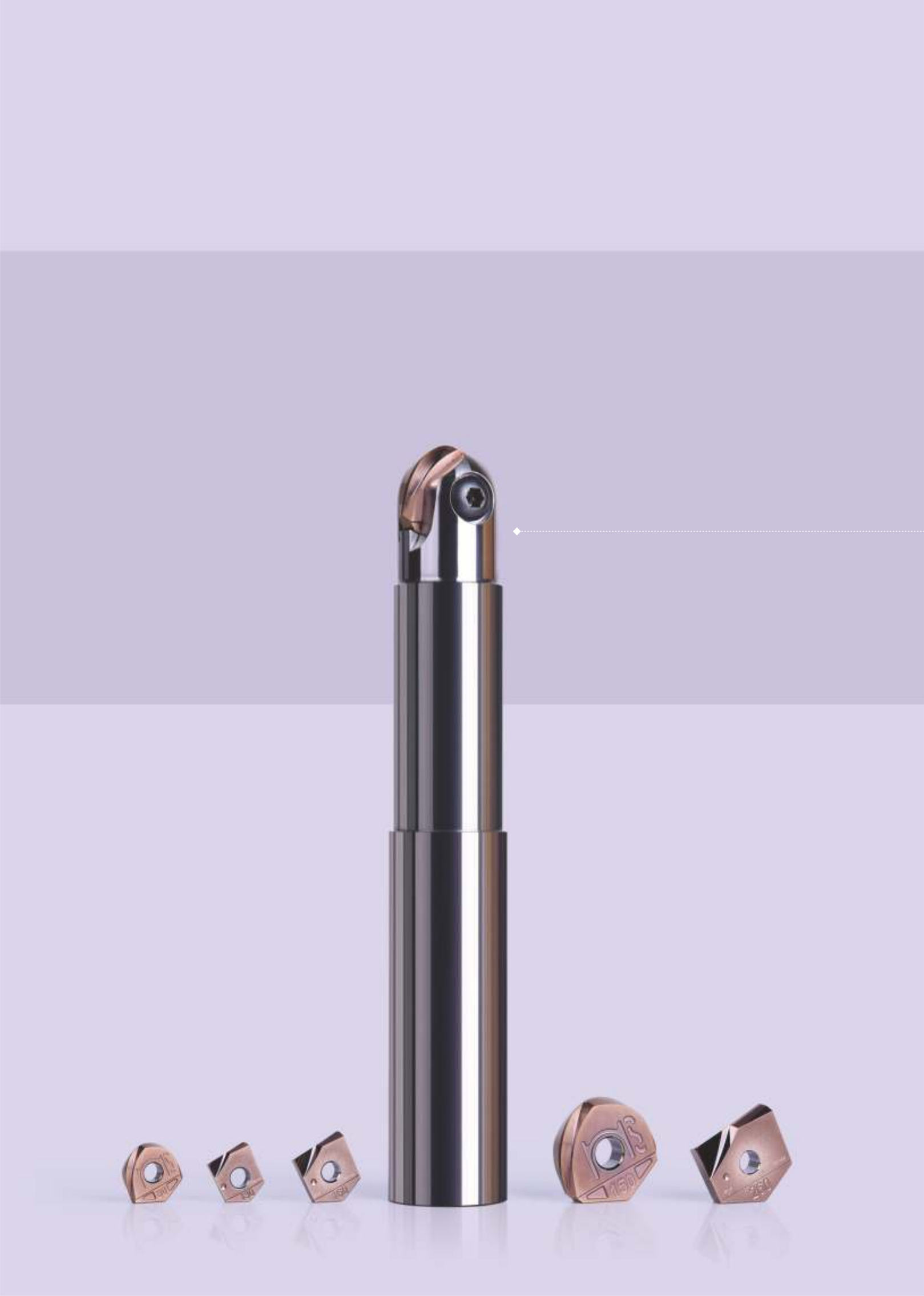


NANOLOY

INDEXABLE END MILLS

"N-IB/IR" SERIES

PRODUCT FEATURE

Features

Excellent tool life for high hardened materials machining
with superior NANO ultrafine grade

1. High precision in R (ball type : ±0.01 / corner R type : ±0.015)
2. Wide range of applications with various geometries and specifications
3. Excellent quality and performance for mold and parts machining

Applications

Profiling | Face milling | Helical milling | Slotting | Ramping | Shouldering

Clamping procedure

※ Follow this procedure for optimal precision

1. Cleaning the clamping space. (Use air blow)
2. Inserts numbering face forward. Insert the insert to holder and tighten the screw.
3. Tighten the screw using the torque wrench at a given torque. Don' t push the insert during tightening.
4. Clamping complete

※ Tightening torque by designation

Designation		Tightening torque (N · M)
Ball type	Corner R type	
NBGT-XX-5R	JRGT-HS-100(110)-Rx.x	1.8
NBGT-XX-6R	JRGT-HS-120(130)-Rx.x	3.7
NBGT-XX-8R	JRGT-HS-160(170)-Rx.x	3.7
NBGT-XX-10R	JRGT-HS-200(210)-Rx.x	3.8
NBGT-XX-12.5R	JRGT-HS-250(260)-Rx.x	5.2
NBGT-XX-15R	JRGT-HS-300-Rx.x	5.7

Geometries features

	Type	Geometry	Application	Features
N-IB Series (Ball End mills insert)	NHS		Hardened material (HRC 50↑)	1. Enhanced wear resistance with special geometries 2. Better tool life and edge strength by applying negative rake angle(α◦) 3. Applied clearance angle(β◦) suitable for hardened machining
N-IR Series (Corner R End mills insert)	HS			1. Available various corner R size 2. Optimal shape, grade, coating for machining over HRC50 3. High quality workpiece' s roughness

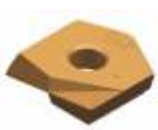
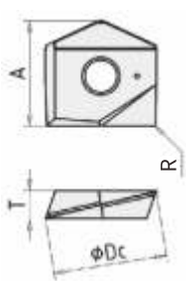
END MILLS INSERT SERIES

N-IB Series (Ball End Mills Insert)

Geometry	Designation	Dimension (mm)				Coated			Configuration
		R	ØDc	A	T	TS1125	TS1145	TS1165	
	NBGT-NHS-5R	5	10	12.2	2.7	○	●	○	
	NBGT-NHS-6R	6	12	14.6	3.2	○	●	○	
	NBGT-NHS-8R	8	16	16.6	4.2	○	●	○	
	NBGT-NHS-10R	10	20	20.3	5.2	○	●	○	
	NBGT-NHS-12.5R	12.5	25	24.1	6.2	○	●	○	
	NBGT-NHS-13R	13	26	24.6	6.2	○	●	○	
	NBGT-NHS-15R	15	30	29.2	7.2	○	●	○	

● Stock item

N-IR Series (Corner R End Mills Insert)

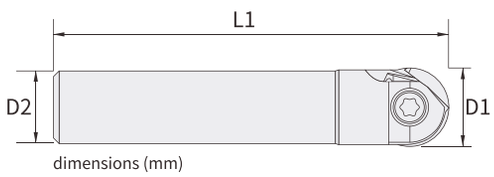
Geometry	Designation	Dimension (mm)				Coated			Configuration
		ØDc	A	T	R	TS1125	TS1145	TS1165	
	JRGT-HS-110-R0.5	11	12.1	2.7	0.5	○	●	○	
	JRGT-HS-110-R1.0	11	12.1	2.7	1.0	○	●	○	
	JRGT-HS-120-R0.5	12	14.6	3.2	0.5	○	●	○	
	JRGT-HS-120-R1.0	12	14.6	3.2	1.0	○	●	○	
	JRGT-HS-130-R0.5	13	14.6	3.2	0.5	○	●	○	
	JRGT-HS-130-R1.0	13	14.6	3.2	1.0	○	●	○	
	JRGT-HS-160-R0.5	16	16.6	4.2	0.5	○	●	○	
	JRGT-HS-160-R1.0	16	16.6	4.2	1.0	○	●	○	
	JRGT-HS-170-R0.5	17	16.4	4.2	0.5	○	●	○	
	JRGT-HS-170-R1.0	17	16.4	4.2	1.0	○	●	○	
	JRGT-HS-200-R0.5	20	19.8	5.2	0.5	○	●	○	
	JRGT-HS-200-R1.0	20	19.8	5.2	1.0	○	●	○	
	JRGT-HS-210-R0.5	21	19.8	5.2	0.5	○	●	○	
	JRGT-HS-210-R1.0	21	19.8	5.2	1.0	○	●	○	
	JRGT-HS-260-R0.5	26	22.6	6.2	0.5	○	●	○	
	JRGT-HS-260-R1.0	26	22.6	6.2	1.0	○	●	○	
	JRGT-HS-260-R2.0	26	22.6	6.2	2.0	○	●	○	

● Stock item

INDEXABLE END MILLS HOLDER SERIES

◎ Steel type and cemented carbide type

◎ Both ball and corner R inserts are available



dimensions (mm)

Designation		Cutting dia	Shank dia	Length	Applied Insert	Screw	Wrench
		D1	D2	L1			
NMC (Cemented carbide)	100 10 145	10	10	145	NBGT-5R/JRGT110	TPM35082	T10-T
	100 10 200	10	10	200			
	120 12 155	12	12	155	NBGT-6R/JRGT120	TPM50098	T20-T
	120 12 200	12	12	200			
	160 16 200	16	16	200	NBGT-8R/JRGT160, 170	TPM50136	
	160 16 250	16	16	250			
	200 20 220	20	20	220	NBGT-10R/JRGT200, 210	TPM60168	T25-T
	200 20 250	20	20	250			
	200 20 300	20	20	300			
	250 25 250	25	25	250	NBGT-12.5R/JRGT210	TPM60219	T30-T
	250 25 300	25	25	300			
	300 30 300	30	30	300	NBGT-15R	TPM80251	
	300 30 350	30	30	350			
	320 32 350	32	32	350	NBGT-16R	TPM80251	TPM80251
	320 32 400	32	32	400			
NMS (Steel)	160 16 220	16	16	220	NBGT-8R/JRGT160, 170	TPM50136	T20-T
	160 16 250	16	16	250			
	200 20 220	20	20	220	NBGT-10R/JRGT200, 210	TPM60168	T25-T
	200 20 250	20	20	250			
	250 25 220	25	25	220	NBGT-12.5R/JRGT210	TPM60219	T30-T
	250 25 250	25	25	250			
	250 25 300	25	25	300			
	300 32 220	32	30	220	NBGT-15R	TPM80251	
	300 32 250	32	30	250			
	300 32 300	32	30	300			
	300 32 350	32	30	350			
	300 32 400	32	30	400			
	320 32 350	32	32	350	NBGT-16R	TPM80251	
	320 32 400	32	32	400			

RECOMMENDED CUTTING CONDITION

N-IB Series (Ball End Mills Insert)

[High hardened Steel (HRC45~63)]

	Hardness	Cutting condition	5R		6R		8R		10R		12.5R		15R		16R	
			Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing
H	HRC45~55	vc (m/min)	100~210	260	100~200	290	100~150	350	100~150	400	100~150	450	100~150	500	100~150	500
		fz (mm/t)	0.10~0.20	0.2	0.10~0.20	0.2	0.12~0.24	0.3	0.12~0.24	0.4	0.12~0.24	0.5	0.12~0.24	0.6	0.12~0.24	0.6
		ap (mm)	0.15~0.25	0.1	0.20~0.30	0.1	0.60~0.80	0.1	0.70~1.00	0.1	0.90~1.25	0.1	1.10~1.60	0.1	1.10~1.60	0.1
		ae (mm)	0.80~1.00	0.25	0.90~1.20	0.3	1.10~1.60	0.3	1.50~2.00	0.4	1.80~2.50	0.5	2.40~3.20	0.6	2.40~3.20	0.6
	HRC55~63	vc (m/min)	80~170	200	80~160	230	80~200	280	80~120	320	80~120	360	80~120	400	80~120	400
		fz (mm/t)	0.10~0.20	0.2	0.10~0.20	0.2	0.12~0.24	0.3	0.12~0.24	0.4	0.12~0.24	0.5	0.12~0.24	0.6	0.12~0.24	0.6
		ap (mm)	0.15~0.25	0.1	0.20~0.30	0.1	0.60~0.80	0.1	0.70~1.00	0.1	0.90~1.25	0.1	1.10~1.60	0.1	1.10~1.60	0.1
		ae (mm)	0.80~1.00	0.25	0.90~1.20	0.3	1.10~1.60	0.3	1.50~2.00	0.4	1.80~2.50	0.5	2.40~3.20	0.6	2.40~3.20	0.6

※ Caution

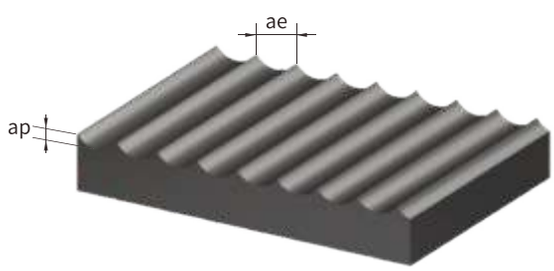
1. Using suitable coolant for the cutting materials and machining types

2. Conditions shown in above table are general guidance
   Adjust the parameters by the user's processing conditions

3. Tools are possible to damaged during machining
   Please follow the safety caution
   (safety glasses, cover, shoes, etc)

Overhang	vc(m/min)	fz(mm/t)
0~3D	100%	100%
3D~5D	70%	70%
5D~8D	60%	60%
8D~10D	50%	50%

※ If overhang length is 3 times over than diameter,
Please adjust the speed and feed condition lower
to use shown in right table



RECOMMENDED CUTTING CONDITION

N-IR Series (Corner R End Mills Insert)

[Hardened Steel (HRC45~63)]

	Hardness	Cutting condition	Φ10		Φ11		Φ12		Φ13		Φ16		Φ17	
			Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing
H	HRC45~55	vc (m/min)	100~280	280	110~310	310	100~280	280	110~300	300	100~280	280	110~300	300
		fz (mm/t)	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.06~0.12	0.06	0.06~0.12	0.06
		ap (mm)	0.25	0.1	0.25	0.1	0.3	0.1	0.3	0.1	0.8	0.2	0.8	0.2
		ae (mm)	0.25~1.00	0.2	0.25~1.00	0.2	0.30~1.20	0.2	0.30~1.20	0.2	0.80~1.60	0.2	0.80~1.60	0.2
	HRC55~63	vc (m/min)	80~220	220	90~240	240	80~220	220	90~240	240	80~220	220	80~230	230
		fz (mm/t)	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.05~0.10	0.05	0.06~0.12	0.06	0.06~0.13	0.06
		ap (mm)	0.25	0.1	0.25	0.1	0.3	0.1	0.3	0.1	0.8	0.2	0.8	0.2
		ae (mm)	0.25~1.00	0.2	0.25~1.00	0.2	0.30~1.20	0.2	0.30~1.20	0.2	0.80~1.60	0.2	0.80~1.60	0.2

	Hardness	Cutting condition	Φ20		Φ21		Φ25		Φ26		Φ30	
			Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing	Semi Finishing	Finishing
	HRC45~55	vc (m/min)	100~280	280	100~290	290	100~280	280	100~290	290	100~280	280
		fz (mm/t)	0.06~0.12	0.06	0.06~0.13	0.06	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06
		ap (mm)	1	0.2	1	0.2	1.25	0.2	1.25	0.2	1.6	0.2
		ae (mm)	1.00~2.00	0.2	1.00~2.00	0.2	1.25~2.50	0.2	1.25~2.50	0.2	1.60~3.20	0.2
	HRC55~63	vc (m/min)	80~220	220	80~230	230	80~220	220	80~230	230	80~220	220
		fz (mm/t)	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06	0.06~0.12	0.06
		ap (mm)	1	0.2	1	0.2	1.25	0.2	1.25	0.2	1.6	0.2
		ae (mm)	1.00~2.00	0.2	1.00~2.00	0.2	1.25~2.50	0.2	1.25~2.50	0.2	1.60~3.20	0.2

※ Caution

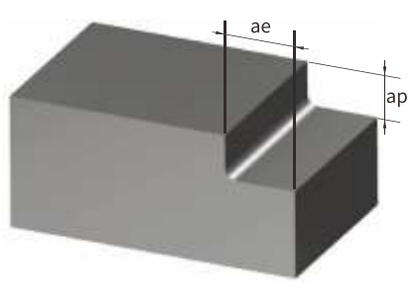
1. Using suitable coolant for the cutting materials and machining types

2. Conditions shown in above table are general guidance
   Adjust the parameters by the user's processing conditions

3. Tools are possible to damaged during machining
   Please follow the safety caution
   (safety glasses, cover, shoes, etc)

※ If overhang length is 3 times over than diameter, Please adjust the speed and feed condition lower to use shown in right table

Overhang	vc(m/min)	fz(mm/t)
0~3D	100%	100%
3D~5D	70%	70%
5D~8D	60%	60%
8D~10D	50%	50%



INDEXABLE END MILLS

Meet the best NANOTECHNOLOGY