

**KING-E/M Series**

# I<sup>+</sup>- Endmill



High quality

Higher productivity

Machining Variety



### Endmill Series for universal machining

- Various types of endmills are in stock.
- Superb performance in various kind of workpiece in wide range of machining(lower than HRC45)
- Optimal coating layer realizes great performance with low production cost.



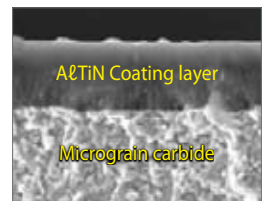
# I<sup>+</sup>-Endmill



## Features

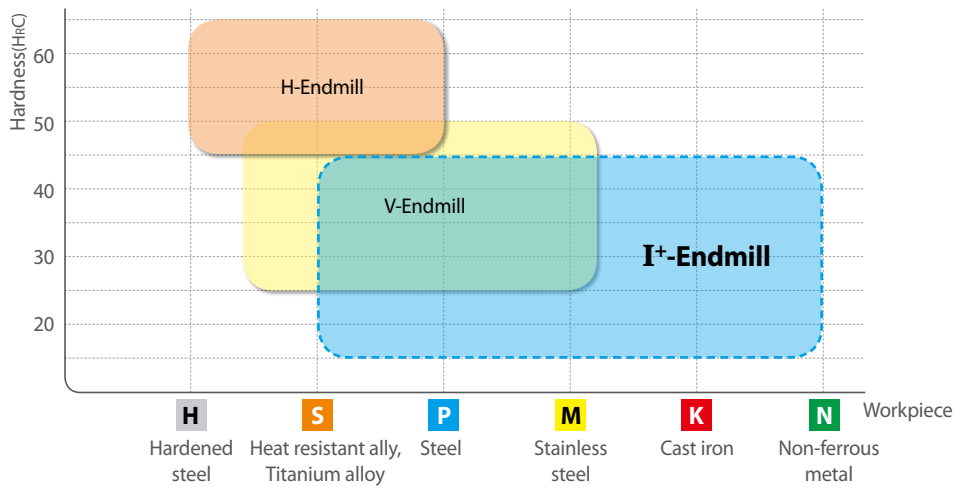


- **Tough substrate & wear-resisting coating technology applied**
- **Wide application range in general use**
  - Stable performance guaranteed for workpiece which is under 45 HRC
- **Saving cost by higher productivity**
- **Product line-up**
  - IPBE : I Plus Ball Endmill (Ø1~Ø20)
  - IPFE : I Plus Flat Endmill (Ø1~Ø20)
  - IPRE : I Plus Radius Endmill (Ø1~Ø12)

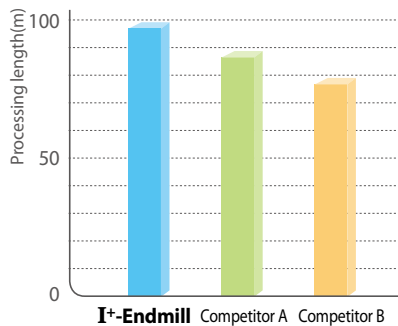


PC320

## Application area



## Comparison



I<sup>+</sup>-Endmill



Competitor A



Competitor B

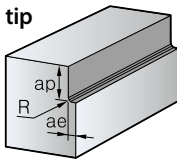
- **Workpiece** SM45C
- **Cutting conditions** Cutting Diameter=Ø8.0 n(min<sup>-1</sup>)=5173 vc(m/min)=130.0 vf(mm/min)=1034 fz(mm/t)=0.1 ap(mm)=0.5 ae(mm)=1.6 Dry
- **Tool** I Plus Ball Endmill / Designation IPBE2080-060 2flute

## Recommend Cutting Condition (Flat)

### • IPFE2000

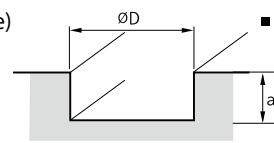
Diameter (ØD)	Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min <sup>-1</sup> )	Feed (mm/min)		R.P.M (min <sup>-1</sup> )	Feed (mm/min)		R.P.M (min <sup>-1</sup> )	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	600	480	20,000	400	320	12,600	300	180
1.5	20,000	600	480	14,000	400	320	8,400	300	180
2.0	15,000	600	480	10,000	400	400	6,300	300	180
2.5	12,000	600	480	8,200	400	320	5,100	300	180
3.0	10,000	600	480	7,000	400	320	4,200	300	180
4.0	7,500	600	480	5,200	400	320	3,100	300	180
5.0	6,000	600	480	4,200	400	320	2,500	300	180
6.0	5,000	600	480	3,500	400	320	2,100	300	180
8.0	4,000	520	410	2,800	350	280	1,600	260	150
10.0	3,200	450	360	2,200	300	240	1,300	230	130
12.0	2,700	410	320	1,900	270	210	1,100	210	120
16.0	2,000	240	190	1,400	210	160	840	160	100
20.0	1,600	200	160	1,100	170	130	680	140	80

#### • Application tip



#### ■ Shouldering depth (ap) and radial depth (ae)

- ap :  $\leq 0.1D$  ( $D \leq \phi 3$ )  
 $\leq 0.2D$  ( $D > \phi 3$ )
- ae :  $\leq 0.1D$  ( $D \leq \phi 2$ )  
 $\leq 0.2D$  ( $D > \phi 2$ )



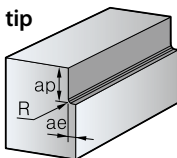
#### ■ Slotting depth (ap)

- ap :  $\leq 0.1D$  ( $D \leq \phi 2$ )  
 $\leq 0.2D$  ( $D > \phi 2$ )

### • IPFE4000

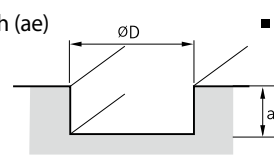
Diameter (ØD)	Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min <sup>-1</sup> )	Feed (mm/min)		R.P.M (min <sup>-1</sup> )	Feed (mm/min)		R.P.M (min <sup>-1</sup> )	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	900	720	20,000	600	480	12,600	450	270
1.5	20,000	900	720	14,000	600	480	8,400	450	270
2.0	15,000	900	720	10,000	600	480	6,300	450	270
2.5	12,000	900	720	8,200	600	480	5,100	450	270
3.0	10,000	900	720	7,000	600	480	4,200	450	270
4.0	7,500	900	720	5,200	600	480	3,100	450	270
5.0	6,000	900	720	4,200	600	480	2,500	450	270
6.0	5,000	900	720	3,500	600	480	2,100	450	270
8.0	4,000	780	620	2,800	520	410	1,600	390	230
10.0	3,200	680	540	2,200	450	360	1,300	340	200
12.0	2,700	620	490	1,900	410	320	1,100	310	180
16.0	2,000	360	280	1,400	310	240	840	240	140
20.0	1,600	300	240	1,100	250	200	680	210	120

#### • Application tip



#### ■ Shouldering depth (ap) and radial depth (ae)

- ap :  $\leq 1.5D$  (All diameter)
- ae :  $\leq 0.1D$  ( $D \leq \phi 3$ )  
 $\leq 0.2D$  ( $D > \phi 3$ )



#### ■ Slotting depth (ap)

- ap :  $\leq 0.1D$  ( $D \leq \phi 2$ )  
 $\leq 0.2D$  ( $D > \phi 2$ )

# I<sup>+</sup>-Endmill

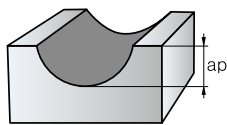


## Recommended Cutting Condition (Ball)

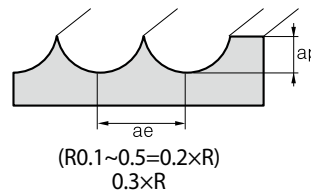
### • IPBE2000

Diameter (ØD)	Carbon steel (SM50C)		Alloy steel (SCM, STD, STS, KP4M, NAK)		Mold steel ~HrC45 (STD61)		Non-ferrous metal (Aluminum)	
	R.P.M (min <sup>-1</sup> )	Feed (mm/min)	R.P.M (min <sup>-1</sup> )	Feed (mm/min)	R.P.M (min <sup>-1</sup> )	Feed (mm/min)	R.P.M (min <sup>-1</sup> )	Feed (mm/min)
1.0	40000	1200	38000	1200	29000	900	40000	1000
1.5	30000	1270	25500	1100	19000	700	40000	1360
2.0	24000	1,160	19,000	800	14,300	600	40000	2,000
2.5	19000	1,000	15,300	670	11,500	510	38,000	2,400
3.0	16,000	930	13,000	600	9,600	460	32,000	2,400
3.5	13,700	930	11,400	580	8,200	450	27,300	2,400
4.0	12,000	930	10,000	570	7,200	450	24,000	2,400
5.0	9,600	930	8,000	560	5,700	450	19,000	2,400
6.0	8,000	930	6,400	540	4,800	450	16,000	2,400
8.0	6,000	900	4,800	540	3,600	450	12,000	2,400
10.0	4,800	900	3,800	540	2,900	450	9,600	2,300
12.0	4,000	900	3,200	540	2,400	450	8,000	2,100
14.0	3,400	900	2,750	540	2,050	450	6,800	2,000
16.0	3,000	900	2,400	540	1,800	450	6,000	2,000
20.0	2,400	900	1,900	520	1,450	450	4,800	2,000

#### • Application tip



- Slotting depth (ap)
  - ap : 0.1×R (~45HrC)
  - 0.08×R (~50HrC)



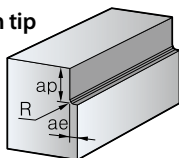
- Shouldering depth (ap) and radial depth (ae)
  - ~0.16×R R ≤ 0.3 (~45HrC)
  - ~0.25×R R ≤ 3 (~45HrC)
  - ~0.17×R R ≤ 4 (~45HrC)
  - ~0.05×R (~50HrC)

## Recommended Cutting Condition (Radius)

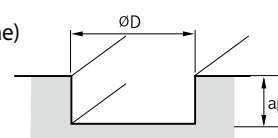
### • IPRE2000

Diameter (ØD)	Carbon steel, Alloy steel ~ HrC30 (AISI 1049, Cast iron, SM50C, SCM)			Alloy steel, High speed steel HrC30~45 (Prehardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min <sup>-1</sup> )	Feed (mm/min)		R.P.M (min <sup>-1</sup> )	Feed (mm/min)		R.P.M (min <sup>-1</sup> )	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
2.0	11,000	180	180	7,200	110	110	6,000	90	90
3.0	8,500	200	160	5,300	130	100	4,400	110	66
4.0	7,200	360	290	4,400	220	180	3,000	180	110
5.0	6,000	380	300	3,600	230	180	2,400	190	110
6.0	5,300	420	340	3,200	240	190	2,200	210	130
8.0	4,000	450	360	2,400	240	190	1,600	220	130
10.0	3,200	390	310	1,900	190	150	1,300	190	110
12.0	2,700	330	260	1,600	160	130	1,000	150	90

#### • Application tip

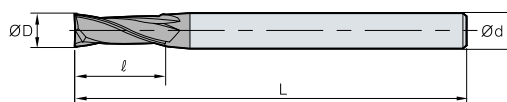
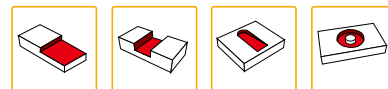


- Shouldering depth (ap) and radial depth (ae)
  - ap : ≤1.5D
  - ap : ≤0.1D



- Slotting depth (ap)
  - ap : ≤0.3D

## IPFE2000(Standard Flat)



Helix  
Angle  
35°

Grades  
PC320

h6  
shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

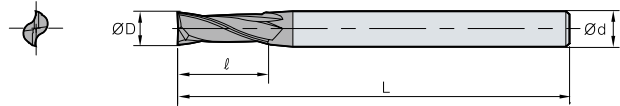
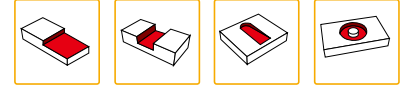
(mm)

Designation		ØD	Ød	ℓ	L
IPFE 2	2010-050-S3	1	3	3	50
	2010-050-S4		4		
	2010-050		6		
	2015-050-S3	1.5	3	4	
	2015-050-S4		4		
	2015-050		6		
	2020-050-S3	2	3	6	
	2020-050-S4		4		
	2020-050		6		
	2025-050-S3	2.5	3	8	
	2025-050-S4		4		
	2025-050		6		
	2030-050-S3	3	3	8	
	2030-050-S4		4		
	2030-050		6		
	2035-050-S4	3.5	4	10	
	2035-050		6		
	2040-050-S4	4	4	11	
	2040-050		6		
	2045-050	4.5	6	13	
	2050-050	5			
	2055-050	5.5	8	16	
	2060-050	6			
	2065-060	6.5	10	19	
	2070-060	7			
	2075-060	7.5	12	20	
	2080-060	8			
	2085-075	8.5	16	25	
	2090-075	9			
	2095-075	9.5	20	30	
	2100-075	10			
	2105-075	10.5	32	32	
2110-075	11				
2115-075	11.5	40	40		
2120-075	12				
2140-100	14	45	45		
2160-100	16				
2180-100	18	100	100		
2200-100	20				

# I<sup>+</sup>-Endmill



## IPLFE2000(Long Flat)



Helix Angle 35°

Grades PC320

h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

### • Long Shank Type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 	2060-075	6	6	16	75
	2060-100				100
	2080-075	8	8	20	75
	2080-100				100
	2100-100	10	10	25	100
	2100-150				150
	2120-100	12	12	32	100
	2120-150				150

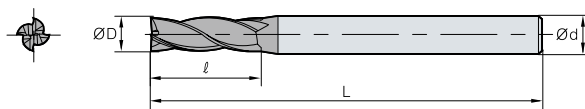
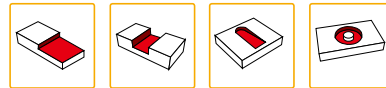
### • Long Flute Type

(mm)

Designation		ØD	Ød	ℓ	L	
IPLFE 	2010-050-V7S4	1	4	7	50	
	2015-050-V9S4	1.5		9		
	2020-050-V12S4	2		12		
	2025-050-V12S4	2.5				
	2030-060-V15S6	3	6	15	60	
	2035-060-V15S6	3.5				
	2040-075-V20S6	4		20		
	2045-075-V20S6	4.5				
	2050-075-V25S6	5	8	25	75	
	2055-075-V25S6	5.5				
	2060-075-V30S6	6		30		
	2070-100-V30S8	7				
	2080-100-V40S8	8	10	40	100	
	2090-100-V40S10	9				
	2100-100-V40S10	10				
	2110-100-V40S12	11				
	2120-100-V50S12	12	16	50	150	
	2140-150-V50S16	14				
	2160-150-V60S16	16		60		
	2200-200-V90S20	20		90		



## IPFE4000(Standard Flat)



Helix Angle 35°

Grades PC320

h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

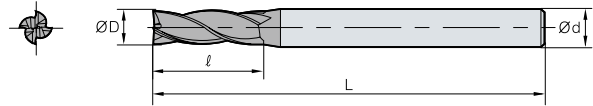
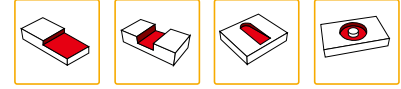
(mm)

Designation	ØD	Ød	ℓ	L	
IPFE 4	4010-050-S3	1	3	50	
	4010-050-S4		4		
	4010-050		6		
	4015-050-S3		3		
4015-050-S4	1.5	4			
4015-050	6				
4020-050-S3	2	3	6		
4020-050-S4		4			
4020-050		6			
4025-050-S3	2.5	3			8
4025-050-S4		4			
4025-050		6			
4030-050-S3	3	3	8		
4030-050-S4		4			
4030-050		6			
4035-050-S4	3.5	4		10	
4035-050		6			
4040-050-S4	4	4		11	
4040-050		6			
4045-050	4.5	6	13	50	
4050-050	5				
4055-050	5.5				
4060-050	6	8	16	60	
4065-060	6.5				
4070-060	7				
4075-060	7.5	10	19	75	
4080-060	8				
4085-075	8.5				
4090-075	9	12	20	75	
4095-075	9.5				
4100-075	10				
4105-075	10.5	16	30	100	
4110-075	11				
4115-075	11.5				
4120-075	12	16	32	100	
4140-100	14				
4160-100	16				
4180-100	18	20	40	100	
4200-100	20				45

# I<sup>+</sup>-Endmill



## IPLFE4000(Long Flat)



Helix Angle 35°

Grades PC320

h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

### • Long Shank Type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 4	4060-075	6	6	16	75
	4060-100				100
	4080-075	8	8	20	75
	4080-100				100
	4100-100	10	10	30	100
	4100-150				150
	4120-100	12	12	32	100
	4120-150				150

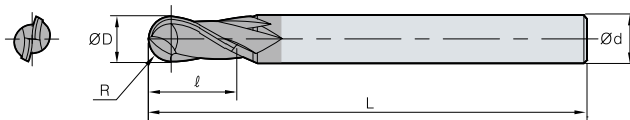
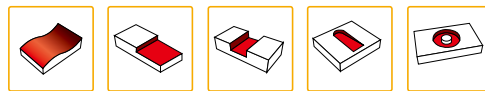
### • Long Flute Type

(mm)

Designation		ØD	Ød	ℓ	L	
IPLFE 4	4010-050-V6S4	1	4	6	50	
	4015-050-V9S4	1.5		9		
	4020-050-V12S4	2		12		
	4025-050-V12S4	2.5	6	20	75	
	4030-060-V15S6	3				15
	4035-060-V15S6	3.5				15
	4040-075-V20S6	4	8	30	100	
	4045-075-V20S6	4.5				20
	4050-075-V25S6	5				25
	4055-075-V25S6	5.5	10	40	150	
	4060-075-V30S6	6				30
	4070-100-V30S8	7				30
	4080-100-V40S8	8	12	50	200	
	4090-100-V40S10	9				40
	4100-100-V40S10	10				40
	4110-100-V40S12	11	16	60	150	
4120-100-V50S12	12	50				
4140-150-V50S16	14	60				
4160-150-V60S16	16	20	90	200		
4200-200-V90S20	20				90	



## IPBE2000(Standard Ball)



Helix  
Angle  
35°

Grades  
PC320

h6  
shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

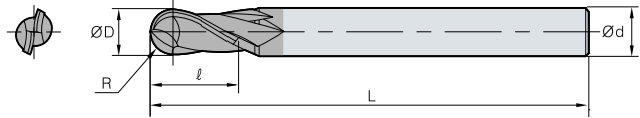
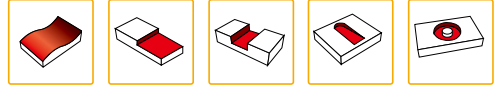
(mm)

Designation		R	ØD	Ød	ℓ	L
IPBE 2	2010-050-S3	0.5	1	3	2	50
	2010-050-S4			4		
	2010-050			6		
	2015-050-S3	0.75	1.5	3	3	
	2015-050-S4			4		
	2015-050			6		
	2020-050-S3	1	2	3	4	
	2020-050-S4			4		
	2020-050			6		
	2025-050-S3	1.25	2.5	3	5	
	2025-050-S4			4		
	2025-050			6		
	2030-050-S3	1.5	3	3	6	
	2030-050-S4			4		
	2030-050			6		
	2035-050-S4	1.75	3.5	4	7	
	2035-050			6		
	2040-050-S4			4		
	2040-050	2	4	6	8	
	2045-050	2.25	4.5	6	9	
	2050-050	2.5	5		10	
	2060-050	3	6		12	
	2070-060	3.5	7	8	14	
	2080-060	4	8		16	
	2090-075	4.5	9	10	18	
	2100-075	5	10		20	
	2120-075	6	12	12	24	
	2140-100	7	14	16	28	
	2160-100	8	16	16	32	
	2180-100	9	18	20	36	
	2200-100	10	20	20	40	

# I<sup>+</sup>-Endmill



## IPLBE2000(Long Ball)



Helix Angle 35°

Grades PC320

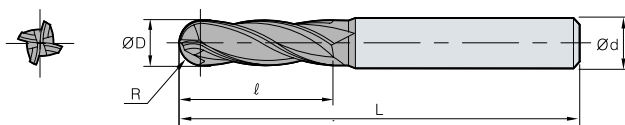
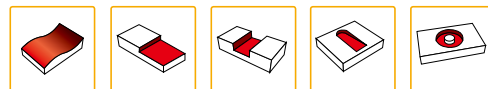
h6 shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø16	0.00 ~ -0.03

(mm)

Designation		R	ØD	Ød	ℓ	L
IPLBE	2010-075	0.5	1	6	2	75
	2010-100					100
2	2015-075	0.75	1.5		3	75
	2015-100					100
	2020-075	1	2		4	75
	2020-100					100
	2025-075	1.25	2.5		5	75
	2025-100					100
	2030-075	1.5	3		6	75
	2030-100					100
	2035-100	1.75	3.5		7	100
	2040-075					75
	2040-100	2	4		8	100
	2050-075					75
	2050-100	2.5	5		10	100
	2060-075					75
	2060-100	3	6		12	100
	2060-150					150
	2080-075	4	8		16	75
	2080-100					100
	2080-150	5	10	20	150	
	2100-100				100	
	2100-150	5	10	20	150	
	2100-200				200	
	2120-100	6	12	24	100	
	2120-150				150	
	2120-200	6	12	24	200	
	2160-150				150	
	2160-200	8	16	32	150	
					200	

## IPBE4000(Standard Ball)



Helix  
Angle  
35°

Grades  
PC320

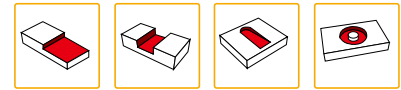
h6  
shank

ØD	Tolerance
Ø1~Ø12	0.00 ~ -0.02
Ø12.1~Ø20	0.00 ~ -0.03

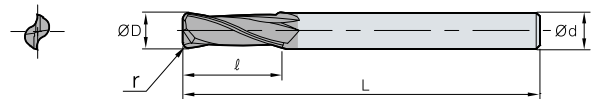
(mm)

Designation		R	ØD	Ød	ℓ	L	
IPBE 4	4010-050-S4	0.5	1	4	2	50	
	4010-050			6			
	4015-050-S4	0.75	1.5	4	3		
	4015-050			6			
	4020-050-S4	1	2	4	4		
	4020-050			6			
	4025-050-S4	1.25	2.5	4	5		
	4025-050			6			
	4030-050-S3	1.5	3	3	6		
	4030-050-S4			4			
	4030-050			6			
	4035-050-S4	1.75	3.5	4	7		
	4035-050			6			
	4040-050-S4	2	4	4	8		
	4040-050			6			
	4045-050	2.25	4.5	6	9		
	4050-050	2.5	5		10		
	4060-050	3	6		12		
	4070-060	3.5	7	8	14		60
	4080-060	4	8		16		
	4090-075	4.5	9	10	18		75
	4100-075	5	10		20		
	4120-075	6	12	12	24		75
	4140-100	7	14	16	28		
	4160-100	8	16	16	32		100
	4180-100	9	18	20	36		
	4200-100	10	20	20	40		

# I<sup>+</sup>-Endmill



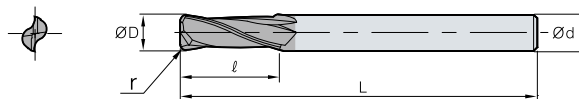
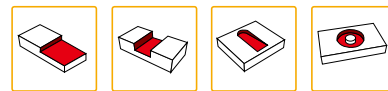
## IPRE2000(Standard Radius)



	Helix Angle 35°	Grades PC320	h6 shank	ØD Ø1~Ø12	Tolerance 0.00 ~ -0.02
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Designation		ØD	Ød	ℓ	L	r				
IPRE 	2010-050-R01	1	4	3	50	0.1				
	2010-050-R02					0.2				
	2010-050-R03					0.3				
	2015-050-R02	1.5		4		4	0.2			
	2015-050-R03						0.3			
	2020-050-R02						0.2			
	2020-050-R03	2				3	6	0.3		
	2020-050-R05							0.5		
	2025-050-R02							0.2		
	2030-050-R02-S3	3					3	8	0.2	
	2030-050-R03-S3								0.3	
	2030-050-R05-S3								0.5	
	2030-050-R10-S3		1							
	2030-050-R02		4						8	0.2
	2030-050-R03									0.3
	2030-050-R05			0.5						
	2030-050-R10			1						
	2040-050-R02			4			10	0.2		
	2040-050-R03					0.3				
	2040-050-R05		0.5							
	2040-050-R10		1							
	2040-050-R15	1.5								
	2050-050-R02	5	13			0.2				
	2050-050-R03			0.3						
	2050-050-R05			0.5						
	2050-050-R10			1						
	2060-050-R02			6		15	0.2			
	2060-050-R03						0.3			
	2060-050-R05	0.5								
	2060-050-R10	1								
	2060-050-R15	1.5								
	2060-050-R20	2								

## IPRE2000(Standard Radius)



Helix  
Angle  
35°

Grades  
PC320

h6  
shank

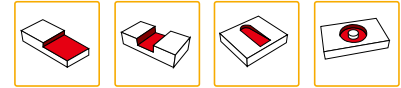
ØD  
Ø1~Ø12

Tolerance  
0.00 ~ -0.02

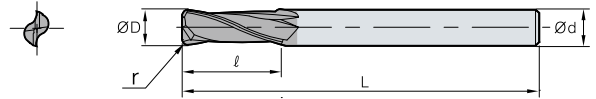
(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE 2	2080-060-R03	8	8	20	60	0.3
	2080-060-R05					0.5
	2080-060-R10					1
	2080-060-R15					1.5
	2080-060-R20					2
	2080-060-R25					2.5
	2080-060-R30					3
	2100-075-R03	10	10	25	75	0.3
	2100-075-R05					0.5
	2100-075-R10					1
	2100-075-R15					1.5
	2100-075-R20					2
	2100-075-R25					2.5
	2100-075-R30					3
	2120-075-R03	12	12	30	75	0.3
	2120-075-R05					0.5
	2120-075-R10					1
	2120-075-R15					1.5
	2120-075-R20					2
	2120-075-R25					2.5
2120-075-R30	3					

# I<sup>+</sup>-Endmill



## IPLRE2000(Long Radius)

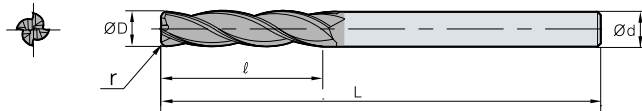
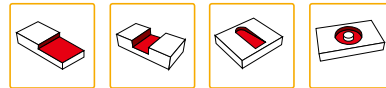


	Helix Angle 35°	Grades PC320	h6 shank	ØD Ø3~Ø12	Tolerance 0.00 ~ -0.02
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Designation		ØD	Ød	ℓ	L	r
	IPLRE 2030-075-R03	3	3	8	75	0.3
	2030-075-R05					0.5
	2030-075-R10					1
	2040-075-R03	4	4	10	75	0.3
	2040-075-R05					0.5
	2040-075-R10					1
	2040-075-R15					1.5
	2060-100-R03	6	6	15	100	0.3
	2060-100-R05					0.5
	2060-100-R10					1
	2060-100-R15					1.5
	2060-100-R20					2
	2080-100-R03	8	8	20	100	0.3
	2080-100-R05					0.5
	2080-100-R10					1
	2080-100-R15					1.5
	2080-100-R20					2
	2080-100-R25					2.5
	2100-100-R03	10	10	25	100	0.3
	2100-100-R05					0.5
	2100-100-R10					1
	2100-100-R15					1.5
	2100-100-R20					2
	2100-100-R25					2.5
	2100-100-R30	3				
	2120-100-R03	12	12	30	100	0.3
	2120-100-R05					0.5
	2120-100-R10					1
	2120-100-R15					1.5
	2120-100-R20					2
	2120-100-R25					2.5
	2120-100-R30	3				



# IPRE4000(Standard Radius)



Helix Angle 35°

Grades PC320

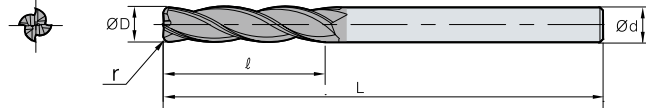
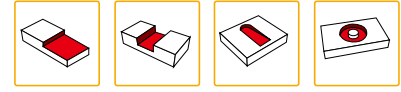
h6 shank

ØD	Tolerance
Ø2~Ø12	0.00 ~ -0.02

(mm)

Designation	ØD	Ød	l	L	r				
IPRE 4	4020-050-R02 4020-050-R03 4020-050-R05	2	4	6	50	0.2			
						0.3			
						0.5			
	4025-050-R02	2.5	4	8	50	0.2			
						0.3			
	4030-050-R02-S3 4030-050-R03-S3 4030-050-R05-S3 4030-050-R10-S3 4030-050-R02 4030-050-R03 4030-050-R05	3	3	8	50	0.2			
						0.3			
						0.5			
			4030-050-R10 4040-050-R02 4040-050-R03 4040-050-R05	4		4	10	50	1
									0.2
									0.3
									0.5
	4040-050-R10 4050-050-R02 4050-050-R03 4050-050-R05 4050-050-R10 4060-050-R02 4060-050-R03	5	6	13	50	1.5			
						0.2			
						0.3			
						0.5			
						1			
						0.2			
						0.3			
	4060-050-R05 4060-050-R10 4060-050-R15 4060-050-R20 4080-060-R03 4080-060-R05 4080-060-R10	6	6	15	50	0.5			
						1			
						1.5			
						2			
						0.3			
						0.5			
						1			
	4080-060-R15 4080-060-R20 4080-060-R25 4080-060-R30 4100-075-R03 4100-075-R05 4100-075-R10	8	8	20	60	1.5			
						2			
						2.5			
						3			
						0.3			
						0.5			
						1			
	4100-075-R15 4100-075-R20 4100-075-R25 4100-075-R30 4120-075-R03 4120-075-R05 4120-075-R10 4120-075-R15 4120-075-R20	10	10	25	75	1.5			
						2			
						2.5			
3									
0.3									
0.5									
1									
1.5									
2									
4120-075-R25 4120-075-R30	12	12	30	75	2.5				
					3				
					3				

## IPLRE4000(Long Radius)



Helix  
Angle  
35°

Grades  
PC320

h6  
shank

ØD	Tolerance
Ø3~Ø12	0.00 ~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L	r
IPLRE 	4030-075-R03	3	3	8	75	0.3
	4030-075-R05					0.5
	4030-075-R10					1
	4040-075-R03	4	4	10	75	0.3
	4040-075-R05					0.5
	4040-075-R10					1
	4040-075-R15					1.5
	4060-100-R03					0.3
	4060-100-R05	0.5				
	4060-100-R10	6	6	15	100	1
	4060-100-R15					1.5
	4060-100-R20					2
	4080-100-R03					0.3
	4080-100-R05	0.5				
	4080-100-R10	8	8	20	100	1
	4080-100-R15					1.5
	4080-100-R20					2
	4080-100-R25					2.5
	4080-100-R30					3
	4100-100-R03					0.3
	4100-100-R05	0.5				
	4100-100-R10	10	10	25	100	1
	4100-100-R15					1.5
	4100-100-R20					2
	4100-100-R25					2.5
	4100-100-R30					3
	4120-100-R03	12	12	30	100	0.3
	4120-100-R05					0.5
	4120-100-R10					1
	4120-100-R15					1.5
	4120-100-R20					2
	4120-100-R25					2.5
	4120-100-R30	3				

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