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

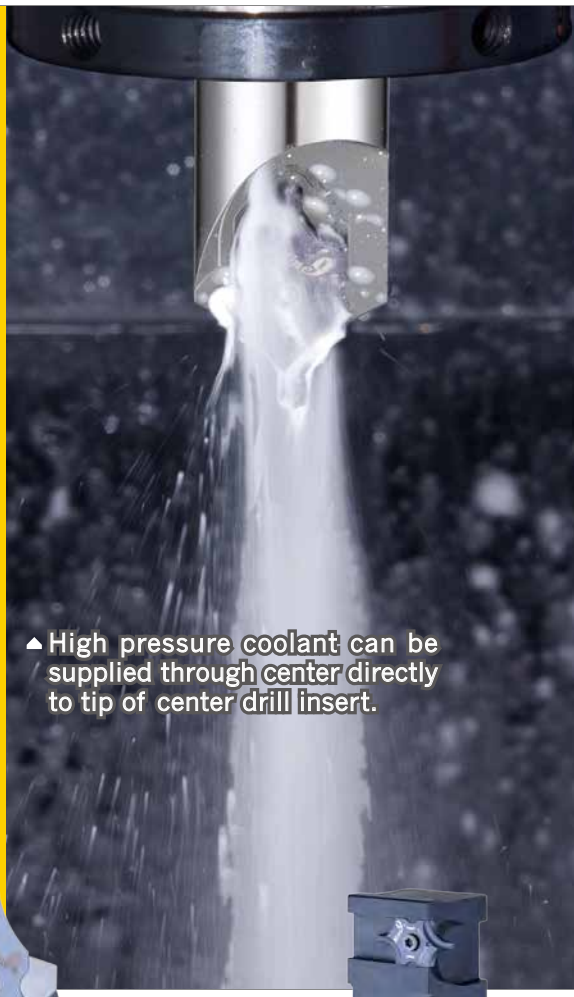
- The special ground insert and rigid holder design facilitate high performance speed and feed rates. For example, drilling alloy steel at 6000 rpm and feed rate of 600 mm/min. (0.1 mm/rev.)

Excellent Repeatability

- The positioning repeatability of the insert is within 0.02 mm (.0008") in radial direction, thus ensuring conformity to any national standards.

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.



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

Extended Tool Life

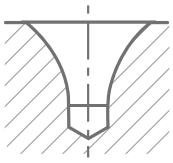
- Coolant can be supplied through the center of the holder to increase performance and extend tool life.
- Insert geometry, grades and coating process are specifically engineered for centering applications.

NC2033

NC5074 (IC08)

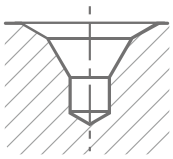
DIN 332 Form R

Ø1.0~Ø10



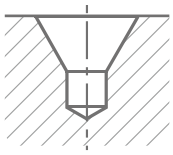
DIN 332 Form A + B

Ø1.0~Ø10



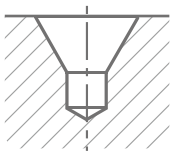
DIN 332 Form A

Ø2.0~Ø2.5

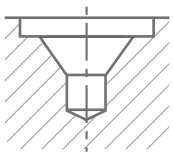


ANSI 60°

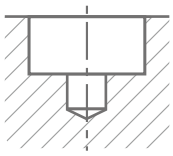
#2.0~#10



*** C Type**



*** F Type**



* special on request

▲ 2 cutting flutes design

Inserts:

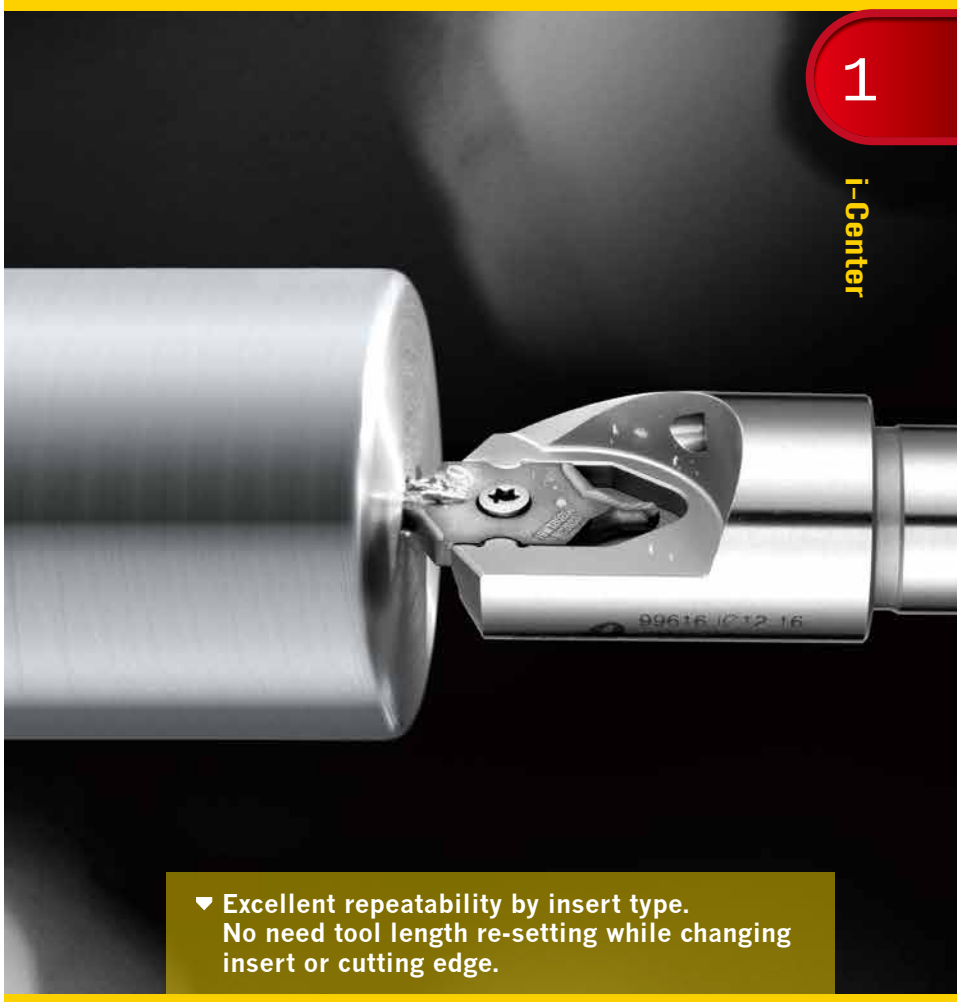
- 2 cutting flutes design same as carbide center drill for high performance speed and feed rate.
- Each insert has 2 cutting edges.

NC2033:

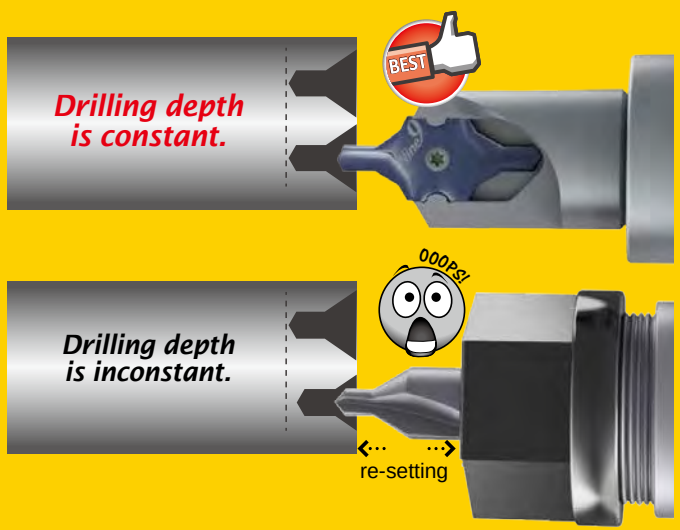
- K20F grade, TiAlN coated, for carbon steel, alloy steel, high alloy steel and cast iron.

NC5074:

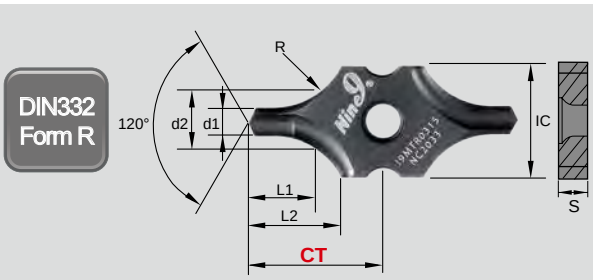
- P40 grade, Helica coated , design for small diameter center drill (IC08 inserts).

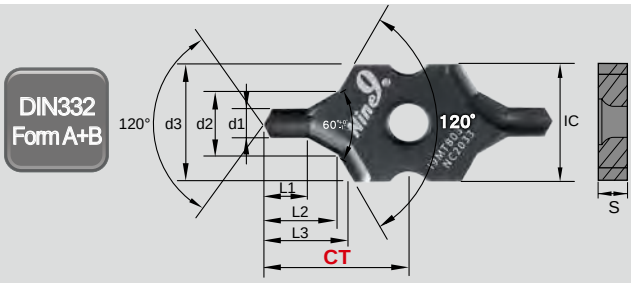


▼ Excellent repeatability by insert type.
No need tool length re-setting while changing insert or cutting edge.



Insert of Indexable Center Drill



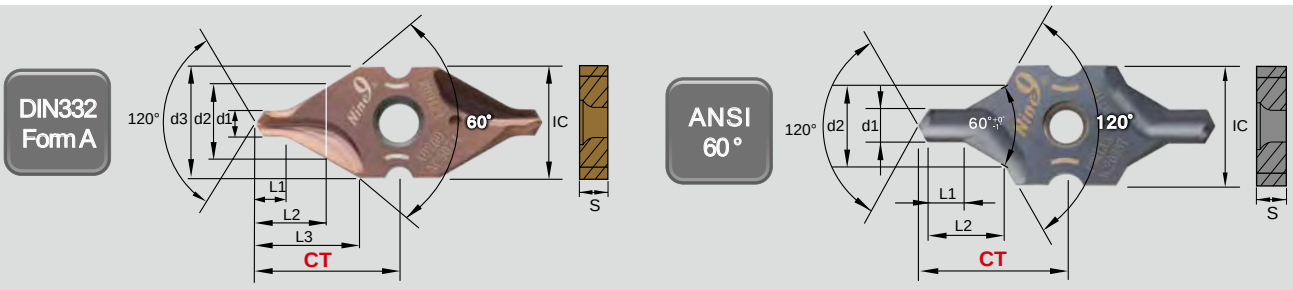


For DIN332 Form R Center Hole >>

IC	Code	Parts No.	Coating	Grade	d1		d2	L1	L2	R	S	CT ±0.025
08	032211	I9MT08T1R0100-NC5074	Helica	P40	1.00	+ 0.14 0	2.12	2.16	4.14	2.8	2.00	7.55
	032212	I9MT08T1R0125-NC5074			1.25		2.65	2.74	4.64	3.5		7.90
	032213	I9MT08T1R0160-NC5074			1.60		3.35	3.45	5.13	4.5		8.40
	032214	I9MT08T1R0200-NC5074			2.00		4.25	4.45	6.08	5.65		9.10
12	033201	I9MT12T2R0200-NC2033	TiAlN	K20F	2.00	+ 0.14 0	4.25	4.45	6.64	5.65	2.54	11.73
	033202	I9MT12T2R0250-NC2033			2.50		5.3	5.59	8.11	7.15		13.00
	033203	I9MT12T2R0315-NC2033			3.15	+ 0.18 0	6.7	7.21	9.63	9.0		14.00
16	034201	I9MT1603R0400-NC2033			4.00		8.5	9.06	12.23	11.0	3.18	19.40
	034202	I9MT1603R0500-NC2033			5.00		10.6	11.45	14.2	14.0		19.40
20	035201	I9MT2004R0630-NC2033			6.30	+ 0.22 0	13.2	14.63	18.2	18.0	4.76	28.40
	035202	I9MT2004R0800-NC2033			8.00		17.0	18.63	20.44	22.5		28.30
25	036201	I9MT2506R1000-NC2033			10.00		21.2	23.51	25.8	28.0	6.35	34.20

For DIN332 Form A+B Center Hole >>

IC	Code	Parts No.	Coating	Grade	d1		d2	d3	L1	L2	L3	S	CT ±0.025
08	032011	I9MT08T1B0100-NC5074	Helica	P40	1.00	+ 0.14 0	2.12	3.15	1.3	2.21	2.51	2.00	7.55
	032012	I9MT08T1B0125-NC5074			1.25		2.65	4.0	1.6	2.75	3.14		7.90
	032013	I9MT08T1B0160-NC5074			1.60		3.35	5.0	2.0	3.46	3.93		8.40
	032014	I9MT08T1B0200-NC5074			2.00		4.25	6.3	2.5	4.39	4.98		9.10
12	033001	I9MT12T2B0200-NC2033	TiAlN	K20F	2.00	+ 0.14 0	4.25	6.3	2.5	4.39	4.98	2.54	11.73
	033002	I9MT12T2B0250-NC2033			2.50		5.3	8.0	3.1	5.53	6.28		13.0
	033003	I9MT12T2B0315-NC2033			3.15	+ 0.18 0	6.7	10.0	3.9	6.90	7.85		14.0
16	034001	I9MT1603B0400-NC2033			4.00		8.5	12.5	5.0	8.9	10.03	3.18	19.4
	034002	I9MT1603B0500-NC2033			5.00		10.6	16.0	6.3	11.15	12.68		19.4
20	035001	I9MT2004B0630-NC2033			6.30	+ 0.22 0	13.2	18.0	8.0	13.98	15.33	4.76	28.4
	035002	I9MT2004B0800-NC2033			8.00		17.0	20	10.1	17.89	18.73		28.3
25	036001	I9MT2506B1000-NC2033			10.00		21.2	25	12.8	22.5	23.57	6.35	34.2



For DIN332 Form A Center Hole >>

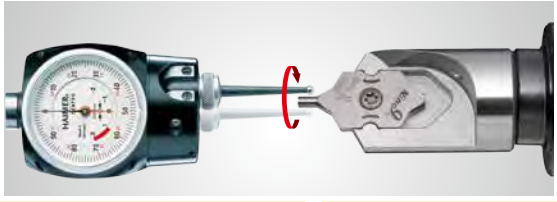
IC	Code	Parts No.	Coating	Grade	d1		d2	d3	L1	L2	L3	S	CT ±0.025
08	032114	I9MT08T1A0200-NC5074	Helica	P40	2.0	+ 0.14 0	4.25	8	2.15	4.10	7.35	2.00	10.5
	032115	I9MT08T1A0250-NC5074			2.5		5.3		2.58	5.00	7.34		
	032116	I9MT08T1A0315-NC5074			3.15	+ 0.18 0	6.7		3.23	6.30	7.43		

For ANSI 60° Center Hole >>

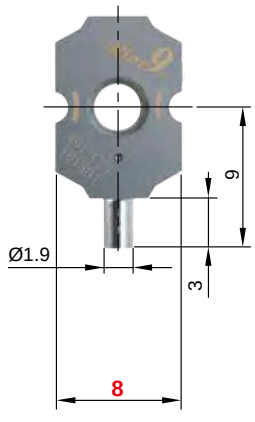
IC	Code	Parts No.	Coating	Grade	Size	d1 mm			d2 mm		L1 mm		L2 mm	S	CT ±0.025
12	033101	I9MT12T2A2-NC2033	TiAlN	K20F	#2	5/64	1.98	+ 0.14 0	3/16	4.76	5/64	1.98	4.4	2.54	12.6
	033102	I9MT12T2A3-NC2033			#3	7/64	2.78		1/4	6.35	7/64	2.78	5.9		13.8
	033103	I9MT12T2A4-NC2033			#4	1/8	3.18	+ 0.18 0	5/16	7.94	1/8	3.18	7.3		14.25
16	034101	I9MT1603A5-NC2033			#5	3/16	4.76		7/16	11.11	3/16	4.76	10.3	3.18	20.0
20	035101	I9MT2004A6-NC2033			#6	7/32	5.56		1/2	12.7	7/32	5.56	11.8	4.76	27.75
	035102	I9MT2004A7-NC2033			#7	1/4	6.35	+ 0.22 0	5/8	15.88	1/4	6.35	14.6		28.5
	035103	I9MT2004A8-NC2033			#8	5/16	7.94		3/4	19.05	5/16	7.94	17.6		29.0
25	036101	I9MT2506A10-NC2033			#10	3/8	9.53		0.98"	25.0	3/8	9.53	22.9	6.35	34.9

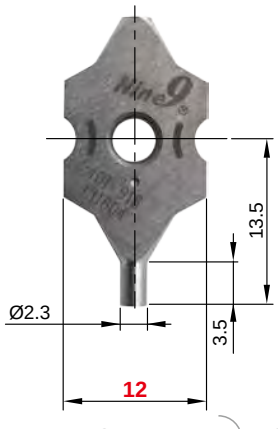
Measuring Master >>

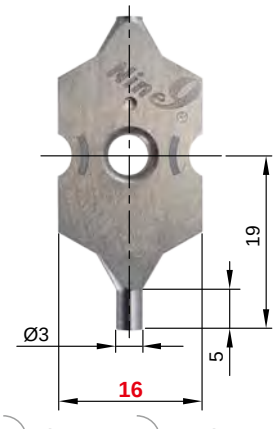
- Apply on lathe to align the center of work spindle and tool.
- Each insert has just one measuring tip.
- Concentricity: ±0.01mm

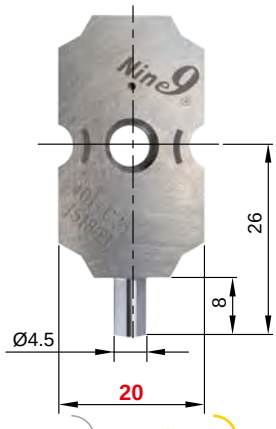


IC08	IC12	IC16	IC20
I9MT08T1-MM	I9MT12T2-MM	I9MT1603-MM	I9MT2004-MM





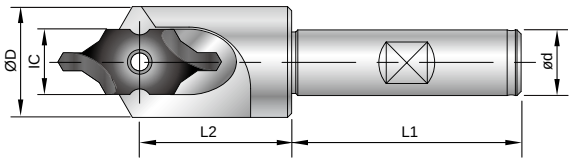


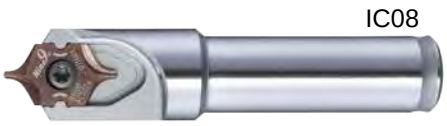


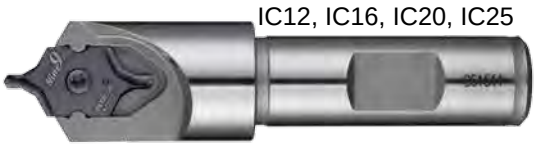
Holders of Indexable Center Drill

Weldon Shank >>

- Made of hardened high alloy steel, 58 HRC.
- IC08 shank is cylindrical shank.
  Other shanks are weldon shank.





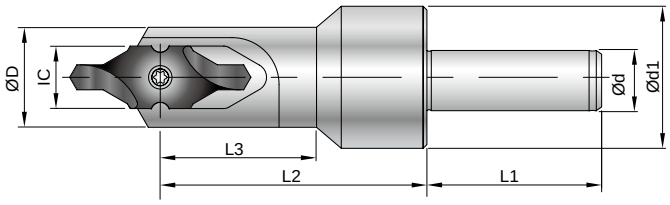


IC	Code	Parts No.	Type	ød	L1	L2	ØD	Screw	Key
08	802002	00-99616-IC08-10F	BC10-IC08F	10	30	18.5	12	*NS-25060 0.9 Nm	NK-T7
	812002	00-99616-IC08-3/8F	BC3/8"-IC08F	3/8"					
12	803002	00-99616-IC12-16F	SB16-IC12F	16	48	30.5	21	NS-30072 2.0 Nm	NK-T9
	813002	00-99616-IC12-5/8F	SB5/8"-IC12F	5/8"					
16	804002	00-99616-IC16-16F	SB16-IC16F	16	48	37	27	NS-35080 2.5 Nm	NK-T15
	814002	00-99616-IC16-5/8F	SB5/8"-IC16F	5/8"					
20	805002	00-99616-IC20-20F	SB20-IC20F	20	50	51	32	NS-50125 5.5 Nm	NK-T20
	815002	00-99616-IC20-3/4F	SB3/4"-IC20F	3/4"					
25	806002	00-99616-IC25-25F	SB25-IC25F	25	56	56	43	NS-50125 5.5 Nm	NK-T20
	816002	00-99616-IC25-1F	SB 1"-IC25F	1"					

*Torque screwdriver is recommended, see page 6-4.

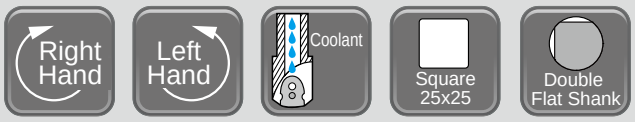
Cylindrical Shank with Pre-balanced >>

- Made of hardened high alloy steel, 58 HRC.
- G6.3 / 10,000 r.p.m.



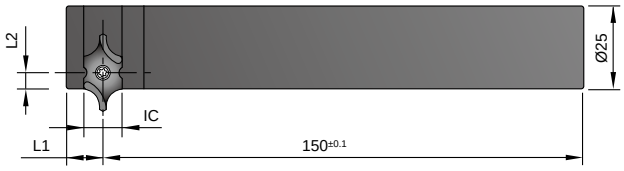
IC	Code	Parts No.	Type	Ød	Ød1	L1	L2	L3	ØD	Screw	Key
08	802003	00-99616-IC08-10B	BC10-IC08B	10	22	30	33.5	19	12	*NS-25060 0.9 Nm	NK-T7
12	803003	00-99616-IC12-12B	BC12-IC12B	12	34	48	51	30	21	NS-30072 2.0 Nm	NK-T9
16	804003	00-99616-IC16-16B	BC16-IC16B	16	39	48	67	37	27	NS-35080 2.5 Nm	NK-T15
20	805003	00-99616-IC20-20B	BC20-IC20B	20	49	50	86	51	32	NS-50125 5.5 Nm	NK-T20
25	806003	00-99616-IC25-25B	BC25-IC25B	25	59	56	99	56	43	NS-50125 5.5 Nm	NK-T20

*Torque screwdriver is recommended, see page 6-4.



Square Shank 25 x 25 Right / Left Hand >>

- For used on lathe.
- Made of hardened alloy steel, 40 HRC.
- Other sizes are available on request.

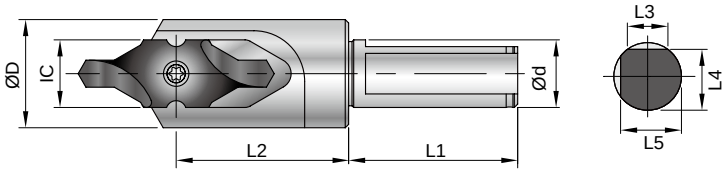


IC	Code	Parts No.	L1	L2	Screw	Key
08	822022	00-99616-IC08-R2525MF	8	3.25	*NS-25060 0.9 Nm	NK-T7
	822012	00-99616-IC08-L2525MF				
12	823022	00-99616-IC12-R2525MF	11	4.9	NS-30072 2.0 Nm	NK-T9
	823012	00-99616-IC12-L2525MF				
16	824022	00-99616-IC16-R2525MF	13	4.9	NS-35080 2.5 Nm	NK-T15
	824012	00-99616-IC16-L2525MF				

*Torque screwdriver is recommended, see page 6-4.

Double Flat Shank >> Non-Stock Item

- Made of hardened high alloy steel, 58 HRC.
- Double flat shank type for used on lathe.
- 180° for insert at top, 90° for insert at front.



IC	Code	Parts No.	Type	Ød	L1	L2	L3	L4	L5	ØD	Screw	Key
08	802004	00-99616-IC08-10S	SL10-IC08S	10	30	18.5	6	9	9	12	*NS-25060 0.9 Nm	NK-T7
12	803004	00-99616-IC12-16S	SL16-IC12S	16	48	30.5	9.33	14.5	14.5	21	NS-30072 2.0 Nm	NK-T9
16	804004	00-99616-IC16-16S	SL16-IC16S	16	48	37	9.33	14.5	14.5	27	NS-35080 2.5 Nm	NK-T15
20	805004	00-99616-IC20-20S	SL20-IC20S	20	50	51	12	18	18	32	NS-50125 5.5 Nm	NK-T20
25	806004	00-99616-IC25-25S	SL25-IC25S	25	56	56	13.57	23	23	43	NS-50125 5.5 Nm	NK-T20

*Torque screwdriver is recommended, see page 6-4.

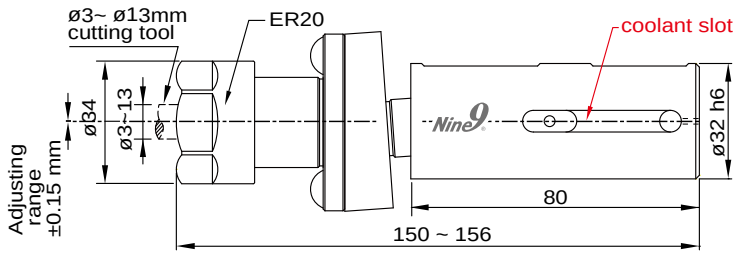
Center Height Adjusting Sleeve

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.

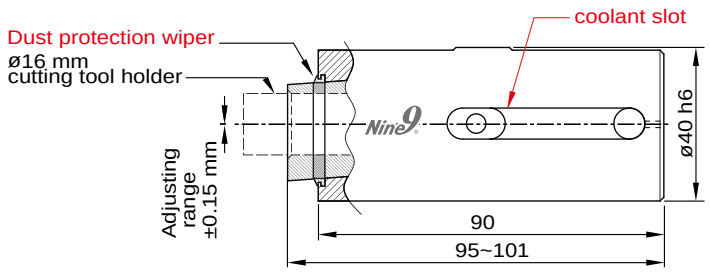
Parts No.:00-99600-320H >>

Type : SB32-IDER20



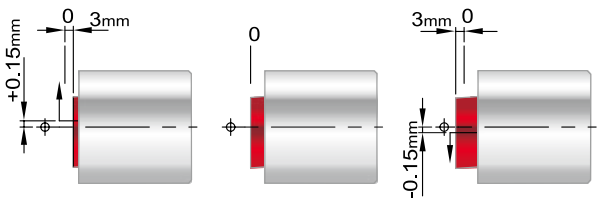
Parts No.:00-99600-400H >>

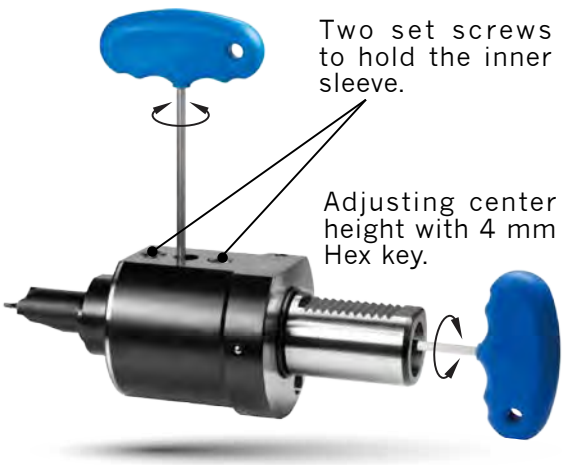
Type : SB40-ID16



Applications >>

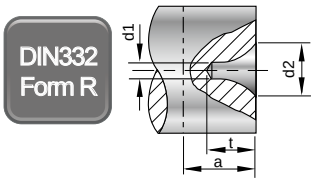
- Used when the CNC lathes need to adjust the center height.
- This sleeve can be clamped by VDI 40, VDI 50 E2 tool holders,and other types internal turning tool holders.
- Center height adjusting range: ±0.15 mm(.006").
- Total axial movement is 6mm(.236").

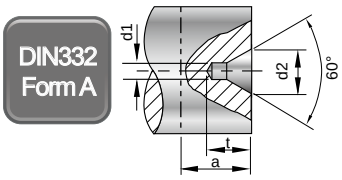


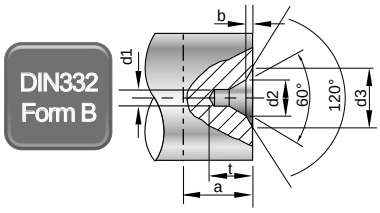


Technical Standard
ISO 2541-1972 / DIN332

60° Center holes





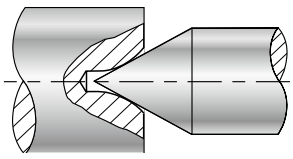


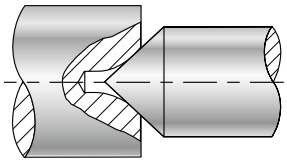
STD	DIN332 Form R ISO 2541-1972			DIN332 Form A ISO 866-1975			DIN332 Form B ISO 2540 1973				
d1	d2	t	a	d2	t	a	d2	b	d3	t	a
1	2.12	1.9	3	2.12	1.9	3	2.12	0.3	3.15	2.2	3.5
1.25	2.65	2.3	4	2.65	2.3	4	2.65	0.4	4	2.7	4.5
1.6	3.35	2.9	5	3.35	2.9	5	3.35	0.5	5	3.4	5.5
2	4.25	3.7	6	4.25	3.7	6	4.25	0.6	6.3	4.3	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

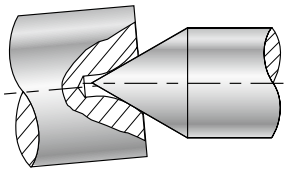
* a: Minimum material will be cut. If the center hole will be removed after turning or grinding. (mm/inch)

Advantage of Form R center hole

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

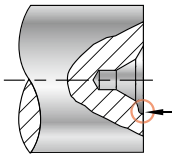


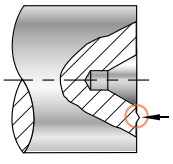


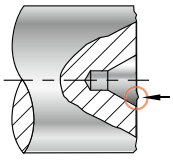


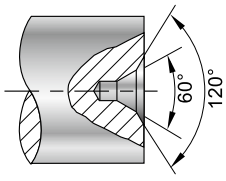
Advantage of Form B center hole

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









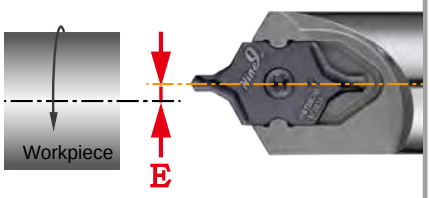
Technical Guide

Before you start, please pay attention the following conditions

1

Center misalignment

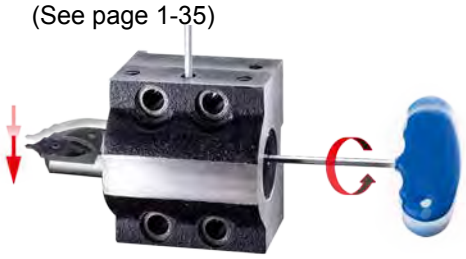
E must be < 0.02mm.



2

Center height adjusting sleeve

When CNC lathe turret center is misaligned ≥ 0.15mm, please use center height adjusting sleeve. (See page 1-35)



3

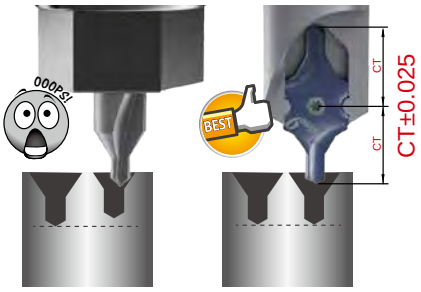
Internal coolant

Internal coolant is recommended.

4

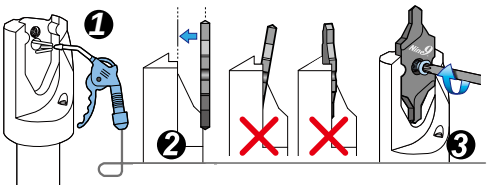
No reset and regrind

Tool length maintain while changing the insert or cutting edge.

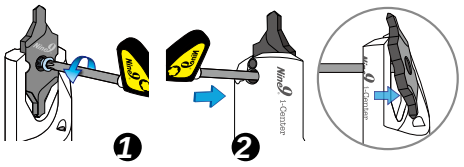


5

Clamping insert

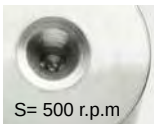


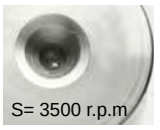
Loosen insert



6

Possible to run on low r.p.m machine





Applications

Various centering applictions and products - shafts of engine, transmission gear boxes, bearings, motors, grinding parts, spindles, gear reducers, cooling fan, universal joints...

Cutting Data

Ø1~Ø3.15 (#2~#4)

Workpiece material	Vc (m/min.)	d1	IC08		IC12				
			Ø1~1.25	Ø1.6~3.15	Ø2 (#2)	Ø2.5 (#3)	Ø3.15 (#4)		
Carbon steel C<0.3%	< 80	S r.p.m.	2000 ~ 10000	1600 ~ 8000	1600 ~ 8000	1400 ~ 7000	1200 ~ 6000	●	○
		f mm/rev.	0.02~0.03~0.05	0.03~0.05~0.06	0.04~0.06~0.08	0.06~0.08~0.10	0.08~0.10~0.12		
Carbon steel C>0.3%	< 70	S r.p.m.	2000 ~ 9000	1600~ 7200	1600 ~ 7200	1400 ~ 6300	1200 ~ 5400	●	○
		f mm/rev.	0.02~0.03~0.05	0.03~0.04~0.05	0.03~0.04~0.05	0.06~0.08~0.10	0.08~0.10~0.12		
Low alloy steel C<0.3%	< 65	S r.p.m.	2000 ~ 8000	1600 ~ 6400	1600 ~ 6400	1400 ~ 5600	1200 ~ 4800	●	○
		f mm/rev.	0.01~0.02~0.04	0.02~0.03~0.05	0.02~0.03~0.05	0.04~0.06~0.08	0.06~0.08~0.10		
High alloy steel C>0.3%	< 60	S r.p.m.	1000 ~ 6000	800 ~ 4800	800 ~ 4800	700 ~ 4200	600 ~ 3600	●	○
		f mm/rev.	0.01 ~ 0.02	0.01~0.02~0.04	0.01~0.02~0.04	0.02~0.04~0.06	0.04~0.06~0.08		
Stainless steel	< 20	S r.p.m.	1000 ~ 3000	800 ~ 2400	800 ~ 2400	700 ~ 2100	600 ~ 1800	● ≥ 5 bar	○
		f mm/rev.	0.003 ~ 0.01	0.005 ~ 0.02	0.01 ~ 0.02	0.01~0.02~0.03	0.02~0.03~0.05		
Casting iron	< 70	S r.p.m.	2000 ~ 9000	1600 ~ 7200	1600 ~ 7200	1400 ~ 6300	1200 ~ 5400	Air	
		f mm/rev.	0.01~0.02~0.04	0.02~0.04~0.06	0.02~0.04~0.06	0.04~0.06~0.08	0.06~0.08~0.10		
Al, and non-ferrous metal	< 200	S r.p.m.	6000 ~ 20000	4800 ~ 16000	4800 ~ 16000	4200 ~ 14000	3600 ~ 12000	●	○
		f mm/rev.	0.01~0.02~0.03	0.01~0.02~0.04	0.01~0.02~0.04	0.02~0.03~0.05	0.02~0.04~0.06		

● Best ○ Possible

Ø4~Ø10 (#5~#10)

Workpiece material	Vc m/min.	d1	IC16		IC20			IC25		
			Ø4 (#5)	Ø5	(#6)	Ø6.3 (#7)	Ø8 (#8)	Ø10 (#10)		
Carbon steel C<0.3%	< 80	S r.p.m.	1000 ~ 5000	900 ~ 4500		800 ~ 4000	700 ~ 3500	600 ~ 3000	●	○
		f mm/rev.	0.08~0.12~0.14	0.10~0.12~0.16		0.10~0.14~0.16	0.12~0.15~0.18	0.14~0.18~0.20		
Carbon steel C>0.3%	< 70	S r.p.m.	1000 ~ 4500	900 ~ 4050		800 ~ 3600	700 ~ 3150	600 ~ 2700	●	○
		f mm/rev.	0.08~0.12~0.14	0.10~0.12~0.16		0.10~0.14~0.16	0.12~0.15~0.18	0.14~0.18~0.20		
Low alloy steel C<0.3%	< 65	S r.p.m.	1000 ~ 4000	900 ~ 3600		800 ~ 3200	700 ~ 2800	600 ~ 2400	●	○
		f mm/rev.	0.06~0.08~0.10	0.08~0.10~0.12		0.08~0.12~0.14	0.10~0.14~0.16	0.12~0.16~0.20		
High alloy steel C>0.3%	< 60	S r.p.m.	500 ~ 3000	450 ~ 2700		400 ~ 2400	350 ~ 2100	300 ~ 1800	●	○
		f mm/rev.	0.04~0.06~0.08	0.06~0.08~0.10		0.08~0.10~0.12	0.10~0.14~0.16	0.10~0.14~0.16		
Stainless Steel	< 25	S r.p.m.	500 ~ 1500	450 ~ 1350		400 ~ 1200	350 ~ 1050	300 ~ 900	● ≥ 5 bar	○
		f mm/rev.	0.02~0.04~0.06	0.02~0.04~0.06		0.04~0.06~0.08	0.04~0.06~0.08	0.05~0.07~0.10		
Casting iron	< 70	S r.p.m.	1000 ~ 4500	900 ~ 4050		800 ~ 3600	700 ~ 3150	600 ~ 2700	Air	
		f mm/rev.	0.06~0.08~0.10	0.08~0.10~0.12		0.08~0.12~0.14	0.10~0.14~0.16	0.12~0.16~0.18		
Al, and non-ferrous metal	< 200	S r.p.m.	3000 ~ 10000	2700 ~ 9000		2400 ~ 8000	2100 ~ 7000	1800 ~ 6000	●	○
		f mm/rev.	0.02~0.04~0.06	0.04~0.06~0.08		0.04~0.06~0.08	0.06~0.08~0.10	0.06~0.08~0.10		

● Best ○ Possible

- **Attention of Form A+B insert:**
  Reduce 30% of Spindle speed and keep same feed rate (mm/rev.) while depth L2 is reached.
- **Using your "d1" value and cutting speed Vc from the data sheet, calculate spindle speed "S"(r.p.m).**
- **" F" feed rate per minute F = S x f = IPR x r.p.m**

Metric		Inch	
$S = \frac{Vc \times 1000}{\pi \times d1}$	d1 = diameter -mm	$S = \frac{(3.82 \times SFM)}{d1}$	d1 = diameter-inch
	S = Spindle Speed -r.p.m.		S = Spindle Speed-r.p.m.
	Vc = Cutting Speed -m/min.		SFM = Surface Speed-ft./min. Vc (m/min.) x 3.28
F = S x f	f = mm/rev.	F = IPRxr.p.m	f = IPR = inch/rev.
	F = mm/min.		F = inch/min.