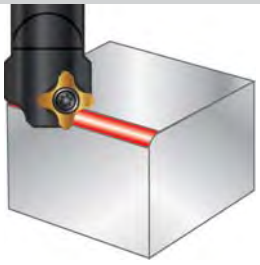
Determine spindle speed and feed:
To decide running speed of the tools and feed rate, please calculate spindle speed and feed rate according to the following formula and cutting data:

Corner Rounding	Calculate spindle speed	
	$d = 2 \times X$ inch	**d =** diameter of the tool for calculation purpose
		X = tool radius offset (ref. page 22~24 for RC inserts)
	$S = \frac{SFM \times 3.82}{d}$ r.p.m.	**SFM =** Cutting speed ft/min.
		S = Spindle Speed -r.p.m.
	$F = S \times f$ inch	**F =** Feed rate inch
		f = inch/rev.

Calculate tool length offest on machining center	
	X = tool radius offset (ref. page 22~24 for RC inserts)
TL = TL'-Y, **H = X**	**Y =** distance to the center of radius. (ref. page 31~33 for RC inserts)
	TL' = tool length
	TL = tool length offset.
	H = tool radius offset

RC Insert	Work Material	SFM	IPR (inch/rev.)	Grade of Insert
	Carbon Steel	500~1050	0.0020~0.0040	NC40, NC2071
	Alloy steel	330~820	0.0020~0.0040	NC40, NC2071
	High alloy steel	260~500	0.0016~0.0031	NC40, NC2071
	Stainless Steel	210~410	0.0020~0.0040	NC9036
	Gray cast iron	500~820	0.0020~0.0040	NC40, NC2071
	Aluminum, Al-alloy Si < 12%	500~1050	0.0020~0.0040	NC9036
	Al-alloy Si >12%	330~1050	0.0020~0.0040	NC9036
	Copper	600~820	0.0020~0.0040	NC9036
	Brass and Bronze	500~80	0.0020~0.0040	NC9036

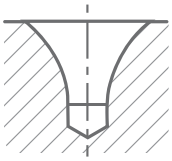
N9MT-R Insert >> Corner Rounding (4 cutting edges)

R Insert	Work Material	SFM	IPR (inch/rev.)	Grade of Insert
	Carbon Steel	500~1050	0.0020~0.0040	NC2071
	Alloy steel	330~820	0.0016~0.0031	NC2071
	High alloy steel	200~260	0.0012~0.0023	NC2071
	Cast iron	500~820	0.0020~0.0040	NC2071

* Standard stock item

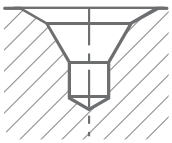
*** DIN 332 Form R**

Ø1.0~Ø10



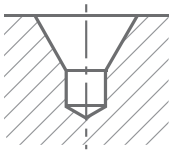
*** DIN 332 Form A + B**

Ø1.0~Ø10



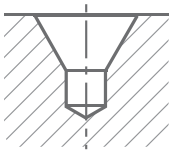
*** DIN 332 Form A**

Ø2.0~Ø2.5

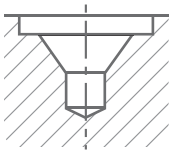


*** ANSI 60°**

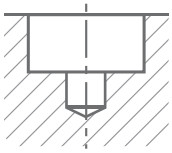
#2.0~#10



C Type



F Type



Center Drill» i-Center®

The " i-Center " is a trademark of Nine9, the developer of the first indexable center drill in the world.(Patented)
Offering an indexable insert system for the 1st time, Nine9's "i-Center " design improves your process performance.

Features

World's first indexable center drill
Shortens set up and center drilling time
Increases tool life and reduces tooling costs

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 r.p.m. and feed rate of 600 mm/min. (0.1 mm/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.

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

Excellent repeatability by insert type. No need tool length re-setting while changing insert or cutting edge.

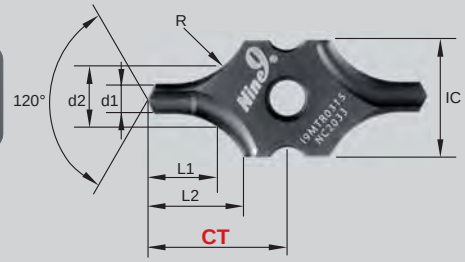
Extended Tool Life

- 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.

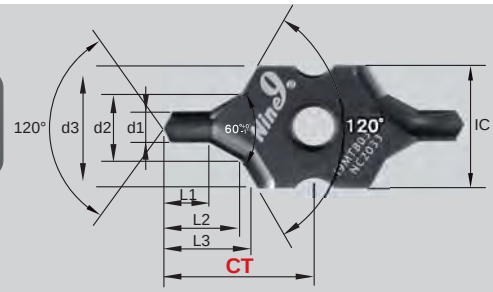
Special forms are possible

Indexable Center Drill

DIN332 Form R



DIN332 Form A+B



DIN332 Form R

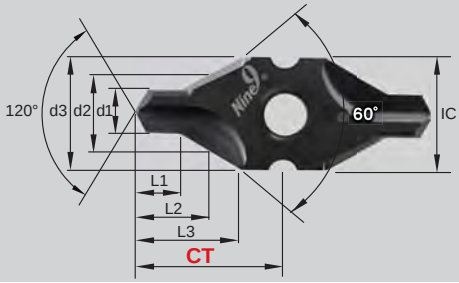
Parts No.	Coating	Grade	d1		d2	L1	L2	R	CT ±0.025 (0.001")	IC
I9MT08T1R0100-NC2033	TiAlN	K20F	1.00 (0.039")	+ 0.14 (0.006") 0	2.12 (0.083")	2.16 (0.085")	4.14 (0.163")	2.8 (0.110")	7.55 (0.297")	08 (0.315")
I9MT08T1R0125-NC2033			1.25 (0.049")		2.65 (0.104")	2.74 (0.108")	4.64 (0.183")	3.5 (0.138")	7.90 (0.311")	
I9MT08T1R0160-NC2033			1.60 (0.063")		3.35 (0.132")	3.45 (0.136")	5.13 (0.202")	4.5 (0.177")	8.40 (0.331")	
I9MT08T1R0200-NC2033			2.00 (0.079")		4.25 (0.167")	4.45 (0.175")	6.08 (0.240")	5.65 (0.222")	9.10 (0.358")	
I9MT12T2R0200-NC2033			2.00 (0.079")	+ 0.14 (0.006") 0	4.25 (0.167")	4.45 (0.175")	6.64 (0.261")	5.65 (0.222")	11.73 (0.462")	12 (0.472")
I9MT12T2R0250-NC2033			2.50 (0.098")		5.3 (0.209")	5.59 (0.220")	8.11 (0.319")	7.15 (0.281")	13.00 (0.512")	
I9MT12T2R0315-NC2033			3.15 (0.124")	+ 0.18 (0.007") 0	6.7 (0.264")	7.21 (0.284")	9.63 (0.379")	9.0 (0.354")	14.00 (0.551")	
I9MT1603R0400-NC2033			4.00 (0.157")		8.5 (0.335")	9.06 (0.357")	12.23 (0.481")	11.0 (0.433")	19.40 (0.764")	16 (0.630")
I9MT1603R0500-NC2033			5.00 (0.197")		10.6 (0.417")	11.45 (0.450")	14.2 (0.481")	14.0 (0.551")	19.40 (0.764")	
I9MT2004R0630-NC2033			6.30 (0.248")	+ 0.22 (0.009") 0	13.2 (0.520")	14.63 (0.576")	18.2 (0.717")	18.0 (0.709")	28.40 (1.118")	20 (0.787")
I9MT2004R0800-NC2033			8.00 (0.315")		17.0 (0.669")	18.63 (0.733")	20.44 (0.805")	22.5 (0.886")	28.30 (1.114")	
I9MT2506R1000-NC2033			10.00 (0.394")		21.2 (0.835")	23.51 (0.926")	25.8 (1.016")	28.0 (1.102")	34.20 (1.346")	25 (0.984")

DIN332 Form A+B

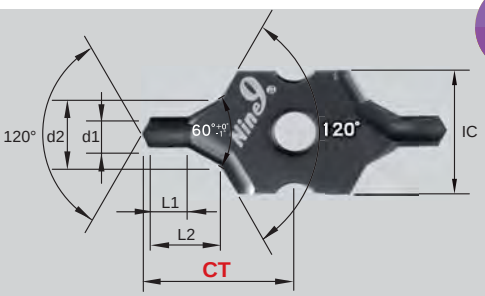
Parts No.	Coating	Grade	d1		d2	d3	L1	L2	L3	CT ±0.025 (0.001")	IC
I9MT08T1B0100-NC2033	TiAlN	K20F	1.00 (0.039")	+ 0.14 (0.006") 0	2.12 (0.083")	3.15 (0.124")	1.3 (0.051")	2.21 (0.087")	2.51 (0.099")	7.55 (0.297")	08 (0.315")
I9MT08T1B0125-NC2033			1.25 (0.049")		2.65 (0.104")	4.0 (0.157")	1.6 (0.063")	2.75 (0.108")	3.14 (0.124")	7.90 (0.311")	
I9MT08T1B0160-NC2033			1.60 (0.063")		3.35 (0.132")	5.0 (0.197")	2.0 (0.079")	3.46 (0.136")	3.93 (0.155")	8.40 (0.331")	
I9MT08T1B0200-NC2033			2.00 (0.079")		4.25 (0.167")	6.3 (0.248")	2.5 (0.098")	4.39 (0.173")	4.98 (0.196")	9.10 (0.358")	
I9MT12T2B0200-NC2033			2.00 (0.079")	+ 0.14 (0.006") 0	4.25 (0.167")	6.3 (0.248")	2.5 (0.098")	4.39 (0.173")	4.98 (0.196")	11.73 (0.462")	12 (0.472")
I9MT12T2B0250-NC2033			2.50 (0.098")		5.3 (0.209")	8.0 (0.315")	3.1 (0.122")	5.53 (0.218")	6.28 (0.247")	13.00 (0.512")	
I9MT12T2B0315-NC2033			3.15 (0.124")	+ 0.18 (0.007") 0	6.7 (0.264")	10.0 (0.394")	3.9 (0.154")	6.90 (0.272")	7.85 (0.309")	14.00 (0.551")	
I9MT1603B0400-NC2033			4.00 (0.157")		8.5 (0.335")	12.5 (0.492")	5.0 (0.197")	8.9 (0.350")	10.03 (0.395")	19.40 (0.764")	16 (0.630")
I9MT1603B0500-NC2033			5.00 (0.197")		10.6 (0.417")	16.0 (0.630")	6.3 (0.248")	11.15 (0.439")	12.68 (0.499")	19.40 (0.764")	
I9MT2004B0630-NC2033			6.30 (0.248")	+ 0.22 (0.009") 0	13.2 (0.520")	18.0 (0.709")	8.0 (0.315")	13.98 (0.550")	15.33 (0.604")	28.40 (1.118")	20 (0.787")
I9MT2004B0800-NC2033			8.00 (0.315")		17.0 (0.669")	20 (0.787")	10.1 (0.398")	17.89 (0.704")	18.73 (0.737")	28.30 (1.114")	
I9MT2506B1000-NC2033			10.00 (0.394")		21.2 (0.835")	25 (0.984")	12.8 (0.504")	22.5 (0.886")	23.57 (0.928")	34.20 (1.346")	25 (0.984")

NEW

DIN332 Form A



ANSI 60°



DIN332 Form A

Parts No.	Coating	Grade	d1		d2	d3	L1	L2	L3	CT ±0.025 (0.001")	IC
New I9MT08T1A0200-NC2033	TiAlN	K20F	2.0 (0.079")	+ 0.14 (0.006") 0	4.25 (0.167")	8 (0.315")	2.15 (0.085")	4.10 (0.161")	7.35 (0.289")	10.5 (0.413")	08 (0.315")
New I9MT08T1A0250-NC2033			2.5 (0.098")		5.3 (0.209")		2.58 (0.102")	5.00 (0.197")	7.34 (0.289")		

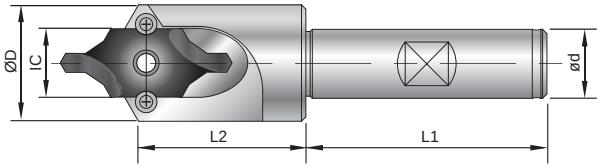
ANSI 60°

Parts No.	Coating	Grade	Size	d1			d2		L1		L2	CT ±0.025 (0.001")	IC
					mm			mm		mm	mm		
I9MT12T2A2-NC2033	TiAlN	K20F	#2	5/64	1.98	+0.14 (0.006") 0	3/16	4.76	5/64	1.98	4.4 (0.173")	12.6 (0.496")	
I9MT12T2A3-NC2033			#3	7/64	2.78		1/4	6.35	7/64	2.78	5.9 (0.232")	13.8 (0.543")	12 (0.472")
I9MT12T2A4-NC2033			#4	1/8	3.18	+0.18 (0.007") 0	5/16	7.94	1/8	3.18	7.3 (0.287")	14.25 (0.561")	
I9MT1603A5-NC2033			#5	3/16	4.76		7/16	11.11	3/16	4.76	10.3 (0.406")	20.0 (0.787")	16 (0.630")
I9MT2004A6-NC2033			#6	7/32	5.56		1/2	12.7	7/32	5.56	11.8 (0.465")	27.75 (1.093")	
I9MT2004A7-NC2033			#7	1/4	6.35	+0.22 (0.009") 0	5/8	15.88	1/4	6.35	14.6 (0.575")	28.5 (1.122")	20 (0.787")
I9MT2004A8-NC2033			#8	5/16	7.94		3/4	19.05	5/16	7.94	17.6 (0.693")	29.0 (1.141")	
I9MT2506A10-NC2033			#10	3/8	9.53		0.98"	25.0	3/8	9.53	22.9 (0.902")	34.9 (1.374")	25 (0.984")

i-Center

Holder >>

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



Parts No.	Type	IC	Ød	L1	L2	ØD	Screw	Key
99616-IC08-10	BC10-IC08	08 (0.315")	10 (0.394")	30 (1.181")	18.5 (0.728")	12 (0.472")	NS-25060 / 1.2 Nm	NK-T7
99616-IC12-16	SB16-IC12	12 (0.472")	16 (0.630")	48 (1.890")	30.5 (1.201")	21 (0.827")	NS-30072 / 2.0 Nm	NK-T9
99616-IC16-16	SB16-IC16	16 (0.630")	16 (0.630")	48 (1.890")	37 (1.457")	27 (1.063")	NS-35080 / 2.5 Nm	NK-T15
99616-IC20-20	SB20-IC20	20 (0.787")	20 (0.787")	50 (1.969")	51 (2.008")	32 (1.260")	NS-50125 / 5.5 Nm	NK-T20
99616-IC25-25	SB25-IC25	25 (0.984")	25 (0.984")	56 (2.205")	56 (2.205")	43 (1.693")	NS-50125 / 5.5 Nm	NK-T20

Parts No.	Type	IC	Ød	L1	L2	ØD	Screw	Key
99616-IC08-3/8	BC3/8"-IC08	08 (0.315")	3/8"	30 (1.181")	18.5 (0.728")	12 (0.472")	NS-25060 / 1.2 Nm	NK-T7
99616-IC12-5/8	SB5/8"-IC12	12 (0.472")	5/8"	48 (1.890")	30.5 (1.201")	21 (0.827")	NS-30072 / 2.0 Nm	NK-T9
99616-IC16-5/8	SB5/8"-IC16	16 (0.630")	5/8"	48 (1.890")	37 (1.457")	27 (1.063")	NS-35080 / 2.5 Nm	NK-T15
99616-IC20-3/4	SB3/4"-IC20	20 (0.787")	3/4"	50 (1.969")	51 (2.008")	32 (1.260")	NS-50125 / 5.5 Nm	NK-T20
99616-IC25-1	SB 1"-IC25	25 (0.984")	1"	56 (2.205")	56 (2.205")	43 (1.693")	NS-50125 / 5.5 Nm	NK-T20

Cutting Data

Attention >>

- For d1< 4 mm or size #5, the center misalignment must be less than 0.05mm (0.002").
- If the CNC lathe turret center's misalignment is above 0.15mm (0.006), please use the Center Height Adjusting Sleeve. (See page 40)
- For low spindle speed special purpose machines or lathes, lower spindle speed is allowed but the feed rate should be maintained.

Ø1~Ø3.15 (#2~#4) >>

Workpiece material			f / d1	f=feed (IPR)					Cutting fluid
Material Group		Sample code (AISI)	S= speed (SFM)	IC08		IC12			
				Ø1~1.25 mm	Ø1.6~ 2.5mm (#2)	Ø2 #2 (0.079")	Ø2.5 #3 (0.098")	Ø3.15 #4 (0.124")	
	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	.0001~.0004	.0002~.0008	.0004~.0008	.0004~.0012	.0008~.0020	emulsion internal≥5 bar
	Grey cast iron	35	165~230	.0004~.0016	.0008~.0024	.0008~.0024	.0016~.0031	.0024~.0039	dry
	Al, and non-ferrous metal	6061	325~650	.0004~.0012	.0004~.0016	.0004~.0016	.0008~.0020	.0008~.0024	emulsion

Ø4~Ø10 (#5~#10) >>

Workpiece material			f / d1	f=feed (IPR)					Cutting fluid
Material Group		Sample code (AISI)	S= speed (SFM)	IC16		IC20		IC25	
				Ø4 #5 (0.157")	Ø5 #6 (0.197")	Ø6.3 #7 (0.248")	Ø8 #8 (0.315")	Ø10 #10 (0.394")	
	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≥5 bar
	Grey cast iron	35	165~230	.0024~.0039	.0031~.0047	.0031~.0055	.0039~.0063	.0047~.0071	dry
	Al, and non-ferrous metal	6061	325~650	.0008~.0024	.0016~.0031	.0016~.0031	.0024~.0039	.0024~.0039	emulsion

• Step-1

Loosen the screw

• Step-2

Hole in the back

• Step-3

Push out insert

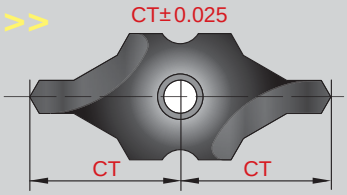
• Step-4

Place new insert
Logo side up

Performance

Profit by making the right choice >>

- High speed and feed rate reduce cutting time.
- The unique design increases tool life and reduces change over time.

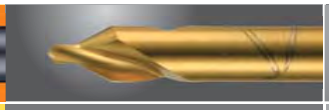
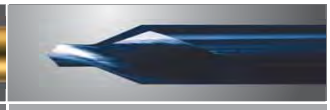


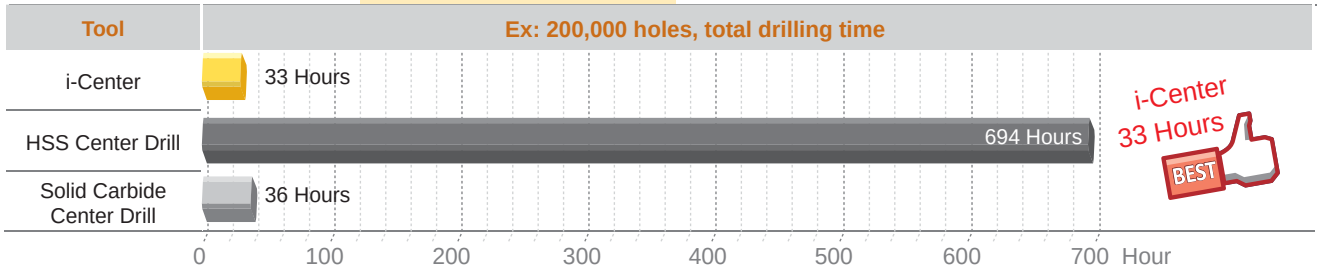
▲ 2 cutting edges

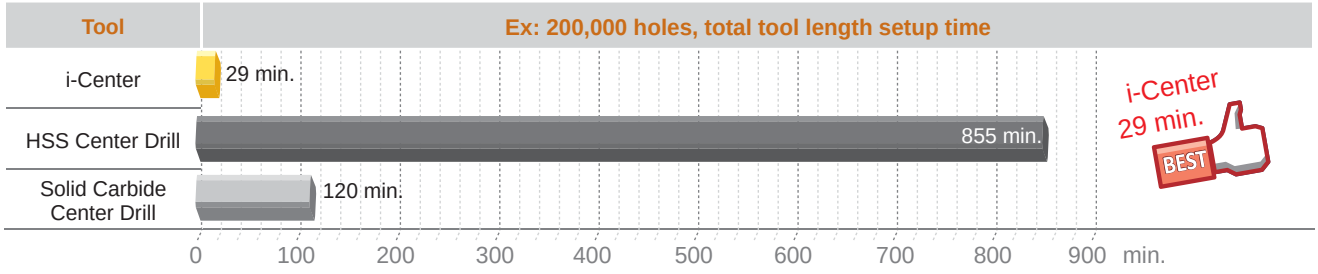
▲ 2 cutting flutes design

Comparison >>

- Workpiece : Low carbon alloy steel, 850 N/mm^2
- Machine: VMC BT40 with internal coolant

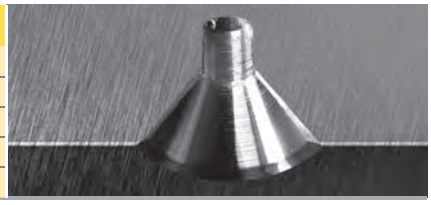
Diameter of tool : Ø3.15 mm Depth of drilling : 7.2 mm				
Comparison		**i-Center**	**HSS Center Drill (TiN Coating)**	**Solid Carbide Center Drill**
Cutting speed	**m/min.**	65	17	65
Spindle speed	**r.p.m.**	6570	1718	6570
Feed rate f =	**mm/rev.**	0.12	0.02	0.1
Feed rate F=	**mm/min.**	788.4	34.4	657
Coolant	**Emulsion**	External / Internal	External	External
Drilling time	**sec.**	0.55	12.5	0.65
Holes of drilling per edge		7000	700	5000

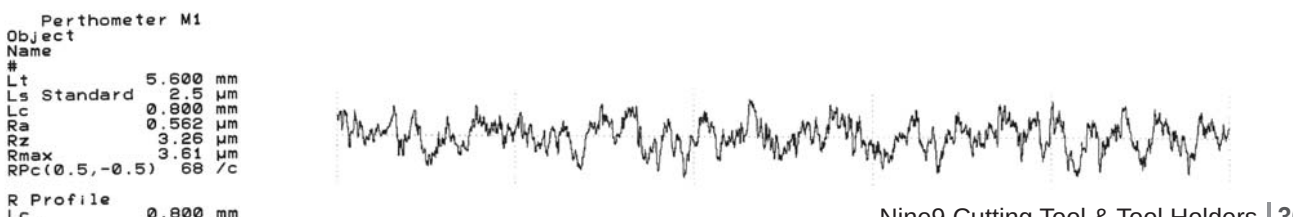




Surface finish >>

i-Center Insert	Material SCM440		
I9MT1603B0500 NC2033	**Vc**	60	m/min.
	S	3800	r.p.m.
	f	0.1	mm/rev.
	F	380	mm/min.
	Ap	13.5	mm.



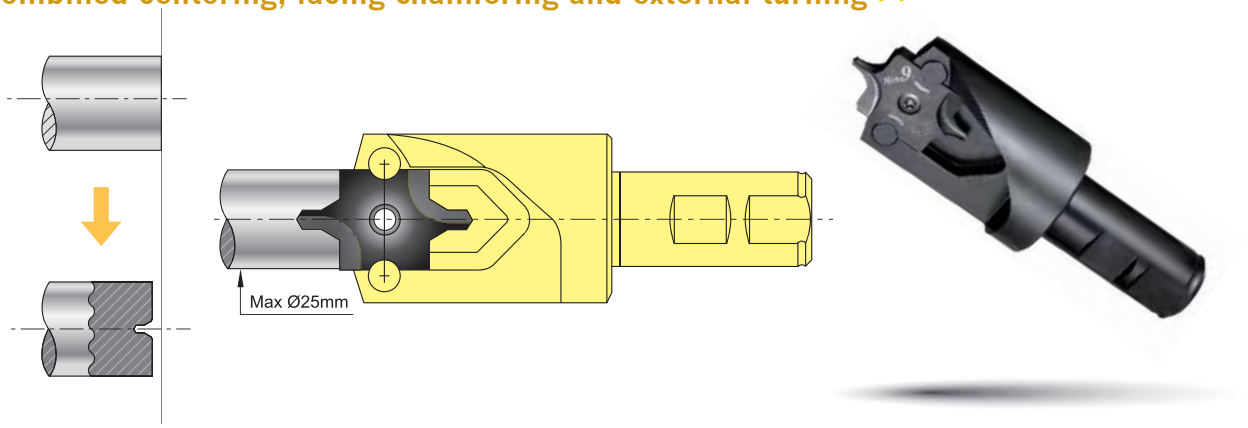


Application of i-Center >> Special holder

NEW

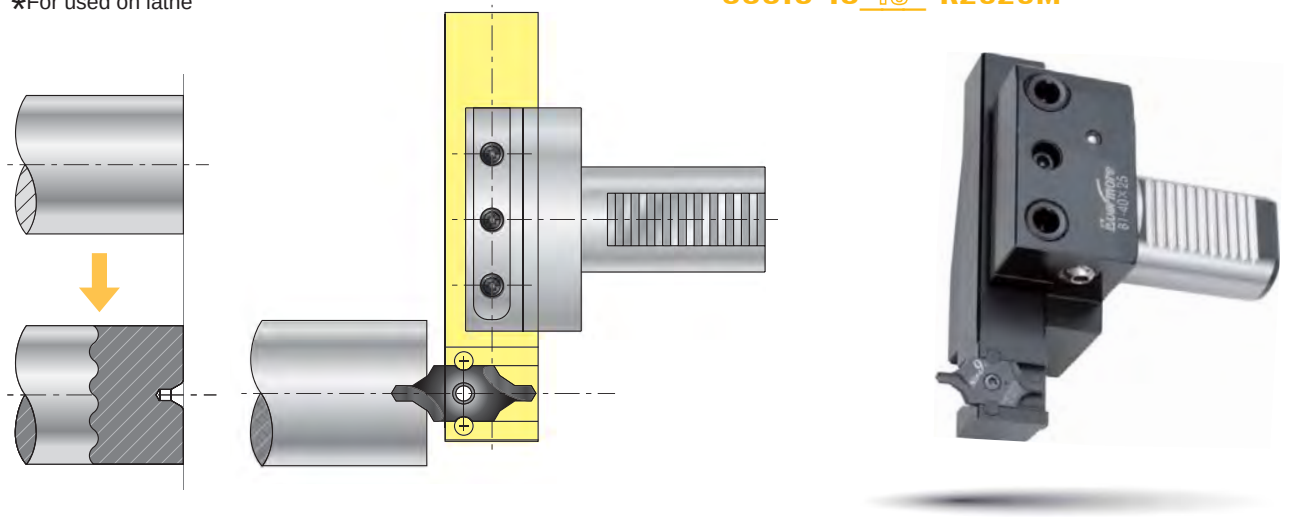
Special insert.

Combined centering, facing chamfering and external turning >>

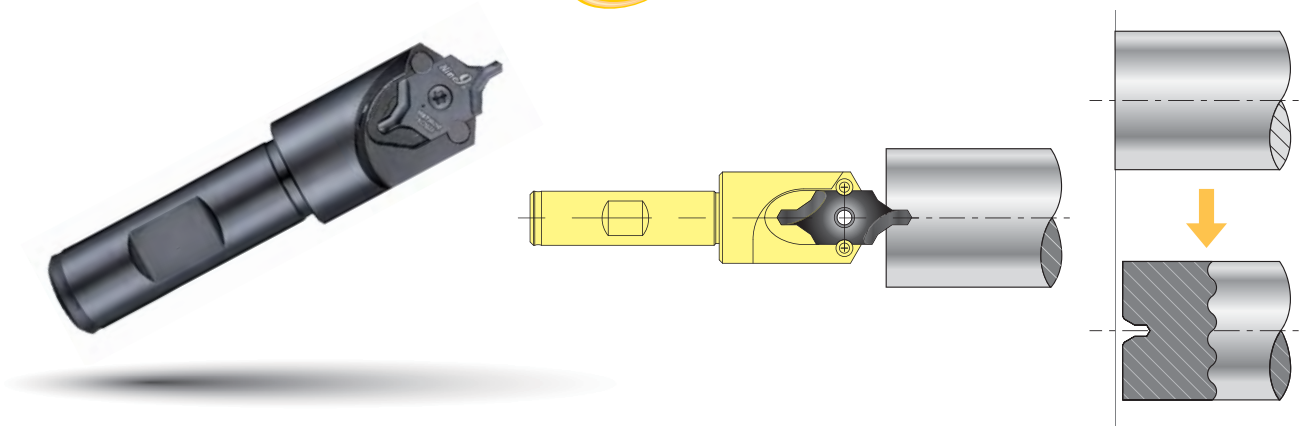


25x25 square shank holder >> Parts NO. 99616-IC 12 -L2525M
99616-IC 16 -R2525M

*For used on lathe

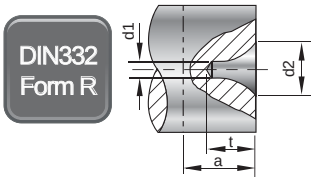


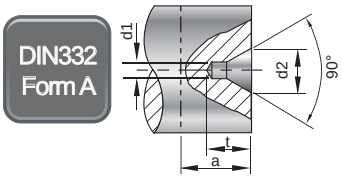
Left hand toolhold and Insert. New

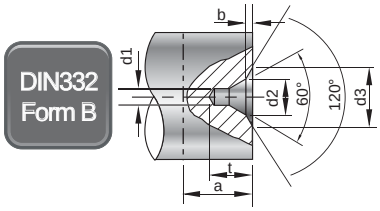


Technical Specifications

60° Center holes DIN 332 >> Form R, A and B

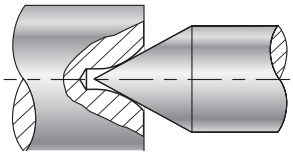
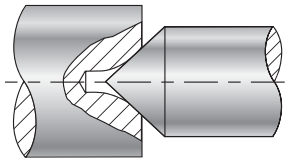
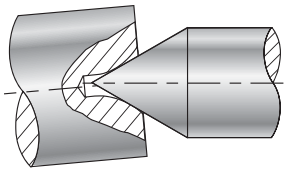




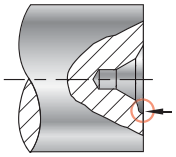
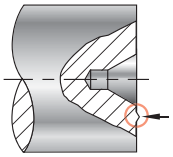
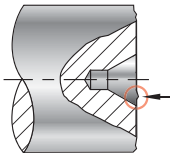
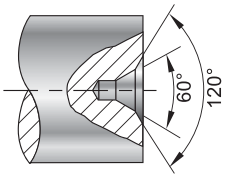


STD	DIN332 Form R ISO 2541-1972			DIN332 Form A ISO 866-1975			DIN332 Form B ISO 2540 1973				
d1	d2	t	a	d2	t	a	d2	b	d3	t	a
1	2.12	1.9	3	2.12	1.9	3	2.12	0.3	3.15	2.2	3.5
1.25	2.65	2.3	4	2.65	2.3	4	2.65	0.4	4	2.7	4.5
1.6	3.35	2.9	5	3.35	2.9	5	3.35	0.5	5	3.4	5.5
2	4.25	3.7	6	4.25	3.7	6	4.25	0.6	6.3	4.3	6.6
2.5	5.3	4.6	7	5.3	4.6	7	5.3	0.8	8	5.4	8.3
3.15	6.7	5.8	9	6.7	5.9	9	6.7	0.9	10	6.8	10
4	8.5	7.4	11	8.5	7.4	11	8.5	1.2	12.5	8.6	12.7
5	10.6	9.2	14	10.6	9.2	14	10.6	1.6	16	10.8	15.6
6.3	13.2	11.4	18	13.2	11.5	18	13.2	1.4	18	12.9	20
8	17	14.7	22	17	14.8	22	17	1.6	22.4	16.4	25
10	21.2	18.3	28	21.2	18.4	28	21.2	2	28	20.4	31

Advantage of Form R Center hole

60° Center of tail stock	90° Center of tail stock	Center hole and center are misaligned
		

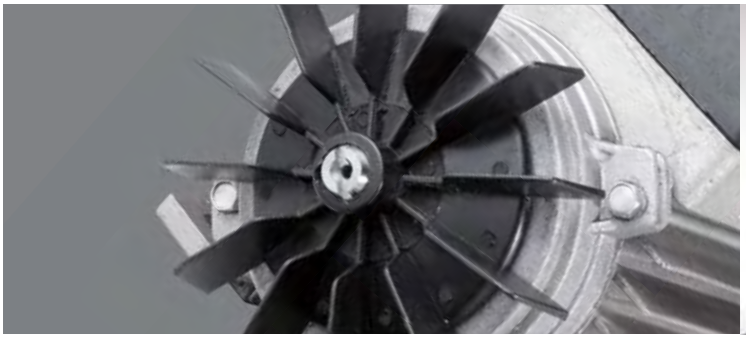
Advantage of Form B center hole

Avoid scar or distortion while transportation	Burr	Rough surface of workpiece	Total solution
			

i-Center Applications

Tip >>

- Various centering applictions and products - shafts of engine, transmission gear boxes, bearings, motors, grinding parts, spindles, gear reducers, cooling fan, universal joints...
- Special forms for other applications also available on request.



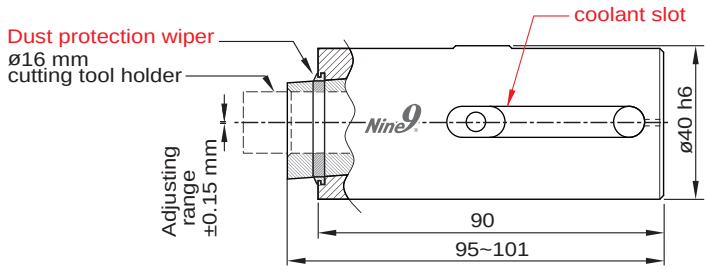
Center Height Adjusting Sleeve

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.

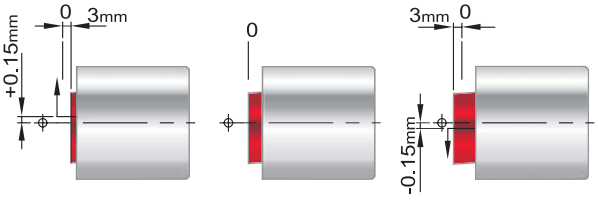
Parts No.:99600-400H >>

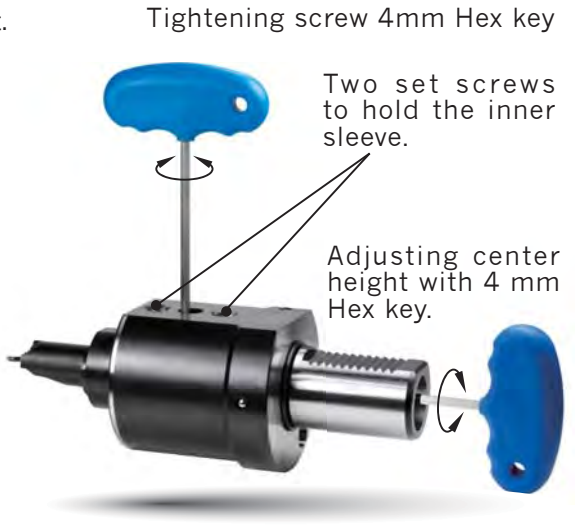
Type : SB32-ID16



Applications >>

- 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: ±0.15 mm(.006").
- Total axial movement is 6mm(.236").





Engraving 45° / 60° >>

This is a revolutionary new concept of engraving tools with indexable carbide inserts. They offer you the ability to produce HIGH QUALITY ENGRAVING in most materials. The latest coated carbide grades help you to obtain higher speed and feed rate, dramatically reducing your cycle time.

Features

High Positive Rake Angle

- Indexable insert.
- Suitable for engraving all types of materials, such as plastic,non-ferrous metal, aluminum, copper carbon steel and stainless steel.

Multi-Side Grinding

- Full peripherally ground insert to ensure efficient repeatability.
- It performs excellently without producing any burrs, especially in copper, aluminum and stainless steel.

High Speed, High Feed Rate

- Designed to run at high speed, up to 40,000 r.p.m.
- Feed rate 0.08mm (0.003") / rev. apply to aluminum; 0.05mm (0.002") / rev. apply to stainless steel.
- Reduces engraving cycle time!

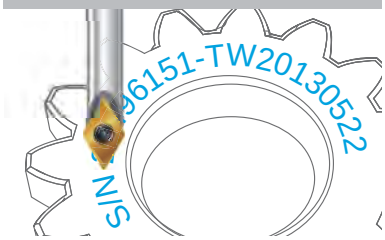
Economical

- Each indexable insert has 2 cutting edges.
- No resharpening required. Tool length is unchanged.
- No need to reset after changing insert or cutting edge.
- Excellent repeatability!

Applications

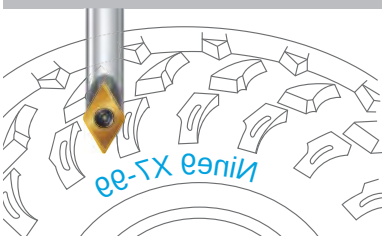
- Serial numbers, product codes, dial scales, signs, logo, graph and almost any character which can be created by the NC programming system.

Serial number

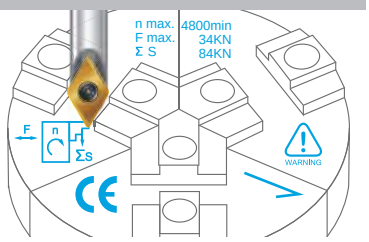


Logo outlines

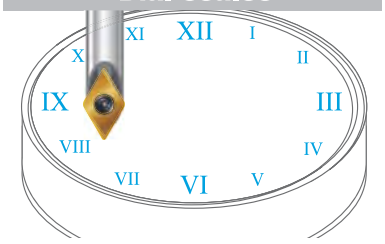
Mold & Die



Product info

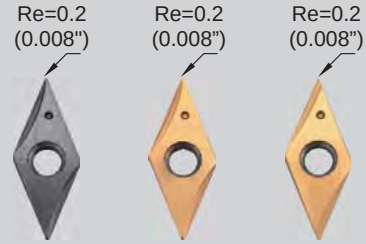


Dial scales



▲ **Commonly used for marking on machine components, medical components, gun components, mold and die, automotive parts, gears, bearings and luxury goods.**

Engraving Tool 45°

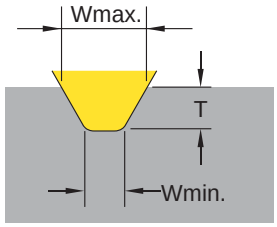


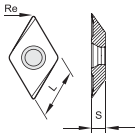
Inserts >>

NC2032: • Long tool life
• For all kinds of steel from 30~50 HRC, carbon steel, alloy steel, and cast iron.

NC2071: • Strong edge on chip groove best suited for min. DOC .008".
• Universal grade for all kinds of steel <30HRC, non-ferrous metal and stainless steel.

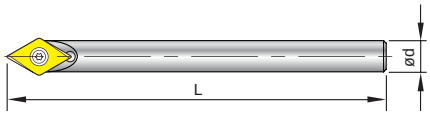
NC9031: • Fully positive ground rake angle, very sharp edge - first choice for shallow engraving.
• For non-ferrous metal such as aluminum, brass, copper, titanium, plastic and acrylic.



Parts No.		Coating	Grade		Dimensions			W		T	
					L	S	Re	Wmin.	Wmax.	Tmin.	Tmax.
V04506T1W06	NC2071	TiN	K20F		6.35 (0.250")	2.0 (0.079")	0.2 (0.008")	0.65 (0.026")	2.1 (0.083")	0.2 (0.008")	2.0 (0.079")
	NC2032	TiAlN						0.65 (0.026")		0.2 (0.008")	
	NC9031	TiN						0.45 (0.018")		0.05 (0.002")	

Holder >>

* • Carbide shank holders designed for shrink-fit holder, engraving machines, high speed cutting.
* • XL (100mm length) is only for Al, Al-alloy cutting, unbalanced <0.6gm.

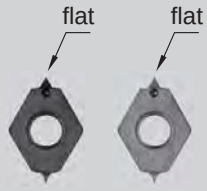


Ø6 (0.236")

Parts No.	Angle	Ød	L	L1	Screw	Key
99619-V045-06	45°	6 (0.236")	40 (1.575")	---	 NS-22044 0.9Nm	 NK-T7
* 99619-V045-06L			60 (2.462")	---		
* 99619-V045-06XL			100 (3.937")	---		

Note: • DC Slim chuck, see page 64.

Engraving Tool 60°



Inserts >>

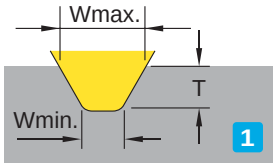
NC2032: • Long tool life
• For all kinds of steel from 30~50 HRC, carbon steel, alloy steel,and cast iron.

NC2071: • Strong edge on chip groove best suited for min. DOC .008".
• Universal grade for all kinds of steel <30HRC, non-ferrous metal and stainless steel.

NC2035: • ALDURA coating, reduces heat and tool wear.
• For steel with heat treatment up to 56 HRC.

NC9031: • Fully postive ground rake angle very sharp edge for shallow engraving.
• For non-ferrous metals such as aluminum, brass, copper, titanium, plastic and acrylic.

NC9036: • DLC coating, very sharp edge produces excellent surface finish.
• For non ferrous metals such as aluminum, brass, copper, titanium, plastic and acrylic.



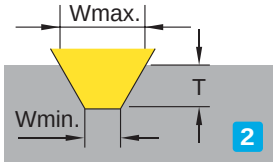


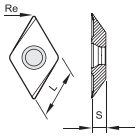
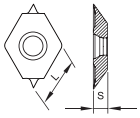
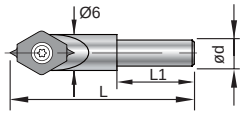
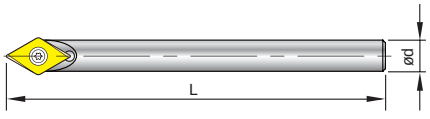
Fig	Parts No.	Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	W Wmin.	W Wmax.	T Tmin.	T Tmax.
1	V06006T1W06 NC2071	TiN	K20F		6.35 (0.250")	2.0 (0.079")	0.2 (0.008")	0.65 (0.026")	2.7 (0.106")	0.2 (0.008")	2.0 (0.079")
	NC2032	TiAlN						0.65 (0.026")		0.2 (0.008")	
	NC2035	ALDURA						0.65 (0.026")		0.2 (0.008")	
	NC9031	TiN						0.45 (0.018")		0.05 (0.002")	

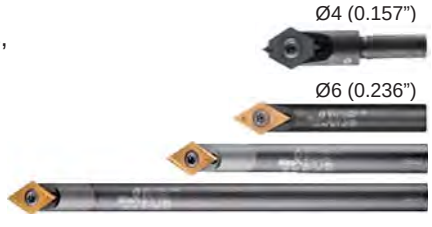
Fig	Parts No.	Coating	Grade		Dimensions L	Dimensions S	Dimensions Re	W Wmin.	W Wmax.	T Tmin.	T Tmax.
2	V06006T1W03 NC2032	TiAlN	K20F		6.35 (0.250")	2.0 (0.079")	---	0.25 (0.01")	1.1 (0.043")	0.05 (0.002")	0.8 (0.031")
	NC9036	DLC									

Holder >>

* • Carbide shank holders designed for shrink-fit holder, engraving machines, high speed cutting.
* • XL (100mm length) is only for Al, Al-alloy cutting, unbalanced <0.6gm.







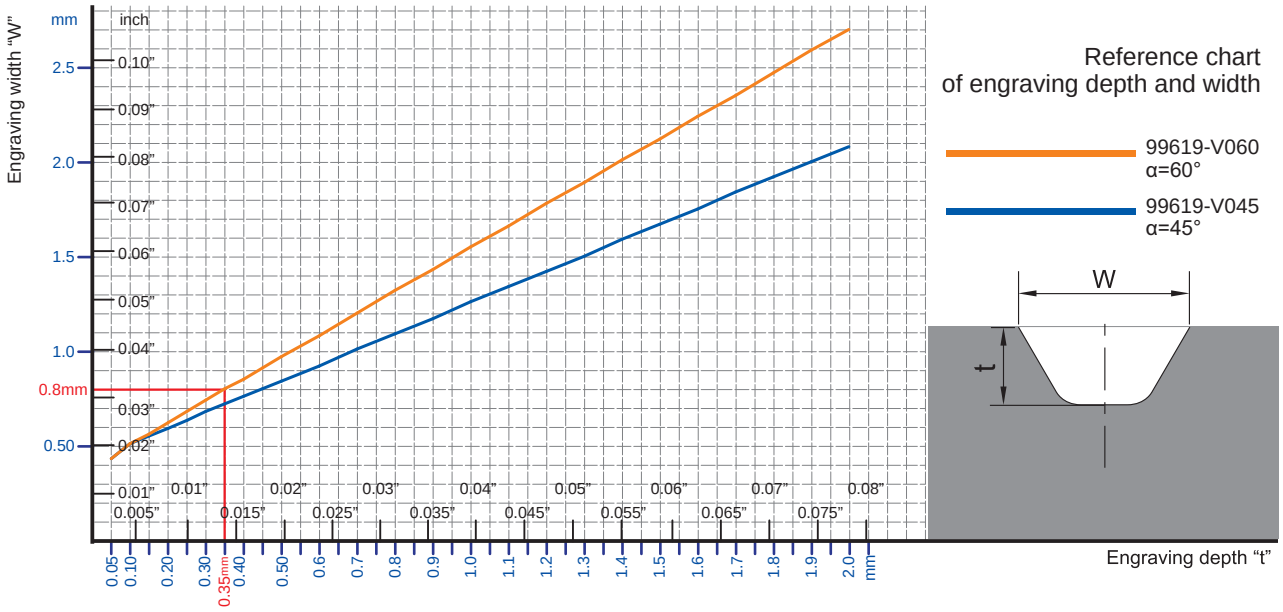
Parts No.	Angle	Ød	L	L1	Screw	Key
99619-V060-04	60°	4 (0.157")	30 (1.181")	12 (0.472")	 NS-22044 0.9Nm	 NK-T7
99619-V060-06		6 (0.236")	40 (1.575")	---		
* 99619-V060-06L			60 (2.462")	---		
* 99619-V060-06XL			100 (3.937")	---		

Cutting Data

Engraving Depth and Width Reference Chart

- 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.

V045/V060 T1W06 >>



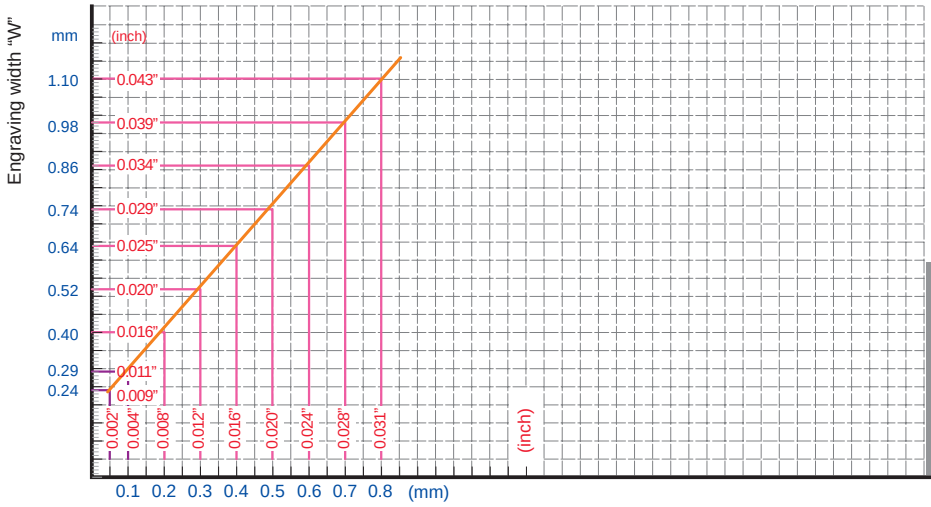
Work Material	S r.p.m.	f (inch/rev.)	Grade of Insert
Carbon steel	5000~40000	0.0003~0.0020	NC2071,NC2032
Alloy steel	5000~40000	0.0003~0.0012	NC2032,NC2071
Alloy steel≧HRc40°~56°	5000~40000	0.0003~0.0008	NC2035
Stainless Steel	5000~40000	0.0003~0.0020	NC2071,NC9031
Cast iron	5000~40000	0.0003~0.0012	NC2032
Aluminum≧Non-Ferrous Metal	5000~40000	0.0003~0.0031	NC2071,NC9031

Tmax.:0.0787"

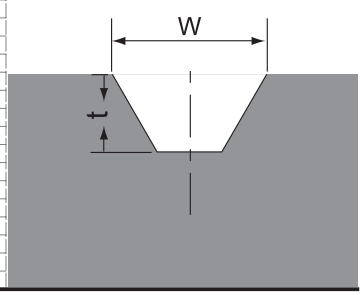
Material \ Ap	1st	2nd	3rd	4th	5th	6th	—	Fine finishing
Carbon steel	0.031"	0.024"	0.012"	0.008"	0.004"	—	—	0.004"
Alloy steel	0.020"	0.016"	0.012"	0.012"	0.008"	0.008"	0.004"	0.004"
Alloy steel≧HRc40°~56°	0.008"	0.008"	0.006"	0.006"	0.004"	0.004"	0.004"	0.002"
Stainless Steel	0.020"	0.016"	0.012"	0.012"	0.008"	0.008"	0.004"	0.002"
Cast iron	0.040"	0.024"	0.012"	0.008"	0.004"	—	—	0.004"
Aluminum≧Non-Ferrous Metal	0.079"	0.040"	0.008"	—	—	—	—	0.004"

Cutting Data

V060 T1W03 >>



Reference chart
of engraving depth and width



Engraving depth "t"

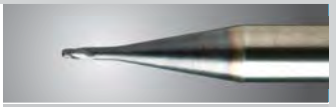
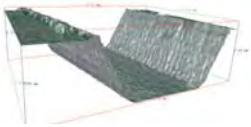
Work Material	S r.p.m.	f (inch/rev.)	Grade of Insert
Carbon steel C<0.3%	5000 ~ 40000	0.0002 ~ 0.0004	NC2032
Carbon steel C>0.3%	5000 ~ 40000	0.0002 ~ 0.0006	NC2032
Alloy steel	5000 ~ 40000	0.0002 ~ 0.0004	NC2032
Stainless Steel	5000 ~ 40000	0.0002 ~ 0.0004	NC9036
Cast iron	5000 ~ 40000	0.0002 ~ 0.0006	NC2032
Aluminum	5000 ~ 40000	0.0002 ~ 0.0006	NC9036
Copper, Brass	5000 ~ 40000	0.0002 ~ 0.0004	NC9036
Titanium	5000 ~ 40000	0.0002 ~ 0.0006	NC9036

Tmax.:0.0315"

Material \ Ap	1st	2nd	3rd	4th	5th	—	Fine finishing
Carbon steel C<0.3%	0.0118"	0.0080"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
Carbon steel C>0.3%	0.0118"	0.0080"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
Alloy steel	0.0118"	0.0040"	0.0040"	0.0020"	0.0020"	0.0020"	0.0012
Stainless Steel	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
Cast iron	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
Aluminum	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
Copper, Brass	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012
Titanium	0.0080"	0.0040"	0.0040"	0.0040"	0.0020"	0.0020"	0.0012

Performance

Comparison >>

Tool / Cutting data	 00-99619-V060-06 V06006T1W06-NC2071	 Engraving tool	 Ball nose end mill Radius 0.4 mm
Workpiece material	Tool steel SKD 61 (JIS G 4404), Hardness: HRB92~93 (HB 200)		
Spindle speed r.p.m.	10000	10000	10000
Feed rate mm/min.	100	100	300
Cutting depth Ap	0.2 mm	0.2 mm	0.05 mm, 4 times to cut to 0.2 mm
Roughness of bottom Ra	0.36 μm	0.83 μm	0.46 μm
Change and resetting	No need	Need	Need
Tool life	Long	Short	Short
Measured result by Alicona IFM system			

Cutting data / Tool	00-99619-V060-06 V06006T1W06-NC2071	00-99619-V060-06 V06006T1W06-NC2071	00-99619-V060-06 V06006T1W06-NC2035
Workpiece material	**SKD 51**	**SS**	SKD 61 (50HRC)
Spindle speed r.p.m.	10000	10000	10000
Feed rate mm/min.	300	300	100
Cutting depth Ap	0.1 mm	0.35 mm	0.2 mm
Change and resetting	No need	No need	No need
Tool life	24 min.(1440 sec.)	7.2 meters	3.5 meters

Attention >>

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%** of the table feed rate.

Cutting fluid and cooling condition

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

Setting-up the tool holder

- The tool shank runout should be below 0.01 mm.(0.0004")
- Shrink fit chucks, hydraulic chuck and high precision spring collet chucks are recommended.
- Pre-balance the tool holder minimum G6.3/10,000 R.P.M. is necessary.

Clamping the engraving insert

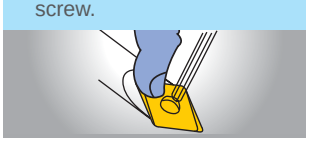
- Place and hold the insert in the insert pocket against the positioning side.
- See illustration below:

• Step-1

Place the insert in the insert pocket.

• Step-2

Push insert against insert pocket and insert the screw.



• Step-3

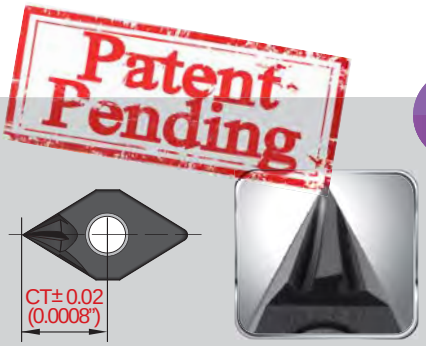
Tighten the insert screw.

NC Deburring

Starter Kit SUPPLY
Page 01~02

Features >>

- High feed rate for high speed deburring on CNC machines.
- Indexable type ensures the relative position of deburring.

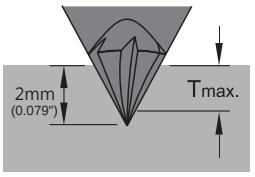


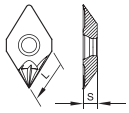
NC2032

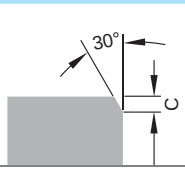
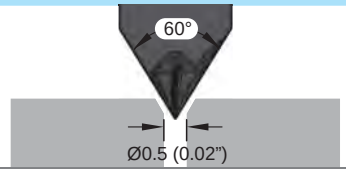
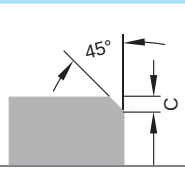
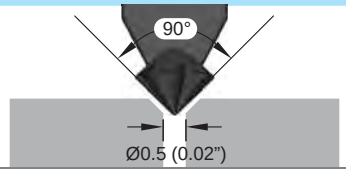
NEW

Inserts >>

- Smallest counter sink diameter Ø0.5 mm (0.019").
- Ideal for fine hole deburring.
- Each insert has one cutting edge.
- Using same tool holder of X060 engraving tool.
- Indexable type. Relative position of deburring depth and diameter are accurate.
- TiAlN coated carbide insert can stand very long life.

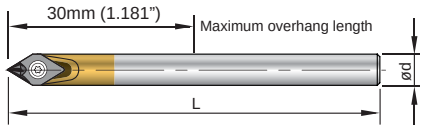


Parts No.	Angle	Coating	Grade		C		Dimensions			Tmax.
					Cmin.	Cmax.	L	S	Re	
X060A60T6-NC2032	60°	TiAlN	K20F		0.1 (0.004")	1.0 (0.040")	6 (0.236)	2.0 (0.079")	--	1.6 (0.063")
X060A90T6-NC2032	90°				0.1 (0.004")	1.2 (0.047")	6 (0.236)	2.0 (0.079")	--	1.75 (0.069")

60 degree		90 degree	
			
Deburring	Counter sinking	Deburring	Counter sinking

Holder >>

- Steel and carbide shank is ground to h6 tolerance.
- 99619-X060-06 made of steel. 99619-X060-06L made of high alloy steel and brazed on a carbide shank.
- Provides high rigidity and anti-vibration.



Ø6 (0.236")
Steel Type

Carbide Type

Parts No.	Ød	L	Screw	Key
99619-X060-06	6 (0.236")	40 (1.575")	 NS-22044 0.9Nm	 NK-T7
* 99619-X060-06L		60 (2.362")		

* 99619-X060-06L is carbide shank holder

Attention >>

- Use high precision tool holder to make sure run-out of tool shank is below 0.01 mm (0.0004").
- High precision collect chuck, shrink fit chuck and hydraulic chuck are recommended.

Super Drill

Ø10 ~ Ø30

- Smallest indexable drill from 10mm.
- 4 cutting edges per insert, same insert for outer and inner insert.

SMALLEST DIMENSION

3xD : Ø10 to Ø30 mm.

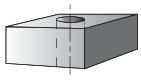
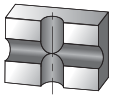
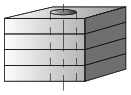
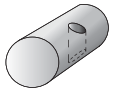
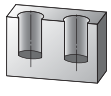
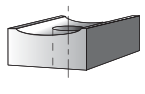
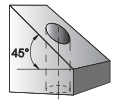
SMALLER CUTTING CHIP

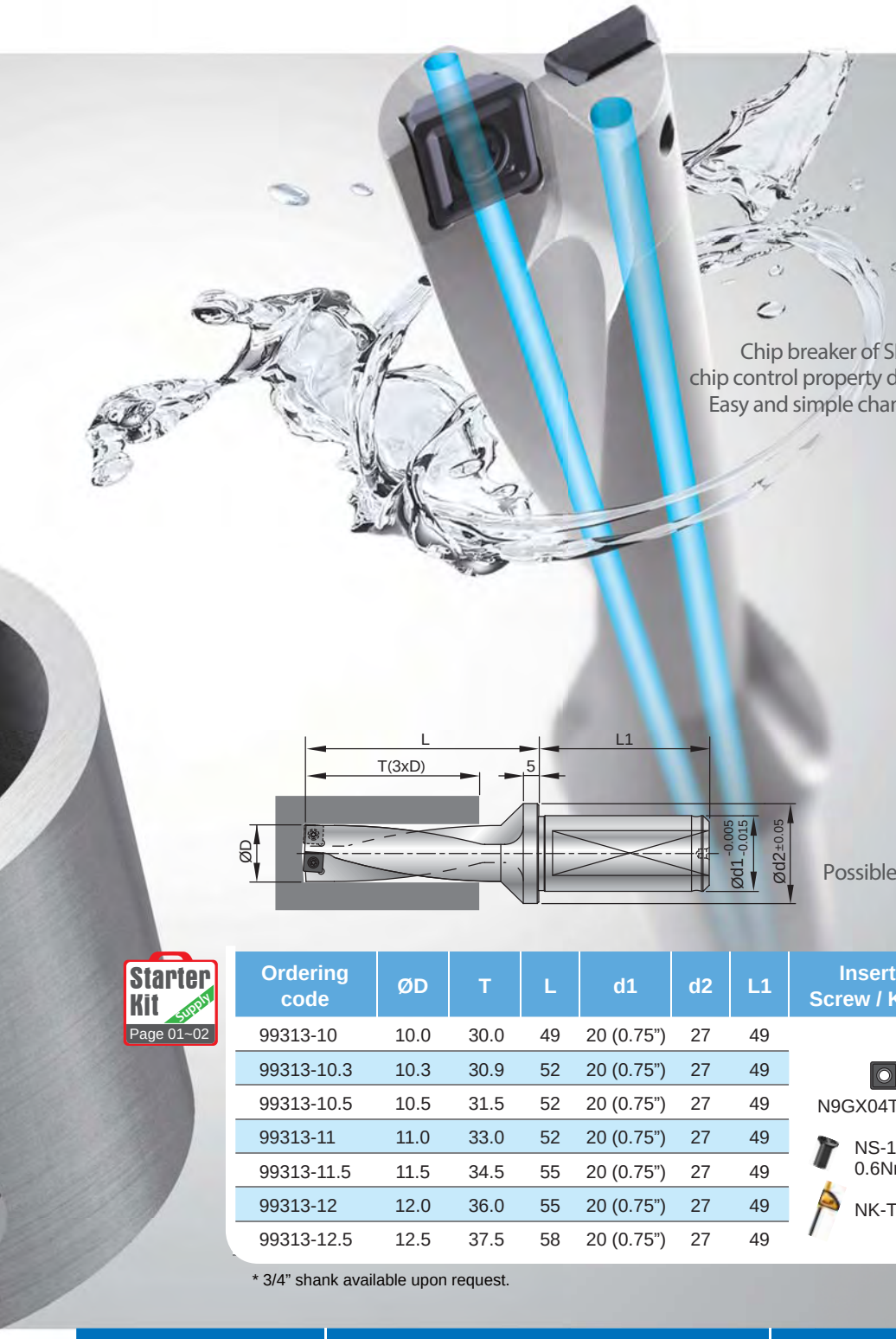
- The center and peripheral inserts are positioned in order to divide the cutting chips into smaller spiral shapes. It helps the cutting chips to be removed faster and easier.
- Designed for high productivity, high speed cutting. Coolant supply is needed.

BETTER SURFACE FINISH AND BETTER DIAMETER ACCURACY

- Special insert positioning to balance the cutting forces, better surface finish and diameter accuracy are achievable.

◘ Application & TECH. >>

Application	Regular Surface 100%	Cross Holes 80%	Stack Drilling 80%~70%	Round Workpiece Offset Drilling 80%~60%	Plunge Drilling 80%	Concave Surfaces 80%	Angled Surfaces 80%~70%	Cone Workpiece Offset Drilling 80%~70%
Workpiece Shape								



Ordering Code:
N9GX04T002-NC2032

4 cutting edges insert NC2032, K20F grade AlTiN coated

Chip breaker of SPD insert provides excellent chip control property due to its engineered design

Easy and simple change of cutting edge without inconvenience

≃ Flat bottom shape

Angled Surfaces

Possible to drill into angled surfaces without pre-drilling

Starter Kit Supply
Page 01~02

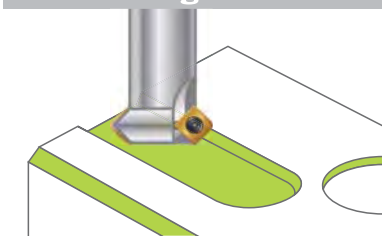
Ordering code	ØD	T	L	d1	d2	L1	Insert Screw / Key	Radial Adjustment	D max
99313-10	10.0	30.0	49	20 (0.75")	27	49		0.25	10.5
99313-10.3	10.3	30.9	52	20 (0.75")	27	49		0.25	10.8
99313-10.5	10.5	31.5	52	20 (0.75")	27	49	N9GX04T002	0.25	11.0
99313-11	11.0	33.0	52	20 (0.75")	27	49	NS-18037 0.6Nm	0.20	11.4
99313-11.5	11.5	34.5	55	20 (0.75")	27	49		0.20	11.9
99313-12	12.0	36.0	55	20 (0.75")	27	49	NK-T6	0.15	12.3
99313-12.5	12.5	37.5	58	20 (0.75")	27	49		0.15	12.8

* 3/4" shank available upon request.

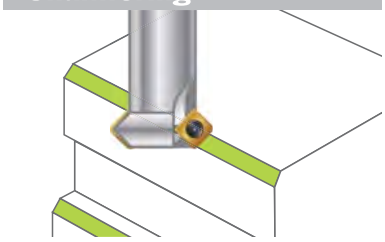
Work Material	SFM	IPR (inch / rev.)
Carbon Steel	200~985	0.0010 ~ 0.0030
Stainless Steel	200~500	0.0010 ~ 0.0020
Cast Iron	265~400	0.0020 ~ 0.0030
Hardened Steel	200~330	0.0010 ~ 0.0020

* Adjust speed and feed percentage by applications.

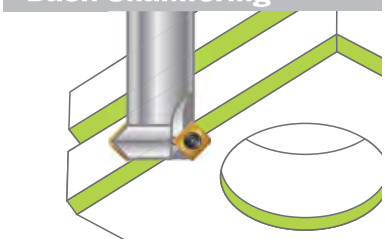
Face Milling



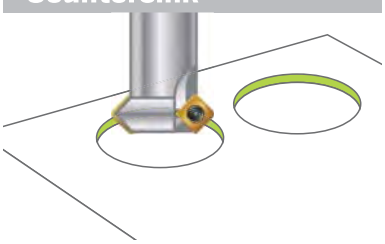
Chamfering



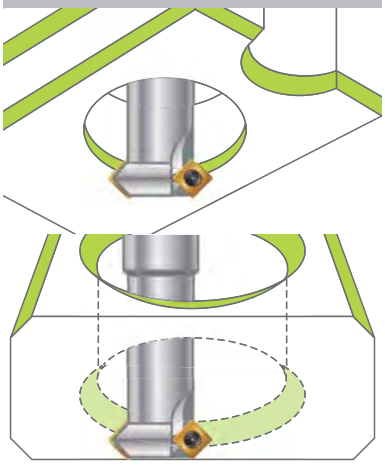
Back Chamfering



Countersink



Back
Circular Chamfering



Chamfer Mill 45° >>

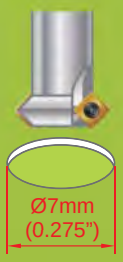
Designed for chamfering and countersinking with an indexable insert. The insert is a specifically designed for use in high speed machining ; the multiple flutes provide for increased feed rate, optimizing performance and reducing cutting time.

Features

Ultra high speed and feed rate is the biggest advantage of Nine9 Chamfer Mills.
It is not a traditional chamfer tool, it runs 4 times faster in cutting speed and 10 times higher in feed rate.
It is the most efficient tool you ever met.

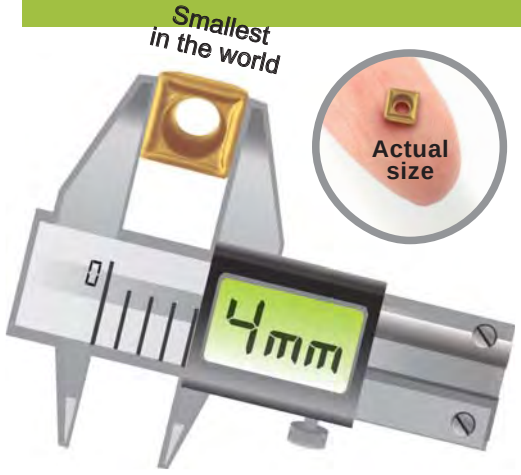
Excellent Repeatability >>

- Smallest insert in the world for chamfering mill.
- Smallest Indexable counter sink, diameter Ø7mm.
- The insert is dual-relief angle, specially edge honning and optimized coated for high cutting speed.
- Optimized the number of teeth on the holder to achieve higher feed rate.
- For front and back chamfering. Eliminates 2nd operation or deburring time.



Applications >>

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



Indexable Chamfer Mill

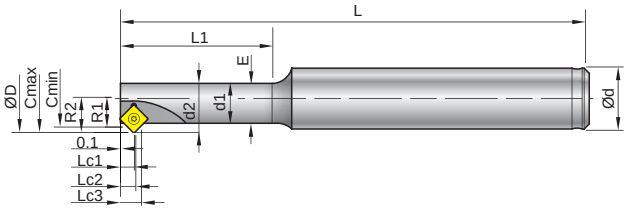
Features >>

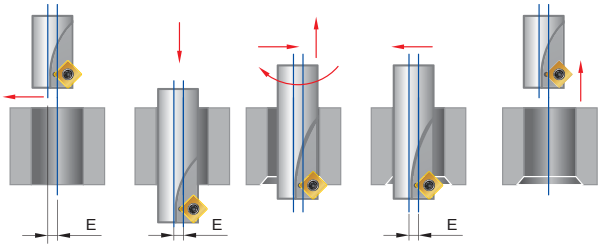
- Benefitting from the specially ground dual-relief insert and optimized coating, higher feed rates and cutting speeds can be achieved on chamfering operations.
- Each insert has 4 cutting edges, reducing cost of inserts.
- Fine edge honning cutting edge, good chip breaking condition and long tool life.

Starter Kit SUPPLY
Page 01~02

99616-C02, C04, C06 >>

- Made from hot working steel and hardened.
- Elliptical necked bar to optimize the tool strength.

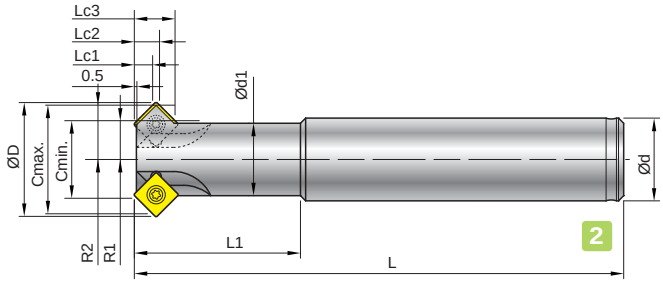




Parts No.	Thread Size	Cmin ø	Cmax ø	ød	ød1	ød2	øD	R1	R2	L	L1	Lc1	Lc2	Lc3	E	z	insert Screw / Key
99616-C02	M8	6.8 (0.268")	8.8 (0.346")	10 (0.394")	5.25 (0.207")	6.5 (0.256")	9 (0.354")	3.4 (0.134")	4.4 (0.173")	80 (3.15")	20 (0.787")	2.56 (0.100")	2.93 (0.115")	3.93 (0.155")	1.25 (0.049")	1	
99616-C04	M10	8.5 (0.335")	10.8 (0.425")	12 (0.472")	6.45 (0.254")	8 (0.315")	11.1 (0.437")	4.25 (0.167")	5.4 (0.212")	100 (3.94")	25 (0.984")	2.51 (0.099")	2.98 (0.117")	4.13 (0.163")	1.55 (0.061")	1	N9GX04T002 NS-18037 0.6Nm NK-T6
99616-C06	M12 1/2	10.26 (0.404")	13.2 (0.520")	12 (0.472")	7.88 (0.310")	9.75 (0.384")	13.5 (0.531")	5.13 (0.202")	6.6 (0.260")	100 (3.94")	30 (1.181")	2.51 (0.099")	2.98 (0.117")	4.45 (0.175")	1.88 (0.074")	1	

99616-C10~99616-C52 >>

- Made from tool steel.



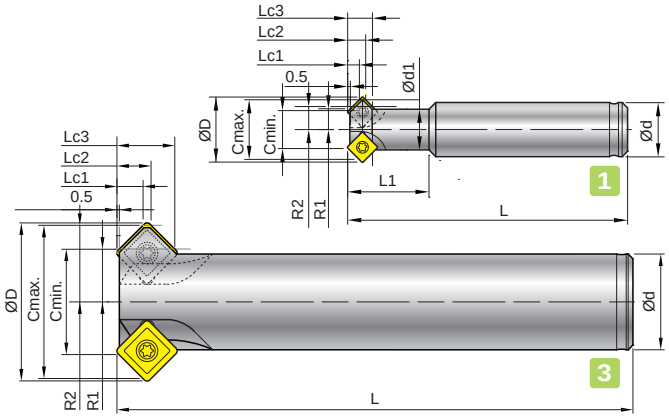
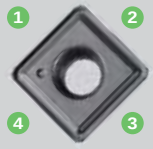


Fig	Parts No.	Type	Cmin ø	Cmax ø	ød	ød1	øD	R1	R2	L	L1	Lc1	Lc2	Lc3	z	insert Screw / Key
1	99616-C10	BC10-C07-60	7 (0.276")	11 (0.433)	10 (0.394")	7.5 (0.295")	12 (0.472")	3.8 (0.150")	4.3 (0.169")	60 (2.362")	15 (0.590")	2.6 (0.102")	2.9 (0.114")	4.6 (0.181")	2	N9GX04T002 NS-18037 0.6Nm NK-T6
2	99616-C20	BC12-C11-100	11 (0.433")	16 (0.630")	12 (0.472")	9.6 (0.378")	16.2 (0.638")	5.9 (0.232")	8 (0.315")	100 (3.937")	25 (0.984")	2.6 (0.102")	2.9 (0.114")	5.0 (0.197")	4	
2	99616-C30	BC16-C15-120	15 (0.590")	21 (0.827")	16 (0.630")	14 (0.551")	22 (0.866")	7.5 (0.295")	11.5 (0.453")	120 (4.724")	40 (1.575")	3.5 (0.138")	4.9 (0.193")	7.9 (0.311")	4	N9GX060204 NS-22055 0.9Nm NK-T7
	99616-C40	BC20-C19-130	19 (0.748")	25 (0.984")	20 (0.787")	18 (0.709)	26 (1.024")	9.5 (0.374")	12.5 (0.492")	130 (5.118")	50 (1.969")	3.5 (0.138")	4.9 (0.193")	7.9 (0.311")	4	
3	99616-C50	BC20-C22-130	22 (0.866")	32 (1.260")	20 (0.787")	--	33 (1.299")	11 (0.039")	16 (0.630")	130 (5.118")	--	5.5 (0.217")	7.1 (0.280")	12.1 (0.476")	4	N9GX090308 NS-30072 2.0Nm NK-T9
2	99616-C52	BC25-C22-180	22 (0.866")	32 (1.260")	25 (0.984")	20 (0.787")	33 (1.299")	11 (0.039")	16 (0.630")	180 (7.090")	80 (3.150")	5.5 (0.217)	7.1 (0.280")	12.1 (0.476")	4	

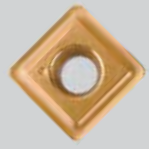
Inserts >>

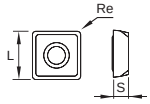
NC2032: • K20F grade, AlTiN coated. The 1st choice for high carbon, high alloy and hardened steels as well as cast iron.

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

Parts No.		Coating	Grade		Dimensions				
Code of insert					L	S	Re	Screw	Key
N9GX04T002	NC2032	AlTiN	K20F		4.0 (0.157")	1.8 (0.070")	0.2 (0.008")	NS-18037 0.6Nm	NK-T6
	NC9071	TiN							
N9GX060204	NC2032	AlTiN			6.35 (0.250")	2.38 (0.094")	0.4 (0.016")	NS-22055 0.9Nm	NK-T7
	NC9071	TiN							
N9GX090308	NC2032	AlTiN			9.52 (0.375")	3.18 (0.125")	0.8 (0.031")	NS-30072 2.0Nm	NK-T9
	NC9071	TiN							

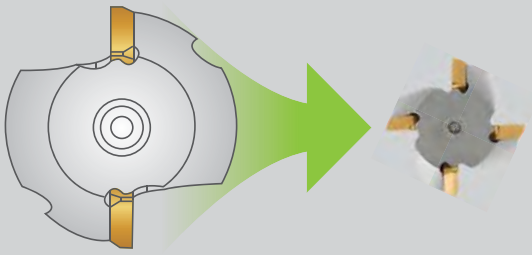
99616-C02, C04, C06 Cutting Data >>

Workpiece Material		Grade of insert	Cutting Speed SFM feet / min.	Feed Rate inch / tooth
Material Group	Sample Code (AISI)			N9GX04T002 Max. Chamfering 0.059 inch
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"

99616-C10~C52 Cutting Data >>

Workpiece material		Grade of insert	Cutting Speed SFM feet / min.	Feed Rate inch / tooth		
				N9GX04T002	N9GX060204	N9GX090308
Material Group	Sample Code (AISI)			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"
Casting 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"

Performance



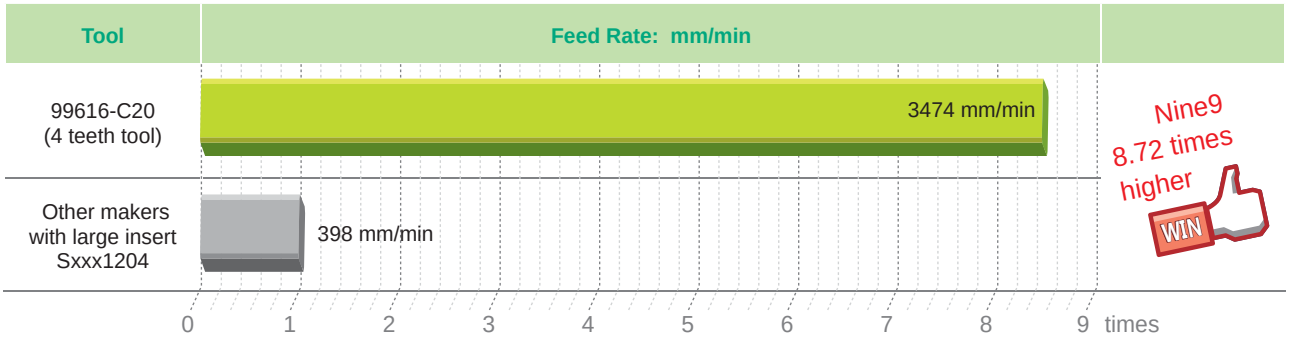
Feed Rate =
Feed per Tooth x Spindle Speed x **No. of Flute** mm/min.

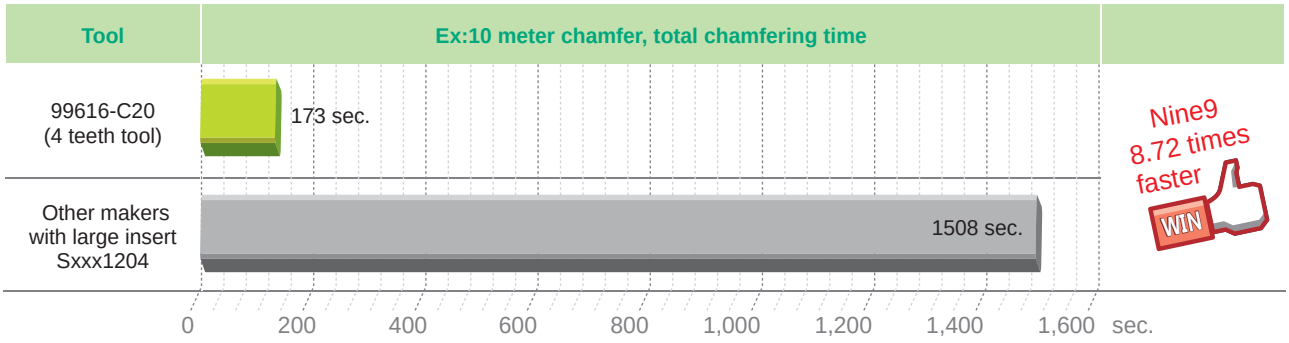
UP **Spindle Speed** = $\frac{\text{Cutting Speed x 1000}}{\pi \text{ x Cmin.}}$

Test Result >> Example 1

• Chamfer tool with larger insert(Sxxx1204) and Nine9 N9GX04 insert.

Tool			
Cutting data		**Nine 9 Chamfer mills**	**Other makers with Large insert**
Chamfering		1 mm	1 mm
Feed rate	**mm/rev.**	0.1	0.1
Dia. of cutter	**mm**	11	32
Teeth of cutter		4	2
Cutting Speed Vc	**m/min.**	300	200
Spindle Speed	**r.p.m.**	8685	1990
Feed rate	**mm/min**	3474	398





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

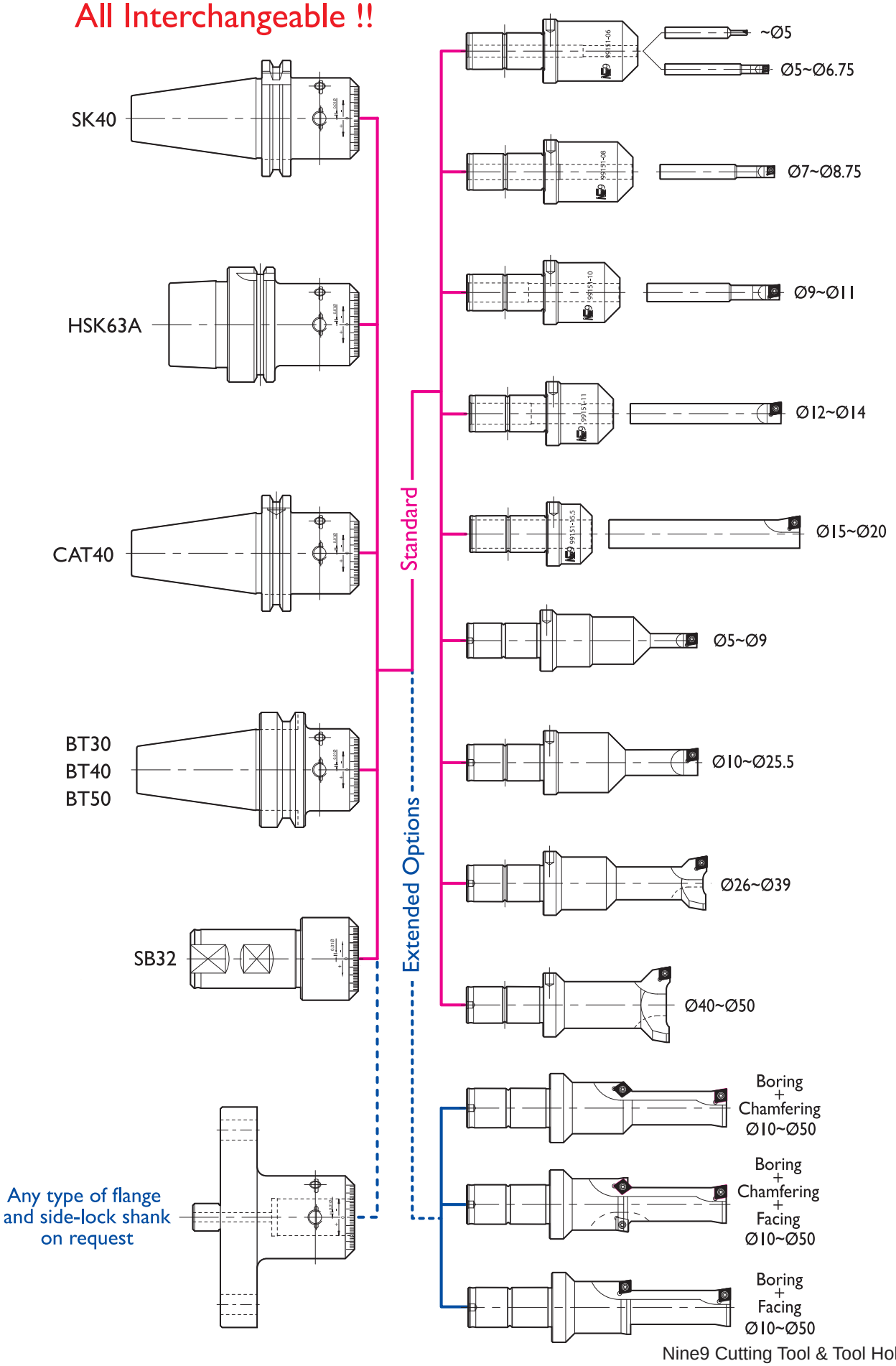
- Boring bar design ensures accurate high speed boring. Grade balance is G6.3 10000 r.p.m., all sizes are guaranteed.
- Surface speeds of carbide inserts up to 700 m/min.
- Combination bore / chamfer / facing tools can be ordered on request.

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. (Recomended 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 (Recomended torque = 8~9Nm)

Quick Change High Speed Boring Tools

All Interchangeable !!



Quick Change High Speed Boring Tools

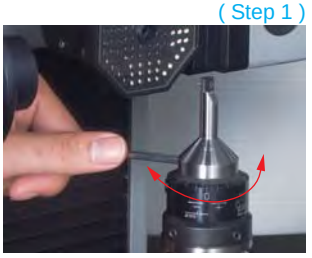
Featuring Improved:

● 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.

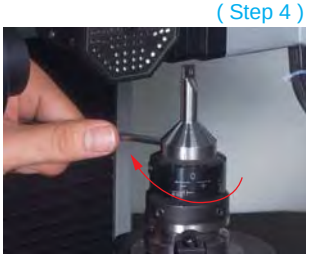
(Step 1)



(Step 2)

(Step 3)

(Step 4)



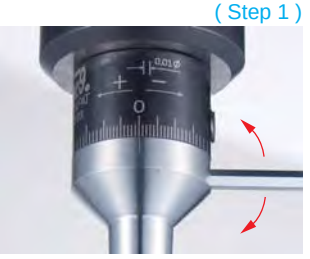
To Increase Diameter

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)

(Step 1)



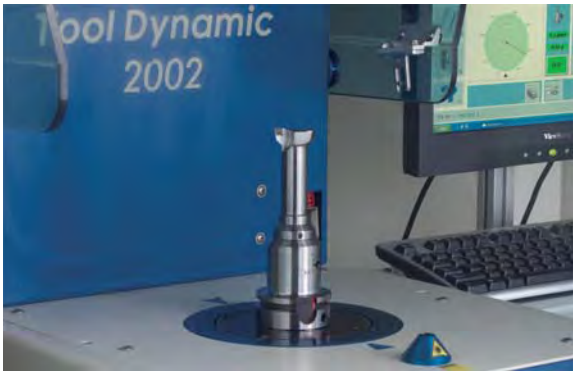
(Step 2)

To Increase Diameter

(Step 3)

(Step 4)

To Reduce Diameter



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

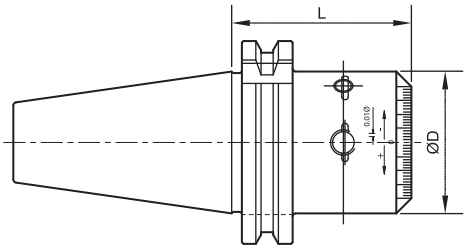
USA Patent ►

Quick Change High Speed Boring Tools

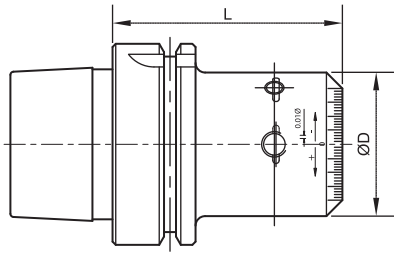
Boring Head Shank

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

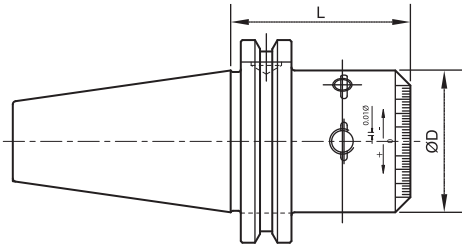
SK40



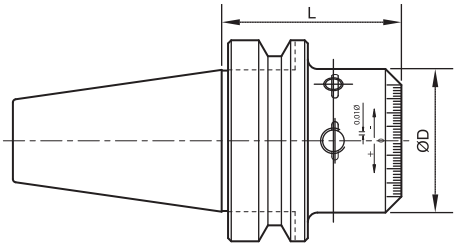
HSK63



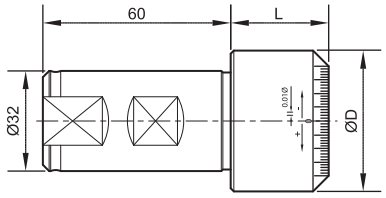
CAT40



BT



SB32

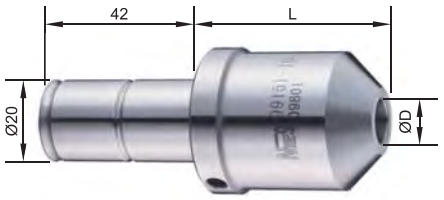


Parts No.	ØD	L
SB32-146-31	45	31.3
BT30-146-51	45	51.3
BT40-146-56	45	56.3
BT50-146-77	45	77.3
CAT40-146-56	45	56.3
HSK63A-146-72	45	72
SK40-146-56	45	56.3

Quick Change High Speed Boring Tools

Adapter

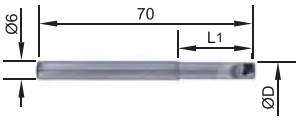
• Economical solution of small dia. boring bar.



Parts 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

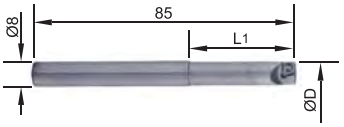
• Solid Carbide Shank • Boring Depth : L1, 4~6xD



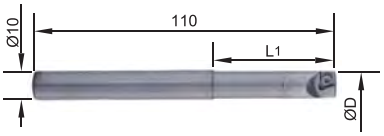
Parts No.	ØD	L1	Insert
C06-0500-20L	4.87~5.12	20.00	CCGT030102-NC30 Screw: NS-16030 Key: NK-T6
C06-0525-20L	5.12~5.37	20.00	
C06-0550-22L	5.37~5.62	22.00	
C06-0575-22L	5.62~5.87	22.00	
C06-0600-24L	5.87~6.12	24.00	
C06-0625-24L	6.12~6.37	24.00	
C06-0650-26L	6.37~6.62	26.00	
C06-0675-26L	6.62~6.87	26.00	

Ø6.87~Ø11.12mm

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



Parts 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	



Parts 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

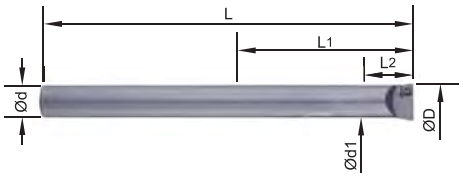
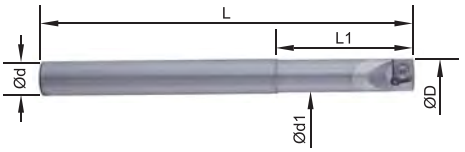


Fig. 2

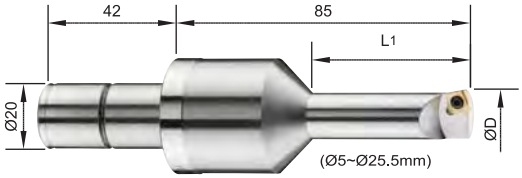


Parts No.	ØD	Ød	Ød1	L1	L2	L	Fig.	Insert
C11-1200-150L	11.87~12.12	11	11	70	20	150	1	CCGT060204 CCFT060204 Screw: NS-25045 Key: NK-T7
C11-1300-150L	12.87~13.12	11	-	70	-	150		
C11-1400-150L	13.87~14.12	11	-	70	-	150		
C15.5-1500-90L	14.87~15.12	15.5	14	90	90	180	2	
C15.5-1600-180L	15.87~16.12	15.5	15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

Quick Change High Speed Boring Tools

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.

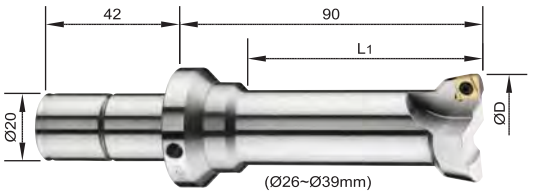
Parts No.	ØD	L1	Insert
C20-0500-10L	4.87~5.12	10.00	CCGT030102-NC30 NS-16030, NK-T6
C20-0600-12L	5.87~6.12	12.00	
C20-0700-14L	6.87~7.12	14.00	CCGT040102-NC30 NS-20036, NK-T6
C20-0800-16L	7.87~8.12	16.00	
C20-0900-18L	8.87~9.12	18.00	CCGT060204 CCFT060204 Screw: NS-25045 Key: NK-T7
C20-1000-25L	9.87~10.12	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	
C20-1325-32L	13.12~13.37	32.50	
C20-1350-33L	13.37~13.62	33.75	
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	CCGT060204 CCFT060204 Screw: NS-25060 Key: NK-T7
C20-1625-40L	16.12~16.37	40.00	
C20-1650-41L	16.37~16.62	41.25	
C20-1675-41L	16.62~16.87	41.25	
C20-1700-42L	16.87~17.12	42.50	

Parts No.	ØD	L1	Insert
C20-1725-42L	17.12~17.37	42.50	CCGT060204 CCFT060204 Screw: NS-25060 Key: NK-T7
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	
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	

Quick Change High Speed Boring Tools

Ø26~Ø39mm

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

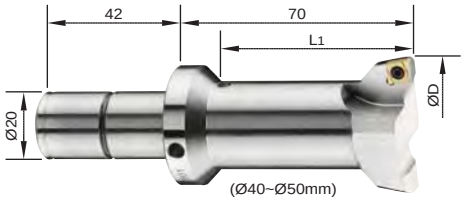


* H type with internal coolant can be ordered on request.
  Ordering example: C20-3600-70LH.

Parts 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.

Parts 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	

Quick Change High Speed Boring Tools

High Speed boring bar kit

Parts No.	Contents	
99146-32HB-05SET	SB32-146-31 Weldon Shank	Boring head shank: 1pc Boring bar: any 5 pcs Key: 3~5 pcs Plastic box: 1pc
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	

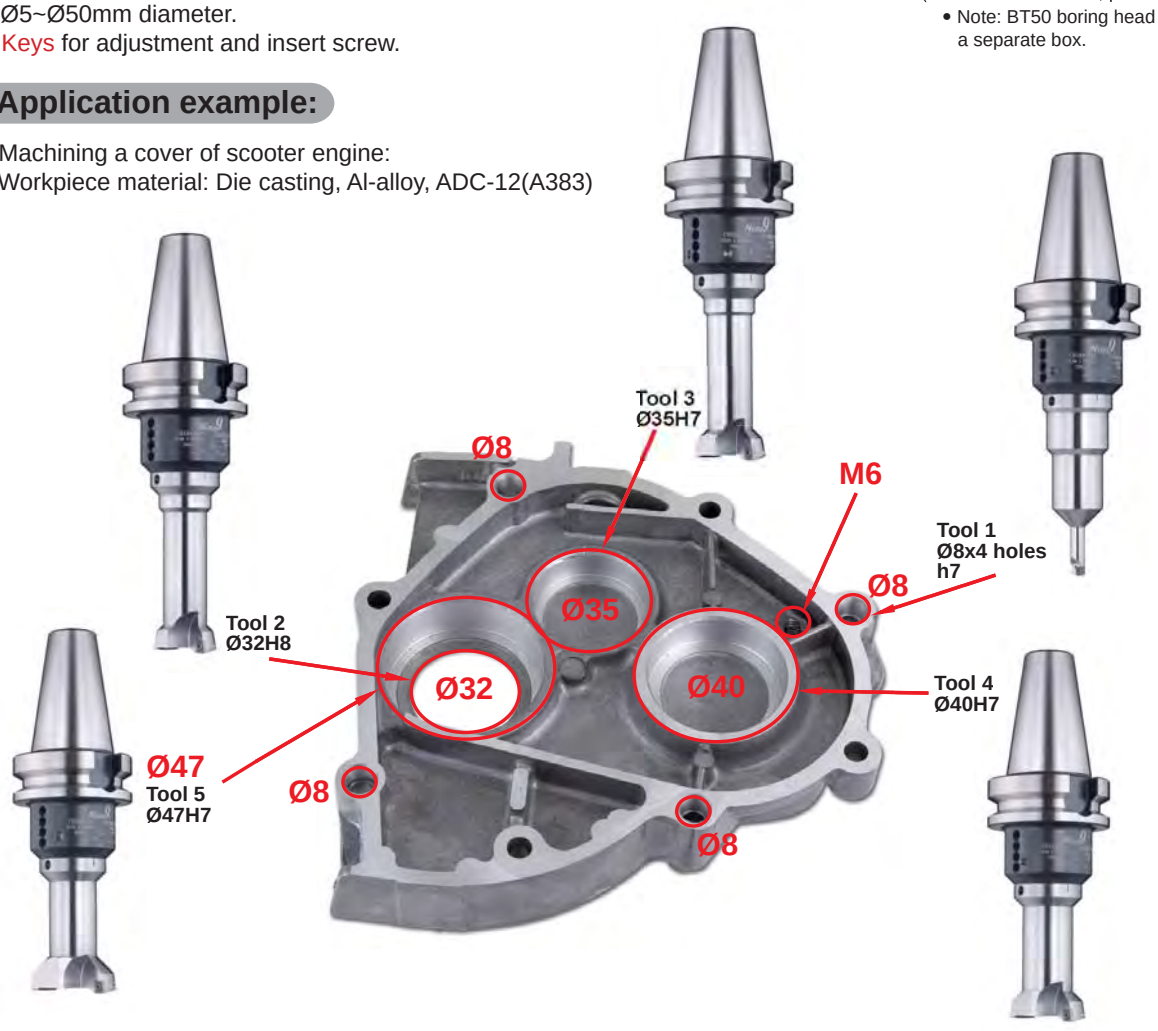
(Insert is not included, please order seperately)
- Note: BT50 boring head shank is packed in a separate box.

Each package includes:

- 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:
  Workpiece material: Die casting, Al-alloy, ADC-12(A383)



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

No.	Parts 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.

Quick Change High Speed Boring Tools

Precisely ground Inserts

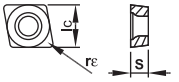
-CCGT030102, CCGT040102

- 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 finish and longer tool life.

Inserts

Inserts	NC30	DM	NC2033	NC9031		Dimensions		
						Ic	S	rε
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

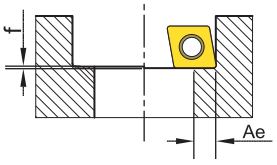
• Note: Super fine finishing insert DM with special specified cutting width 0.006inch.(Radius)

Spindle speed and feed rate formulas: **(see table below)**

inch

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

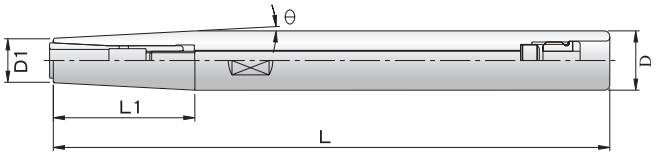
IPM=RPM x IPR

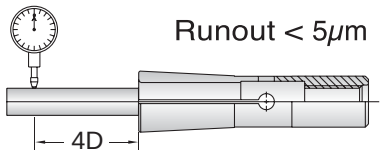


Material	Cutting conditions or surface finishes	Grade of insert	Ae Max. inch	SFM	IPR (inch/rev.)
Carbon Steel	Regular cutting	NC2033	.020	394 ~ 656	.002 ~ .004
	Interrupted cutting	NC30	.012	328 ~ 459	.002 ~ .003
Alloy Steel	Regular cutting	NC2033	.020	328 ~ 459	.002 ~ .004
	Interrupted cutting	NC30	.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

DC Slim Chuck

Extension Adaptor >>





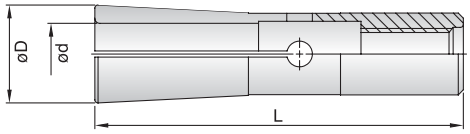
Parts No.	Type of Holder	d	L	L1	øD	D1	θ	Collet	Back Screw	Stop Screw	Hexagon Key	Stop Nut
0-329090-212	ST12-DC6-120	2~6	120	40	12	14	--	DC6	M5 * L95	--	0-301940~642	TP-M12
-222	ST16-DC6-150	2~6	150	38	16	14	3°		M5 * L100	OP-M10		--
-232	ST20-DC6-200	2~6	200	70	20	14	3°		M5 * L100	OP-M10		--
-242	ST25-DC6-250	2~6	250	115	25	14	3°		M5 * L100	OP-M10	0-301940~643	--

DC-E Collet >>

• The design of DC-E collets is emphasized on increasing the clamping force of end mills.

DC6-E	
Parts No.	Size(mm)
0-300090-203	3.0
0-300090-204	4.0
0-300090-206	6.0

Type	DC6
D	9.6
L	36



Extension Bar For NC Spot Drill

Solid Carbide Extension Bar >>

• TiN coated to identify the efficient length.

• NC Spot Drill
99616-10-M6 (P.15)
99616-14-M8 (P.16)

Parts No.	Type	ØD	T	L	M
99801-12W	BC12-100M06W	12	60	100	M6xP1.0
99801-16W	BC16-150M08W	16	80	150	M8xP1.25

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