



Center Drill >>>

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.



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



Features >>>

► 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. (24 inch/min.) 0.1 mm/rev. (0.004 inch/rev.).

► Excellent Repeatability

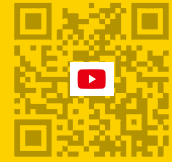
- The positioning repeatability of the insert is within 0.02 mm (.0008") in radial direction, thus ensuring conformity to any national standards.

► 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.

► 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.



Applications

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

Drilling depth is constant

Drilling depth is inconstant

re-setting

DIN 332 Form R
Ø1.0~Ø10 (0.039"~0.394")

DIN 332 Form A
Ø2.0~Ø3.15 (0.079"~0.124")

DIN 332 Form A+B
Ø1.0~Ø10 (0.039"~0.394")

ANSI 60°
#2.0~#10




2

i-Center

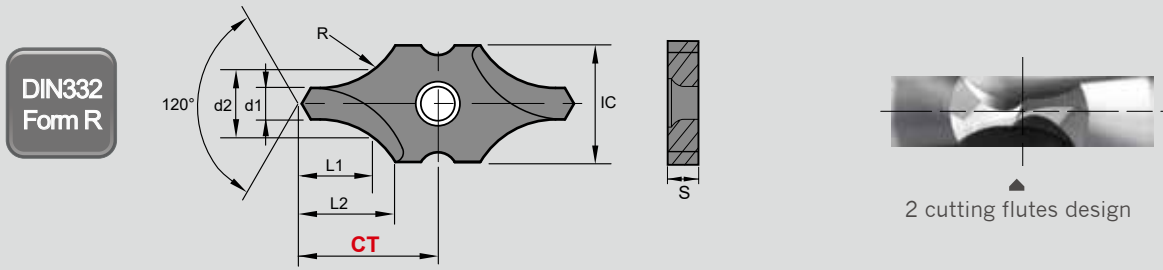


“ World’s first indexable center drill.
Shortens set up and
center drilling time.
Increases tool life and
reduces tooling costs. ”



- NC2057**  • P35 grade, AlTiN + TiSiN coating, Universal grade for all kind of steel.
• Double-edged cutting, fully ground insert for improving machining stability. (IC10 inserts)
- NC5074**  • P40 grade, Helica (AlCrN) coating,
design for small diameter center drill (IC08 inserts).
- NC2033**  • K20F grade, TiAlN coated, for carbon steel, alloy steel,
high alloy steel and cast iron.

DIN332 Form R



► For DIN332
Form R Center Hole ►►

2

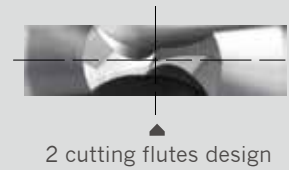
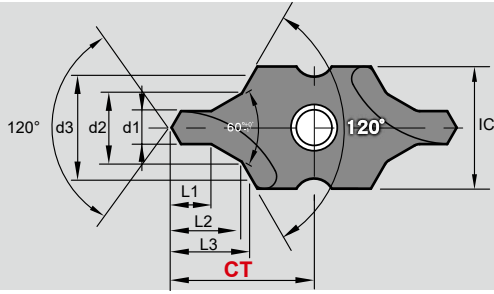
i-Center

IC	Parts No.	Coating	Grade	d1	d2	L1	L2	R	S	CT ±0.025 (0.001")	
08 (0.315")	I9MT08T1R0100-NC5074	Helica	P40	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")	2.00 (0.079")	7.55 (0.297")
	I9MT08T1R0125-NC5074			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-NC5074			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-NC5074			2.00 (0.079")		4.25 (0.167")	4.45 (0.175")	6.08 (0.240")	5.65 (0.222")		9.10 (0.358")
10 (0.394")	I9MT1003R0100-NC2057	AlTiN+ TiSiN	P35	1.00 (0.039")	+ 0.14 (0.006") 0	2.12 (0.083")	2.16 (0.085")	4.72 (0.186")	2.8 (0.110")	3.00 (0.118")	12.35 (0.486")
	I9MT1003R0125-NC2057			1.25 (0.049")		2.65 (0.104")	2.74 (0.108")	5.22 (0.206")	3.5 (0.138")		
	I9MT1003R0150-NC2057			1.50 (0.059")		3.60 (0.142")	3.67 (0.144")	6.14 (0.242")	5.0 (0.197")		
	I9MT1003R0160-NC2057			1.60 (0.063")		3.35 (0.132")	3.45 (0.136")	5.32 (0.210")	4.5 (0.177")		
	I9MT1003R0200-NC2057			2.00 (0.079")		4.25 (0.167")	4.45 (0.175")	6.50 (0.256")	5.65 (0.222")		
	I9MT1003R0250-NC2057			2.50 (0.098")		5.30 (0.209")	5.59 (0.220")	7.66 (0.302")	7.15 (0.281")		
	I9MT1003R0300-NC2057			3.00 (0.118")		5.70 (0.224")	6.92 (0.272")	9.50 (0.374")	10.00 (0.394")		
	I9MT1003R0315-NC2057			3.15 (0.124")		6.70 (0.264")	7.21 (0.284")	8.93 (0.352")	9.00 (0.354")		
12 (0.472")	I9MT12T2R0200-NC2033	TiAlN	K20F	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")	2.54 (0.1")	11.73 (0.462")
	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")		6.7 (0.264")	7.21 (0.284")	9.63 (0.379")	9.0 (0.354")		14.00 (0.551")
16 (0.630")	I9MT1603R0400-NC2033			+ 0.18 (0.007") 0	4.00 (0.157")	8.5 (0.335")	9.06 (0.357")	12.23 (0.481")	11.0 (0.433")	3.18 (0.125")	19.40 (0.764")
	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")
20 (0.787")	I9MT2004R0630-NC2033			+ 0.22 (0.009") 0	6.30 (0.248")	13.2 (0.520")	14.63 (0.576")	18.2 (0.717")	18.0 (0.709")	4.76 (0.187")	28.40 (1.118")
	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")			
25 (0.984")	I9MT2506R1000-NC2033			10.00 (0.394")	21.2 (0.835")	23.51 (0.926")	25.8 (1.016")	28.0 (1.102")	6.35 (0.25")	34.20 (1.346")	

The quantity of insert per box.:	IC 08	IC 10	IC 12	IC 16	IC 20	IC 25
	5	5	5	2	1	1

DIN332 Form A+B

DIN332
Form A+B



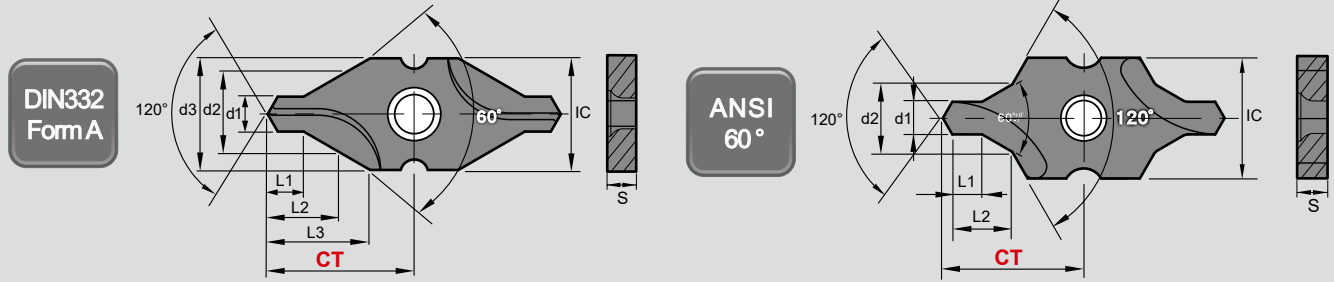
► For DIN332
Form A+B Center Hole >>

IC	Parts No.	Coating	Grade	d1	d2	d3	L1	L2	L3	S	CT ±0.025 (0.001")	
08 (0.315")	I9MT08T1B0100-NC5074	Helica	P40	1.00 (0.039")	2.12 (0.083")	3.15 (0.124")	1.3 (0.051")	2.21 (0.087")	2.51 (0.099")	2.00 (0.079")	7.55 (0.297")	
	I9MT08T1B0125-NC5074			+ 0.14 (0.006") 0	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-NC5074			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-NC5074			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")	
10 (0.394")	I9MT1003B0100-NC2057	AlTiN+ TiSiN	P35	1.00 (0.039")	2.12 (0.083")	3.15 (0.124")	1.3 (0.051")	2.21 (0.087")	2.51 (0.099")	3.00 (0.118")	12.35 (0.486")	
	I9MT1003B0125-NC2057			1.25 (0.049")	2.65 (0.104")	4.0 (0.157")	1.6 (0.063")	2.75 (0.108")	3.14 (0.124")			
	I9MT1003B0150-NC2057			1.50 (0.059")	3.18 (0.125")	4.50 (0.177")	2.0 (0.079")	3.45 (0.136")	3.84 (0.151")			
	I9MT1003B0160-NC2057			1.60 (0.063")	3.35 (0.132")	5.0 (0.197")	2.0 (0.079")	3.46 (0.136")	3.93 (0.155")			
	I9MT1003B0200-NC2057			2.00 (0.079")	4.25 (0.167")	6.3 (0.248")	2.5 (0.098")	4.39 (0.173")	4.98 (0.196")			
	I9MT1003B0250-NC2057			2.50 (0.098")	5.3 (0.209")	8.0 (0.315")	3.1 (0.122")	5.53 (0.218")	6.28 (0.247")			
	I9MT1003B0300-NC2057			3.00 (0.118")	6.46 (0.254")	9.00 (0.354")	4.1 (0.161")	7.10 (0.280")	7.83 (0.308")			
	I9MT1003B0315-NC2057			3.15 (0.124")	6.7 (0.264")	10.0 (0.394")	3.9 (0.154")	6.90 (0.272")	7.85 (0.309")			
12 (0.472")	I9MT12T2B0200-NC2033	TiAlN	K20F	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")	2.54 (0.1")	11.73 (0.462")
	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")	6.7 (0.264")	10.0 (0.394")	3.9 (0.154")	6.90 (0.272")	7.85 (0.309")	14.00 (0.551")		
16 (0.630")	I9MT1603B0400-NC2033			4.00 (0.157")	+ 0.18 (0.007") 0	8.5 (0.335")	12.5 (0.492")	5.0 (0.197")	8.9 (0.350")	10.03 (0.395")	3.18 (0.125")	19.40 (0.764")
	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")		
20 (0.787")	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")	4.76 (0.187")	28.40 (1.118")
	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")			
25 (0.984")	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")	6.35 (0.25")	34.20 (1.346")		

The quantity of insert per box: IC 08 5, IC 10 5, IC 12 5, IC 16 2, IC 20 1, IC 25 1

* Notice: The d3 size is different from DIN332 center hole.

DIN332 Form A & ANSI 60°



► For DIN332 Form A Center Hole >>

The quantity of insert per box.:

IC 08	IC 10	IC 12	IC 16	IC 20	IC 25
5	5	5	2	1	1

2

i-Center

IC	Parts No.	Coating	Grade	d1	d2	d3	L1	L2	L3	S	CT ±0.025 (0.001")	
08 (0.315")	I9MT08T1A0200-NC5074	Helica	P40	2.0 (0.079")	+ 0.03 (0.001")	4.25 (0.167")	2.15 (0.085")	4.10 (0.161")	7.35 (0.289")	2.00 (0.079")	10.5 (0.413")	
	I9MT08T1A0250-NC5074			2.5 (0.098")	0	5.3 (0.209")	8	2.58 (0.102")	5.00 (0.197")			7.34 (0.289")
	I9MT08T1A0315-NC5074			3.15 (0.124")	+ 0.03 (0.001")	6.70 (0.264")	3.23 (0.127")	6.30 (0.248")	7.43 (0.293")			

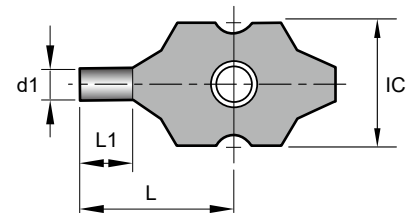


► For ANSI 60° Center Hole >>

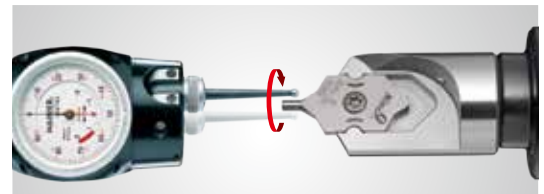
IC	Parts No.	Coating	Grade	Size	d1		d2		L1		L2	S	CT ±0.025 (0.001")		
					mm		mm		mm	mm	mm				
12 (0.472")	I9MT12T2A2-NC2033	TiAlN	K20F	#2	5/64	1.98	+ 0.14 (0.006")	3/16	4.76	5/64	1.98	4.4 (0.173")	2.54 (0.1")	12.6 (0.496")	
	I9MT12T2A3-NC2033			#3	7/64	2.78	0	1/4	6.35	7/64	2.78	5.9 (0.232")	2.54 (0.1")	13.8 (0.543")	
	I9MT12T2A4-NC2033			#4	1/8	3.18		5/16	7.94	1/8	3.18	7.3 (0.287")		14.25 (0.561")	
16 (0.630")	I9MT1603A5-NC2033			#5	3/16	4.76	+ 0.18 (0.007")	0	7/16	11.11	3/16	4.76	10.3 (0.406")	3.18 (0.125")	20.0 (0.787")
	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			5/8	15.88	1/4	6.35	14.6 (0.575")	4.76 (0.187")	28.5 (1.122")
20 (0.787")	I9MT2004A8-NC2033			#8	5/16	7.94	+ 0.22 (0.009")	0	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")	6.35 (0.25")	34.9 (1.374")

► Measuring Master >>

- Apply on lathe to align the center of work spindle and tool.
- Each insert has just one measuring tip.
- Concentricity: ±0.01mm (0.004")



IC	Parts No.	d1	L	L1
08 (0.315")	I9MT08T1-PATTERN	Ø1.9 (0.075")	9.0 (0.354")	3.0 (0.118")
10 (0.394")	I9MT1003-PATTERN	Ø2.9 (0.114")	11.5 (0.453")	5.0 (0.197")
12 (0.472")	I9MT12T2-PATTERN	Ø2.3 (0.091")	13.5 (0.531")	3.5 (0.138")
16 (0.630")	I9MT1603-PATTERN	Ø3.0 (0.118")	19.0 (0.748")	5.0 (0.197")
20 (0.787")	I9MT2004-PATTERN	Ø4.5 (0.177")	26.0 (1.024")	8.0 (0.315")

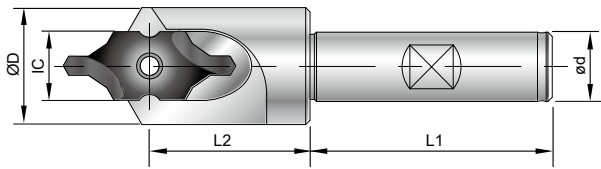


Holders of Indexable Center Drill



▶ Holder >>

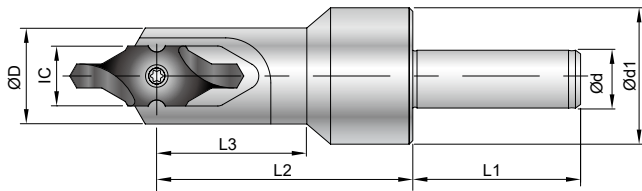
- Made of hardened high alloy steel, 53 HRC.
- IC08 shank is cylindrical shank.
- Other shanks are weldon shank.



IC	Parts No.	Type	ød	L1	L2	ØD	Screw	Key
08 (0.315")	99616-IC08-10F	BC10-IC08F	10 (0.394")	30	18.5	12	NS-25060 0.9 Nm	NK-T7
	99616-IC08-3/8F	BC3/8"-IC08F	3/8"	(1.181")	(0.728")	(0.472")		
10 (0.394")	99616-IC10-12F	SB12-IC10F	12 (0.472")	45	24.5	16	NS-25060 0.9 Nm	NK-T7
12 (0.472")	99616-IC12-16F	SB16-IC12F	16 (0.630")	48	30.5	21		
16 (0.630")	99616-IC12-5/8F	SB5/8"-IC12F	5/8"	(1.890")	(1.201")	(0.827")	NS-30072 2.0 Nm	NK-T9
	99616-IC16-16F	SB16-IC16F	16 (0.630")	48	37	27		
20 (0.787")	99616-IC16-5/8F	SB5/8"-IC16F	5/8"	(1.890")	(1.457")	(1.063")	NS-35080 2.5 Nm	NK-T15
	99616-IC20-20F	SB20-IC20F	20 (0.787")	50	51	32		
25 (0.984")	99616-IC20-3/4F	SB3/4"-IC20F	3/4"	(1.969")	(2.008")	(1.260")	NS-50125 5.5 Nm	NK-T20
	99616-IC25-25F	SB25-IC25F	25 (0.984")	56	56	43		
	99616-IC25-1F	SB 1"-IC25F	1"	(2.205")	(2.205")	(1.693")	NS-50125 5.5 Nm	NK-T20

▶ Cylindrical Shank with Pre-balanced >>

- Pre-balanced holder enhance the stability of centering to get high accurate profile.
- G6.3 / 10,000 r.p.m.



IC	Parts No.	Type	ød	ød1	L1	L2	L3	ØD	Screw	Key
08 (0.315")	99616-IC08-10B	BC10-IC08B	10 (0.394")	22 (0.866")	30 (1.181")	33.5 (1.319")	19 (0.748")	12 (0.472")	NS-25060 0.9 Nm	NK-T7
12 (0.472")	99616-IC12-12B	BC12-IC12B	12 (0.472")	34 (1.339")	48 (1.890")	51 (2.008")	30 (1.181")	21 (0.827")		
16 (0.630")	99616-IC16-16B	BC16-IC16B	16 (0.630")	39 (1.535")	48 (1.890")	67 (2.638")	37 (1.457")	27 (1.063")	NS-35080 2.5 Nm	NK-T15
20 (0.787")	99616-IC20-20B	BC20-IC20B	20 (0.787")	49 (1.929")	50 (1.969")	86 (3.386")	51 (2.008")	32 (1.260")		
25 (0.984")	99616-IC25-25B	BC25-IC25B	25 (0.984")	59 (2.323")	56 (2.205")	99 (3.898")	56 (2.205")	43 (1.693")	NS-50125 5.5 Nm	NK-T20



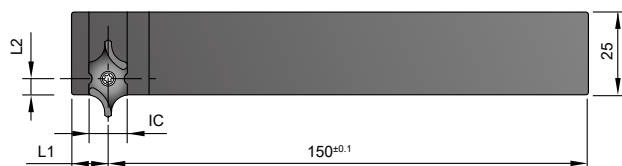
i-Center

HOLDERS OF INDEXABLE CENTER DRILL



▶ Square Shank 25 x 25 Right / Left Hand >>

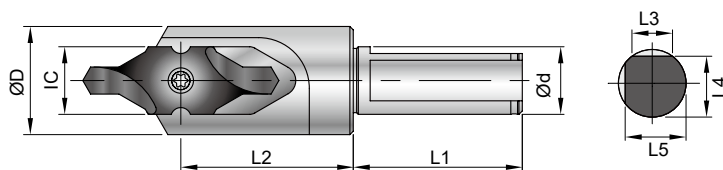
- For used on lathe, clamp by VDI and BMT holders.
- Made of hardened alloy steel, 40 HRC.
- Other sizes are available on request.



IC	Parts No.	L1	L2	Screw	Key
08 (0.315")	99616-IC08-R2525MF	8 (0.315")	3.25 (0.128")	NS-25060 0.9 Nm	NK-T7
	99616-IC08-L2525MF				
12 (0.472")	99616-IC12-R2525MF	11 (0.433")	4.9 (0.193")	NS-30072 2.0 Nm	NK-T9
	99616-IC12-L2525MF				
16 (0.630")	99616-IC16-R2525MF	13 (0.512")	4.9 (0.193")	NS-35080 2.5 Nm	NK-T15
	99616-IC16-L2525MF				

▶ Double Flat Shank >> Non-Stock Item

- Used on lathe.
- Double flat shank design for tool holder with side lock flat.
- 180° for insert at top, 90° for insert at front.

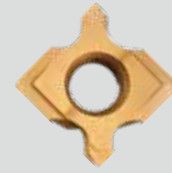


IC	Parts No.	Type	Ød	L1	L2	L3	L4	L5	ØD	Screw	Key
08 (0.315")	99616-IC08-10S	SL10-IC08S	10 (0.394")	30 (1.181")	18.5 (0.728")	6 (0.236")	9 (0.354")	9 (0.354")	12 (0.472")	NS-25060 0.9 Nm	NK-T7
12 (0.472")	99616-IC12-16S	SL16-IC12S	16 (0.630")	48 (1.890")	30.5 (1.201")	9.33 (0.367")	14.5 (0.571")	14.5 (0.571")	21 (0.827")	NS-30072 2.0 Nm	NK-T9
16 (0.630")	99616-IC16-16S	SL16-IC16S	16 (0.630")	48 (1.890")	37 (1.457")	9.33 (0.367")	14.5 (0.571")	14.5 (0.571")	27 (1.063")	NS-35080 2.5 Nm	NK-T15
20 (0.787")	99616-IC20-20S	SL20-IC20S	20 (0.787")	50 (1.969")	51 (2.008")	12 (0.472")	18 (0.709")	18 (0.709")	32 (1.260")	NS-50125 5.5 Nm	NK-T20
25 (0.984")	99616-IC25-25S	SL25-IC25S	25 (0.984")	56 (2.205")	56 (2.205")	13.57 (0.534")	23 (0.905")	23 (0.905")	43 (1.693")	NS-50125 5.5 Nm	NK-T20

2

i-Center

N9MT11T3PR Radius Center Drilling

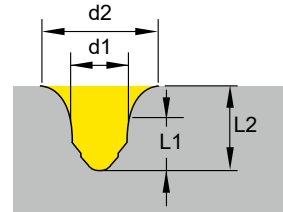


NC40

▶ 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.

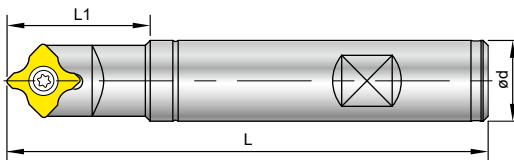
- NC40:**
- Universal grade for all unhardened steel and cast iron.
 - Radius curve eliminates the sharp transition from drill point to countersink angle.
 - The risk of breakage is reduced.
 - Each insert has 2 cutting edges.



Parts No.	Coating	Grade	Dimensions			
			d1	d2	L1	L2
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 >>

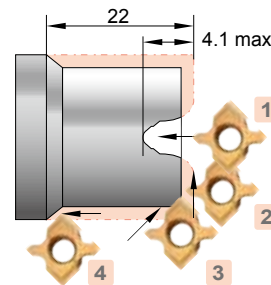
- PR holder has small offset value.
- Also apply as a 90° spotting drill while fitted with N9MT11T3CT2T-H insert (page 2-14).



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 >>

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	



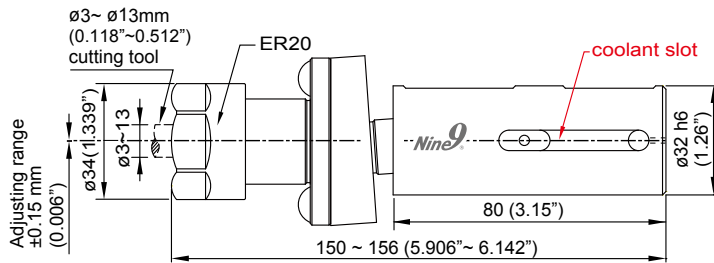
i-Center

Center Height Adjusting Sleeve

► Principle >>

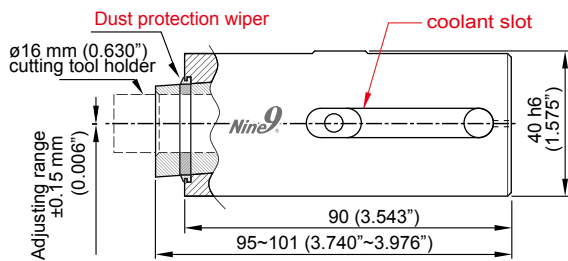
- Designed for adjusting Center Height of center drills, NC spot drills, reamers and taps on the CNC lathes.
- The main body is made from two sleeves. The inner sleeve is to hold and lock the cutting tool.
- Its center is inclined to the outer sleeve. When the inner sleeve is pushed or pulled, the cutting tool's center height is adjusted to lower or higher position.

► Parts No.:99600-320H >>



► Type : SB32-IDER20

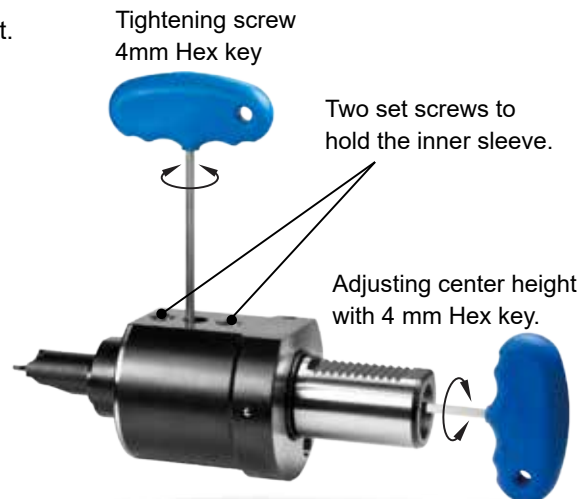
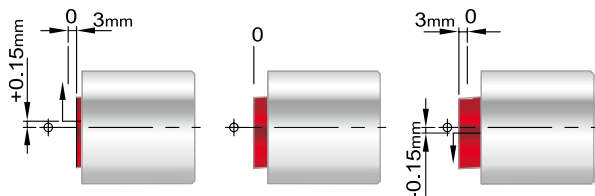
► Parts No.:99600-400H >>



► Type : SB40-ID16

► Applications >>

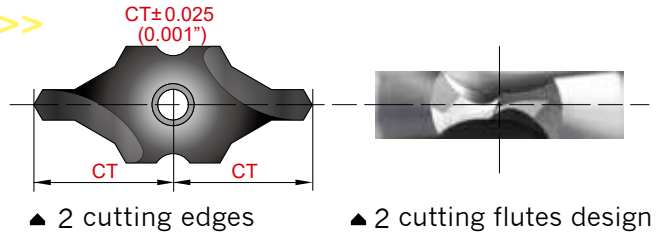
- Used when the CNC lathes need to adjust the center height.
- This sleeve can be clamped by VDI 40, VDI 50 E2 tool holders, and other types internal turning tool holders.
- Center height adjusting range: ± 0.15 mm (.006").
- Total axial movement is 6mm (.236").



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.



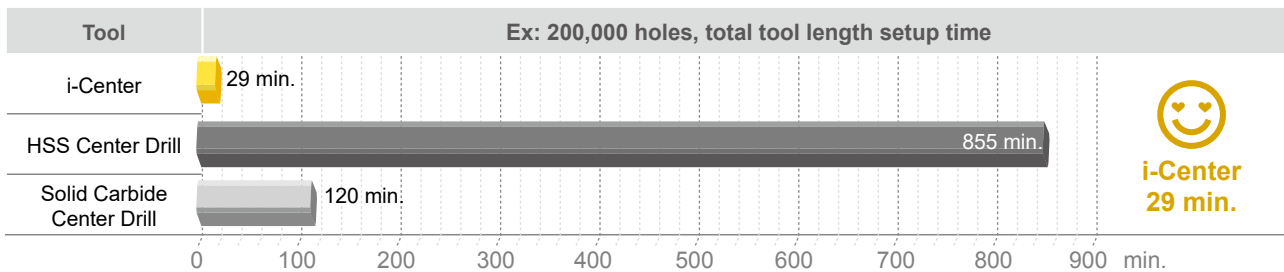
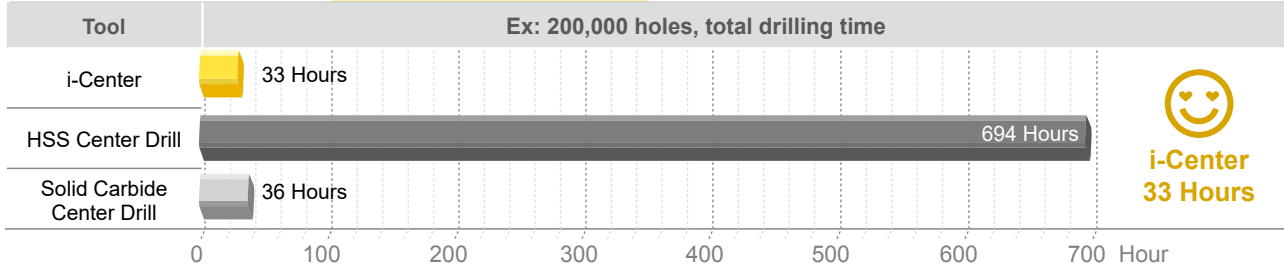
► Comparison >>

- Workpiece : Low carbon alloy steel, 850 N/mm²
- 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

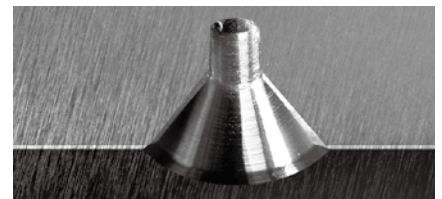
2

i-Center



► Surface finish >>

i-Center Insert	Material SCM440	
19MT1603B0500 NC2033	Vc	60 m/min.
	S	3800 r.p.m.
	f	0.1 mm/rev.
	F	380 mm/min.
	Ap	13.5 mm



```

Perthometer M1
Object
Name
#
Lt 5.633 mm
Ls Standard 0.25 µm
Lc 0.833 mm
Ra 0.533 µm
Rz 3.25 µm
Rmax 3.51 µm
RPa(0.5,-0.5) 58 %
R Profile
Lc 0.833 mm
VER 2.50 µm
    
```



i-Center Enquiry Form

▶ Previous process tool >>

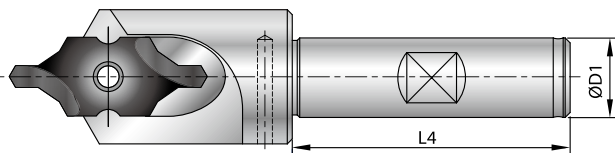
▶ Challenge or improvement >>

The following information should be checked while discussing with customer.

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

▶ Special Tool holder shank dimensions >>

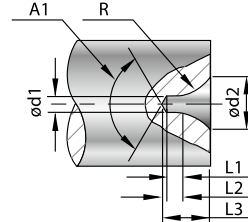
- Special tool holder shank, please fill in D1 and L4.
- As attached workpiece drawing.
- Metric Inch Right Left



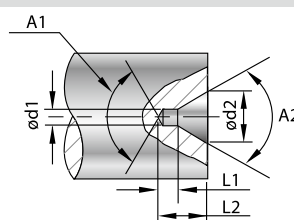
▶ Center hole dimension >>

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

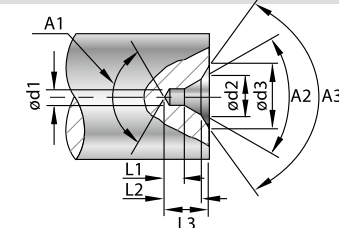
Type R



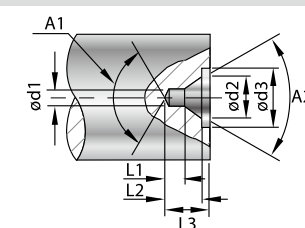
Type A



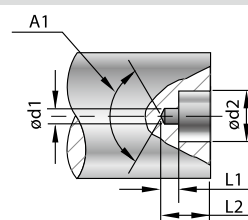
Type B



Type C



Other

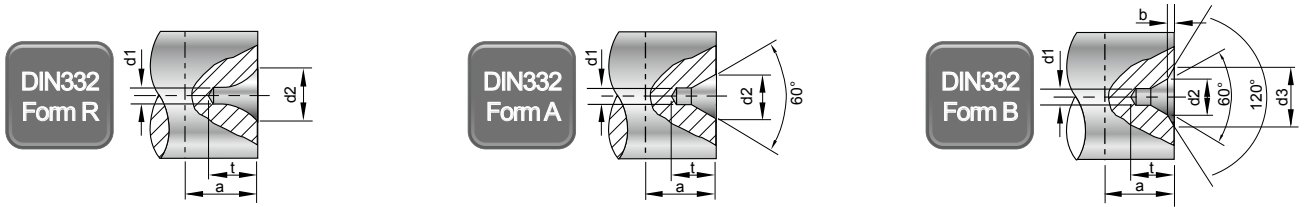


Dimension Table	A1	A2	A3	ød1	ød2	ød3
Dimension						
Tolerance	—	+0° -1°	±1°	±0.05	±0.05	—

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

Technical Standard ISO 2541-1972 / DIN332

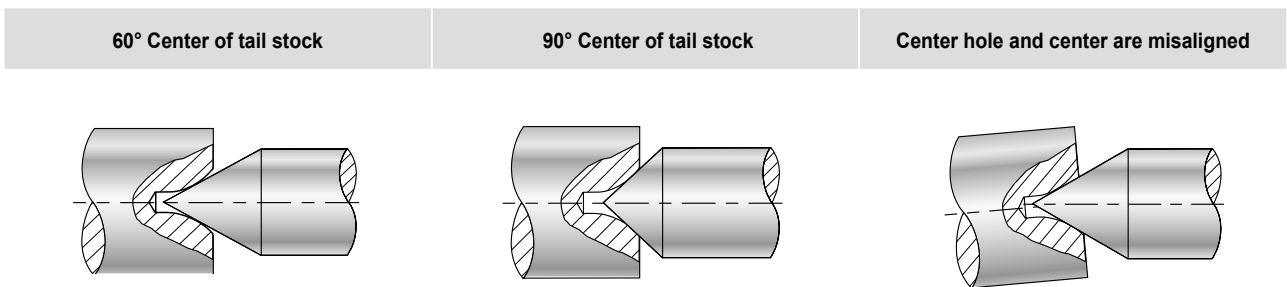
► 60° Center holes >>



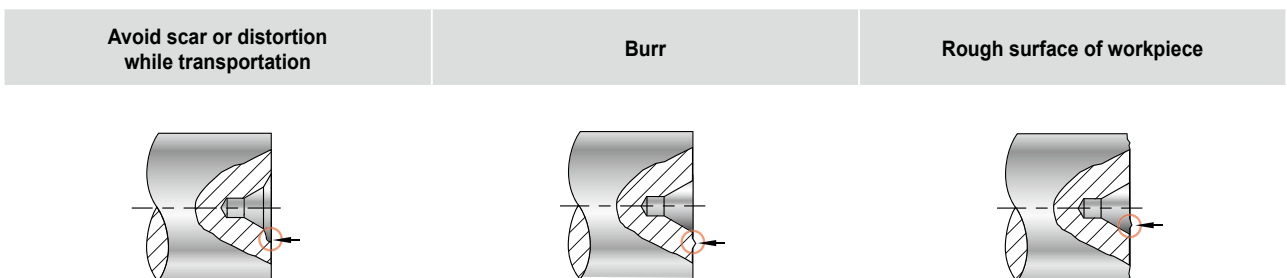
STD	DIN332 Form R ISO 2541-1972			DIN332 Form A ISO 866-1975			DIN332 Form B ISO 2540 1973				
d1	d2	t	a	d2	t	a	d2	b	d3	t	a
1	2.12	1.9	3	2.12	1.9	3	2.12	0.3	3.15	2.2	3.5
1.25	2.65	2.3	4	2.65	2.3	4	2.65	0.4	4	2.7	4.5
1.6	3.35	2.9	5	3.35	2.9	5	3.35	0.5	5	3.4	5.5
2	4.25	3.7	6	4.25	3.7	6	4.25	0.6	6.3	4.3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

► Form R center hole apply for >>



► Form B center hole apply for >>

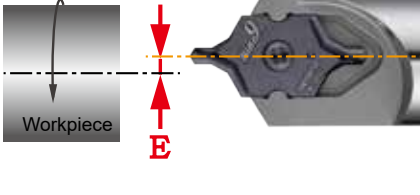
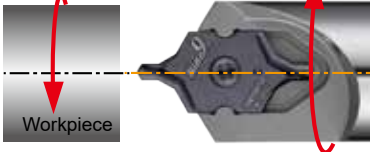

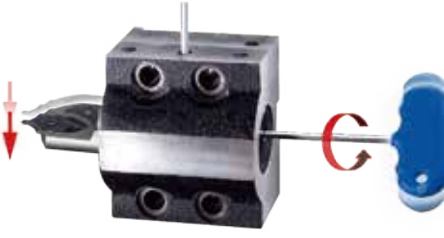

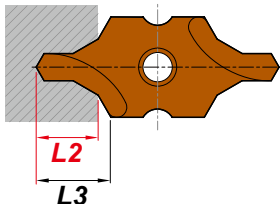
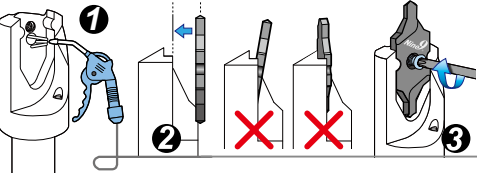
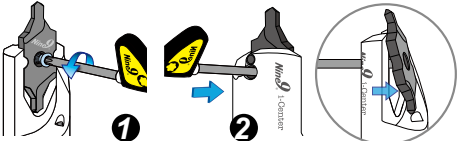


2

i-Center

Technical Guide

► Before you start, please pay attention the following conditions ►►

Center misalignment	Driving Tool	Center height adjusting sleeve
<p>E must be < 0.02mm (0.0008").</p> 	<p>low speed : high speed 1 : 3</p> <p>low speed</p>  <p>high speed</p> 	<p>When CNC lathe turret center is misaligned $\geq 0.15\text{mm}$ (0.006"), please use center height adjusting sleeve. (See page 2-58)</p> 
Internal coolant	DIN 332 Form A+B	Clamping insert
<p>Internal coolant is recommended.</p> 	<p>Reduce 30% of Spindle speed and keep same feed rate (inch/rev.) while depth L2 is reached.</p> 	 <p>Loosen insert</p> 

Applications

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





2

i-Center

Cutting Data



▶ Ø1~Ø3.15 (A2~A4)

● Best ○ Possible

Workpiece material	d1	IC08 / IC10		IC12				
		Ø1~1.25mm (0.039"~0.049")	Ø1.6~3.15 (0.063"~0.124")	Ø2mm A2 (0.079")	Ø2.5 A3 (0.098")	Ø3.15 A4 (0.124")		
Carbon steel C<0.3%	SFM	21 ~ 125	30 ~ 255	35 ~ 160	40 ~ 180	40 ~ 195	●	○
	IPR inch/rev.	.0008 ~ .0020	.0012 ~ .0024	.0016 ~ .0031	.0024 ~ .0039	.0031 ~ .0047	●	○
Carbon steel C>0.3%	SFM	21 ~ 115	30 ~ 230	35 ~ 145	40 ~ 180	40 ~ 175	●	○
	IPR inch/rev.	.0008 ~ .0020	.0012 ~ .0020	.0012 ~ .0020	.0024 ~ .0039	.0031 ~ .0047	●	○
Low alloy steel C<0.3%	SFM	21 ~ 100	30 ~ 200	35 ~ 130	40 ~ 160	40 ~ 155	●	○
	IPR inch/rev.	.0004 ~ .0016	.0008 ~ .0020	.0008 ~ .0020	.0016 ~ .0031	.0024 ~ .0039	●	○
High alloy steel	SFM	11 ~ 75	15 ~ 155	20 ~ 95	21 ~ 120	20 ~ 115	●	○
	IPR inch/rev.	.0004 ~ .0008	.0004 ~ .0016	.0004 ~ .0016	.0008 ~ .0024	.0016 ~ .0031	●	○
Stainless steel	SFM	11 ~ 35	15 ~ 75	20 ~ 45	21 ~ 60	20 ~ 55	●	○
	IPR inch/rev.	.0001 ~ .0004	.0002 ~ .0008	.0004 ~ .0008	.0004 ~ .0012	.0008 ~ .0020	●	○
Cast iron	SFM	21 ~ 115	30 ~ 230	35 ~ 145	41 ~ 180	40 ~ 175	Air	
	IPR inch/rev.	.0004 ~ .0016	.0008 ~ .0024	.0008 ~ .0024	.0016 ~ .0031	.0024 ~ .0039	Air	
Non-ferrous metal	SFM	62 ~ 255	80 ~ 515	100 ~ 515	121 ~ 400	118 ~ 390	●	○
	IPR inch/rev.	.0004 ~ .0012	.0004 ~ .0016	.0004 ~ .0016	.0008 ~ .0020	.0008 ~ .0024	●	○

▶ Ø4~Ø10 (A5~A10)

● Best ○ Possible

Workpiece material	d1	IC16	IC20			IC25		
		Ø4 A5 (0.157")	Ø5 A6 (0.197")	Ø6.3 A7 (0.248")	Ø8 A8 (0.315")	Ø10 A10 (0.394")		
Carbon steel C<0.3%	SFM	50 ~ 245	52 ~ 255	55 ~ 260	58 ~ 285	60 ~ 290	●	○
	IPR inch/rev.	.0031 ~ .0055	.0039 ~ .0063	.0039 ~ .0063	.0047 ~ .0071	.0055 ~ .0079	●	○
Carbon steel C>0.3%	SFM	50 ~ 220	52 ~ 230	55 ~ 235	58 ~ 255	60 ~ 265	●	○
	IPR inch/rev.	.0031 ~ .0055	.0039 ~ .0063	.0039 ~ .0063	.0047 ~ .0071	.0055 ~ .0079	●	○
Low alloy steel C<0.3%	SFM	50 ~ 195	52 ~ 205	55 ~ 205	58 ~ 225	60 ~ 235	●	○
	IPR inch/rev.	.0024 ~ .0039	.0031 ~ .0047	.0031 ~ .0055	.0039 ~ .0063	.0047 ~ .0079	●	○
High alloy steel	SFM	25 ~ 145	26 ~ 150	30 ~ 155	30 ~ 170	30 ~ 175	●	○
	IPR inch/rev.	.0016 ~ .0031	.0024 ~ .0039	.0031 ~ .0047	.0039 ~ .0063	.0039 ~ .0063	●	○
Stainless steel	SFM	25 ~ 70	26 ~ 75	27 ~ 78	30 ~ 85	30 ~ 88	●	○
	IPR inch/rev.	.0008 ~ .0024	.0008 ~ .0024	.0016 ~ .0031	.0016 ~ .0031	.0020 ~ .0039	●	○
Cast iron	SFM	50 ~ 220	52 ~ 230	55 ~ 235	60 ~ 255	60 ~ 265	Air	
	IPR inch/rev.	.0024 ~ .0039	.0031 ~ .0047	.0031 ~ .0055	.0039 ~ .0063	.0047 ~ .0071	Air	
Non-ferrous metal	SFM	150 ~ 490	155 ~ 515	160 ~ 520	172 ~ 570	177 ~ 585	●	○
	IPR inch/rev.	.0008 ~ .0024	.0016 ~ .0031	.0016 ~ .0031	.0024 ~ .0039	.0024 ~ .0039	●	○

▶ Calculate spindle speed and feed rate

Using your "d1" value and Surface Speed SFM from the data sheet, calculate spindle speed "S" (r.p.m.).

Example: I9MT12T2T2A2 has d1: 0.078", material: SS304

S (r.p.m.) = $3.82 \times 35 / 0.078 = 1714$ r.p.m. ▶▶ $3.82 \times 160 / 0.078 = 7835$ r.p.m.

Inch		
$S = \frac{(3.82 \times \text{SFM})}{d1}$	d1 = diameter-inch	f = IPR = inch/rev.
F = IPR x r.p.m.	S = Spindle Speed-r.p.m.	F = inch/min.
	SFM = Surface Speed-ft./min.	

