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

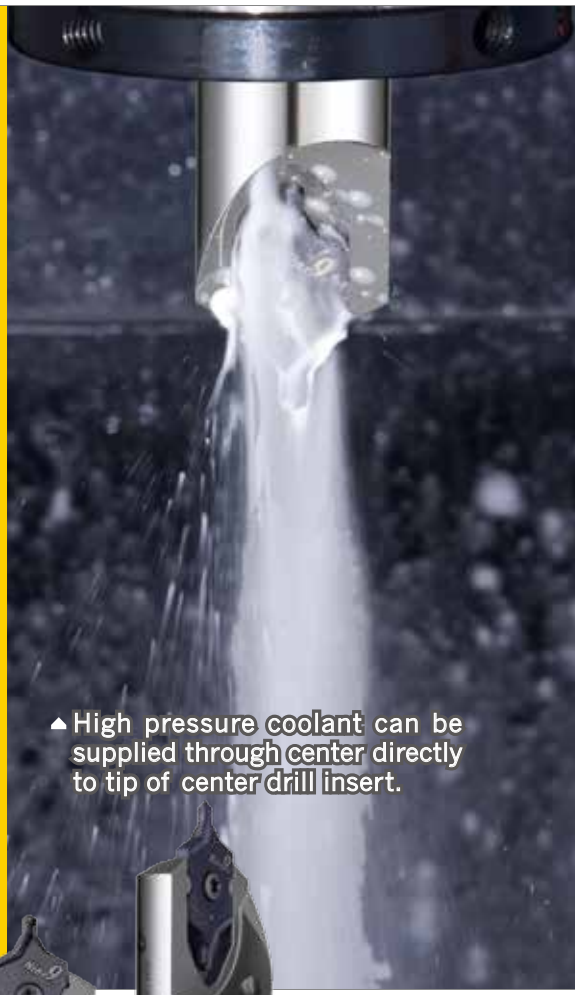
- The special ground insert and rigid holder design facilitate high performance speed and feed rates. For example, drilling alloy steel at 6000 rpm and feed rate of 600 mm/min. (0.1 mm/rev.)

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 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.

Extended Tool Life

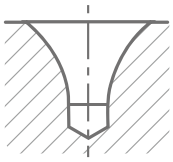
- Coolant can be supplied through the center of the holder to increase performance and extend tool life.
- Insert geometry, grades and coating process are specifically engineered for centering applications.

Special forms are possible

* Standard stock item

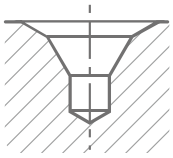
*** DIN 332 Form R**

Ø1.0~Ø10



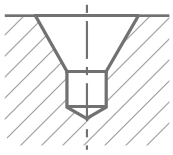
*** DIN 332 Form A + B**

Ø1.0~Ø10



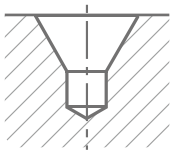
*** DIN 332 Form A**

Ø2.0~Ø2.5

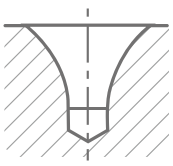


*** ANSI 60°**

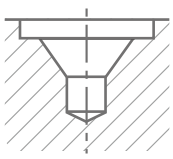
#2.0~#10



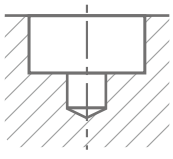
PR (Similar DIN332 R)



C Type



F Type



Insert Type:

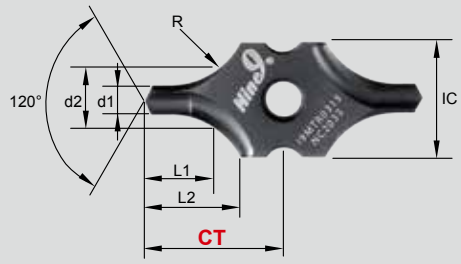
*  NC2033 / K20F grade TiAlN FUDURA NANO COATING.

*  NC5074 / P40 grade Helica coating , for IC08 inserts.

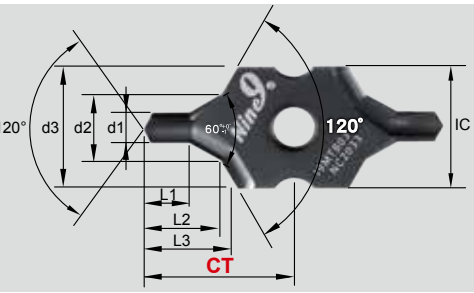
▲Excellent repeatability by insert type.
No need tool length re-setting while changing insert or cutting edge.

Indexable Center Drill

DIN332 Form R



DIN332 Form A+B



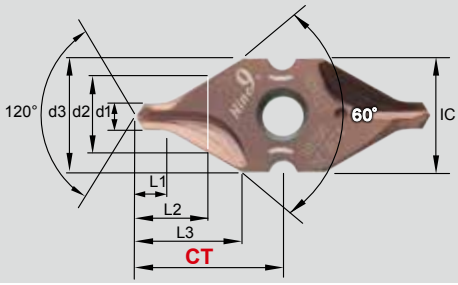
DIN332 Form R >>

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

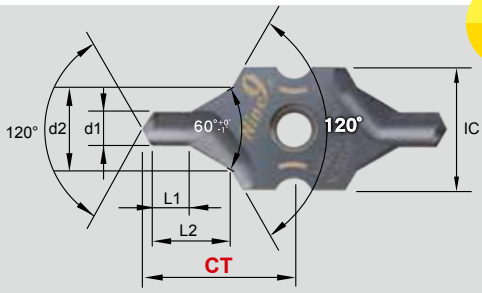
DIN332 Form A+B >>

Code	Parts No.	Coating	Grade	d1		d2	d3	L1	L2	L3	CT ±0.025	IC
New 032011	I9MT08T1B0100-NC5074	Helica	P40	1.00	+ 0.14 0	2.12	3.15	1.3	2.21	2.51	7.55	08
New 032012	I9MT08T1B0125-NC5074			1.25		2.65	4.0	1.6	2.75	3.14	7.90	
New 032013	I9MT08T1B0160-NC5074			1.60		3.35	5.0	2.0	3.46	3.93	8.4	
New 032014	I9MT08T1B0200-NC5074			2.00		4.25	6.3	2.5	4.39	4.98	9.1	
033001	I9MT12T2B0200-NC2033	TiAlN	K20F	2.00	+ 0.14 0	4.25	6.3	2.5	4.39	4.98	11.73	12
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	
034001	I9MT1603B0400-NC2033			4.00		8.5	12.5	5.0	8.9	10.03	19.4	16
034002	I9MT1603B0500-NC2033			5.00		10.6	16.0	6.3	11.15	12.68	19.4	
035001	I9MT2004B0630-NC2033			6.30	+ 0.22 0	13.2	18.0	8.0	13.98	15.33	28.4	20
035002	I9MT2004B0800-NC2033			8.00		17.0	20	10.1	17.89	18.73	28.3	
036001	I9MT2506B1000-NC2033			10.00		21.2	25	12.8	22.5	23.57	34.2	25

DIN332 Form A



ANSI 60 °



DIN332 Form A >>

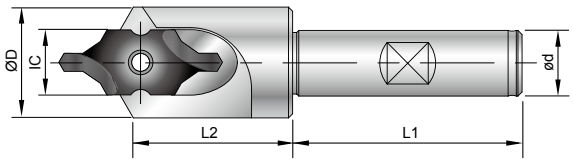
Code	Parts No.	Grade	Coating	d1		d2	d3	L1	L2	L3	CT ±0.025	IC
New 032114	I9MT08T1A0200-NC5074	P40	Helica	2.0	+ 0.14 0	4.25	8	2.15	4.10	7.35	10.5	08
New 032115	I9MT08T1A0250-NC5074			2.5		5.3		2.58	5.00	7.34		
New 032116	I9MT08T1A0315-NC5074			3.15	+ 0.18 0	6.7		3.23	6.30	7.43		

ANSI 60° >>

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

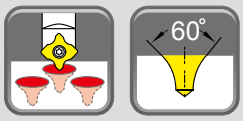
Holder >>

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



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

N9MT11T3PR Radius Center Drilling

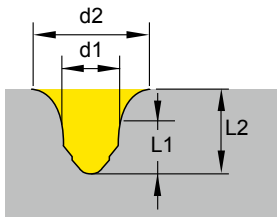


NC40

Inserts >>

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

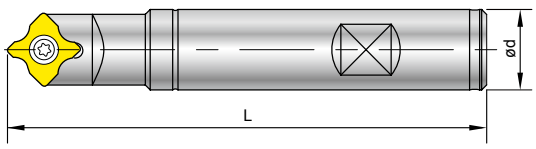
NC40:
- Universal grade for all unhardened steel and cast iron.
- Radius curve eliminates the sharp transition from drill point to countersink angle.
- Each insert has 2 cutting edges.



Code	Parts No.	Coating	Grade	Dimensions			
				d1	d2	L1	L2
014205	N9MT11T3PR20-NC40	TiN	P32	2.0	5.4	2.7	3.3
014206	N9MT11T3PR25-NC40			2.5	5.9	3.0	3.7
014207	N9MT11T3PR30-NC40			3.0	6.4	3.3	4.0

Holder >>

- PR holder has small offset value.
- Also apply as a 90° spotting drill while fitted with N9MT11T3CT2T-H insert (page 21).

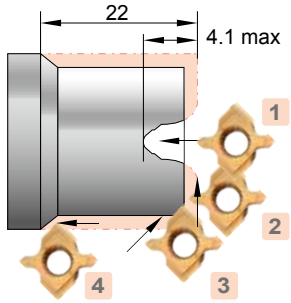


Ø16

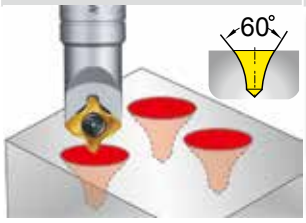
Code	Parts No.	Ød	L	Screw	Key
604004PR	00-99616-14-PR	16	100	NS-35080 2.5 Nm	NK-T15

Turning and Centering Capacity on CNC Lathes

Action	
1	Center Drilling
2	Facing
3	Chamfering
4	External Turning



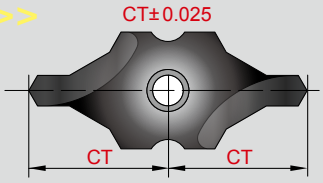
PR Insert >> Radius Center Drilling

Center Drilling	Work Material	Vc (m/min)	f (mm/rev.)	Grade of Insert
	Carbon Steel	80-150	0.05-0.20	NC40
	Alloy steel	80-150	0.05-0.20	
	High alloy steel	80-150	0.05-0.20	
	Cast iron	80-150	0.05-0.20	

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.

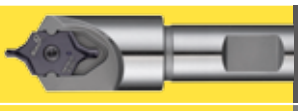


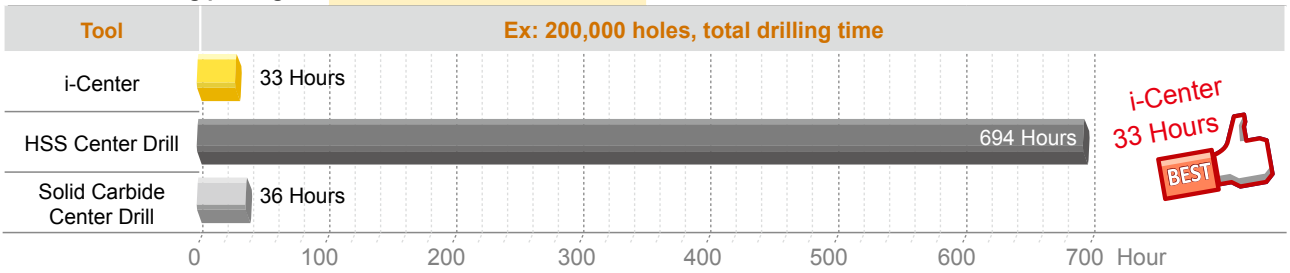
▲ 2 cutting edges

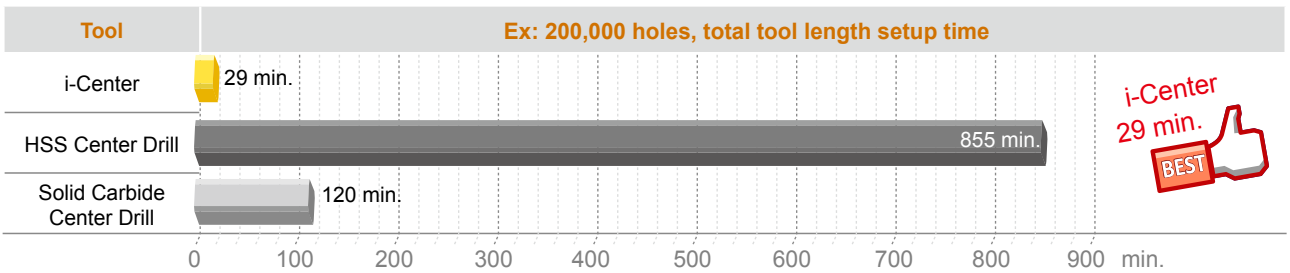
▲ 2 cutting flutes design

Comparison >>

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

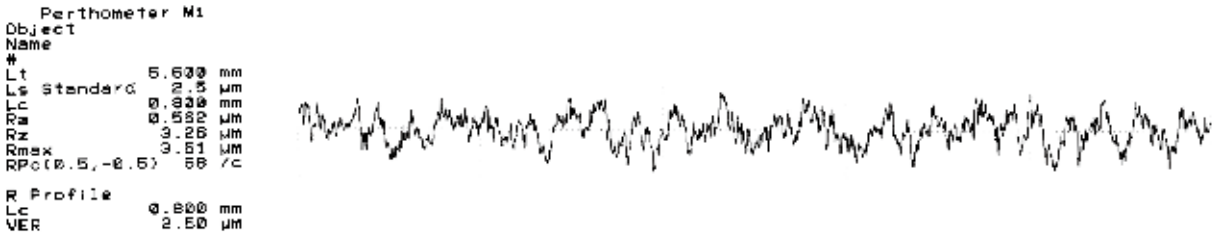
Diameter of tool : Ø3.15 mm Depth of drilling : 7.2 mm				
Comparison		**i-Center**	**HSS Center Drill (TiN Coating)**	**Solid Carbide Center Drill**
Cutting speed	**m/min.**	65	17	65
Spindle speed	**r.p.m.**	6570	1718	6570
Feed rate f =	**mm/rev.**	0.12	0.02	0.1
Feed rate F=	**mm/min.**	788.4	34.4	657
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 >>

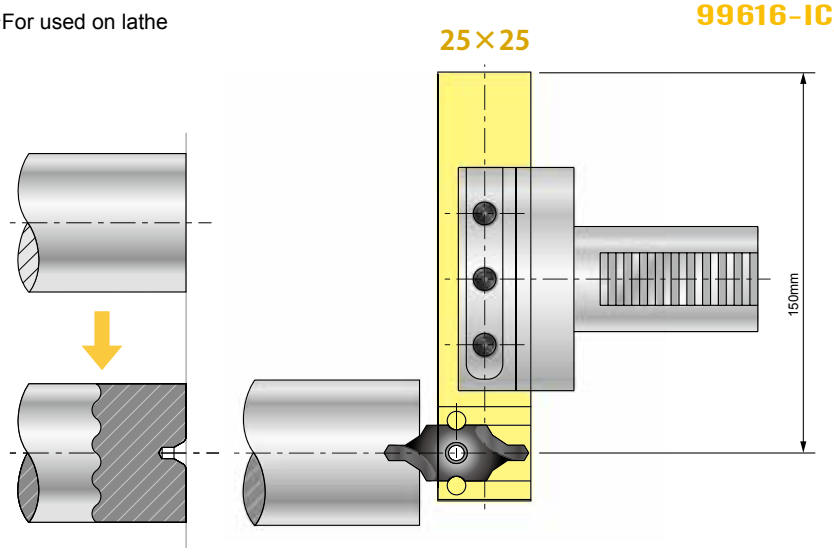
i-Center Insert	Material SCM440		
I9MT1603B0500 NC2033	**Vc**	60	m/min.
	S	3800	r.p.m.
	f	0.1	mm/rev.
	F	380	mm/min.
	Ap	13.5	mm



Also Available >> Special holder & Insert

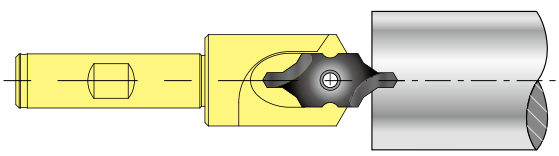
25x25 square shank holder >> Parts NO. 99616-IC 12 -L2525MF
99616-IC 16 -R2525MF

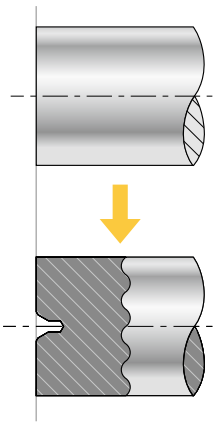
*For used on lathe



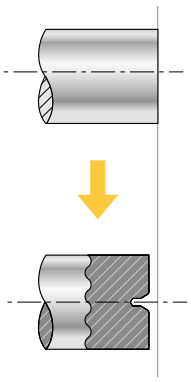
Cylindrical Shank >> Pre-balanced (G2.5 / 10,000 rpm)

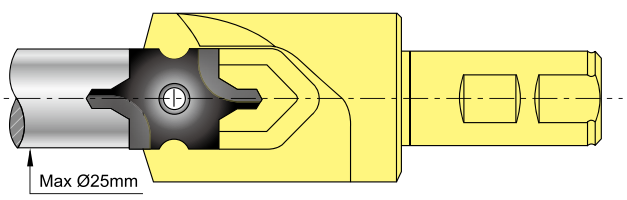
Left hand tool holder and Insert. (NC5074. NC2033)





Special insert.
Combined centering, facing chamfering and external turning >>





i-Center Enquiry Form

Company >>

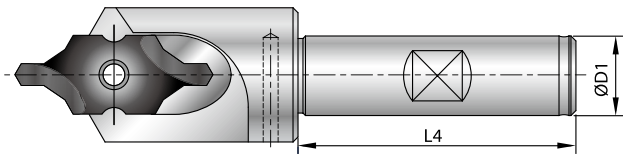
Challenge or improvement >>

The following information should be checked while discussing with customer.

Machine		
Machine Type		
Spindle Speed	Max.	r.p.m.
Power of Spindle motor	☐ KW	☐ HP
Coolant supply	☐ NO	
	☐ If yes, ☐ External	
	☐ Internal	bar(psi)
Current tool		
Cutting Speed	☐ HSS	☐ Solid Carbide
	m/min.	SFM
Others		
Feed Rate	mm/rev.	inch/rev.
Work Piece		
Material code		
Center hole type	☐ R ☐ A ☐ B ☐ C	
	☐ Other as attached drawing	
Other request	☐ Surface roughness	
	☐ Tolerance(see below)	

Special Tool holder shank dimensions >>

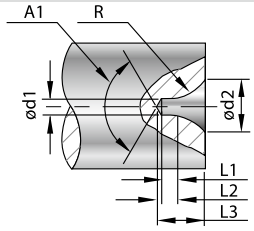
☐ Special tool holder shank, please fill in D1 and L4.
☐ As attached drawing.
☐ Metric ☐ Inch ☐ Right ☐ Left



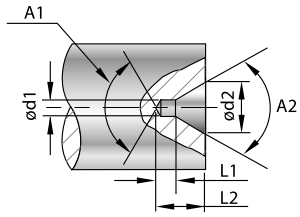
Center hole dimension >>

- Please provide workpiece drawing
- One of following type should be chosen.

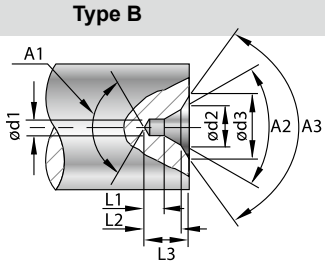
Type R



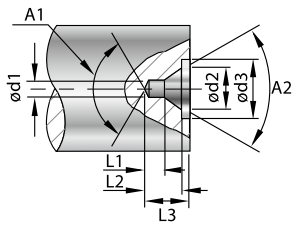
Type A



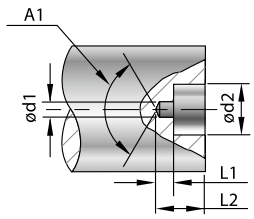
Type B



Type C



Other

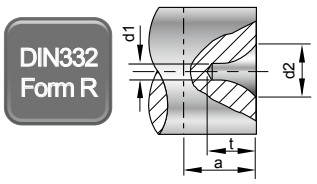


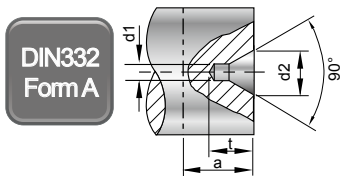
Dimension Table	A1	A2	A3	ød1	ød2	ød3
Dimension						
Tolerance	---	$^{+0°}_{-1°}$	±1°	±0.05	±0.05	---

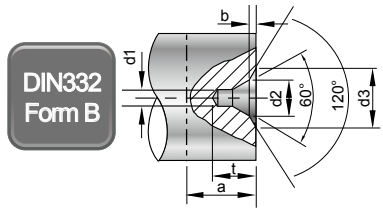
Dimension Table	L1	L2	L3	R	øD1	L4
Dimension						
Tolerance	±0.05	±0.05	±0.05	±0.5	h6	---

Technical Specifications

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



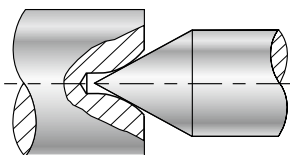


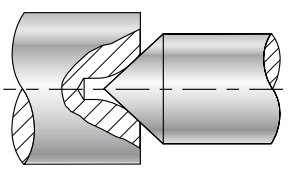


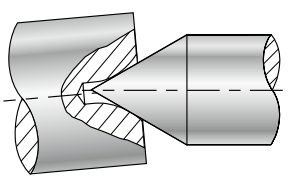
STD	DIN332 Form R ISO 2541-1972			DIN332 Form A ISO 866-1975			DIN332 Form B ISO 2540 1973				
d1	d2	t	a	d2	t	a	d2	b	d3	t	a
1	2.12	1.9	3	2.12	1.9	3	2.12	0.3	3.15	2.2	3.5
1.25	2.65	2.3	4	2.65	2.3	4	2.65	0.4	4	2.7	4.5
1.6	3.35	2.9	5	3.35	2.9	5	3.35	0.5	5	3.4	5.5
2	4.25	3.7	6	4.25	3.7	6	4.25	0.6	6.3	4.3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

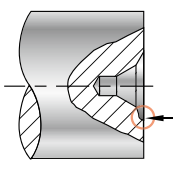


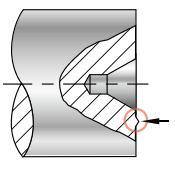


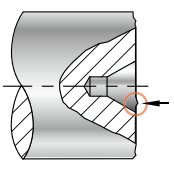


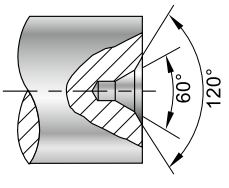
Advantage of Form B center hole

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





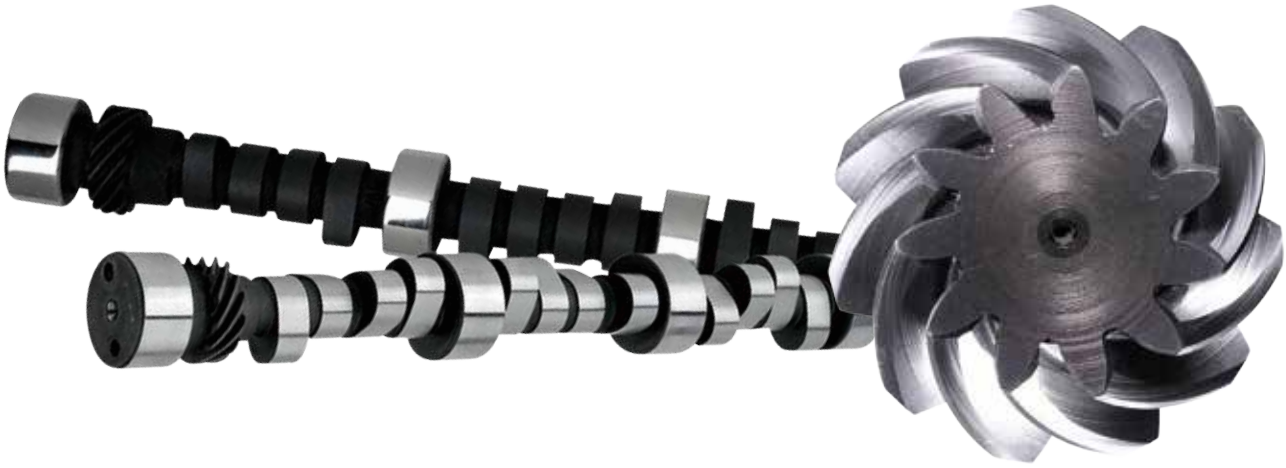


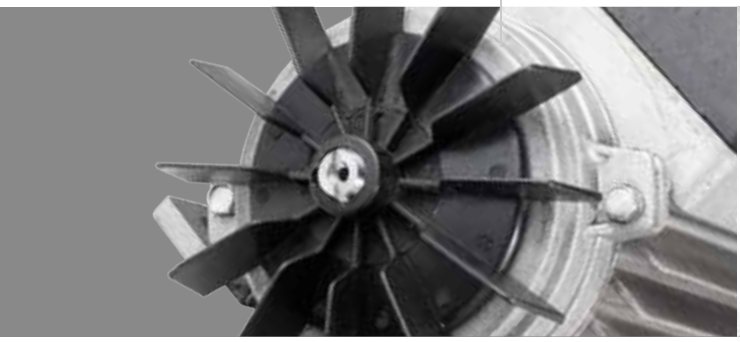


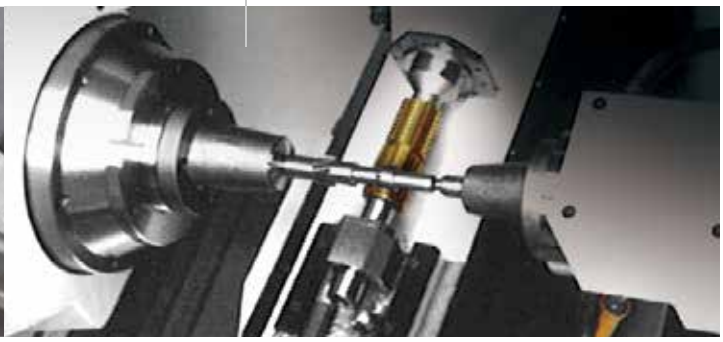
i-Center Applications

Tip >>

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







Cutting Data

Attention >>

- For d1< 4 mm or size #5, the center misalignment must be less than 0.05mm.
- If the CNC lathe turret center's misalignment is above 0.15mm, please use the Center Height Adjusting Sleeve. (See page 71)
- For low spindle speed special purpose machines or lathes, lower spindle speed is allowed but the feed rate should be maintained.

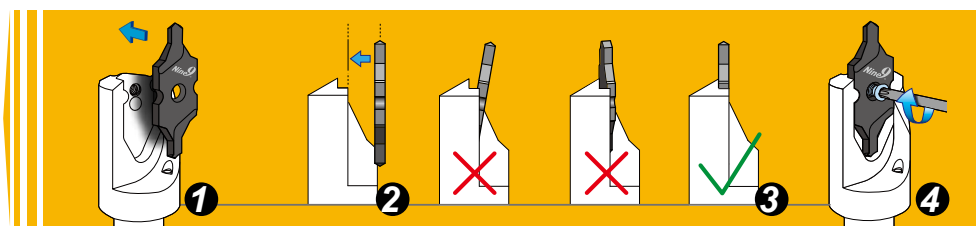
Ø1~Ø3.15 (#2~#4) >>

Workpiece material	Vc (m/min.) \ f / d1	f (mm/rev)					Cutting fluid
		IC08		IC12			
		Ø1~1.25	Ø1.6~3.15	Ø2 (#2)	Ø2.5 (#3)	Ø3.15 (#4)	
Carbon steel C<0.3%	60-70-80	(S=17825 rpm) 0.02-0.03-0.05	(S=13930 rpm) 0.03-0.05-0.06	(S=11140 rpm) 0.04-0.06-0.08	(S=8912 rpm) 0.06-0.08-0.10	(S=7073 rpm) 0.08-0.10-0.12	emulsion
Carbon steel C>0.3%	50-60-70	(S=17825 rpm) 0.02-0.03-0.05	(S=11940 rpm) 0.03-0.04-0.05	(S=9549 rpm) 0.03-0.04-0.05	(S=7639 rpm) 0.06-0.08-0.10	(S=6063 rpm) 0.08-0.10-0.12	emulsion
Low alloy steel C<0.3%	45-55-65	(S=14005 rpm) 0.01-0.02-0.04	(S=10950 rpm) 0.02-0.03-0.05	(S=8753 rpm) 0.02-0.03-0.05	(S=7002 rpm) 0.04-0.06-0.08	(S=5557 rpm) 0.06-0.08-0.10	emulsion
High alloy steel C>0.3%	40-50-60	(S=12732 rpm) 0.01-0.02	(S=9950 rpm) 0.01-0.02-0.04	(S=7957 rpm) 0.01-0.02-0.04	(S=6366 rpm) 0.02-0.04-0.06	(S=5052 rpm) 0.04-0.06-0.08	emulsion
Stainless Steel	5-10-20	(S=2546 rpm) 0.003-0.01	(S=1592 rpm) 0.005-0.02	(S=1592 rpm) 0.01-0.02	(S=1270 rpm) 0.01-0.02-0.03	(S=1010 rpm) 0.02-0.03-0.05	emulsion internal≥5 bar
Cast iron	50-60-70	(S=15278 rpm) 0.01-0.02-0.04	(S=11940 rpm) 0.02-0.04-0.06	(S=9549 rpm) 0.02-0.04-0.06	(S=7639 rpm) 0.04-0.06-0.08	(S=6063 rpm) 0.06-0.08-0.10	dry
Al, and non-ferrous metal	100-150 -200	(S=38197 rpm) 0.01-0.02-0.03	(S=29850 rpm) 0.01-0.02-0.04	(S=23873 rpm) 0.01-0.02-0.04	(S=19098 rpm) 0.02-0.03-0.05	(S=15157 rpm) 0.02-0.04-0.06	emulsion

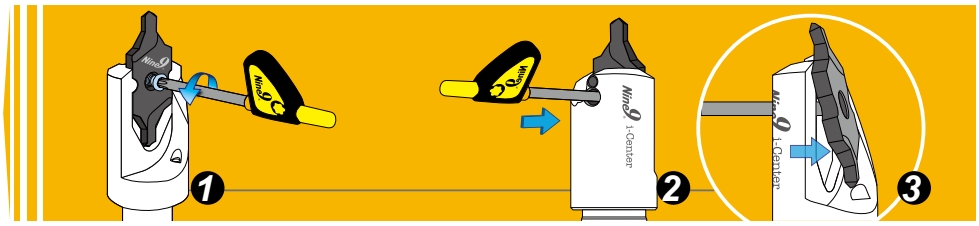
Ø4~Ø10 (#5~#10) >>

Workpiece material	Vc (m/min.) \ f / d1	f (mm/rev)						Cutting fluid
		IC16		IC20			IC25	
		Ø4 (#5)	Ø5	(#6)	Ø6.3 (#7)	Ø8 (#8)	Ø10 (#10)	
Carbon steel C<0.3%	60-70-80	(S=5570 rpm) 0.08-0.12-0.14	(S=4456 rpm) 0.10-0.12-0.16	(S=3536 rpm) 0.10-0.14-0.16	(S=2785 rpm) 0.12-0.15-0.18	(S=2228 rpm) 0.14-0.18-0.20		emulsion
Carbon steel C>0.3%	50-60-70	(S=4774 rpm) 0.08-0.12-0.14	(S=3819 rpm) 0.10-0.12-0.16	(S=3031 rpm) 0.10-0.14-0.16	(S=2387 rpm) 0.12-0.15-0.18	(S=1909 rpm) 0.14-0.18-0.20		emulsion
Low alloy steel C<0.3%	45-55-65	(S=4376 rpm) 0.06-0.08-0.10	(S=3501 rpm) 0.08-0.10-0.12	(S=2778 rpm) 0.08-0.12-0.14	(S=2188 rpm) 0.10-0.14-0.16	(S=1750 rpm) 0.12-0.16-0.20		emulsion
High alloy steel C>0.3%	40-50-60	(S=3978 rpm) 0.04-0.06-0.08	(S=3183 rpm) 0.06-0.08-0.10	(S=2526 rpm) 0.08-0.10-0.12	(S=1989 rpm) 0.10-0.14-0.16	(S=1591 rpm) 0.10-0.14-0.16		emulsion
Stainless Steel	10-15-25	(S=1194 rpm) 0.02-0.04-0.06	(S=955 rpm) 0.02-0.04-0.06	(S=758 rpm) 0.04-0.06-0.08	(S=597 rpm) 0.04-0.06-0.08	(S=477 rpm) 0.05-0.07-0.10		emulsion internal≥5 bar
Cast iron	50-60-70	(S=4774 rpm) 0.06-0.08-0.10	(S=3819 rpm) 0.08-0.10-0.12	(S=3031 rpm) 0.08-0.12-0.14	(S=2387 rpm) 0.10-0.14-0.16	(S=1909 rpm) 0.12-0.16-0.18		dry
Al, and non-ferrous metal	100-150 -200	(S=11936 rpm) 0.02-0.04-0.06	(S=9549 rpm) 0.04-0.06-0.08	(S=7578 rpm) 0.04-0.06-0.08	(S=5968 rpm) 0.06-0.08-0.10	(S=4774 rpm) 0.06-0.08-0.10		emulsion

- Clamping of the insert



- Unscrew the insert



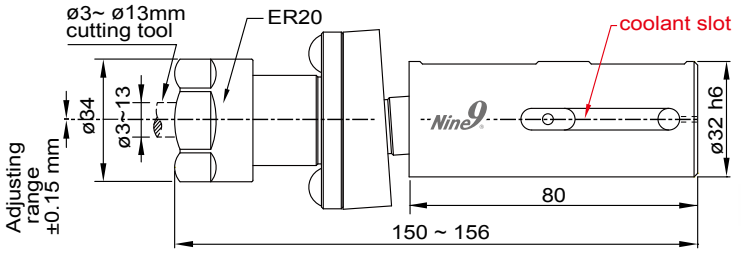
Center Height Adjusting Sleeve

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.

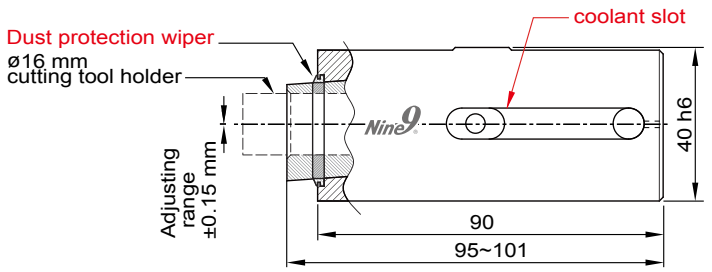
Parts No.:00-99600-320H >>

Type : SB32-IDER20



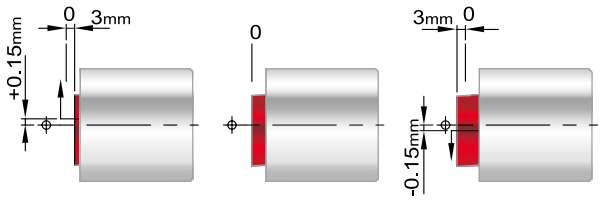
Parts No.:00-99600-400H >>

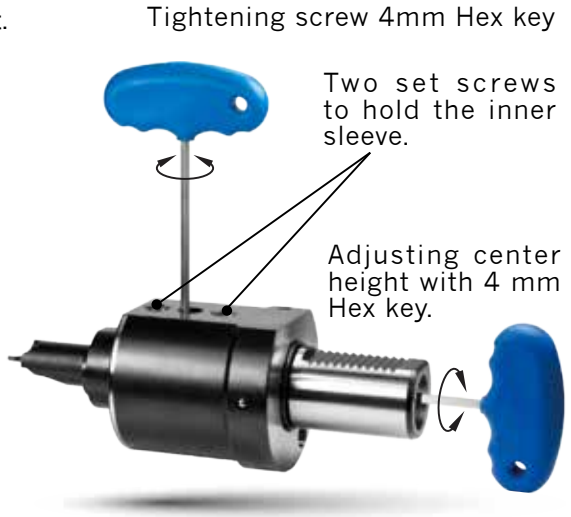
Type : SB32-ID16



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 type of internal turning tool holders.
- Center height adjusting range: ±0.15 mm(.006").
- Total axial movement is 6mm(.236").





You will be interested to know the whole range of Nine9 tools.