



Endmill

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Zamus Star

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Zamus Sus-Mate

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Zamus Gra-Mate

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Zamus Al-Mate

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Standard Endmill

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Power Max Drill

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Power Drill

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Solid Spiral Drill

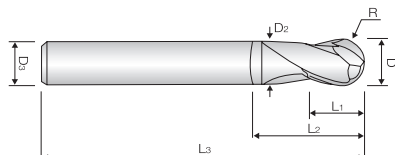
SSD	SSDL
	
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ZAMUS STAR SERIES

INCH

METRIC

DA702



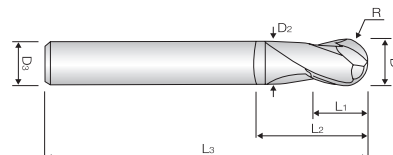
2 FLUTE, STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finishes.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
DA702001	1/32	R1/64	1/32	1/16	2	.029	1/4	●
DA702002	1/16	R1/32	1/16	1/8	2	.059	1/4	●
DA702003	3/32	R3/64	3/32	3/16	2	.090	1/4	●
DA702004	1/8	R1/16	1/8	1/4	2-1/2	.121	1/4	●
DA702006	3/16	R3/32	3/16	3/8	3	.184	1/4	●
DA702008	1/4	R1/8	1/4	1/2	3-1/2	.246	1/4	●
DA702010	5/16	R5/32	5/16	5/8	4	.309	5/16	●
DA702012	3/8	R3/16	3/8	3/4	4	.371	3/8	●
DA702016	1/2	R1/4	1/2	1	4-1/2	.496	1/2	●

Data → P94

DB702



2 FLUTE, STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finishes.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
DB702005	0.5	0.25	0.7	-	40	-	4	●
DB702006	0.6	0.3	0.9	-	40	-	4	●
DB702007	0.7	0.35	1.1	-	40	-	4	●
DB702008	0.8	0.4	1.2	-	40	-	4	●
DB702009	0.9	0.45	1.4	-	40	-	4	●
DB702010	1	0.5	1.5	3	50	0.95	6	●
DB702015	1.5	0.75	2	4	50	1.45	6	●
DB702020	2	1	2.5	5	50	1.9	6	●
DB702025	2.5	1.25	3	7	50	2.45	6	●
DB702030S	3	1.5	4	10	50	2.9	6	●
DB702030	3	1.5	4	10	60	2.9	6	●
DB702031	3	1.5	4	10	70	2.9	6	●
DB702040S	4	2	5	10	50	3.7	6	●
DB702040	4	2	5	10	60	3.7	6	●
DB702041	4	2	5	10	70	3.7	6	●
DB702050	5	2.5	6	12	60	4.7	6	●
DB702060	6	3	7	12	60	5.6	6	●
DB702061	6	3	7	12	90	5.9	6	●
DB702080	8	4	9	15	70	7.4	8	●
DB702081	8	4	9	15	100	7.9	8	●
DB702100	10	5	11	25	75	9.4	10	●
DB702101	10	5	11	25	100	9.9	10	●
DB702120	12	6	12	25	80	11.4	12	●
DB702121	12	6	12	25	110	11.9	12	●

Data → P94

Diameter	Tolerance of Radius(Inch)	Tolerance of Shank Dia.
up to 1/4	±.0002	h6
over 1/4	±.0004	

※ For the items produced from 1st. 2010, apply to these tolerance.

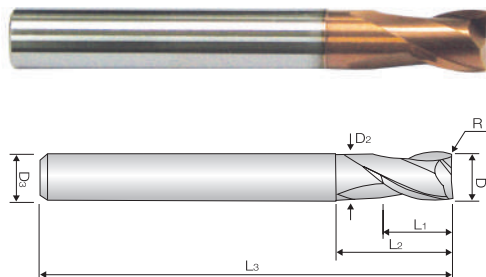
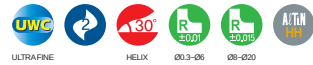
Diameter	Tolerance of Radius(Inch)	Tolerance of Shank Dia.
up to 6	±0.005	h6
over 6	±0.01	

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZE702



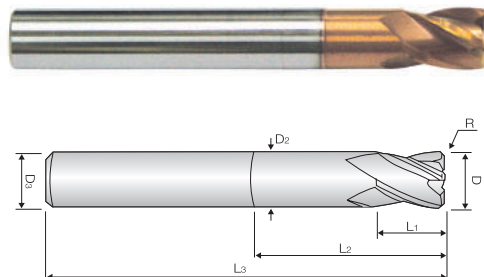
2 FLUTE, STUB CUT LENGTH with EXTENDED NECK

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Corner radius against chipping in high speed machining.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZE702003	0.3	-	0.5	-	40	-	4	●
ZE702004	0.4	-	0.7	-	40	-	4	●
ZE702005	0.5	0.05	1	-	40	-	4	●
ZE702006	0.6	0.05	1.2	-	40	-	4	●
ZE702007	0.7	0.05	1.4	-	40	-	4	●
ZE702008	0.8	0.05	1.6	-	40	-	4	●
ZE702009	0.9	0.05	2	-	40	-	4	●
ZE702010S4	1	0.1	1.5	-	40	-	4	●
ZE702010	1	0.1	1.5	-	40	-	6	●
ZE7020 15	1.5	0.1	2.2	-	40	-	6	●
ZE702020S4	2	0.1	3	6	40	1.9	4	●
ZE702020	2	0.1	3	6	40	1.9	6	●
ZE702025	2.5	0.1	4	6	40	2.4	6	●
ZE702030	3	0.1	4	7	45	2.9	6	●
ZE702035	3.5	0.1	6	9	45	3.3	6	●
ZE702040	4	0.1	6	9	45	3.8	6	●
ZE702045	4.5	0.1	6	10	45	4.3	6	●
ZE702050	5	0.2	6	11	50	4.8	6	●
ZE702060	6	0.2	7	14	50	5.8	6	●
ZE702080	8	0.2	9	18	60	7.8	8	●
ZE702100	10	0.2	12	25	75	9.7	10	●
ZE702120	12	0.3	15	30	75	11.7	12	●
ZE702160	16	0.3	18	38	90	15.7	16	●
ZE702200	20	0.3	24	45	100	19.7	20	●

Data → P95

ZE704



4 FLUTE, STUB CUT LENGTH with EXTENDED NECK

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Corner radius against chipping in high speed machining.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZE704010S4	1	0.1	1.5	-	40	-	4	●
ZE704010	1	0.1	1.5	-	40	-	6	●
ZE704015	1.5	0.1	2.2	-	40	-	6	●
ZE704020S4	2	0.1	3	6	40	1.9	4	●
ZE704020	2	0.1	3	6	40	1.9	6	●
ZE704025	2.5	0.1	4	6	40	2.4	6	●
ZE704030	3	0.1	4	7	45	2.9	6	●
ZE704035	3.5	0.1	5	9	45	3.3	6	●
ZE704040	4	0.1	5	9	45	3.8	6	●
ZE704045	4.5	0.1	6	10	45	4.3	6	●
ZE704050	5	0.2	6	11	50	4.8	6	●
ZE704060	6	0.2	7	14	50	5.8	6	●
ZE704080	8	0.2	9	18	60	7.8	8	●
ZE704100	10	0.2	12	25	75	9.7	10	●
ZE704120	12	0.3	15	30	75	11.7	12	●
ZE704160	16	0.3	18	38	90	15.7	16	●
ZE704200	20	0.3	24	45	100	19.7	20	●

Data → P96

Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	
over 6	0 ~ -0.015	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

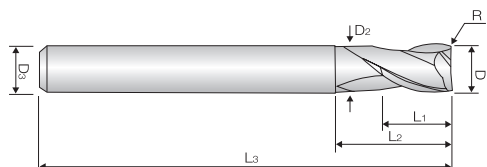
Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	
over 6	0 ~ -0.015	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZE752



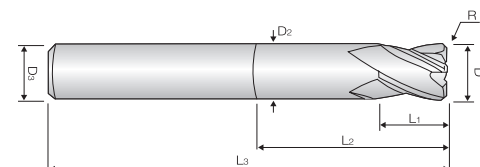
2 FLUTE, STUB CUT LENGTH with EXTENDED NECK

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Corner radius(**below 0.05**) against chipping in high speed machining.

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK
ZE752010S4	1	0.05	1.5	-	40	-	4	●
ZE752010	1	0.05	1.5	-	40	-	6	●
ZE7520 15	1.5	0.05	2.2	-	40	-	6	●
ZE752020S4	2	0.05	3	6	40	1.9	4	●
ZE752020	2	0.05	3	6	40	1.9	6	●
ZE752025	2.5	0.05	4	6	40	2.4	6	●
ZE752030	3	0.05	4	7	45	2.9	6	●
ZE752035	3.5	0.05	6	9	45	3.3	6	●
ZE752040	4	0.05	6	9	45	3.8	6	●
ZE752045	4.5	0.05	6	10	45	4.3	6	●
ZE752050	5	0.05	6	11	50	4.8	6	●
ZE752060	6	0.05	7	14	50	5.8	6	●
ZE752080	8	0.05	9	18	60	7.8	8	●
ZE752100	10	0.05	12	25	75	9.7	10	●
ZE752120	12	0.05	15	30	75	11.7	12	●

Data → P95

ZE754



4 FLUTE, STUB CUT LENGTH with EXTENDED NECK

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Corner radius(**below 0.05**) against chipping in high speed machining.

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK
ZE754020S4	2	0.05	3	6	40	1.9	4	●
ZE754020	2	0.05	3	6	40	1.9	6	●
ZE754025	2.5	0.05	4	6	40	2.4	6	●
ZE754030	3	0.05	4	7	45	2.9	6	●
ZE754035	3.5	0.05	5	9	45	3.3	6	●
ZE754040	4	0.05	5	9	45	3.8	6	●
ZE754045	4.5	0.05	6	10	45	4.3	6	●
ZE754050	5	0.05	6	11	50	4.8	6	●
ZE754060	6	0.05	7	14	50	5.8	6	●
ZE754080	8	0.05	9	18	60	7.8	8	●
ZE754100	10	0.05	12	25	75	9.7	10	●
ZE754120	12	0.05	15	30	75	11.7	12	●

Data → P96

Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ For the items produced from 1st. 2010, apply to these tolerance.

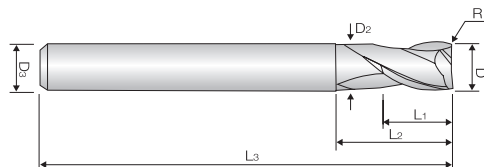
Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZR702



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "R" and effected length.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZR7020100104	1	0.1	1.5	4	50	0.95	6	●
ZR7020100106				6				●
ZR7020100204		0.2		4				●
ZR7020100206				6				●
ZR7020100210				10				●
ZR7020100212				12				●
ZR7020120208	1.2	0.2	2	8	50	1.15	6	●
ZR7020120212				12				●
ZR7020150204	1.5	0.2	2.5	4	50	1.45	6	●
ZR7020150206				6				●
ZR7020150208				8				●
ZR7020150210				10				●
ZR7020150215				15				●
ZR7020200108	2	0.1	3	8	50	1.9	6	●
ZR7020200112				12				●
ZR7020200206				6				●
ZR7020200209		0.2		9				●
ZR7020200216				16				●
ZR7020200306		0.3		6				●
ZR7020200506				6				●
ZR7020200509		0.5		9				●
ZR7020200512				12				●
ZR7020200516				16				●
ZR7020300108	3	0.1	4	8	55	2.9	6	●
ZR7020300112				12				●
ZR7020300209		0.2		9				●
ZR7020300309				9				●
ZR7020300312		0.3		12				●
ZR7020300314				14				●
ZR7020300509		0.5		9				●
ZR7020300516				16				●
ZR7020300520				20				●

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK
ZR7020400212	4	0.2	5	12	55	3.8	6	●
ZR7020400216				16				●
ZR7020400220				20				●
ZR7020400312		0.3		12				●
ZR7020400316				16				●
ZR7020400512		0.5		12				●
ZR7020400516				16				●
ZR7020400520				20				●
ZR7020500318	5	0.3	6	18	60	4.8	6	●
ZR7020600320	6	0.3	7	20	60	5.8	6	●
ZR7020600520		0.5		20				●
ZR7020601020		1		20				●
ZR7020800325	8	0.3	9	25	60	7.8	8	●
ZR7020800525		0.5		25				●
ZR7020801025		1		25				●
ZR7021000332	10	0.3	11	32	70	9.7	10	●
ZR7021000532		0.5		32				●
ZR7021001032		1		32				●
ZR7021200538	12	0.5	12	38	80	11.7	12	●
ZR7021201038		1		38				●

Data → P97

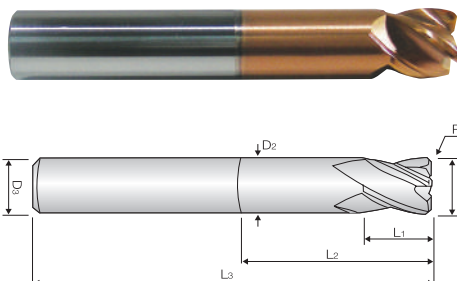
Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	
over 6	0 ~ -0.015	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZS1(2)04



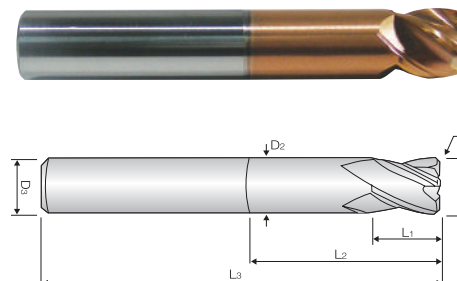
4 FLUTE, CORNER RADIUS BROKEN INDEX

- The impacting debut of new type endmill for high hardened steels up to HRC70 and high speed machining up to 200m/min.
- High precision and excellent surface due to each 4F unequal index geometry.
- Longer tool life over 50% as reducing chatter and resonance.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZS104030	3	-	4	7	45	2.9	6	●
ZS204030	3	0.1	4	7	45	2.9	6	●
ZS104040	4	-	5	9	45	3.8	6	●
ZS204040	4	0.1	5	9	45	3.8	6	●
ZS104060	6	-	7	14	50	5.8	6	●
ZS204060	6	0.2	7	14	50	5.8	6	●
ZS104080	8	-	9	18	60	7.8	8	●
ZS204080	8	0.2	9	18	60	7.8	8	●
ZS104100	10	-	12	25	75	9.7	10	●
ZS204100	10	0.2	12	25	75	9.7	10	●
ZS104120	12	-	15	30	75	11.7	12	●
ZS204120	12	0.3	15	30	75	11.7	12	●

Data → P98

ZS204



4 FLUTE, CORNER RADIUS BROKEN INDEX

- The impacting debut of new type endmill for high hardened steels up to HRC70 and high speed machining up to 200m/min.
- High precision and excellent surface due to each 4F unequal index geometry.
- Longer tool life over 50% as reducing chatter and resonance.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZS2040300309	3	0.3	4	9	55	2.9	6	●
ZS2040300312		0.3		12				●
ZS2040300316		0.3		16				●
ZS2040400312	4	0.3	5	12	55	3.8	6	●
ZS2040400316		0.3		16				●
ZS2040400320		0.3		20				●
ZS2040400512		0.5		12				●
ZS2040400516		0.5		16				●
ZS2040400520	6	0.5	7	20	60	5.8	6	●
ZS2040401012		1.0		12				●
ZS2040600520		0.5		20				●
ZS2040601020		1.0		20				●
ZS2040601520		1.5		20				●
ZS2040800525	8	0.5	9	25	60	7.8	8	●
ZS2040801025		1.0		25				●
ZS2040801525		1.5		25				●
ZS2040802025		2.0		25				●
ZS2041000532	10	0.5	11	32	75	9.7	10	●
ZS2041001032		1.0		32				●
ZS2041001532		1.5		32				●
ZS2041002032		2.0		32				●
ZS2041200538	12	0.5	12	38	75	11.7	12	●
ZS2041201038		1.0		38				●
ZS2041201538		1.5		38				●
ZS2041202038		2.0		38				●

Data → P98

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

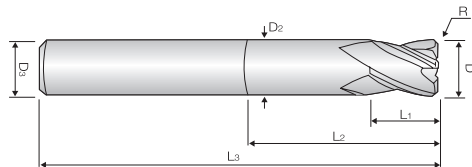
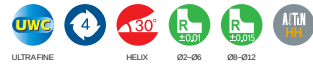
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZR704



4 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "R" and effected length.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.

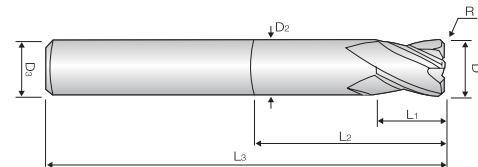
EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZR7040200208	2	0.2	3	8	50	1.9	6	●
ZR7040300309		0.3		9				●
ZR7040300312		0.3		12				●
ZR7040300316		0.3		16				●
ZR7040300509	3	0.5	4	9	55	2.9	6	●
ZR7040300516		0.5		16				●
ZR7040300520		0.5		20				●
ZR7040400212		0.2		12				●
ZR7040400312		0.3		12				●
ZR7040400512	4	0.5	5	12	55	3.8	6	●
ZR7040400516		0.5		16				●
ZR7040400520		0.5		20				●
ZR7040600520	6	0.5	7	20	60	5.8	6	●
ZR7040601020		1.0		20				●
ZR7040800525	8	0.5	9	25	60	7.8	8	●
ZR7040801025		1.0		25				●
ZR7041000532	10	0.5	11	32	70	9.7	10	●
ZR7041001032		1.0		32				●
ZR7041200538	12	0.5	12	38	80	11.7	12	●
ZR7041201038		1.0		38				●

Data → P98

Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	
over 6	0 ~ -0.015	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZR724



4 FLUTE, STUB CUT LENGTH, CORNER RADIUS with LONG SHANK

- Applied various corner "R" and effected length.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZR7240600520	6	0.5	9	20	90	5.8	6	●
ZR7240601020		1.0						●
ZR7240800525	8	0.5	12	25	100	7.7	8	●
ZR7240801025		1.0						●
ZR7241000532		0.5						●
ZR7241001032	10	1.0	15	32	100	9.7	10	●
ZR7241002032		2.0						●
ZR7241200538		0.5						●
ZR7241201038	12	1.0	18	38	110	11.7	12	●
ZR7241202038		2.0						●

Data → P98

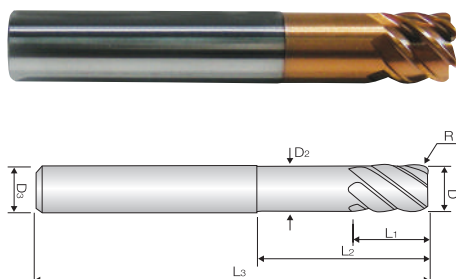
Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	
over 6	0 ~ -0.015	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZR706



6 FLUTE, 45° HELIX STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "R" and effected length.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZR7060600314	6	0.3	6	14	50	5.8	6	●
ZR7060600514	6	0.5	6	14	50	5.8	6	●
ZR7060800524	8	0.5	8	24	60	7.8	8	●
ZR7060801024	8	1	8	24	60	7.8	8	●
ZR7061000530	10	0.5	10	30	70	9.8	10	●
ZR7061001030	10	1	10	30	70	9.8	10	●
ZR7061200530	12	0.5	12	30	75	11.8	12	●
ZR7061201030	12	1	12	30	75	11.8	12	●

Data → P99

ZE712



2 FLUTE, 35° HELIX REGULAR LENGTH

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE712010	1	3	40	6	●
ZE712015	1.5	4	40	6	●
ZE712020	2	5	40	6	●
ZE712025	2.5	6	40	6	●
ZE712030	3	8	45	6	●
ZE712035	3.5	10	45	6	●
ZE712040	4	10	45	6	●
ZE712045	4.5	11	45	6	●
ZE712050	5	13	50	6	●
ZE712055	5.5	13	50	6	●
ZE712060	6	13	50	6	●
ZE712065	6.5	16	60	8	●
ZE712070	7	18	60	8	●
ZE712080	8	19	60	8	●
ZE712100	10	22	70	10	●
ZE712120	12	26	75	12	●

Data → P95

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZE714



4 FLUTE, 45° HELIX REGULAR LENGTH

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE714020	2	5	40	6	●
ZE714025	2.5	6	40	6	●
ZE714030	3	8	45	6	●
ZE714040	4	10	45	6	●
ZE714050	5	13	50	6	●
ZE714060	6	13	50	6	●
ZE714080	8	19	60	8	●
ZE714100	10	22	70	10	●
ZE714120	12	26	75	12	●

Data → P96

ZE716



6 FLUTE, 50° HELIX REGULAR LENGTH

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE716060	6	13	50	6	●
ZE716080	8	18	60	8	●
ZE716100	10	22	70	10	●
ZE716120	12	26	75	12	●
ZE716160	16	35	90	16	●
ZE716200	20	44	100	20	●

Data → P99

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

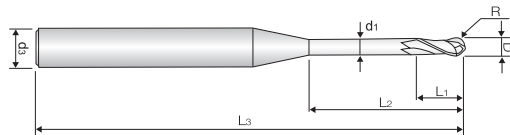
Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZSLNB



For RIB PROCESSING

- Designed to machine high hardened materials up to HRC 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Long neck design for deep machining near walls.

EDP. No.	Dimension(mm)							STOCK
	R	D	L ₂	L ₁	d ₁	L ₃	d ₃	
ZSLNB2001-0.2	0.05	0.1	0.2	0.08	0.08	45	4	●
ZSLNB2001-0.3			0.3					●
ZSLNB2001-0.5			0.5					●
ZSLNB2002-0.5	0.1	0.2	0.5	0.15	0.17	50	4	●
ZSLNB2002-1			1					●
ZSLNB2002-1.5			1.5					●
ZSLNB2002-2			2					●
ZSLNB2002-2.5			2.5					●
ZSLNB2002-3.0			3					●
ZSLNB2003-1	0.15	0.3	1	0.25	0.27	50	4	●
ZSLNB2003-1.5			1.5					●
ZSLNB2003-2			2					●
ZSLNB2003-2.5			2.5					●
ZSLNB2003-3	0.2	0.4	3	0.3	0.37	50	4	●
ZSLNB2004-1			1					●
ZSLNB2004-1.5			1.5					●
ZSLNB2004-2			2					●
ZSLNB2004-2.5			2.5					●
ZSLNB2004-3			3					●
ZSLNB2004-3.5	0.25	0.5	3.5	0.35	0.47	50	4	●
ZSLNB2004-4			4					●
ZSLNB2004-4.5			4.5					●
ZSLNB2005-1			1	0.4	0.57	50	4	●
ZSLNB2005-2	0.3	0.6	2					●
ZSLNB2005-3			3					●
ZSLNB2005-4			4					●
ZSLNB2005-5			5					●
ZSLNB2005-6			6					●
ZSLNB2005-7	0.3	0.6	8					●
ZSLNB2006-1			1	0.4	0.57	50	4	●
ZSLNB2006-2			2					●
ZSLNB2006-3			3					●
ZSLNB2006-4			4					●
ZSLNB2006-5			5					●
ZSLNB2006-6			6					●
ZSLNB2006-7			7					●
ZSLNB2006-8			8					●
ZSLNB2006-9			9					●
ZSLNB2006-10			10					●
ZSLNB2006-12			12					●
ZSLNB2008-2	0.4	0.8	2	0.5	0.77	50	4	●
ZSLNB2008-4			4					●
ZSLNB2008-5			5					●
ZSLNB2008-6			6					●
ZSLNB2008-8			8					●
ZSLNB2008-10			10					●

ZAMUS STAR SERIES

METRIC

EDP. No.	Dimension(mm)							STOCK	
	R	D	L ₂	L ₁	d ₁	L ₃	d ₃		
ZSLNB2010-2	0.5	1	2	0.8	0.96	50	4	●	
ZSLNB2010-3			3					●	
ZSLNB2010-4			4					●	
ZSLNB2010-5			5					●	
ZSLNB2010-6			6					●	
ZSLNB2010-7			7					●	
ZSLNB2010-8			8					●	
ZSLNB2010-9			9					●	
ZSLNB2010-10			10					●	
ZSLNB2010-12			12			55		●	
ZSLNB2010-14			14					●	
ZSLNB2010-16			16			60		●	
ZSLNB2010-18			18					●	
ZSLNB2010-20			20					●	
ZSLNB2012-8	0.6	1.2	8	1.1	1.15	50	4	●	
ZSLNB2012-12			12			55		●	
ZSLNB2014-8	0.7	1.4	8	1.3	1.34	50	4	●	
ZSLNB2014-12			12			55		●	
ZSLNB2014-16			16			●			
ZSLNB2015-4	0.75	1.5	4	1.35	1.44	50	4	●	
ZSLNB2015-6			6					●	
ZSLNB2015-8			8					●	
ZSLNB2015-10			10					●	
ZSLNB2015-12			12			55		●	
ZSLNB2015-16			16					●	
ZSLNB2015-20			20					60	●
ZSLNB2016-8	0.8	1.6	8	1.4	1.54	50	4	●	
ZSLNB2016-12			12			55		●	
ZSLNB2016-16			16					●	
ZSLNB2016-20			20			60		●	
ZSLNB2018-8	0.9	1.8	8	1.6	1.73	50	4	●	
ZSLNB2018-12			12			55		●	
ZSLNB2018-16			16					●	
ZSLNB2018-20			20			60		●	
ZSLNB2020-3	1	2	3	1.7	1.92	50	4	●	
ZSLNB2020-4			4					●	
ZSLNB2020-6			6					●	
ZSLNB2020-8			8					●	
ZSLNB2020-10			10					55	●
ZSLNB2020-12			12						●
ZSLNB2020-14			14			60		●	
ZSLNB2020-16			16					●	
ZSLNB2020-18			18					●	
ZSLNB2020-20			20			60		●	
ZSLNB2020-22			22			60		●	
ZSLNB2020-25			25			65		●	
ZSLNB2020-30			30			70		●	
ZSLNB2020-35			35			75		●	
ZSLNB2020-40			40			80		●	

EDP. No.	Dimension(mm)							STOCK
	R	D	L ₂	L ₁	d ₁	L ₃	d ₃	
ZSLNB2030-8	1.5	3	8	2.5	2.88	55	6	●
ZSLNB2030-10			10					●
ZSLNB2030-13			13					●
ZSLNB2030-16			16					●
ZSLNB2030-20			20					●
ZSLNB2030-25			25					●
ZSLNB2030-30			30					●
ZSLNB2030-35			35					●
ZSLNB2040-10	2	4	10	3	3.9	55	6	●
ZSLNB2040-13			13					●
ZSLNB2040-16			16					●
ZSLNB2040-20			20					●
ZSLNB2040-25			25					●
ZSLNB2040-30			30					●
ZSLNB2040-35			35					●
ZSLNB2040-40			40					●
ZSLNB2040-45			45					●
ZSLNB2040-50			50					●
ZSLNB2050-20	2.5	5	20	3.5	4.9	65	6	●
ZSLNB2050-25			25					●
ZSLNB2050-30			30					●
ZSLNB2050-35			35					●

Data → P99

Endmill & Drill

Tolerance of Radius (mm)

±0.005

Tolerance of Shank Dia.

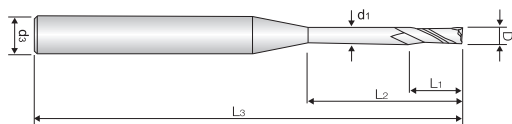
h5

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS STAR SERIES

METRIC

ZSLNS



For RIB PROCESSING

- Designed to machine high hardened materials up to HRc 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Long neck design for deep machining near walls.

EDP. No.	Dimension(mm)						STOCK
	D	L2	L1	d1	L3	d3	
ZSLNS2001-1.5	0.1	0.3	0.15	0.08	45	4	●
ZSLNS2001-0.5		0.5					●
ZSLNS2001-1		1					●
ZSLNS2002-0.5	0.2	0.5	0.3	0.17	50	4	●
ZSLNS2002-1		1					●
ZSLNS2002-1.5		1.5					●
ZSLNS2003-1	0.3	1	0.45	0.27	50	4	●
ZSLNS2003-1.5		1.5					●
ZSLNS2003-2		2					●
ZSLNS2003-2.5		2.5					●
ZSLNS2003-3		3					●
ZSLNS2004-1	0.4	1	0.6	0.37	50	4	●
ZSLNS2004-1.5		1.5					●
ZSLNS2004-2		2					●
ZSLNS2004-2.5		2.5					●
ZSLNS2004-3		3					●
ZSLNS2004-3.5		3.5					●
ZSLNS2004-4		4					●
ZSLNS2004-5	0.5	5	0.75	0.47	50	4	●
ZSLNS2004-6		6					●
ZSLNS2005-1		1					●
ZSLNS2005-1.5		1.5					●
ZSLNS2005-2		2					●
ZSLNS2005-2.5		2.5					●
ZSLNS2005-3		3					●
ZSLNS2005-4		4					●
ZSLNS2005-5	0.6	5	0.9	0.57	50	4	●
ZSLNS2005-6		6					●
ZSLNS2005-8		8					●
ZSLNS2006-2		2					●
ZSLNS2006-4	0.7	4	1.05	0.67	50	4	●
ZSLNS2006-6		6					●
ZSLNS2006-8		8					●
ZSLNS2006-10		10					●
ZSLNS2007-2	0.8	2	1.2	0.77	50	4	●
ZSLNS2007-4		4					●
ZSLNS2007-6		6					●
ZSLNS2007-8		8					●
ZSLNS2007-10	0.9	10	1.35	0.86	50	4	●
ZSLNS2008-4		4					●
ZSLNS2008-6		6					●
ZSLNS2008-8		8					●
ZSLNS2008-10	0.9	10	1.35	0.86	55	4	●
ZSLNS2008-12		12					●
ZSLNS2009-6		6					●
ZSLNS2009-8		8					●
ZSLNS2009-10	0.9	10			55	4	●
ZSLNS2009-12		12					●

ZAMUS STAR SERIES

METRIC

EDP. No.	Dimension(mm)						STOCK
	D	L2	L1	d1	L3	d3	
ZSLNS2010-2	1	2	1.5	0.96	50	4	●
ZSLNS2010-4		4					●
ZSLNS2010-6		6					●
ZSLNS2010-8		8					●
ZSLNS2010-10		10			55		●
ZSLNS2010-12		12					●
ZSLNS2010-14		14					●
ZSLNS2010-16		16					●
ZSLNS2012-6	1.2	6	1.8	1.15	50	4	●
ZSLNS2012-8		8					●
ZSLNS2012-10		10					●
ZSLNS2012-12		12					●
ZSLNS2012-16		16			55		●
ZSLNS2014-6	1.4	6	2.1	1.34	50	4	●
ZSLNS2014-8		8					●
ZSLNS2014-10		10					●
ZSLNS2014-12		12			55		●
ZSLNS2014-14		14					●
ZSLNS2014-16		16					●
ZSLNS2015-4	1.5	4	2.25	1.44	50	4	●
ZSLNS2015-6		6					●
ZSLNS2015-8		8					●
ZSLNS2015-10		10					●
ZSLNS2015-12		12			55		●
ZSLNS2015-14		14					●
ZSLNS2015-16		16					●
ZSLNS2015-18		18			60		●
ZSLNS2015-20		20					●
ZSLNS2015-25		25					65
ZSLNS2016-6	1.6	6	2.4	1.54	50	4	●
ZSLNS2016-8		8					●
ZSLNS2016-10		10					●
ZSLNS2016-12		12			55		●
ZSLNS2016-14		14					●
ZSLNS2016-16		16					●
ZSLNS2016-18		18			60		●
ZSLNS2016-20		20					●
ZSLNS2018-6	1.8	6	2.7	1.73	50	4	●
ZSLNS2018-8		8					●
ZSLNS2018-10		10					●
ZSLNS2018-12		12					55
ZSLNS2018-14		14			●		
ZSLNS2018-16		16			●		
ZSLNS2018-18		18			60		
ZSLNS2018-20		20					●

EDP. No.	Dimension(mm)						STOCK	
	D	L2	L1	d1	L3	d3		
ZSLNS2020-4	2	4	3	1.92	50	4	●	
ZSLNS2020-6		6					●	
ZSLNS2020-8		8					●	
ZSLNS2020-10		10					●	
ZSLNS2020-12		12			55		●	
ZSLNS2020-14		14					●	
ZSLNS2020-16		16					●	
ZSLNS2020-18		18					●	
ZSLNS2020-20		20					60	●
ZSLNS2020-25		25					65	●
ZSLNS2020-30		30					70	●
ZSLNS2025-8		2.5					8	3.75
ZSLNS2025-12	12		55	●				
ZSLNS2025-16	16		●					
ZSLNS2025-20	20		60	●				
ZSLNS2030-8	3	8	4.5	2.88	55	6	●	
ZSLNS2030-12		12			60		●	
ZSLNS2030-16		16			●			
ZSLNS2030-20		20			65		●	
ZSLNS2030-25		25			70		●	
ZSLNS2030-30		30			75		●	
ZSLNS2030-40		40			90		●	
ZSLNS2040-12		4			12		6	3.85
ZSLNS2040-16	16		●					
ZSLNS2040-20	20		70	●				
ZSLNS2040-25	25		80	●				
ZSLNS2040-30	30			●				
ZSLNS2040-35	35			●				
ZSLNS2040-40	40			90	●			

Data → P100

Endmill & Drill

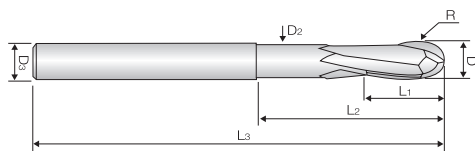
Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.012	h5
0 ~ -0.015	h5

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS PLUS SERIES

METRIC

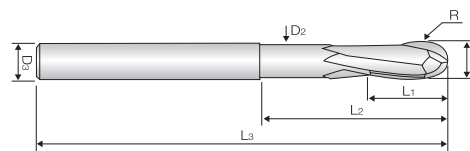
DA412



2 FLUTE, 15° HELIX STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed for high hardened materials up to HRC 62.
- Suitable for high speed machining.

DB412



2 FLUTE, 15° HELIX STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed for high hardened materials up to HRC 62.
- Suitable for high speed machining.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
DA412001	1/32	R 1/64	1/32	1/16	2	.029	1/4	●
DA412002	1/16	R 1/32	1/16	1/8	2	.059	1/4	●
DA412003	3/32	R 3/64	3/32	3/16	2	.090	1/4	●
DA412004	1/8	R 1/16	1/8	1/4	2-1/2	.121	1/4	●
DA412006	3/16	R 3/32	3/16	3/8	3	.184	1/4	●
DA412008	1/4	R 1/8	1/4	1/2	3-1/2	.246	1/4	●
DA412010	5/16	R 5/32	5/16	5/8	4	.309	5/16	●
DA412012	3/8	R 3/16	3/8	3/4	4	.371	3/8	●
DA412016	1/2	R 1/4	1/2	1	4-1/2	.496	1/2	●

Data → P101

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
DB412010	1	0.5	1	3	50	4	0.95	●
DB412015	1.5	0.75	2	5	50	4	1.4	●
DB412020	2	1	3	6	50	6	1.9	●
DB412030S	3	1.5	4	8	50	4	2.9	●
DB412030	3	1.5	4	8	50	6	2.9	●
DB412030L	3	1.5	4	8	75	6	2.9	●
DB412040S	4	2	5	10	50	4	3.9	●
DB412040	4	2	5	10	50	6	3.9	●
DB412040L	4	2	5	10	75	6	3.9	●
DB412050	5	2.5	5	10	50	6	4.9	●
DB412060S	6	3	6	12	50	6	5.9	●
DB412060	6	3	6	12	75	6	5.9	●
DB412060L	6	3	6	16	100	6	5.9	●
DB412080	8	4	8	16	60	8	7.9	●
DB412080L	8	4	8	25	100	8	7.9	●
DB412100	10	5	10	20	70	10	9.9	●
DB412100L	10	5	10	30	100	10	9.9	●

Data → P101

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS PLUS SERIES

METRIC

ZE512



2 FLUTE, 35° HELIX REGULAR LENGTH

- Designed for high hardened materials up to HRC 62.
- Suitable for high speed machining.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE512010	1	3	40	6	●
ZE512015	1.5	4	40	6	●
ZE512020	2	5	40	6	●
ZE512025	2.5	6	40	6	●
ZE512030	3	8	45	6	●
ZE512035	3.5	10	45	6	●
ZE512040	4	10	45	6	●
ZE512045	4.5	11	45	6	●
ZE512050	5	13	50	6	●
ZE512055	5.5	13	50	6	●
ZE512060	6	13	50	6	●
ZE512065	6.5	16	60	8	●
ZE512070	7	18	60	8	●
ZE512080	8	19	60	8	●
ZE512100	10	22	70	10	●
ZE512120	12	26	75	12	●

ZE514



4 FLUTE, 45° HELIX REGULAR LENGTH

- Designed for high hardened materials up to HRC 62.
- Suitable for high speed machining.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE514020	2	5	40	6	●
ZE514025	2.5	6	40	6	●
ZE514030	3	8	45	6	●
ZE514040	4	10	45	6	●
ZE514050	5	13	50	6	●
ZE514060	6	13	50	6	●
ZE514080	8	19	60	8	●
ZE514100	10	22	70	10	●
ZE514120	12	26	75	12	●

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS PLUS SERIES

METRIC

ZE516

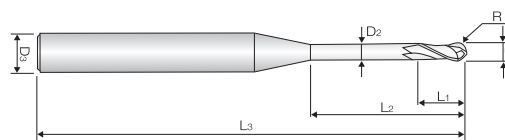


6 FLUTE, 50° HELIX REGULAR LENGTH

- Designed for high hardened materials up to HRC 62.
- Suitable for high speed machining.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE516060	6	13	50	6	●
ZE516080	8	18	60	8	●
ZE516100	10	22	70	10	●
ZE516120	12	26	75	12	●
ZE516160	16	35	90	16	●
ZE516200	20	44	100	20	●

DB602



For RIB PROCESSING

- Designed for machine tool steel, alloy steel, mold steel and other high hardened materials.
- Long neck design for deep machining near walls.

EDP. No.	R	L1	L2	L3	D2	D3	STOCK	
DB6020502	0.25	0.4	2	45	0.45	4	●	
DB6020503			3				●	
DB6020504			4				●	
DB6020505			5				●	
DB6020506			6				●	
DB6020602	0.3	0.5	2	45	0.55	4	●	
DB6020603			3				●	
DB6020604			4				●	
DB6020605			5				●	
DB6020606			6				●	
DB6020802	0.4	0.6	2	45	0.75	4	●	
DB6020804			4				●	
DB6020805			5				●	
DB6020806			6				●	
DB6020807			7				●	
DB6020808			8				●	
DB6021003	0.5	0.8	3	45	0.95	4	●	
DB6021004			4				●	
DB6021005			5				●	
DB6021006			6				●	
DB6021007			7				●	
DB6021008			8				●	
DB6021009			9				●	
DB6021010			10				●	
DB6021012			12				●	
DB6021014			14				50	●
DB6021016			16					●
DB6021020			20					55

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS PLUS SERIES

METRIC

EDP. No.	R	L1	L2	L3	D2	D3	STOCK	
DB6021206	0.6	1	6	45	1.15	4	●	
DB6021208			8				●	
DB6021210			10				●	
DB6021212			12				●	
DB6021408	0.7	1.1	8	45	1.35	4	●	
DB6021412			12	●				
DB6021416			16	50			●	
DB6021506	0.75	1.2	6	45	1.45	4	●	
DB6021508			8				●	
DB6021510			10				●	
DB6021512			12				●	
DB6021514			14	50			●	
DB6021516			16				●	
DB6021520			20				55	●
DB6021608			0.8	1.3			8	45
DB6021610	10	●						
DB6021612	12	●						
DB6021616	16	50			●			
DB6021620	20	55			●			
DB6021808	0.9	1.4	8	45	1.75	4	●	
DB6021812			12	●				
DB6021816			16	50			●	
DB6021820			20	55			●	
DB6022004	1	1.6	4	45	1.95	4	●	
DB6022006			6				●	
DB6022008			8				●	
DB6022010			10				●	
DB6022012			12	50			●	
DB6022014			14				●	
DB6022016			16				●	
DB6022018			18				●	
DB6022020			20				55	●
DB6022022			22				60	●
DB6022025			25				65	●
DB6022030			30				70	●
DB6022510	1.25	2	10	50	2.4	6	●	
DB6022516			16	55			●	
DB6022520			20	60			●	
DB6023008	1.5	2.4	8	50	2.85	6	●	
DB6023010			10				●	
DB6023012			12				●	
DB6023014			14	55			●	
DB6023016			16				●	
DB6023018			18				●	
DB6023020			20	60			●	
DB6023025			25	65			●	
DB6023030			30	70			●	
DB6023035			35	80			●	

EDP. No.	R	L1	L2	L3	D2	D3	STOCK
DB6024010	2	3.2	10	60	3.85	6	●
DB6024012			12				●
DB6024016			16	●			
DB6024020			20	65			●
DB6024025			25	70			●
DB6024030			30	80			●
DB6024035			35				●
DB6024040			40	90			●
DB6024045			45				●
DB6024050			50	100			●
DB6025025	2.5	4	25	70	4.85	6	●
DB6025030			30	80			●
DB6025035			35				●
DB6025040			40	90			●

Data → P102

Endmill & Drill

Tolerance of Radius (mm)

±0.01

Tolerance of Shank Dia.

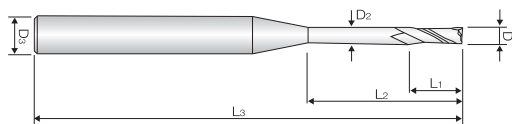
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS PLUS SERIES

METRIC

ZE602



For RIB PROCESSING

- Designed for machine tool steel, alloy steel, mold steel and other high hardened materials.
- Long neck design for deep machining near walls.

EDP. No.	D	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK
ZE6020402	0.4	0.6	2	45	0.37	4	●
ZE6020403			3				●
ZE6020404			4				●
ZE6020502	0.5	0.7	2	45	0.45	4	●
ZE6020504			4				●
ZE6020506			6				●
ZE6020508			8				●
ZE6020602	0.6	0.9	2	45	0.55	4	●
ZE6020604			4				●
ZE6020606			6				●
ZE6020608			8				●
ZE6020610			10				●
ZE6020702	0.7	1	2	45	0.65	4	●
ZE6020704			4				●
ZE6020706			6				●
ZE6020804	0.8	1.2	4	45	0.75	4	●
ZE6020806			6				●
ZE6020808			8				●
ZE6020810			10				●
ZE6020812			12				●
ZE6020906	0.9	1.4	6	45	0.85	4	●
ZE6020908			8				●
ZE6020910			10				●
ZE6021004	1	1.5	4	45	0.95	4	●
ZE6021006			6				●
ZE6021008			8				●
ZE6021010			10				●
ZE6021012			12	●			
ZE6021016			16	50			●
ZE6021020			20				●
ZE6021206	1.2	1.8	6	45	1.15	4	●
ZE6021208			8				●
ZE6021210			10				●
ZE6021212			12				●
ZE6021216			16	50			●
ZE6021406	1.4	2.1	6	45	1.35	4	●
ZE6021408			8				●
ZE6021410			10				●
ZE6021412			12				●
ZE6021414			14	50			●
ZE6021416			16				●

ZAMUS PLUS SERIES

METRIC

EDP. No.	D	L1	L2	L3	D2	D3	STOCK
ZE6021506	1.5	2.3	6	45	1.45	4	●
ZE6021508			8				●
ZE6021510			10				●
ZE6021512			12	50			●
ZE6021514			14				●
ZE6021516			16				●
ZE6021518			18	55			●
ZE6021520			20				●
ZE6021606	1.6	2.5	6	45	1.55	4	●
ZE6021608			8				●
ZE6021610			10				●
ZE6021612			12	50			●
ZE6021614			14				●
ZE6021616			16				●
ZE6021618			18	55			●
ZE6021620			20				●
ZE6021806	1.8	2.8	6	45	1.75	4	●
ZE6021808			8				●
ZE6021810			10				●
ZE6021812			12	50			●
ZE6021814			14				●
ZE6021816			16				●
ZE6021818			18	55			●
ZE6021820			20				●
ZE6022006	2	3	6	45	1.95	4	●
ZE6022008			8				●
ZE6022010			10				●
ZE6022012			12	50			●
ZE6022014			14				●
ZE6022016			16				●
ZE6022018			18	55			●
ZE6022020			20				●
ZE6022025			25	60			●
ZE6022030			30	70			●
ZE6022508	2.5	3.7	8	45	2.45	4	●
ZE6022510			10				●
ZE6022512			12				●
ZE6022514			14	50			●
ZE6022516			16				●
ZE6022518			18				●
ZE6022520			20	55			●
ZE6022525			25				60
ZE6022530			30	70			●

EDP. No.	D	L1	L2	L3	D2	D3	STOCK
ZE6023008	3	4.5	8	45	2.85	6	●
ZE6023010			10				●
ZE6023012			12				●
ZE6023014			14	50			●
ZE6023016			16				●
ZE6023018			18				●
ZE6023020			20	55			●
ZE6023025			25				●
ZE6023030			30				70
ZE6023035			35	80			●
ZE6023040			40	90			●
ZE6024012	4	6	12	50	3.85	6	●
ZE6024016			16	60			●
ZE6024020			20				●
ZE6024025			25				70
ZE6024030			30	●			
ZE6024035			35	80			
ZE6024040			40	90			●
ZE6024045			45				●
ZE6024050			50				100
ZE6025016	5	7.5	16	60	4.85	6	●
ZE6025020			20	70			●
ZE6025025			25				●
ZE6025030			30				●
ZE6025035			35	80			●
ZE6025040			40	90			●
ZE6025050			50	100			●

Data → P103

Endmill & Drill

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

DA512



2 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- For copy-milling machines.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
DA512001	1/32	R1/64	1/32	2-1/2	1/4	●
DA512002	1/16	R1/32	1/16	2-1/2	1/4	●
DA512003	3/32	R3/64	3/32	2-1/2	1/4	●
DA512004	1/8	R1/16	5/16	2-3/8	1/8	●
DA512006	3/16	R3/32	3/8	3-1/8	3/16	●
DA512008	1/4	R1/8	1/2	3-1/2	1/4	●
DA512010	5/16	R5/32	9/16	4	5/16	●
DA512012	3/8	R3/16	3/4	4	3/8	●
DA512016	1/2	R1/4	7/8	4-1/4	1/2	●
DA512020	5/8	R5/16	1-1/4	5-1/2	5/8	●
DA512024	3/4	R3/8	1-1/2	6-1/4	3/4	●
DA512032	1	R1/2	2	7-1/8	1	●

Data → P104

DA514



4 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- For copy-milling machines.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
DA514004	1/8	R1/16	5/16	2-3/8	1/8	●
DA514006	3/16	R3/32	3/8	3-1/8	3/16	●
DA514008	1/4	R1/8	1/2	3-1/2	1/4	●
DA514010	5/16	R5/32	9/16	4	5/16	●
DA514012	3/8	R3/16	3/4	4	3/8	●
DA514016	1/2	R1/4	7/8	4-1/4	1/2	●
DA514020	5/8	R5/16	1-1/4	5-1/2	5/8	●
DA514024	3/4	R 3/8	1-1/2	6-1/4	3/4	●
DA514032	1	R 1/2	2	7-1/8	1	●

Data → P105

Tolerance of Mill Dia. (mm)

0 ~ -0.012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.012

Tolerance of Shank Dia.

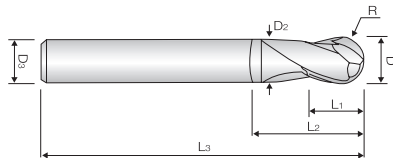
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

DA522



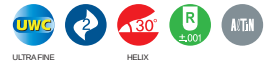
2 FLUTE, LONG LENGTH, BALL NOSE with EXTENDED NECK

- Deep slotting milling is possible by reduced neck.
- High efficiency milling is possible in deep slotting with projection of the end mill being long.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
DA522004	1/8	R1/16	5/16	-	2-3/4	-	1/4	●
DA522006	3/16	R3/32	1/2	-	3-1/8	-	1/4	●
DA522008	1/4	R1/8	1/2	7/8	3-1/8	.242	1/4	●
DA522010	5/16	R5/32	9/16	1-1/16	3-1/2	.305	5/16	●
DA522012	3/8	R3/16	3/4	1-1/4	4	.367	3/8	●
DA522016	1/2	R1/4	7/8	1-3/8	4-1/4	.492	1/2	●
DA522020	5/8	R5/16	1-1/4	2	5-1/2	.617	5/8	●
DA522024	3/4	R3/8	1-1/2	2-1/4	6-1/4	.742	3/4	●
DA522032	1	R1/2	2-1/8	3	7	.992	1	●

Data → P106

MD502



2 FLUTE, MINIATURE, BALL NOSE

- High precision milling in medical, optical, electronics and aerospace industrials.
- Excellent performance at dry cutting conditon.
- Excellent performance on high hardened steel.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
MD502024	.024	R.012	.043	1-1/2	1/8	●
MD502028	.028	R.014	.060	1-1/2	1/8	●
MD502031	.031	R.0155	.080	1-1/2	1/8	●
MD502035	.035	R.0175	.087	1-1/2	1/8	●
MD502040	.040	R.020	.100	1-1/2	1/8	●
MD502043	.043	R.0215	.118	1-1/2	1/8	●
MD502047	.047	R.0235	.118	1-1/2	1/8	●
MD502052	.052	R.026	.138	1-1/2	1/8	●
MD502055	.055	R.0275	.138	1-1/2	1/8	●
MD502062	.062	R.031	.157	1-1/2	1/8	●

Data → P107

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -.0012	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

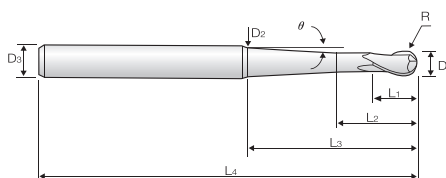
Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -.001	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

DA542



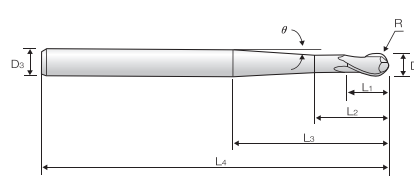
2 FLUTE, BALL NOSE with TAPER NECK

- High efficiency milling is possible in deep slotting with projection of the end mill being long.

EDP. No.	D	R	L1	L2	L3	D2	D3	L4	θ	STOCK
DA542001	1/16	R1/32	5/32	15/64	7/8	.096	1/4	2-3/8	1° 30'	●
DA542002	1/16	R1/32	5/32	15/64	1-5/8	.208	1/4	3-1/8	3°	●
DA542004	1/8	R1/16	1/4	21/64	2-1/16	.216	1/4	3-5/8	1° 30'	●
DA542006	3/16	R3/32	3/8	29/64	2-3/8	.288	3/8	4-3/8	1° 30'	●
DA542008	1/4	R1/8	1/2	5/8	2-1/16	.325	3/8	4-3/8	1° 30'	●
DA542010	5/16	R5/32	9/16	11/16	2-1/16	.385	1/2	4-3/4	1° 30'	●
DA542012	3/8	R3/16	11/16	13/16	2-3/8	.458	1/2	5-1/16	1° 30'	●
DA542016	1/2	R1/4	7/8	1	3-1/4	.618	3/4	6-3/8	1° 30'	●

Data → P108

DA552

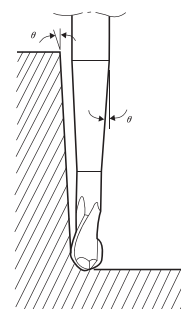


2 FLUTE, BALL NOSE with PENCIL NECK

- High efficiency milling is possible in deep slotting with projection of the end mill being long.

EDP. No.	D	R	L1	L2	L3	D3	D4	θ	STOCK
DA552006	3/16	R3/32	9/16	.659	3-11/32	3/8	7-3/4	2°	●
DA552007	3/16	R3/32	9/16	.666	2-13/16	3/8	6	2° 30'	●
DA552008	1/4	R1/8	3/4	.859	4-7/16	1/2	7-3/4	2°	●
DA552009	1/4	R1/8	3/4	.856	3-23/32	1/2	6	2° 30'	●
DA552010	5/16	R5/32	3/4	.868	4-29/32	1/2	7-3/4	1° 20'	●
DA552011	5/16	R5/32	3/4	.870	3-15/16	1/2	6	1° 45'	●
DA552012	3/8	R3/16	1-3/16	1.326	4-29/32	5/8	7-3/4	2°	●
DA552013	3/8	R3/16	1-3/16	1.325	4-3/16	5/8	6	2° 30'	●
DA552016	1/2	R1/4	1-3/16	1.309	4	5/8	7-3/4	1° 20'	●
DA552017	1/2	R1/4	1-3/16	1.329	3-3/8	5/8	6	1° 45'	●

Data → P109



MILLING ON TAPERED WALL

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

ZA502 - Regular Length

ZA522 - Long Length



2 FLUTE, REGULAR & LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZA502004	1/16	3/16	1-1/2	1/8	●
ZA502008	1/8	1/2	1-1/2	1/8	●
ZA502012	3/16	5/8	2	3/16	●
ZA502016	1/4	3/4	2-1/2	1/4	●
ZA502020	5/16	13/16	2-1/2	5/16	●
ZA502024	3/8	1	2-1/2	3/8	●
ZA502032	1/2	1	3	1/2	●
ZA502040	5/8	1-1/4	3-1/2	5/8	●
ZA502048	3/4	1-1/2	4	3/4	●
ZA502064	1	1-1/2	4	1	●

Data → P110

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZA522008	1/8	3/4	2-1/4	1/8	●
ZA522012	3/16	3/4	2-1/2	3/16	●
ZA522016	1/4	1-1/8	3	1/4	●
ZA522020	5/16	1-1/8	3	5/16	●
ZA522024	3/8	1-1/8	3	3/8	●
ZA522032	1/2	2	4	1/2	●
ZA522040	5/8	2-1/4	5	5/8	●
ZA522048	3/4	2-1/4	5	3/4	●
ZA522064	1	2-1/4	5	1	●

Data → P110

MZ502



2 FLUTE, MINIATURE

- High precision milling in medical, optical, electronics and aero space industries.
- Excellent performance on high hardened steel.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
MZ502016	.016	.031	1-1/2	1/8	●
MZ502020	.020	.040	1-1/2	1/8	●
MZ502024	.024	.047	1-1/2	1/8	●
MZ502028	.028	.055	1-1/2	1/8	●
MZ502031	.031	.063	1-1/2	1/8	●
MZ502035	.035	.080	1-1/2	1/8	●
MZ502040	.040	.100	1-1/2	1/8	●
MZ502043	.043	.100	1-1/2	1/8	●
MZ502047	.047	.157	1-1/2	1/8	●
MZ502052	.052	.157	1-1/2	1/8	●
MZ502055	.055	.157	1-1/2	1/8	●
MZ502062	.062	.157	1-1/2	1/8	●

Data → P111

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -.001

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

ZA504 - Regular Length

ZA524 - Long Length



ZA506(8) - Long Length

ZA526(8) - Extra Long Length



4 FLUTE, REGULAR & LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZA504004	1/16	3/16	1-1/2	1/8	●
ZA504008	1/8	1/2	1-1/2	1/8	●
ZA504012	3/16	5/8	2	3/16	●
ZA504016	1/4	3/4	2-1/2	1/4	●
ZA504020	5/16	13/16	2-1/2	5/16	●
ZA504024	3/8	1	2-1/2	3/8	●
ZA504028	7/16	1	2-3/4	7/16	●
ZA504032	1/2	1	3	1/2	●
ZA504040	5/8	1-1/4	3-1/2	5/8	●
ZA504048	3/4	1-1/2	4	3/4	●
ZA504064	1	1-1/2	4	1	●

Data → P111

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZA524008	1/8	3/4	2-1/4	1/8	●
ZA524012	3/16	3/4	2-1/2	3/16	●
ZA524016	1/4	1-1/8	3	1/4	●
ZA524020	5/16	1-1/8	3	5/16	●
ZA524024	3/8	1-1/8	3	3/8	●
ZA524032	1/2	2	4	1/2	●
ZA524040	5/8	2-1/4	5	5/8	●
ZA524048	3/4	2-1/4	5	3/4	●
ZA524064	1	2-1/4	5	1	●

Data → P112

6&8 FLUTE, 45 HELIX LONG EXTRA LONG LENGTH

- Designed to machine tool steel, hardened materials.
- High speed cutting and finish milling with high feed rate.
- Superior workpiece finishes.
- Superior wear resistant.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	NO. OF FLUTE	STOCK
ZA506016	1/4	1/2	2-1/4	1/4	6	●
ZA506020	5/16	3/4	2-1/2	5/16	6	●
ZA506024	3/8	7/8	2-7/8	3/8	6	●
ZA506032	1/2	1	3-1/4	1/2	6	●
ZA506040	5/8	1-1/4	3-5/8	5/8	6	●
ZA508048	3/4	1-1/2	4-1/8	3/4	8	●
ZA508064	1	1-3/4	4-1/4	1	8	●

Data → P113

EDP. No.	Dia.	C.L	OAL	SH.Dia.	NO. OF FLUTE	STOCK
ZA526016	1/4	1	2-3/4	1/4	6	●
ZA526020	5/16	1-1/2	3-5/8	5/16	6	●
ZA526024	3/8	1-3/4	4	3/8	6	●
ZA526032	1/2	2-3/16	4-3/8	1/2	6	●
ZA526040	5/8	2-5/8	5-1/8	5/8	6	●
ZA528048	3/4	2-1/4	5	3/4	8	●
ZA528049	3/4	3-1/4	6	3/4	8	●
ZA528050	3/4	4-1/8	7	3/4	8	●
ZA528064	1	4-1/8	7	1	8	●

Data → P113

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

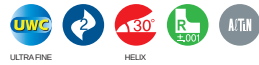
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

ZR502A



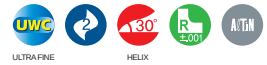
2 FLUTE, STUB LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR502A00408	1/16	R.008	1/8	2-1/4	1/4	●
ZR502A00810		R.010				●
ZR502A00820	1/8	R.020	1/4	2-1/4	1/4	●
ZR502A00830		R.030				●
ZR502A01210		R.010				●
ZR502A01220	3/16	R.020	3/8	2-1/2	1/4	●
ZR502A01230		R.030				●
ZR502A01610		R.010				●
ZR502A01620	1/4	R.020	1/2	3	1/4	●
ZR502A01630		R.030				●
ZR502A02020		R.020				●
ZR502A02030	5/16	R.030	1/2	3	5/16	●
ZR502A02060		R.060				●
ZR502A02090		R.090				●
ZR502A02420		R.020				●
ZR502A02430	3/8	R.030	5/8	3	3/8	●
ZR502A02460		R.060				●
ZR502A02490		R.090				●
ZR502A03220		R.020				●
ZR502A03230	1/2	R.030	5/8	4	1/2	●
ZR502A03260		R.060				●
ZR502A03290		R.090				●

Data → P114

ZR522A



2 FLUTE, REGULAR LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR522A00408	1/16	R.008	3/16	2-1/4	1/4	●
ZR522A00810		R.010				●
ZR522A00820	1/8	R.020	1/2	2-1/4	1/4	●
ZR522A00830		R.030				●
ZR522A01210		R.010				●
ZR522A01220	3/16	R.020	5/8	2-1/2	1/4	●
ZR522A01230		R.030				●
ZR522A01610		R.010				●
ZR522A01620	1/4	R.020	3/4	3	1/4	●
ZR522A01630		R.030				●
ZR522A02020		R.020				●
ZR522A02030	5/16	R.030	13/16	3	5/16	●
ZR522A02060		R.060				●
ZR522A02090		R.090				●
ZR522A02420		R.020				●
ZR522A02430	3/8	R.030	1	3	3/8	●
ZR522A02460		R.060				●
ZR522A02490		R.090				●
ZR522A02820		R.020				●
ZR522A02830	7/16	R.030	1	4	7/16	●
ZR522A02860		R.060				●
ZR522A02890		R.090				●
ZR522A03220		R.020				●
ZR522A03230	1/2	R.030	1	4	1/2	●
ZR522A03260		R.060				●
ZR522A03290		R.090				●

Data → P114

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

ZR532A



2 FLUTE, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR532A01620	1/4	R.020	1-1/8	3	1/4	●
ZR532A01630		R.030				●
ZR532A02020	5/16	R.020	1-1/8	3	5/16	●
ZR532A02030		R.030				●
ZR532A02060		R.060				●
ZR532A02090		R.090				●
ZR532A02420	3/8	R.020	1-1/8	3	3/8	●
ZR532A02430		R.030				●
ZR532A02460		R.060				●
ZR532A02490		R.090				●
ZR532A03220	1/2	R.020	2	4	1/2	●
ZR532A03230		R.030				●
ZR532A03260		R.060				●
ZR532A03290		R.090				●

Data → P114

ZR504A



4 FLUTE, STUB LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR504A00408	1/16	R.008	1/8	2-1/4	1/4	●
ZR504A00810	1/8	R.010	1/4	2-1/4	1/4	●
ZR504A00820		R.020				●
ZR504A00830		R.030				●
ZR504A01210	3/16	R.010	3/8	2-1/2	1/4	●
ZR504A01220		R.020				●
ZR504A01230		R.030				●
ZR504A01610	1/4	R.010	1/2	3	1/4	●
ZR504A01620		R.020				●
ZR504A01630		R.030				●
ZR504A02020	5/16	R.020	1/2	3	5/16	●
ZR504A02030		R.030				●
ZR504A02060		R.060				●
ZR504A02090		R.090				●
ZR504A02420	3/8	R.020	5/8	3	3/8	●
ZR504A02430		R.030				●
ZR504A02460		R.060				●
ZR504A02490		R.090				●
ZR504A03220	7/16	R.020	5/8	4	1/2	●
ZR504A03230		R.030				●
ZR504A03260		R.060				●
ZR504A03290		R.090				●

Data → P114

Tolerance of Mill Dia. (mm)

0 ~ -0.012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

ZR524A



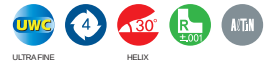
4 FLUTE, REGULAR LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR524A00408	1/16	R.008	3/16	2-1/4	1/4	●
ZR524A00810		R.010				●
ZR524A00820	1/8	R.020	1/2	2-1/4	1/4	●
ZR524A00830		R.030				●
ZR524A01210		R.010				●
ZR524A01220	3/16	R.020	5/8	2-1/2	1/4	●
ZR524A01230		R.030				●
ZR524A01610		R.010				●
ZR524A01620	1/4	R.020	3/4	3	1/4	●
ZR524A01630		R.030				●
ZR524A02020		R.020				●
ZR524A02030	5/16	R.030	13/16	3	5/16	●
ZR524A02060		R.060				●
ZR524A02090		R.090				●
ZR524A02420		R.020				●
ZR524A02430	3/8	R.030	1	3	3/8	●
ZR524A02460		R.060				●
ZR524A02490		R.090				●
ZR524A02820		R.020				●
ZR524A02830	7/16	R.030	1	4	7/16	●
ZR524A02860		R.060				●
ZR524A02890		R.090				●
ZR524A03220		R.020				●
ZR524A03230	1/2	R.030	1	4	1/2	●
ZR524A03260		R.060				●
ZR524A03290		R.090				●

Data → P114

ZR534A



4 FLUTE, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR534A01620	1/4	R.020	1-1/8	3	1/4	●
ZR534A01630		R.030				●
ZR534A02020		R.020				●
ZR534A02030	5/16	R.030	1-1/8	3	5/16	●
ZR534A02060		R.060				●
ZR534A02090		R.090				●
ZR534A02420		R.020				●
ZR534A02430	3/8	R.030	1-1/8	3	3/8	●
ZR534A02460		R.060				●
ZR534A02490		R.090				●
ZR534A03220		R.020				●
ZR534A03230	1/2	R.030	2	4	1/2	●
ZR534A03260		R.060				●
ZR534A03290		R.090				●

Data → P114

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

INCH

ZR506(8)A



**6&8 FLUTE, 45° HELIX,
LONG LENGTH, CORNER RADIUS**

- Designed to machine tool steel, hardened materials.
- High speed cutting and finish milling with high feed rates.
- Superior workpiece finishes.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	NO. OF FLUTE	STOCK
ZR506A01620	1/4	R.020	1/2	2-1/4	1/4	6	●
ZR506A02020	5/16	R.020	3/4	2-1/2	5/16	6	●
ZR506A02420	3/8	R.020	7/8	2-7/8	3/8	6	●
ZR506A02430	3/8	R.030	7/8	2-7/8	3/8	6	●
ZR506A03220	1/2	R.020	1	3-1/4	1/2	6	●
ZR506A03230	1/2	R.030	1	3-1/4	1/2	6	●
ZR506A04030	5/8	R.030	1-1/4	3-5/8	5/8	6	●
ZR506A04060	5/8	R.060	1-1/4	3-5/8	5/8	6	●
ZR508A04830	3/4	R.030	1-1/2	4-1/8	3/4	8	●
ZR508A04860	3/4	R.060	1-1/2	4-1/8	3/4	8	●
ZR508A04890	3/4	R.090	1-1/2	4-1/8	3/4	8	●

Data → P115

Tolerance of Mill Dia. (mm)

0 ~ -.0012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

DB512



2 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Suitable for copy milling.

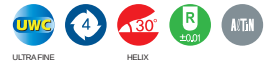
EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
DB512010	1.0	0.5	3	50	6	●
DB512015	1.5	0.75	4	50	6	●
DB512020	2.0	1	5	60	6	●
DB512025	2.5	1.25	6	60	6	●
DB512030	3.0	1.5	8	70	6	●
DB512035	3.5	1.75	8	70	6	●
DB512040	4.0	2	8	70	6	●
DB512045	4.5	2.25	10	70	6	●
DB512050	5.0	2.5	12	80	6	●
DB512055	5.5	2.75	12	80	6	●
DB512060	6.0	3	12	90	6	●
DB512065	6.5	3.25	12	90	8	●
DB512070	7.0	3.5	15	90	8	●
DB512080	8.0	4	15	100	8	●
DB512090	9.0	4.5	20	100	10	●
DB512100	10	5	20	100	10	●
DB512101			25	150		●
DB512110	11	5.5	25	110	12	●
DB512120	12	6	25	110	12	●
DB512121			30	150		●
DB512122			35	200		●
DB512130	13	6.5	30	120	14	●
DB512140	14	7	30	120	14	●
DB512150	15	7.5	35	140	16	●
DB512160	16	8	35	140	16	●
DB512161			40	200		●
DB512162			45	250		●
DB512180	18	9	40	150	18	●
DB512200	20	10	40	160	20	●
DB512201			45	200		●
DB512202			50	250		●
DB512250	25	12.5	50	180	25	●

Data → P116

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

DB514



4 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Suitable for copy milling.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
DB514030	3	1.5	8	70	6	●
DB514040	4	2	8	70	6	●
DB514050	5	2.5	10	80	6	●
DB514060	6	3	12	90	6	●
DB514070	7	3.5	15	90	8	●
DB514080	8	4	15	100	8	●
DB514090	9	4.5	20	100	10	●
DB514100	10	5	20	100	10	●
DB514110	11	5.5	25	110	12	●
DB514120	12	6	25	110	12	●
DB514130	13	6.5	30	120	14	●
DB514140	14	7	30	120	14	●
DB514150	15	7.5	35	140	16	●
DB514160	16	8	35	140	16	●
DB514180	18	9	40	150	18	●
DB514200	20	10	40	160	20	●
DB514250	25	12.5	50	180	25	●

Data → P117

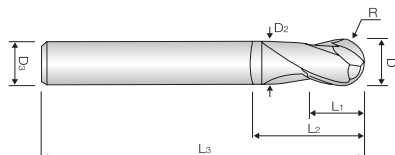
Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

DB502



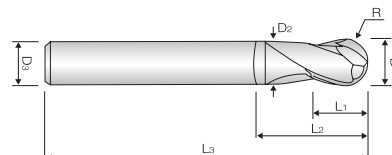
2 FLUTE, STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Suitable for copy milling.
- Designed to high strength.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
DB502010	1.0	0.5	1	3	50	0.95	6	●
DB502015	1.5	0.75	1.5	4	50	1.45	6	●
DB502020	2.0	1	2	6	60	1.9	6	●
DB502030	3.0	1.5	4	9	70	2.85	6	●
DB502040	4.0	2	5	12	70	3.85	6	●
DB502050	5.0	2.5	6	15	80	4.7	6	●
DB502060	6.0	3	7	18	90	5.7	6	●
DB502080	8.0	4	10	24	90	7.7	8	●
DB502100	10.0	5	12	30	100	9.5	10	●
DB502120	12.0	6	14	36	110	11.5	12	●

Data → P116

DB522



2 FLUTE, EXTENDED NECK-LONG SHANK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Suitable for copy milling.
- Suitable for deep copy milling with long neck type.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
DB522030	3	1.5	4	35	100	2.9	6	●
DB522040	4	2	6	35	100	3.9	6	●
DB522050	5	2.5	7	40	115	4.9	6	●
DB522060	6	3	8	45	115	5.9	6	●
DB522061	6	3	8	45	115	5.9	8	●
DB522070	7	3.5	10	45	125	6.9	8	●
DB522080	8	4	12	55	125	7.9	8	●
DB522081	8	4	12	55	125	7.9	10	●
DB522090	9	4.5	15	65	140	8.9	10	●
DB522100	10	5	15	65	140	9.9	10	●
DB522120	12	6	18	75	150	11.9	12	●
DB522140	14	7	23	75	155	13.9	14	●
DB522160	16	8	30	75	155	15.9	16	●

Data → P116

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

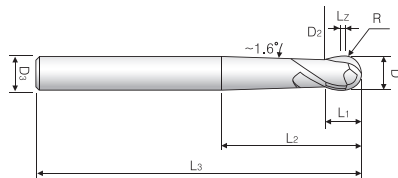
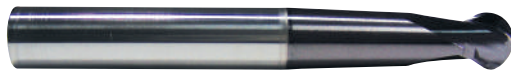
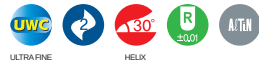
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

DB532



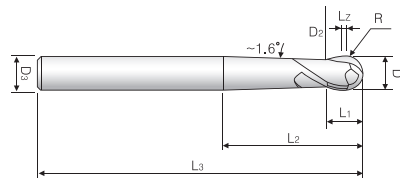
2 FLUTE, MMC-SPHERE TYPE

- For copy milling & steep sloped machining in Mold & Die.
- ALTiN coated for high wear resistance.

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₂	D ₃	L _z	STOCK
DB532030	3	1.5	4	30	80	2.5	6	1.5	●
DB532031	3	1.5	2.3	30	80	2.5	6	-	●
DB532040	4	2	5	30	80	3.3	6	1.5	●
DB532041	4	2	3.1	30	80	3.3	6	-	●
DB532050	5	2.5	6	43	80	4.1	6	2	●
DB532051	5	2.5	3.9	38	80	4.1	6	-	●
DB532060	6	3	7	30	100	4.7	6	2	●
DB532061	6	3	4.9	28	100	4.7	6	-	●
DB532080	8	4	9	36	100	6.5	8	3	●
DB532081	8	4	6.3	33	100	6.5	8	-	●
DB532100	10	5	11	43	100	8.2	10	3	●
DB532101	10	5	7.9	40	100	8.2	10	-	●
DB532120	12	6	13	52	100	9.8	12	3	●
DB532121	12	6	9.5	49	100	9.8	12	-	●
DB532160	16	8	15	61	150	13.4	16	3	●
DB532161	16	8	12.4	59	150	13.4	16	-	●

Data → P118

DB534



4 FLUTE, MMC-SPHERE TYPE

- For copy milling & steep sloped machining in Mold & Die.
- ALTiN coated for high wear resistance.

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₂	D ₃	L _z	STOCK
DB534050	5	2.5	6	43	80	4.1	6	2	●
DB534051	5	2.5	3.9	38	80	4.1	6	-	●
DB534060	6	3	7	30	100	4.7	6	2	●
DB534061	6	3	4.9	28	100	4.7	6	-	●
DB534080	8	4	9	36	100	6.5	8	3	●
DB534081	8	4	6.3	33	100	6.5	8	-	●
DB534100	10	5	11	43	100	8.2	10	3	●
DB534101	10	5	7.9	40	100	8.2	10	-	●
DB534120	12	6	13	52	100	9.8	12	3	●
DB534121	12	6	9.5	49	100	9.8	12	-	●
DB534160	16	8	15	61	150	13.4	16	3	●
DB534161	16	8	12.4	59	150	13.4	16	-	●

Data → P119

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

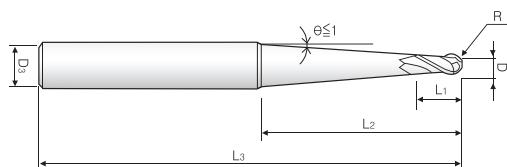
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

DB54(5)2



2 FLUTE, BALL NOSE with TAPER NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Suitable for copy milling.
- Suitable for deep copy milling with taper long neck type.

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₃	STOCK
DB542020	2	1.0	3	63	110	6	●
DB552020	2	1.0	5	85	155	6	●
DB542030	3	1.5	5	65	110	6	●
DB552030	3	1.5	7	87	155	6	●
DB542040	4	2.0	7	67	110	6	●
DB552040	4	2.0	10	90	155	8	●
DB542050	5	2.5	10	70	110	6	●
DB552050	5	2.5	15	95	155	8	●
DB542060	6	3.0	18	78	155	10	●
DB552060	6	3.0	20	110	200	10	●
DB542080	8	4.0	30	100	155	12	●
DB552080	8	4.0	30	120	200	12	●
DB542100	10	5.0	40	100	155	12	●
DB552100	10	5.0	40	120	200	12	●
DB542120	12	6.0	50	110	155	16	●
DB552120	12	6.0	50	130	200	16	●

ZE502



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE502010	1	3	42	6	●
ZE502015	1.5	4	42	6	●
ZE502020	2	6	42	6	●
ZE502025	2.5	8	42	6	●
ZE502030	3	10	50	6	●
ZE502035	3.5	10	50	6	●
ZE502040	4	12	50	6	●
ZE502045	4.5	14	50	6	●
ZE502050	5	15	50	6	●
ZE502055	5.5	15	50	6	●
ZE502060	6	15	50	6	●
ZE502065	6.5	18	60	8	●
ZE502070	7	20	60	8	●
ZE502075	7.5	20	60	8	●
ZE502080	8	20	60	8	●
ZE502085	8.5	23	70	10	●
ZE502090	9	25	70	10	●
ZE502095	9.5	25	70	10	●
ZE502100	10	25	70	10	●
ZE502105	10.5	28	75	12	●
ZE502110	11	30	75	12	●
ZE502115	11.5	30	75	12	●
ZE502120	12	30	75	12	●
ZE502130S12	13	30	80	12	●
ZE502130	13	35	85	14	●
ZE502130S16	13	35	90	16	●
ZE502140	14	35	85	14	●
ZE502140S16	14	35	90	16	●
ZE502150	15	40	90	16	●
ZE502160	16	40	90	16	●

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE502170	17	40	100	16	●
ZE502180	18	45	100	18	●
ZE502190	19	45	100	20	●
ZE502200	20	45	100	20	●
ZE502220	22	45	100	20	●
ZE502240	24	50	120	25	●
ZE502250	25	50	120	25	●

Data → P120

ZE504



4 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE504020	2	6	42	6	●
ZE504025	2.5	8	42	6	●
ZE504030	3	10	50	6	●
ZE504035	3.5	10	50	6	●
ZE504040	4	12	50	6	●
ZE504045	4.5	14	50	6	●
ZE504050	5	15	50	6	●
ZE504055	5.5	15	50	6	●
ZE504060	6	15	50	6	●
ZE504065	6.5	18	60	8	●
ZE504070	7	20	60	8	●
ZE504075	7.5	20	60	8	●
ZE504080	8	20	60	8	●
ZE504085	8.5	23	70	10	●
ZE504090	9	25	70	10	●
ZE504095	9.5	25	70	10	●
ZE504100	10	25	70	10	●
ZE504105	10.5	28	75	12	●
ZE504110	11	30	75	12	●
ZE504115	11.5	30	75	12	●
ZE504120	12	30	75	12	●
ZE504130S12	13	35	80	12	●
ZE504130	13	35	85	14	●
ZE504130S16	13	35	90	16	●
ZE504140	14	35	85	14	●
ZE504140S16	14	35	90	16	●
ZE504150	15	40	90	16	●
ZE504160	16	40	90	16	●
ZE504170	17	40	100	16	●
ZE504180	18	45	100	18	●
ZE504190	19	45	100	20	●
ZE504200	20	45	100	20	●
ZE504220	22	45	100	20	●
ZE504240	24	50	120	25	●
ZE504250	25	50	120	25	●

Data → P122

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZE503



3 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE503060	6	15	50	6	●
ZE503070	7	18	60	8	●
ZE503080	8	18	60	8	●
ZE503090	9	22	70	10	●
ZE503100	10	22	70	10	●
ZE503110	11	26	75	12	●
ZE503120	12	26	75	12	●
ZE503130	13	32	85	14	●
ZE503140	14	32	85	14	●
ZE503150	15	35	90	16	●
ZE503160	16	35	90	16	●
ZE503180	18	40	100	18	●
ZE503200	20	40	100	20	●
ZE503250	25	50	120	25	●
ZE503320	32	70	150	32	●

Data → P121

ZE506



6 FLUTE, REGULAR & LONG LENGTH

- Designed for highly hardened materials up to HRC 55.
- Suitable for high speed & finishing machining.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE506060	6	15	50	6	●
ZE506061	6	26	70	6	●
ZE506070	7	18	60	8	●
ZE506080	8	18	60	8	●
ZE506081	8	36	90	8	●
ZE506090	9	22	70	10	●
ZE506100	10	22	70	10	●
ZE506101	10	46	100	10	●
ZE506110	11	26	75	12	●
ZE506120	12	26	75	12	●
ZE506121	12	56	110	12	●
ZE506130	13	32	85	14	●
ZE506140	14	32	85	14	●
ZE506150	15	35	90	16	●
ZE506160	16	35	90	16	●
ZE506161	16	66	130	16	●
ZE506180	18	44	100	18	●
ZE506200	20	44	100	20	●
ZE506201	20	76	150	20	●
ZE506250	25	50	120	25	●
ZE506251	25	92	180	25	●
ZE506320	32	70	150	32	●

Data → P123

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZM502



2 FLUTE, MEDIUM LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZM502020	2	8	40	4	●
ZM502030	3	12	50	6	●
ZM502040	4	15	50	6	●
ZM502050	5	20	60	6	●
ZM502060	6	20	60	6	●
ZM502080	8	25	70	8	●
ZM502100	10	30	90	10	●
ZM502120	12	30	90	12	●
ZM502140	14	40	110	16	●
ZM502160	16	50	110	16	●
ZM502180	18	50	110	20	●
ZM502200	20	55	110	20	●
ZM502250	25	75	140	25	●

Data → P124

ZM504



4 FLUTE, MEDIUM LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZM504020	2	8	40	4	●
ZM504030	3	12	50	6	●
ZM504040	4	15	50	6	●
ZM504050	5	20	60	6	●
ZM504060	6	20	60	6	●
ZM504080	8	25	70	8	●
ZM504100	10	30	90	10	●
ZM504120	12	30	90	12	●
ZM504140	14	40	110	16	●
ZM504160	16	50	110	16	●
ZM504180	18	50	110	20	●
ZM504200	20	55	110	20	●
ZM504250	25	75	140	25	●

Data → P124

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZM522



2 FLUTE, MEDIUM CUT LONG SHANK TYPE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZM522030	3	10	70	6	●
ZM522040	4	12	70	6	●
ZM522050	5	15	80	6	●
ZM522060	6	15	80	6	●
ZM522080	8	20	100	8	●
ZM522100	10	25	100	10	●
ZM522120	12	30	110	12	●
ZM522160	16	40	125	16	●
ZM522200	20	45	150	20	●

Data → P124

ZM524



4 FLUTE, MEDIUM CUT LONG SHANK TYPE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZM524030	3	10	70	6	●
ZM524040	4	12	70	6	●
ZM524050	5	15	80	6	●
ZM524060	6	15	80	6	●
ZM524080	8	20	100	8	●
ZM524100	10	25	100	10	●
ZM524120	12	30	110	12	●
ZM524160	16	40	125	16	●
ZM524200	20	45	150	20	●

Data → P124

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZE522



2 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE522030	3	25	75	6	●
ZE522040	4	25	75	6	●
ZE522050	5	30	85	6	●
ZE522060	6	30	85	6	●
ZE522070	7	35	85	8	●
ZE522080	8	35	85	8	●
ZE522090	9	45	100	10	●
ZE522100	10	45	100	10	●
ZE522101	10	60	155	10	●
ZE522120	12	55	120	12	●
ZE522121	12	65	155	12	●
ZE522140	14	60	120	14	●
ZE522160	16	60	120	16	●
ZE522161	16	75	165	16	●
ZE522180	18	60	120	18	●
ZE522200	20	60	120	20	●
ZE522201	20	75	165	20	●

Data → P120

ZE524



4 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE524030	3	25	75	6	●
ZE524040	4	25	75	6	●
ZE524050	5	30	85	6	●
ZE524060	6	30	85	6	●
ZE524070	7	35	85	8	●
ZE524080	8	35	85	8	●
ZE524090	9	45	100	10	●
ZE524100	10	45	100	10	●
ZE524120	12	55	120	12	●
ZE524140	14	60	120	14	●
ZE524160	16	60	120	16	●
ZE524180	18	60	120	18	●
ZE524200	20	60	120	20	●

Data → P122

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZE534

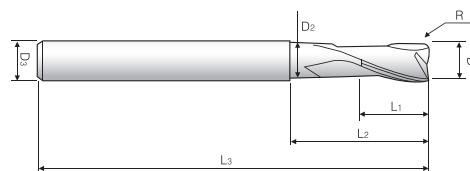


4 FLUTE, EXTRA LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE534040	4	30	130	6	●
ZE534050	5	35	130	6	●
ZE534060	6	40	130	6	●
ZE534061	6	50	155	6	●
ZE534081	8	60	155	8	●
ZE534082	8	80	200	8	●
ZE534101	10	60	155	10	●
ZE534102	10	80	200	10	●
ZE534121	12	60	155	12	●
ZE534122	12	80	200	12	●
ZE534161	16	80	155	16	●
ZE534162	16	100	200	16	●
ZE534163	16	120	250	16	●
ZE534201	20	80	165	20	●
ZE534202	20	100	200	20	●
ZE534203	20	130	250	20	●
ZE534252	25	100	200	25	●
ZE534253	25	150	250	25	●

ZR502



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
ZR5020405	4	0.5	6	10	55	3.7	6	●
ZR5020410		1						●
ZR5020605	6	0.5	8	15	55	5.7	6	●
ZR5020610		1						●
ZR5020805		0.5						●
ZR5020810	8	1	10	20	65	7.7	8	●
ZR5020815		1.5						●
ZR5020820		2						●
ZR5021005		0.5						●
ZR5021010	10	1	12	28	80	9.5	10	●
ZR5021015		1.5						●
ZR5021020		2						●
ZR5021205		0.5						●
ZR5021210	12	1	15	30	82	11.5	12	●
ZR5021215		1.5						●
ZR5021220		2						●

Data → P125

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

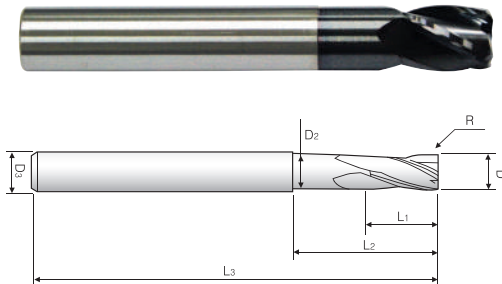
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZR504



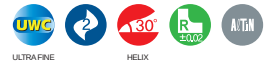
4 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK
ZR5040405	4	0.5	6	10	55	3.7	6	●
ZR5040410		1						●
ZR5040605	6	0.5	8	15	55	5.7	6	●
ZR5040610		1						●
ZR5040805	8	0.5	10	20	65	7.7	8	●
ZR5040810		1						●
ZR5040815		1.5						●
ZR5040820		2						●
ZR5041005	10	0.5	12	28	80	9.5	10	●
ZR5041010		1						●
ZR5041015		1.5						●
ZR5041020		2						●
ZR5041205	12	0.5	15	30	82	11.5	12	●
ZR5041210		1						●
ZR5041215		1.5						●
ZR5041220		2						●

Data → P126

ZR512



2 FLUTE, REGULAR LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR5120605	6	0.5	15	55	6	●
ZR5120610		1				●
ZR5120805	8	0.5	20	65	8	●
ZR5120810		1				●
ZR5120815		1.5				●
ZR5120820	10	2	25	80	10	●
ZR5121005		0.5				●
ZR5121010		1				●
ZR5121015		1.5				●
ZR5121020	12	2	30	82	12	●
ZR5121025		2.5				●
ZR5121030		3				●
ZR5121205	12	0.5	30	82	12	●
ZR5121210		1				●
ZR5121215		1.5				●
ZR5121220		2				●
ZR5121225	16	2.5	40	100	16	●
ZR5121230		3				●
ZR5121605		0.5				●
ZR5121610		1				●
ZR5121615	20	1.5	45	110	20	●
ZR5121620		2				●
ZR5121630		3				●
ZR5122005	20	0.5	45	110	20	●
ZR5122010		1				●
ZR5122015		1.5				●
ZR5122020		2				●
ZR5122030		3				●

Data → P125

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZR514



4 FLUTE, REGULAR LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR5140605	6	0.5	15	55	6	●
ZR5140610		1				●
ZR5140805	8	0.5	20	65	8	●
ZR5140810		1				●
ZR5140815		1.5				●
ZR5140820	10	2	25	80	10	●
ZR5141005		0.5				●
ZR5141010		1				●
ZR5141015		1.5				●
ZR5141020		2				●
ZR5141025		2.5				●
ZR5141030	12	3	30	82	12	●
ZR5141205		0.5				●
ZR5141210		1				●
ZR5141215		1.5				●
ZR5141220		2				●
ZR5141225		2.5				●
ZR5141230	16	3	40	100	16	●
ZR5141605		0.5				●
ZR5141610		1				●
ZR5141615		1.5				●
ZR5141620	20	2	45	110	20	●
ZR5141630		3				●
ZR5142005		0.5				●
ZR5142010	20	1	45	110	20	●
ZR5142015		1.5				●
ZR5142020		2				●
ZR5142030		3				●

Data → P126

ZR522



2 FLUTE, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR5220302	3	0.2	8	60	6	●
ZR5220305		0.5				●
ZR5220402	4	0.2	11	70	6	●
ZR5220405		0.5				●
ZR5220410		1				●
ZR5220502	5	0.2	13	80	6	●
ZR5220505		0.5				●
ZR5220510		1				●
ZR5220602	6	0.2	13	90	6	●
ZR5220605		0.5				●
ZR5220610		1				●
ZR5220805	8	0.5	19	100	8	●
ZR5220810		1				●
ZR5220815		1.5				●
ZR5220820		2				●
ZR5221005	10	0.5	22	100	10	●
ZR5221010		1				●
ZR5221015		1.5				●
ZR5221020		2				●
ZR5221025	12	2.5	26	110	12	●
ZR5221205		0.5				●
ZR5221210		1				●
ZR5221215		1.5				●
ZR5221220		2				●
ZR5221225		2.5				●
ZR5221230		3				●

Data → P125

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

ZR524



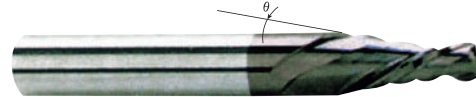
4 FLUTE, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR5240302	3	0.2	8	60	6	●
ZR5240305		0.5				●
ZR5240402	4	0.2	11	70	6	●
ZR5240405		0.5				●
ZR5240410	5	1	13	80	6	●
ZR5240502		0.2				●
ZR5240505	6	0.5	13	90	6	●
ZR5240510		1				●
ZR5240602	8	0.2	19	100	8	●
ZR5240605		0.5				●
ZR5240610	10	1	22	100	10	●
ZR5240805		0.5				●
ZR5240810	12	1	26	110	12	●
ZR5240815		1.5				●
ZR5240820	12	2	26	110	12	●
ZR5241005		0.5				●
ZR5241010	10	1	22	100	10	●
ZR5241015		1.5				●
ZR5241020	12	2	26	110	12	●
ZR5241025		2.5				●
ZR5241205	12	0.5	26	110	12	●
ZR5241210		1				●
ZR5241215	12	1.5	26	110	12	●
ZR5241220		2				●
ZR5241225	12	2.5	26	110	12	●
ZR5241230		3				●

Data → P126

TE503



3 FLUTE, TAPER END MILL

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ALTiN coated for high wear resistance.

EDP. No.	Dia.	θ°	C.L	N.D	OAL	SH.Dia.	STOCK
TE5033106	3	1	10	3.4	50	6	●
TE5033206		2		3.7			●
TE5033306		3		4			●
TE5033506	4	5	15	4.8	50	6	●
TE5034106		1		4.5			●
TE5034206		2		5			●
TE5034306	5	3	20	5.6	60	8	●
TE5034508		5		6.6			●
TE5035106	6	1	20	5.7	70	10	●
TE5035208		2		6.4			●
TE5035308		3		7.1			●
TE5035508	8	5	25	8.5	75	12	●
TE5036108		1		6.7			●
TE5036208		2		7.4			●
TE5036308	10	3	35	8.1	90	14	●
TE5036510		5		9.5			●
TE5038110	10	1	35	8.9	90	14	●
TE5038210		2		9.8			●
TE5038312		3		10.6			●
TE5038512	12	5	35	12.4	90	16	●
TE5030112		1		11.2			●
TE5030212		2		12.4			●
TE5030314	12	3	35	13.7	90	16	●
TE5030516		5		16.1			●

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS CLASSIC SERIES

METRIC

TB503



3 FLUTE, TAPER BALL END MILL

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ALTiN coated for high wear resistance.

EDP. No.	Dia.	R	θ°	C.L	OAL	SH.Dia.	STOCK
TB50315306	3	1.5	3°	12	60	6	
TB50320306	4	2		15	60	6	
TB50325308	5	2.5		18	60	8	
TB50330310	6	3		22	70	10	
TB50340312	8	4		26	75	12	
TB50350312	10	5	5°	19	75	12	
TB50360316	12	6		36	90	16	
TB50315506	3	1.5		12	60	6	
TB50320508	4	2		15	60	8	
TB50325510	5	2.5		18	70	10	
TB50330510	6	3	7°	22	70	10	
TB50340512	8	4		26	75	12	
TB50350516	10	5		30	90	16	
TB50360520	12	6		36	100	20	
TB50315706	3	1.5		12	60	6	
TB50320708	4	2	7°	15	60	8	
TB50325710	5	2.5		18	70	10	
TB50330712	6	3		22	75	12	
TB50340716	8	4		26	90	16	
TB50350716	10	5		30	90	16	
TB50360720	12	6		36	100	20	

TB504



4 FLUTE, TAPER BALL END MILL

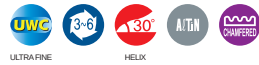
- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ALTiN coated for high wear resistance.

EDP. No.	Dia.	R	θ°	C.L	OAL	SH.Dia.	STOCK
TB50425308	5	2.5	3°	18	60	8	
TB50430310	6	3		22	70	10	
TB50440312	8	4		26	75	12	
TB50450312	10	5		19	75	12	
TB50460316	12	6		36	90	16	
TB50425510	5	2.5	5°	18	70	10	
TB50430510	6	3		22	70	10	
TB50440512	8	4		26	75	12	
TB50450516	10	5		30	90	16	
TB50460520	12	6		36	100	20	
TB50425710	5	2.5	7°	18	70	10	
TB50430712	6	3		22	75	12	
TB50440716	8	4		26	90	16	
TB50450716	10	5		30	90	16	
TB50460720	12	6		36	100	20	

ZAMUS CLASSIC SERIES

METRIC

ZF60



ROUGHING END MILL

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ALTiN coated for high wear resistance.
- Rough & finish type.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	Z	STOCK
ZF603060	6	15	50	6	3	●
ZF603070	7	18	60	8	3	●
ZF603080	8	18	60	8	3	●
ZF604090	9	22	70	10	4	●
ZF604100	10	22	70	10	4	●
ZF604110	11	26	75	12	4	●
ZF604120	12	26	75	12	4	●
ZF604130	13	32	85	14	4	●
ZF604140	14	32	85	14	4	●
ZF604150	15	35	90	16	4	●
ZF604160	16	35	90	16	4	●
ZF604180	18	44	100	18	4	●
ZF604200	20	44	100	20	4	●
ZF605250	25	50	120	25	5	●
ZF606320	32	70	150	32	6	●

Data → P127

ZF61



ROUGHING END MILL - FINE Pitch DIN6527L / DIN6535-HA, DIN6535-HB

- Designed for machine tool steel, alloy steel, mold steel and other highly hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.

EDP. No.		Dia.	C.L	OAL	SH. Dia.	Z	STOCK
PLAIN SHANK	FLAT SHANK						
ZF613060	ZF613060F	6	16	57	6	3	●
ZF613070	ZF613070F	7	16	63	8	3	●
ZF613080	ZF613080F	8	16	63	8	3	●
ZF614090	ZF614090F	9	19	72	10	4	●
ZF614100	ZF614100F	10	22	72	10	4	●
ZF614120	ZF614120F	12	26	83	12	4	●
ZF614140	ZF614140F	14	32	83	14	4	●
ZF614160	ZF614160F	16	35	92	16	4	●
ZF614180	ZF614180F	18	40	100	18	4	●
ZF614200	ZF614200F	20	44	104	20	4	●
ZF615250	ZF615250F	25	50	120	25	5	●

Data → P127

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

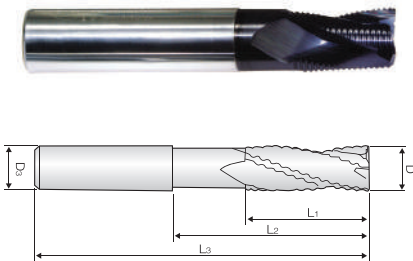
μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

ZAMUS CLASSIC SERIES

METRIC

PK503



EDP. No.	D	L ₁	L ₂	L ₃	d	Z	STOCK
PK503060	6	9	15	57	6	3	●
PK503080	8	12	20	63	8		●
PK503100	10	15	25	72	10		●
PK503120	12	18	30	83	12		●
PK503140	14	21	35	83	14		●
PK503160	16	24	40	92	16		●
PK503200	20	30	50	104	20		●

Data → P128

Z - AXIS ROUGHING END MILL

- Reducing cycle time by 1pass operating from Z-axis to slotting.
- Preventing the working interruption as Neck type.

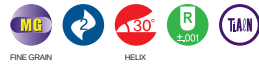
μm=1/1000mm

Tolerance / Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h11)	-20 -85	-30 -105	-40 -150	-50 -180	-65 -225
Shank (h6)	0 -6	0 -8	0 -9	0 -11	0 -13

ZAMUS THUNDER SERIES

INCH

DA302



2 FLUTE, REGULAR LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
DA302001	1/32	R1/64	1/32	1-1/2	1/8	●
DA302002	1/16	R1/32	1/16	1-1/2	1/8	●
DA302003	3/32	R3/64	3/32	1-1/2	1/8	●
DA302004	1/8	R1/16	5/16	1-1/2	1/8	●
DA302006	3/16	R3/32	3/8	2	3/16	●
DA302008	1/4	R1/8	1/2	2-1/2	1/4	●
DA302010	5/16	R5/32	9/16	2-1/2	5/16	●
DA302012	3/8	R3/16	3/4	2-1/2	3/8	●
DA302016	1/2	R1/4	7/8	3	1/2	●
DA302020	5/8	R5/16	1-1/4	3-1/2	5/8	●
DA302024	3/4	R3/8	1-1/2	4	3/4	●
DA302032	1	R1/2	1-1/2	4	1	●

Data → P104

ZA302



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZA302002	1/32	1/8	1-1/2	1/8	●
ZA302004	1/16	3/16	1-1/2	1/8	●
ZA302008	1/8	1/2	1-1/2	1/8	●
ZA302012	3/16	5/8	2	3/16	●
ZA302016	1/4	3/4	2-1/2	1/4	●
ZA302020	5/16	13/16	2-1/2	5/16	●
ZA302024	3/8	1	2-1/2	3/8	●
ZA302032	1/2	1	3	1/2	●
ZA302040	5/8	1-1/4	3-1/2	5/8	●
ZA302048	3/4	1-1/2	4	3/4	●
ZA302064	1	1-1/2	4	1	●

Data → P110

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -.0012	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -.0012	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

INCH

ZA304



4 FLUTE, REGULAR LENGTH

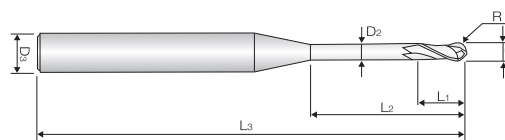
- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZA304004	1/16	3/16	1-1/2	1/8	●
ZA304008	1/8	1/2	1-1/2	1/8	●
ZA304012	3/16	5/8	2	3/16	●
ZA304016	1/4	3/4	2-1/2	1/4	●
ZA304020	5/16	13/16	2-1/2	5/16	●
ZA304024	3/8	1	2-1/2	3/8	●
ZA304032	1/2	1	3	1/2	●
ZA304040	5/8	1-1/4	3-1/2	5/8	●
ZA304048	3/4	1-1/2	4	3/4	●
ZA304064	1	1-1/2	4	1	●

Data → P111

METRIC

DB302



For RIB PROCESSING

- Designed for machine tool steel, alloy steel, mold steel and other highly hardened materials.
- Substitution of EDM.

EDP. No.	R	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK	
DB3020502	0.25	0.4	2	45	0.45	4	●	
DB3020503			3				●	
DB3020504			4				●	
DB3020505			5				●	
DB3020506			6				●	
DB3020602	0.3	0.5	2	45	0.55	4	●	
DB3020603			3				●	
DB3020604			4				●	
DB3020605			5				●	
DB3020606			6				●	
DB3020802	0.4	0.6	2	45	0.75	4	●	
DB3020804			4				●	
DB3020805			5				●	
DB3020806			6				●	
DB3020807			7				●	
DB3020808			8				●	
DB3021003	0.5	0.8	3	45	0.95	4	●	
DB3021004			4				●	
DB3021005			5				●	
DB3021006			6				●	
DB3021007			7				●	
DB3021008			8				●	
DB3021009			9				●	
DB3021010			10				●	
DB3021012			12				●	
DB3021014			14				50	●
DB3021016			16					●
DB3021020			20					●

Tolerance of Mill Dia. (mm)

0 ~ -0.012

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

METRIC

EDP. No.	R	L1	L2	L3	D2	D3	STOCK
DB3021206	0.6	1	6	45	1.15	4	●
DB3021208			8				●
DB3021210			10				●
DB3021212			12				●
DB3021408	0.7	1.1	8	45	1.35	4	●
DB3021412			12				●
DB3021416			16				●
DB3021506			6				●
DB3021508	0.75	1.2	8	45	1.45	4	●
DB3021510			10				●
DB3021512			12				●
DB3021514			14				●
DB3021516			16				●
DB3021520			20				●
DB3021608	0.8	1.3	8	45	1.55	4	●
DB3021610			10				●
DB3021612			12				●
DB3021616			16				●
DB3021620			20				●
DB3021808	0.9	1.4	8	45	1.75	4	●
DB3021812			12				●
DB3021816			16				●
DB3021820			20				●
DB3022004	1	1.6	4	45	1.95	4	●
DB3022006			6				●
DB3022008			8				●
DB3022010			10				●
DB3022012			12				●
DB3022014			14				●
DB3022016			16				●
DB3022018			18				●
DB3022020			20				●
DB3022022			22				●
DB3022025			25				●
DB3022030			30				●
DB3022510	1.25	2	10	50	2.4	6	●
DB3022516			16				●
DB3022520			20				●
DB3023008	1.5	2.4	8	50	2.85	6	●
DB3023010			10				●
DB3023012			12				●
DB3023014			14				●
DB3023016			16				●
DB3023018			18				●
DB3023020			20				●
DB3023025			25				●
DB3023030			30				●
DB3023035			35				●

EDP. No.	R	L1	L2	L3	D2	D3	STOCK
DB3024010	2	3.2	10	60	3.85	6	●
DB3024012			12				●
DB3024016			16				●
DB3024020			20				●
DB3024025			25				●
DB3024030			30				●
DB3024035			35				●
DB3024040			40				●
DB3024045			45				●
DB3024050			50				●
DB3025025	2.5	4	25	70	4.85	6	●
DB3025030			30				●
DB3025035			35				●
DB3025040			40				●

Data → P102

Endmill & Drill

Tolerance of Radius (mm)

±0.01

Tolerance of Shank Dia.

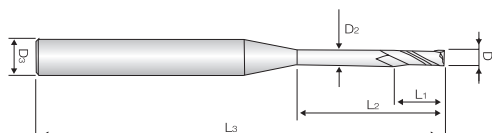
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

METRIC

ZE302



For RIB PROCESSING

- Designed for machine tool steel, alloy steel, mold steel and other highly hardened materials.
- Long neck design for deep machining near walls.

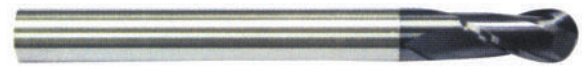
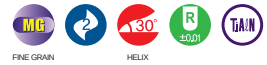
EDP. No.	D	L1	L2	L3	D2	D3	STOCK
ZE3020402	0.4	0.6	2	45	0.37	4	●
ZE3020403			3				●
ZE3020404			4				●
ZE3020502	0.5	0.7	2	45	0.45	4	●
ZE3020504			4				●
ZE3020506			6				●
ZE3020508			8				●
ZE3020602	0.6	0.9	2	45	0.55	4	●
ZE3020604			4				●
ZE3020606			6				●
ZE3020608			8				●
ZE3020610			10				●
ZE3020702	0.7	1	2	45	0.65	4	●
ZE3020704			4				●
ZE3020706			6				●
ZE3020804	0.8	1.2	4	45	0.75	4	●
ZE3020806			6				●
ZE3020808			8				●
ZE3020810			10				●
ZE3020812			12				●
ZE3020906	0.9	1.4	6	45	0.85	4	●
ZE3020908			8				●
ZE3020910			10				●
ZE3021004	1	1.5	4	45	0.95	4	●
ZE3021006			6				●
ZE3021008			8				●
ZE3021010			10				●
ZE3021012			12	50			●
ZE3021016			16				●
ZE3021020			20				●

EDP. No.	D	L1	L2	L3	D2	D3	STOCK
ZE3021206	1.2	1.8	6	45	1.15	4	●
ZE3021208			8				●
ZE3021210			10				●
ZE3021212			12	●			
ZE3021216			16	50			●
ZE3021406	1.4	2.1	6	45	1.35	4	●
ZE3021408			8				●
ZE3021410			10				●
ZE3021412			12	●			
ZE3021414			14	50			●
ZE3021416	16	●					
ZE3021506	1.5	2.3	6	45	1.45	14	●
ZE3021508			8				●
ZE3021510			10				●
ZE3021512			12	50			●
ZE3021514			14				●
ZE3021516			16				●
ZE3021518			18	55			●
ZE3021520			20				●
ZE3021606	1.6	2.5	6	45	1.55	4	●
ZE3021608			8				●
ZE3021610			10				●
ZE3021612			12	50			●
ZE3021614			14				●
ZE3021616			16				●
ZE3021618			18	55			●
ZE3021620			20				●
ZE3021806	1.8	2.8	6	45	1.75	4	●
ZE3021808			8				●
ZE3021810			10				●
ZE3021812			12	50			●
ZE3021814			14				●
ZE3021816			16				●
ZE3021818			18	55			●
ZE3021820			20				●
ZE3022006	2	3	6	45	1.95	4	●
ZE3022008			8				●
ZE3022010			10				●
ZE3022012			12	50			●
ZE3022014			14				●
ZE3022016			16				●
ZE3022018			18	55			●
ZE3022020			20				●
ZE3022025			25	60			●
ZE3022030			30	70			●
ZE3022508	2.5	3.7	8	45	2.45	4	●
ZE3022510			10				●
ZE3022512			12				●
ZE3022514			14	50			●
ZE3022516			16				●
ZE3022518			18				●
ZE3022520			20	55			●
ZE3022525			25				60
ZE3022530			30	70			●

ZAMUS THUNDER SERIES

METRIC

DB312



2 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Suitable for copy milling.

EDP. No.	D	L1	L2	L3	D2	D3	STOCK	
ZE3023008	3	4.5	8	45	2.85	6	●	
ZE3023010			10				●	
ZE3023012			12	50			●	
ZE3023014			14				●	
ZE3023016			16				●	
ZE3023018			18	55			●	
ZE3023020			20	60			●	
ZE3023025			25				●	
ZE3023030			30				70	●
ZE3023035			35				80	●
ZE3023040			40				90	●
ZE3024012	4	6	12	50	3.85	6	●	
ZE3024016			16	60			●	
ZE3024020			20				●	
ZE3024025			25	70			●	
ZE3024030			30				●	
ZE3024035			35	80			●	
ZE3024040			40	90			●	
ZE3024045			45	100			●	
ZE3024050			50				●	
ZE3025016	5	7.5	16	60	4.85	6	●	
ZE3025020			20	70			●	
ZE3025025			25				●	
ZE3025030			30	80			●	
ZE3025035			35	90			●	
ZE3025040			40				●	
ZE3025050			50				100	●

Data → P103

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
DB312010S4	1	0.5	2.5	50	4	●
DB312010	1	0.5	2.5	50	6	●
DB312012	1.2	0.6	3	50	6	●
DB312015	1.5	0.75	4	50	6	●
DB312020S4	2	1	5	50	4	●
DB312020	2	1	5	50	6	●
DB312025	2.5	1.25	6	60	6	●
DB312030S3	3	1.5	8	60	3	●
DB312030S4	3	1.5	8	60	4	●
DB312030	3	1.5	8	60	6	●
DB312035	3.5	1.75	8	70	6	●
DB312040S4	4	2	8	70	4	●
DB312040	4	2	8	70	6	●
DB312045	4.5	2.25	8	70	6	●
DB312050	5	2.5	10	80	6	●
DB312055	5.5	2.75	10	80	6	●
DB312060S	6	3	12	60	6	●
DB312060	6	3	12	90	6	●
DB312065	6.5	3.25	12	90	8	●
DB312070	7	3.5	14	90	8	●
DB312080S	8	4	14	60	8	●
DB312080	8	4	14	100	8	●
DB312090	9	4.5	18	100	10	●
DB312100S	10	5	18	60	10	●
DB312100	10	5	18	100	10	●
DB312120	12	6	22	110	12	●
DB312140	14	7	26	110	14	●
DB312160	16	8	30	140	16	●
DB312180	18	9	34	140	18	●
DB312200	20	10	38	160	20	●

Data → P116

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

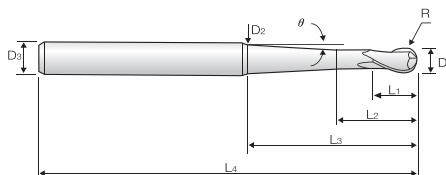
Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

METRIC

DB342



2 FLUTE, BALL NOSE with TAPER NECK

- High efficiency milling is possible in deep slotting with projection of the end mill being long.

ZE302



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.

EDP. No.	D	R	L ₁	L ₂	L ₃	L ₄	D ₂	D ₃	θ	STOCK
DB34201015	1	0.5	2	4	23	60	6	2	1° 30'	●
DB34201050	1	0.5	2	4	23	60	6	4.3	5°	●
DB34201030	1	0.5	2	4	42	80	6	5	3°	●
DB34202015	2	1	4	6	23	60	6	2.9	1° 30'	●
DB34202050	2	1	4	6	23	60	6	5	5°	●
DB34202030	2	1	4	6	41	80	6	5.7	3°	●
DB34203030	3	1.5	6	8	32	70	6	5.6	3°	●
DB34203015	3	1.5	6	8	52	90	6	5.3	1° 30'	●
DB34204030	4	2	8	10	28	70	6	6	3°	●
DB34204015	4	2	8	10	49	90	6	6	1° 30'	●
DB34205030	5	2.5	10	12	41	90	8	8	3°	●
DB34205015	5	2.5	10	12	61	110	8	7.6	1° 30'	●
DB34206030	6	3	12	15	34	90	8	8	3°	●
DB34206015	6	3	12	15	53	110	8	8	1° 30'	●
DB34208030	8	4	14	17	36	100	10	10	3°	●
DB34208015	8	4	14	17	55	120	10	10	1° 30'	●
DB34210030	10	5	18	21	40	110	12	12	3°	●
DB34210015	10	5	18	21	59	130	12	12	1° 30'	●
DB34212030	12	6	22	25	63	140	16	16	3°	●
DB34212015	12	6	22	25	83	160	16	15	1° 30'	●

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE302010	1	2.5	40	6	●
ZE302015	1.5	4	40	6	●
ZE302020	2	6	40	6	●
ZE302025	2.5	8	40	6	●
ZE302030	3	8	45	6	●
ZE302035	3.5	10	45	6	●
ZE302040	4	11	45	6	●
ZE302045	4.5	11	45	6	●
ZE302050	5	13	50	6	●
ZE302055	5.5	13	50	6	●
ZE302060	6	13	50	6	●
ZE302065	6.5	16	60	8	●
ZE302070	7	16	60	8	●
ZE302075	7.5	16	60	8	●
ZE302080	8	19	60	8	●
ZE302085	8.5	19	70	10	●
ZE302090	9	19	70	10	●
ZE302095	9.5	19	70	10	●
ZE302100	10	22	70	10	●
ZE302105	10.5	22	75	12	●
ZE302110	11	22	75	12	●
ZE302115	11.5	22	75	12	●
ZE302120	12	26	75	12	●
ZE302130	13	26	80	12	●
ZE302140	14	26	80	14	●
ZE302150	15	32	90	16	●
ZE302160	16	32	90	16	●
ZE302180	18	32	100	18	●
ZE302200	20	38	100	20	●

Data → P120

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

METRIC

ZE304



4 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.

EDP. No.	Dia.	C.L.	OAL	SH.Dia.	STOCK
ZE304020	2	6	40	6	●
ZE304025	2.5	8	40	6	●
ZE304030	3	8	45	6	●
ZE304035	3.5	10	45	6	●
ZE304040	4	11	45	6	●
ZE304045	4.5	11	45	6	●
ZE304050	5	13	50	6	●
ZE304055	5.5	13	50	6	●
ZE304060	6	13	50	6	●
ZE304065	6.5	16	60	8	●
ZE304070	7	16	60	8	●
ZE304075	7.5	16	60	8	●
ZE304080	8	19	60	8	●
ZE304085	8.5	19	70	10	●
ZE304090	9	19	70	10	●
ZE304095	9.5	19	70	10	●
ZE304100	10	22	70	10	●
ZE304105	10.5	22	75	12	●
ZE304110	11	22	75	12	●
ZE304115	11.5	22	75	12	●
ZE304120	12	26	75	12	●
ZE304130	13	26	80	12	●
ZE304140	14	26	80	14	●
ZE304150	15	32	90	16	●
ZE304160	16	32	90	16	●
ZE304180	18	32	100	18	●
ZE304200	20	38	100	20	●

Data → P122

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZE322



2 FLUTE, LONG & EXTRA LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.

EDP. No.	Dia.	C.L.	OAL	SH.Dia.	STOCK
ZE322030	3	15	60	6	●
ZE322031		20	70	6	●
ZE322030S	3	20	100	3	●
ZE322040		15	60	6	●
ZE322041	4	20	70	6	●
ZE322040S		20	100	4	●
ZE322050	5	20	60	6	●
ZE322051		20	80	6	●
ZE322052	5	25	100	6	●
ZE322060		20	80	6	●
ZE322061	6	30	100	6	●
ZE322062		40	150	6	●
ZE322080	8	30	90	8	●
ZE322081		35	100	8	●
ZE322082	8	40	150	8	●
ZE322100		30	90	10	●
ZE322101	10	35	100	10	●
ZE322102		45	150	10	●
ZE322103	10	55	180	10	●
ZE322120		30	90	12	●
ZE322121	12	40	110	12	●
ZE322122		50	150	12	●
ZE322123	12	60	200	12	●
ZE322140		40	120	14	●
ZE322141	14	60	150	14	●
ZE322160		50	140	16	●
ZE322161	16	70	160	16	●
ZE322162		80	200	16	●
ZE322180	18	50	140	18	●
ZE322200		60	150	20	●
ZE322201	20	100	200	20	●
ZE322202		130	250	20	●

Data → P120

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.03	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

METRIC

ZE324



4 FLUTE, LONG & EXTRA LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
ZE324030	3	15	60	6	●
ZE324031		20	70	6	●
ZE324030S		20	100	3	●
ZE324040	4	15	60	6	●
ZE324041		20	70	6	●
ZE324040S		20	100	4	●
ZE324050	5	20	60	6	●
ZE324051		20	80	6	●
ZE324052		25	100	6	●
ZE324060	6	20	80	6	●
ZE324061		30	100	6	●
ZE324062		40	150	6	●
ZE324080	8	30	90	8	●
ZE324081		35	100	8	●
ZE324082		40	150	8	●
ZE324100	10	30	90	10	●
ZE324101		35	100	10	●
ZE324102		45	150	10	●
ZE324103		55	180	10	●
ZE324120	12	30	90	12	●
ZE324121		40	110	12	●
ZE324122		50	150	12	●
ZE324123		60	200	12	●
ZE324140	14	40	120	14	●
ZE324141		60	150	14	●
ZE324160	16	50	140	16	●
ZE324161		70	160	16	●
ZE324162		80	200	16	●
ZE324180	18	50	140	18	●
ZE324200	20	60	150	20	●
ZE324201		100	200	20	●
ZE324202		130	250	20	●

Data → P122

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.03	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZR322



2F CORNER RADIUS LONG LENGTH

- Designed to machine tool steel, alloy steel mold steel and other high hardened materials.

- TiAlN coated for high wear resistance.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR3220302	3	0.2	8	60	6	●
ZR3220303		0.3				●
ZR3220305		0.5				●
ZR3220402	4	0.2	11	70	6	●
ZR3220403		0.3				●
ZR3220405		0.5				●
ZR3220410		1.0				●
ZR3220502	5	0.2	13	80	6	●
ZR3220503		0.3				●
ZR3220505		0.5				●
ZR3220510		1.0				●
ZR3220602	6	0.2	13	90	6	●
ZR3220603		0.3				●
ZR3220605		0.5				●
ZR3220610		1.0				●
ZR3220803	8	0.3	19	100	8	●
ZR3220805		0.5				●
ZR3220810		1.0				●
ZR3220815		1.5				●
ZR3220820		2.0				●
ZR3221003	10	0.3	22	100	10	●
ZR3221005		0.5				●
ZR3221010		1.0				●
ZR3221015		1.5				●
ZR3221020		2.0				●
ZR3221025		2.5				●
ZR3221205	12	0.5	26	110	12	●
ZR3221210		1.0				●
ZR3221215		1.5				●
ZR3221220		2.0				●
ZR3221225		2.5				●
ZR3221230		3.0				●

Data → P125

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.03	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

METRIC

ZR324



4F CORNER RADIUS LONG LENGTH

- Designed to machine tool steel, alloy steel mold steel and other high hardened materials.
- TiAlN coated for high wear resistance.

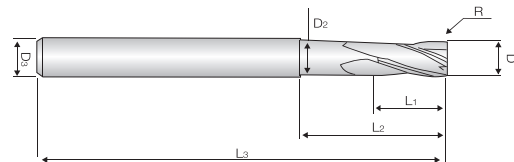
EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
ZR3240302	3	0.2	8	60	6	●
ZR3240303		0.3				●
ZR3240305		0.5				●
ZR3240402	4	0.2	11	70	6	●
ZR3240403		0.3				●
ZR3240405		0.5				●
ZR3240410	5	1.0	13	80	6	●
ZR3240502		0.2				●
ZR3240503		0.3				●
ZR3240505	6	0.5	13	90	6	●
ZR3240510		1.0				●
ZR3240602		0.2	13	90	6	●
ZR3240603	6	0.3				●
ZR3240605		0.5				●
ZR3240610	8	1.0	19	100	8	●
ZR3240803		0.3				●
ZR3240805		0.5				●
ZR3240810	10	1.0	22	100	10	●
ZR3240815		1.5				●
ZR3240820		2.0				●
ZR3241003	12	0.3	26	110	12	●
ZR3241005		0.5				●
ZR3241010		1.0				●
ZR3241015	12	1.5	26	110	12	●
ZR3241020		2.0				●
ZR3241025		2.5				●
ZR3241205	12	0.5	26	110	12	●
ZR3241210		1.0				●
ZR3241215		1.5				●
ZR3241220	12	2.0	26	110	12	●
ZR3241225		2.5				●
ZR3241230		3.0				●

Data → P126

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.03	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZR304H



4 FLUTE, 45° HELIX STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Designed for high hardened materials up to HRC 45.
- Suitable for high speed machining.

EDP. No.	D	C.L	L1	L2	OAL	SH.Dia.	STOCK
ZR304H0303	3	0.3	4	12	55	6	●
ZR304H0305		0.5					●
ZR304H0403	4	0.3	5	16	55	6	●
ZR304H0405		0.5					●
ZR304H0605	6	0.5	7	20	60	6	●
ZR304H0610		1.0					●
ZR304H0805	8	0.5	10	25	65	8	●
ZR304H0810		1.0					●
ZR304H1005	10	0.5	12	30	70	10	●
ZR304H1010		1.0					●
ZR304H1015		1.5					●
ZR304H1020		2.0					●
ZR304H1205	12	0.5	15	30	80	12	●
ZR304H1210		1.0					●
ZR304H1215		1.5					●
ZR304H1220		2.0					●

Data → P126

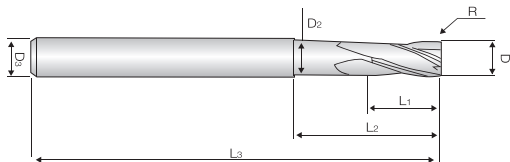
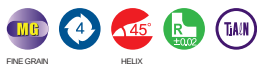
Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.03	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS THUNDER SERIES

METRIC

ZR324H



**4 FLUTE, 45° HELIX STUB CUT LENGTH,
CORNER RADIUS with LONG SHANK**

- Designed for high hardened materials up to HRC 45.
- Suitable for high speed machining.

EDP. No.	D	C.L	L ₁	L ₂	OAL	SH.Dia.	STOCK
ZR324H0605	6	0.5	9	20	90	6	●
ZR324H0610		1.0					●
ZR324H0805	8	0.5	12	25	100	8	●
ZR324H0810		1.0					●
ZR324H1005	10	0.5	15	32	100	10	●
ZR324H1010		1.0					●
ZR324H1015		1.5					●
ZR324H1020		2.0					●
ZR324H1205	12	0.5	18	38	110	12	●
ZR324H1210		1.0					●
ZR324H1215		1.5					●
ZR324H1220		2.0					●

Data → P126

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS SUS-MATE SERIES

METRIC

DS502



2 FLUTE, BALL NOSE REGULAR & LONG LENGTH

- Suitable for Stainless steel, Titanium, Inconel.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
DS502010	1	0.5	3	50	6	●
DS502020	2	1	6	50	6	●
DS502030	3	1.5	8	50	6	●
DS502031				70		●
DS502040	4	2	10	50	6	●
DS502041				70		●
DS502050	5	2.5	13	50	6	●
DS502051				80		●
DS502060	6	3	13	50	6	●
DS502061				90		●
DS502080	8	4	19	60	8	●
DS502081				100		●
DS502100	1	5	22	70	10	●
DS502101				100		●
DS502120	12	6	26	75	12	●
DS502121				110		●

SM503



3 FLUTE, REGULAR LENGTH

- Suitable for Stainless steel, Titanium, Inconel.

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
SM503020	2	6	45	6	●
SM503030	3	8	45	6	●
SM503040	4	10	50	6	●
SM503050	5	13	50	6	●
SM503060	6	13	50	6	●
SM503080	8	19	60	8	●
SM503100	10	22	70	10	●
SM503120	12	26	75	12	●
SM503140	14	30	82	14	●
SM503160	16	40	100	16	●
SM503180	18	40	100	18	●
SM503200	20	40	100	20	●

Data → P129

Tolerance of Radius (mm)	Tolerance of Shank Dia.
±0.01	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS SUS-MATE SERIES

METRIC

SM504



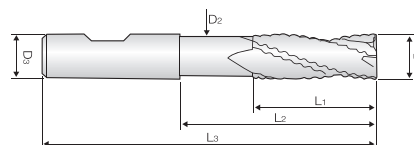
4 FLUTE, REGULAR LENGTH

- Suitable for Stainless steel, Titanium, Inconel.
- Broken Index Type.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
SM504030	3	0.1	10	45	6	●
SM504040	4	0.2	12	50	6	●
SM504050	5	0.2	13	50	6	●
SM504060	6	0.2	13	50	6	●
SM504070	7	0.2	16	60	8	●
SM504080	8	0.2	16	60	8	●
SM504090	9	0.2	19	70	10	●
SM504100	10	0.3	22	70	10	●
SM504120	12	0.3	26	75	12	●
SM504140	14	0.3	26	82	14	●
SM504160	16	0.3	32	90	16	●
SM504180	18	0.3	32	100	18	●
SM504200	20	0.3	38	100	20	●

Data → P130

ZF62



ROUGHING END MILL

DIN6527 / DIN6535-HA, DIN6535-HB

- Designed to machine tool steel, alloy steel, stainless steel and other high hardness materials.
- Fast chip ejection.

EDP. No.		D	L1	L2	D2	L3	D3	Z	STOCK
PLAIN SHANK	FLAT SHANK								
ZF624060	ZF624060F	6	7	-	-	54			●
ZF624061	ZF624061F		16	-	-	57	6	4	●
ZF624062	ZF624062F		16	20	5.5	57			●
ZF624080	ZF624080F		9	-	-	58			●
ZF624081	ZF624081F	8	16	-	-	63	8	4	●
ZF624082	ZF624082F		16	26	7.5	63			●
ZF624100	ZF624100F		14	-	-	66			●
ZF624101	ZF624101F	10	22	-	-	72	10	4	●
ZF624102	ZF624102F		22	31	9.5	72			●
ZF624120	ZF624120F		16	-	-	73			●
ZF624121	ZF624121F	12	26	-	-	83	12	4	●
ZF624122	ZF624122F		26	37	11.5	83			●
ZF625160	ZF625160F		22	-	-	82			●
ZF625161	ZF625161F	16	32	-	-	92	16	5	●
ZF625162	ZF625162F		32	51	15.5	100			●
ZF626200	ZF626200F		26	-	-	92			●
ZF626201	ZF626201F	20	38	-	-	104	20	6	●
ZF626202	ZF626202F		38	59	19.2	110			●

Data → P131

μm=1/1000mm

Dia.	Ø 1	Ø 3	Ø 6	Ø 10	Ø 18
Tolerance	~Ø 3	~Ø 6	~Ø 10	~Ø 18	~Ø 30
Cutting Edge (h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Tolerance of Mill Dia. (mm)

Tolerance of Shank Dia.

0 ~ -0.02

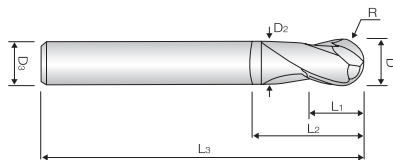
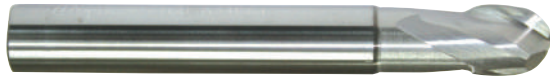
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS COPPER-MATE SERIES

METRIC

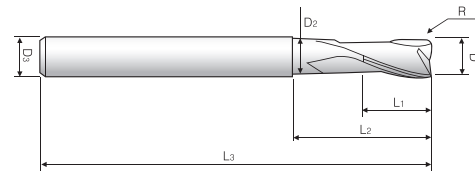
BC502



**2 FLUTE, STUB CUT LENGTH,
BALL NOSE with EXTENDED NECK**

- Suitable for copper & non-ferrous material.

RC502



**2 FLUTE, STUB CUT LENGTH,
CORNER RADIUS with EXTENDED NECK**

- Suitable for copper & non-ferrous material.

Endmill & Drill

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
BC502010	1	0.5	1.5	3	50	0.95	6	●
BC502015	1.5	0.75	2	4	50	1.45	6	●
BC502020	2	1	2.5	5	50	1.95	6	●
BC502025	2.5	1.25	3	7	50	2.45	6	●
BC502030	3	1.5	4	10	60	2.9	6	●
BC502040	4	2	5	10	60	3.9	6	●
BC502050	5	2.5	6	12	60	4.9	6	●
BC502060	6	3	7	12	60	5.9	6	●
BC502061	6	3	7	12	90	5.9	6	●
BC502080	8	4	9	15	70	7.9	8	●
BC502081	8	4	9	16	100	7.9	8	●
BC502100	10	5	11	25	75	9.9	10	●
BC502101	10	5	11	25	100	9.9	10	●
BC502120	12	6	12	25	80	11.9	12	●
BC502121	12	6	12	25	110	11.9	12	●

Data → P130

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
RC5020200509	2	0.5	3	9	55	1.8	6	●
RC5020300509	3	0.5	4	9	55	2.8	6	●
RC5020300516	3	0.5	4	16	55	2.8	6	●
RC5020300520	3	0.5	4	20	55	2.8	6	●
RC5020400512	4	0.5	5	12	55	3.7	6	●
RC5020400516	4	0.5	5	16	55	3.7	6	●
RC5020400520	4	0.5	5	20	55	3.7	6	●
RC5020600520	6	0.5	7	20	60	5.5	6	●
RC5020601020	6	1	7	20	60	5.5	6	●
RC5020800525	8	0.5	9	25	60	7.4	8	●
RC5020801025	8	1	9	25	60	7.4	8	●
RC5021000532	10	0.5	11	32	70	9.2	10	●
RC5021001032	10	1	11	32	70	9.2	10	●
RC5021200538	12	0.5	12	38	80	11	12	●
RC5021201038	12	1	12	38	80	11	12	●

Data → P132

Tolerance of Radius (mm)	Tolerance of Shank Dia.
±0.01	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

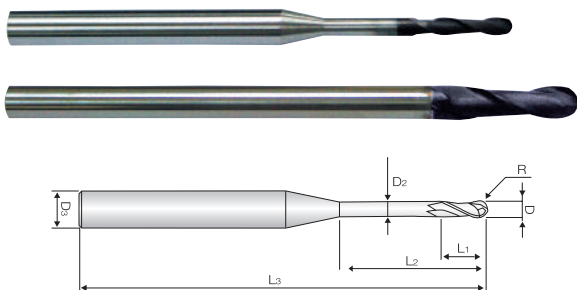
Tolerance of Mill Dia. (mm)		Tolerance of Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	
over 6	0 ~ -0.015	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS GRA-MATE SERIES

METRIC

G



2 FLUTE, DIAMOND COATING BALL NOSE

- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc.

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
G00501003	0.5	0.25	1	3	50	0.45	4	●
G00501006				6				●
G00501010				10				●
G00601203	0.6	0.3	1.2	3	50	0.55	4	●
G00601206				6				●
G00601208				8				●
G00601210				10				●
G00601212				12				●
G0080164	0.8	0.4	1.6	4	50	0.75	4	●
G0100306	1	0.5	3	6	60	0.95	4	●
G0100308				8				●
G0100310				10				●
G0100312				12				●
G0100314				14				●
G0100316				16				●
G0100318				18				●
G0100320				20				●
G0120410	1.2	0.6	4	10	70	1.15	4	●
G0150510	1.5	0.75	5	10	60	1.45	4	●
G0150512				12				●
G0150516				16				●
G0150520				20				●
G0150525				25	70			●
G0150530				30				●
G0200812	2	1	8	12	60	1.95	4	●
G0200816				16				●
G0200820				20				●
G0200825				25	70			●
G0200830				30				●
G0200835			35	●				
G0200840			10	40	80			●
G0201020				20				●
G0201020L				20	100			●

EDP. No.	D	R	L1	L2	L3	D2	D3	STOCK
G0251020	2.5	1.25	10	20	80	2.43	4	●
G0301216	3	1.5	12	16	60	2.9	6	●
G0301220				20	70			●
G0301225				25	●			
G0301230				30	80			●
G0301235				35	●			
G0301240				40	90			●
G0301245				45	●			
G0301525			15	25	80		4	●
G04015S	4	2	15	-	50	-	4	●
G04015M				-	80	-		●
G04015L				-	120	-		●
G0401520				20	60	3.9	6	●
G0401525				25	70			●
G0401530				30	80			●
G0401535				35	90			●
G0401540				40	●			
G0401545				45	●			
G0401550			50	100	●			
G0402030	20	30	80	4	●			
G0503050	5	2.5	30	50	100	4.8	6	●
G0503050L					150			●
G06020S	6	3	20	-	70	-	6	●
G06020M				-	100	-		●
G06020L				-	150	-		●
G0603050			30	50	100	5.8		●
G0603050L					150			●
G08025S	8	4	25	-	70	-	8	●
G08025M				-	110	-		●
G08025L				-	160	-		●
G0804060			40	60	110	7.8		●
G0804060L					200			●
G10030S	10	5	30	-	80	-	10	●
G10030M				-	120	-		●
G10030L				-	170	-		●
G1005070			50	70	120	9.7		●
G1005070L					200			●
G12035S	12	6	35	-	80	-	12	●
G12035M				-	130	-		●
G12035L				-	180	-		●
G1205575			55	75	130	11.7		●
G1205575L					200			●

Data → P134

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

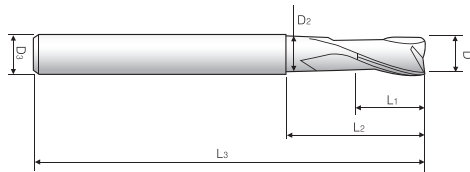
h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS GRA-MATE SERIES

METRIC

GE



2 FLUTE, DIAMOND COATING END MILL

- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc.

EDP. No.	D	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK
GE00501006	0.5	1	6	50	0.45	4	●
GE00601206	0.6	1.2	6	50	0.55	4	●
GE00601210			10				●
GE00701506	0.7	1.5	6	50	0.65	4	●
GE00802006	0.8	2	6	50	0.75	4	●
GE0100308	1	3	8	60	0.95	4	●
GE0100310			10				●
GE0100312			12				●
GE0150412	1.5	4	12	60	1.45	4	●
GE0200612	2	6	12	60	1.95	4	●
GE0200612S6			12			6	●
GE0250812	2.5	8	12	60	2.43	4	●
GE0301012	3	10	12	60	2.9	4	●
GE0301016			16			6	●
GE0301012S6			12				●
GE0301016S6			16				●
GE0401212	4	12	12	60	3.9	6	●
GE0401216			16				●
GE0401220			20				●
GE0501520	5	15	20	60	4.8	6	●
GE06020S	6	20	-	60	5.8	6	●
GE0602030			30	80			●
GE0603050			50	150			●
GE08025S	8	25	-	70	7.8	8	●
GE0802540			40	100			●
GE0804070			40	150			●
GE10030S	10	30	-	80	9.7	10	●
GE1003050			50	100			●
GE1004580			45	80			●
GE12030S	12	30	-	80	11.7	12	●
GE1203050			50	110			●
GE1205080			50	80			●

Endmill & Drill

Tolerance of Mill Dia. (mm)

0 ~ -0.03

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS AL-MATE SERIES

METRIC

AE302

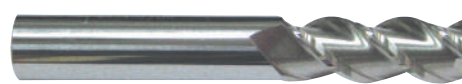


2 FLUTE, LONG LENGTH - for Aluminum

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
AE302010	1	3	40	4	●
AE302020S4	2	6	40	4	●
AE302020	2	6	57	6	●
AE302030	3	12	57	6	●
AE302040	4	14	57	6	●
AE302050	5	16	57	6	●
AE302060	6	16	57	6	●
AE302070	7	20	63	8	●
AE302080	8	22	63	8	●
AE302090	9	25	72	10	●
AE302100	10	28	72	10	●
AE302110	11	30	80	12	●
AE302120	12	32	80	12	●
AE302130	13	35	85	14	●
AE302140	14	35	85	14	●
AE302150	15	40	90	16	●
AE302160	16	45	90	16	●
AE302180	18	45	100	18	●
AE302200	20	50	100	20	●
AE302250	25	50	120	25	●

Data → P132

AE30(2)3



3 FLUTE, LONG & EXTRA LONG LENGTH - for Aluminum

EDP. No.	D	C.L	OAL	SH.Dia.	STOCK
AE303030	3	12	57	6	●
AE303031		15	57		●
AE323030		20	62		●
AE323031	4	25	62	6	●
AE303040		14	57		●
AE303041		20	57		●
AE323040		25	62		●
AE323041	5	30	70	6	●
AE303050		16	57		●
AE303051		20	57		●
AE303052	6	25	62	6	●
AE323050		30	70		●
AE323051		35	70		●
AE303060	7	16	57	8	●
AE303061		20	57		●
AE303062		25	62		●
AE303063	8	30	70	8	●
AE323060		35	80		●
AE323061		42	90		●
AE303070	9	20	63	10	●
AE303080		22	63		●
AE303081		30	70		●
AE303082	10	35	80	10	●
AE323080		40	100		●
AE323081		45	100		●
AE303090	11	25	72	12	●
AE303100		28	72		●
AE303101		35	80		●
AE303102	12	45	100	12	●
AE323100		55	110		●
AE323101		65	120		●
AE303110	13	30	80	12	●
AE303120		35	80		●
AE303130		40	80		●

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

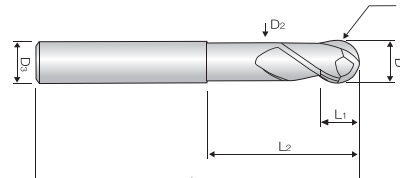
ZAMUS AL-MATE SERIES

METRIC

EDP. No.	D	C.L	OAL	SH.Dia.	STOCK
AE303120	12	32	80	12	●
AE303121		40	90		●
AE303122		45	100		●
AE303123		55	110		●
AE323120		65	120		●
AE323121		75	125		●
AE303130	13	35	85	14	●
AE303140	14	35	85	14	●
AE303150	15	40	90	16	●
AE303160	16	45	90	16	●
AE303161		55	110		●
AE303162		65	125		●
AE303163		75	130		●
AE323160		85	150		●
AE303180	18	45	100	18	●
AE303200	20	50	100	20	●
AE303201		60	110		●
AE303202		70	130		●
AE323200		80	150		●
AE323201		90	160		●
AE323202		100	160		●
AE303250	25	50	120	25	●

Data → P133

AB302



2 FLUTE, STUB CUT BALL NOSE - for Aluminum

- Excellent cutting qualities on aluminum & copper.

EDP. No.	D	R	L ₁	L ₂	L ₃	D ₂	D ₃	STOCK
AB302060	6	3	5.5	25	55	5.4	6	●
AB302061	6	3	5.5	40	90	5.4	6	●
AB302080	8	4	7	30	65	7.2	8	●
AB302081	8	4	7	50	100	7.2	8	●
AB302100	10	5	8.5	35	75	9	10	●
AB302101	10	5	10	50	100	9	10	●
AB302102	10	5	10	60	150	9	10	●
AB302120	12	6	10.5	40	75	11	12	●
AB302121	12	6	12	50	110	11	12	●
AB302122	12	6	12	60	150	11	12	●
AB302160	16	8	14	50	90	14.5	16	●
AB302161	16	8	16	70	150	14.5	16	●
AB302162	16	8	16	90	200	14.5	16	●
AB302200	20	10	17	50	100	18	20	●

Endmill & Drill

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
0 ~ -0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)	Tolerance of Shank Dia.
±0.02	h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS AL-MATE SERIES

METRIC

AR502



2 FLUTE, CORNER RADIUS, LONG LENGTH

- Suitable for aluminium, aluminium alloy, copper & non-ferrous material.
- Corner radius against chipping in high speed machining.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
AR502010	1	0.05	3	40	6	●
AR502015	1.5	0.05	5	40	6	●
AR502020	2	0.1	6	40	6	●
AR502021	2	0.1	12	50	6	●
AR502030	3	0.1	10	50	6	●
AR502031	3	0.1	20	60	6	●
AR502040	4	0.1	12	50	6	●
AR502041	4	0.1	20	60	6	●
AR502050	5	0.1	15	57	6	●
AR502060	6	0.1	15	57	6	●
AR502061	6	0.1	22	65	6	●
AR502070	7	0.1	20	63	8	●
AR502080	8	0.1	20	63	8	●
AR502081	8	0.1	28	70	8	●
AR502090	9	0.1	25	72	10	●
AR502100	10	0.2	28	72	10	●
AR502101	10	0.2	32	80	10	●
AR502110	11	0.2	30	80	12	●
AR502120	12	0.2	32	80	12	●
AR502121	12	0.2	40	100	12	●

AR503



3 FLUTE, CORNER RADIUS, LONG LENGTH

- Suitable for aluminium, aluminium alloy, copper & non-ferrous material.
- Corner radius against chipping in high speed machining.

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
AR503040	4	0.5	14	57	6	●
AR503041	4	1	25	62	6	●
AR503060	6	0.5	16	57	6	●
AR503061	6	1	25	62	6	●
AR503080	8	0.5	22	63	8	●
AR503081	8	1	35	80	8	●
AR503100	10	0.5	28	72	10	●
AR503101	10	1	45	100	10	●
AR503120	12	0.5	32	80	12	●
AR503121	12	1	45	100	12	●
AR503160	16	0.5	45	90	16	●
AR503161	16	1	65	125	16	●
AR503200	20	0.5	50	100	20	●
AR503201	20	1	70	130	20	●

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.02

Tolerance of Shank Dia.

h6

※ For the items produced from 1st. 2010, apply to these tolerance.

ZAMUS AL-MATE SERIES

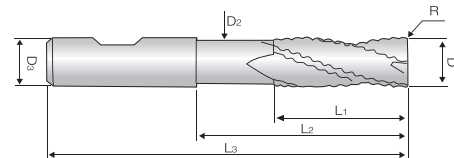
METRIC

AF303



ROUGHING END MILL - for Aluminum
DIN6527L / DIN6535-HA, DIN6535-HB

AF313



ROUGHING END MILL - for Aluminum
DIN6527L / DIN6535-HA, DIN6535-HB

Endmill & Drill

EDP. No.		D	C.L	OAL	SH.Dia.	STOCK
PLAIN SHANK	FLAT SHANK					
AF303060	AF303060F	6	16	57	6	●
AF303070	AF303070F	7	16	63	8	●
AF303080	AF303080F	8	16	63	8	●
AF303090	AF303090F	9	19	72	10	●
AF303100	AF303100F	10	22	72	10	●
AF303120	AF303120F	12	26	83	12	●
AF303140	AF303140F	14	26	83	14	●
AF303160	AF303160F	16	32	92	16	●
AF303180	AF303180F	18	32	92	18	●
AF303200	AF303200F	20	38	104	20	●

Data → P134

EDP. No.		D	R	L1	L2	L3	D2	D3	STOCK
PLAIN SHANK	FLAT SHANK								
AF313060	AF313060F	6	0.2	9	21	57	5.5	6	
AF313080	AF313080F	8	0.2	12	27	63	7.5	8	
AF313100	AF313100F	10	0.2	12	31	72	9.5	10	
AF313120	AF313120F	12	0.2	12	37	83	11.5	12	
AF313160	AF313160F	16	0.2	14	43	92	15.5	16	
AF313200	AF313200F	20	0.2	17	53	104	19.2	20	

Data → P134

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

STANDARD ENDMILL SERIES

METRIC

E302



E304



Endmill & Drill

2 FLUTE, REGULAR LENGTH

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
E302010S4	1	3	42	4	●
E302010	1	3	42	6	●
E302015S4	1.5	4	42	4	●
E302015	1.5	4	42	6	●
E302020S4	2	6	42	4	●
E302020	2	6	42	6	●
E302025S4	2.5	8	42	4	●
E302025	2.5	8	42	6	●
E302030	3	10	50	6	●
E302035	3.5	10	50	6	●
E302040	4	12	50	6	●
E302045	4.5	14	50	6	●
E302050	5	15	50	6	●
E302055	5.5	15	50	6	●
E302060	6	15	50	6	●
E302065	6.5	18	60	8	●
E302070	7	20	60	8	●
E302075	7.5	20	60	8	●
E302080	8	20	60	8	●
E302085	8.5	23	70	10	●
E302090	9	25	70	10	●
E302095	9.5	25	70	10	●
E302100	10	25	70	10	●
E302105	10.5	28	75	12	●
E302110	11	30	75	12	●
E302115	11.5	30	75	12	●
E302120	12	30	75	12	●
E302130	13	35	85	14	●
E302130S16	13	35	90	16	●
E302140	14	35	85	14	●
E302140S16	14	35	90	16	●
E302150	15	40	90	16	●
E302160	16	40	90	16	●
E302180	18	45	100	18	●
E302200	20	45	100	20	●
E302250	25	50	120	25	●

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

4 FLUTE, REGULAR LENGTH

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
E304020S4	2	6	42	4	●
E304020	2	6	42	6	●
E304025	2.5	8	42	6	●
E304030	3	10	50	6	●
E304035	3.5	10	50	6	●
E304040	4	12	50	6	●
E304045	4.5	14	50	6	●
E304050	5	15	50	6	●
E304055	5.5	15	50	6	●
E304060	6	15	50	6	●
E304065	6.5	18	60	8	●
E304070	7	20	60	8	●
E304075	7.5	20	60	8	●
E304080	8	20	60	8	●
E304085	8.5	23	70	10	●
E304090	9	25	70	10	●
E304095	9.5	25	70	10	●
E304100	10	25	70	10	●
E304105	10.5	28	75	12	●
E304110	11	30	75	12	●
E304115	11.5	30	75	12	●
E304120	12	30	75	12	●
E304130	13	35	85	14	●
E304130S16	13	35	90	16	●
E304140	14	35	85	14	●
E404140S16	14	35	90	16	●
E304150	15	40	90	16	●
E304160	16	40	90	16	●
E304180	18	45	100	18	●
E304200	20	45	100	20	●
E304250	25	50	120	25	●

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

STANDARD ENDMILL SERIES

METRIC

B302



2 FLUTE, BALL NOSE LONG LENGTH

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
B302010	1	0.5	3	50	6	●
B302015	1.5	0.75	4	50	6	●
B302020	2	1	6	60	6	●
B302025	2.5	1.25	6	60	6	●
B302030	3	1.5	8	70	6	●
B302035	3.5	1.75	8	70	6	●
B302040	4	2	8	70	6	●
B302045	4.5	2.25	10	70	6	●
B302050	5	2.5	12	80	6	●
B302055	5.5	2.75	12	80	6	●
B302060	6	3	12	90	6	●
B302065	6.5	3.25	12	90	8	●
B302070	7	3.5	20	90	8	●
B302080	8	4	20	100	8	●
B302090	9	4.5	25	100	10	●
B302100	10	5	25	100	10	●
B302110	11	5.5	30	110	12	●
B302120	12	6	30	110	12	●
B302130	13	6.5	35	120	14	●
B302140	14	7	35	120	14	●
B302150	15	7.5	40	140	16	●
B302160	16	8	40	140	16	●
B302180	18	9	45	150	18	●
B302200	20	10	45	160	20	●
B302250	25	12.5	50	180	25	●

B304



4 FLUTE, BALL NOSE LONG LENGTH

EDP. No.	Dia.	R	C.L	OAL	SH.Dia.	STOCK
B304030	3	1.5	8	70	6	●
B304040	4	2	8	70	6	●
B304050	5	2.5	12	80	6	●
B304060	6	3	12	90	6	●
B304070	7	3.5	20	90	8	●
B304080	8	4	20	100	8	●
B304090	9	4.5	25	100	10	●
B304100	10	5	25	100	10	●
B304110	11	5.5	30	110	12	●
B304120	12	6	30	110	12	●
B304130	13	6.5	35	120	14	●
B304140	14	7	35	120	14	●
B304150	15	7.5	40	140	16	●
B304160	16	8	40	140	16	●
B304180	18	9	45	150	18	●
B304200	20	10	45	160	20	●
B304250	25	12.5	50	180	25	●

Endmill & Drill

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

STANDARD ENDMILL SERIES

METRIC

E322



2 FLUTE, LONG LENGTH

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
E322030	3	25	75	6	●
E322040	4	25	75	6	●
E322050	5	30	85	6	●
E322060	6	30	85	6	●
E322070	7	35	85	8	●
E322080	8	35	85	8	●
E322090	9	45	100	10	●
E322100	10	45	100	10	●
E322101	10	60	155	10	●
E322120	12	55	120	12	●
E322121	12	65	155	12	●
E322140	14	60	120	14	●
E322160	16	60	120	16	●
E322161	16	75	165	16	●
E322180	18	60	120	18	●
E322200	20	60	120	20	●
E322201	20	75	165	20	●

E324



4 FLUTE, LONG LENGTH

EDP. No.	Dia.	C.L	OAL	SH.Dia.	STOCK
E324030	3	25	75	6	●
E324040	4	25	75	6	●
E324050	5	30	85	6	●
E324060	6	30	85	6	●
E324070	7	35	85	8	●
E324080	8	35	85	8	●
E324090	9	45	100	10	●
E324100	10	45	100	10	●
E324101	10	60	155	10	●
E324120	12	55	120	12	●
E324121	12	65	155	12	●
E324140	14	60	120	14	●
E324160	16	60	120	16	●
E324161	16	75	165	16	●
E324180	18	60	120	18	●
E324200	20	60	120	20	●
E324201	20	75	165	20	●

μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

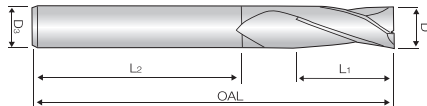
μm=1/1000mm

Tolerance	Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge (h10)		0 -40	0 -48	0 -58	0 -70	0 -84
Shank (h6)		0 -6	0 -8	0 -9	0 -11	0 -13

STANDARD ENDMILL SERIES

METRIC

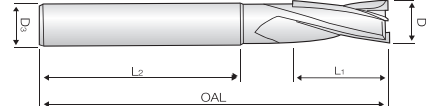
EB302



2 FLUTE, REGULAR LENGTH - BRAZED TYPE

EDP. No.	D	L ₂	L ₁	OAL	D ₃	STOCK
EB302140	14	60	28	98	16	●
EB302150	15	60	28	98	16	●
EB302160	16	60	28	98	16	●
EB302170	17	70	32	115	20	●
EB302180	18	70	32	115	20	●
EB302190	19	70	32	115	20	●
EB302200	20	70	32	115	20	●
EB302220	22	70	32	115	20	●
EB302230	23	85	40	140	25	●
EB302240	24	85	40	140	25	●
EB302250	25	85	40	140	25	●
EB302260	26	85	40	140	25	●
EB302280	28	85	40	140	25	●
EB302300	30	85	50	150	32	●
EB302320	32	85	50	150	32	●
EB302350	35	85	50	150	32	●
EB302360	36	85	50	150	32	●
EB302380	38	85	55	155	32	●
EB302400	40	85	55	155	32	●
EB302450	45	85	63	160	32	●
EB302500	50	85	63	160	32	●

EB304



4 FLUTE, REGULAR LENGTH - BRAZED TYPE

EDP. No.	D	L ₁	L ₂	OAL	D ₃	STOCK
EB304140	14	28	60	98	16	●
EB304150	15	28	60	98	16	●
EB304160	16	28	60	98	16	●
EB304170	17	32	70	115	20	●
EB304180	18	32	70	115	20	●
EB304190	19	32	70	115	20	●
EB304200	20	32	70	115	20	●
EB304220	22	32	70	115	20	●
EB304230	23	40	85	140	25	●
EB304240	24	40	85	140	25	●
EB304250	25	40	85	140	25	●
EB304260	26	40	85	140	25	●
EB304280	28	40	85	140	25	●
EB304300	30	50	85	150	32	●
EB304320	32	50	85	150	32	●
EB304350	35	50	85	150	32	●
EB304360	36	50	85	150	32	●
EB304380	38	55	85	155	32	●
EB304400	40	55	85	155	32	●
EB304450	45	63	85	160	32	●
EB304500	50	63	85	160	32	●

Endmill & Drill

Tolerance of Mill Dia. (mm)

0 ~ -0.05

Tolerance of Shank Dia.

h7

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.05

Tolerance of Shank Dia.

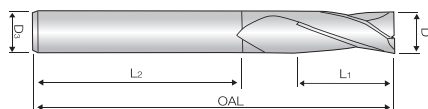
h7

※ For the items produced from 1st. 2010, apply to these tolerance.

STANDARD ENDMILL SERIES

METRIC

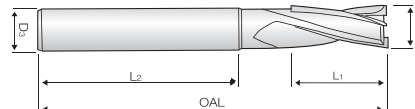
EB322



2 FLUTE, LONG LENGTH - BRAZED TYPE

EDP. No.	D	L ₁	L ₂	OAL	D ₃	STOCK
EB322140	14	50	60	130	16	●
EB322150	15	50	60	130	16	●
EB322160	16	60	60	140	16	●
EB322180	18	65	60	145	20	●
EB322200	20	65	60	145	20	●
EB322220	22	65	60	145	25	●
EB322240	24	70	60	150	25	●
EB322250	25	70	60	150	25	●
EB322260	26	70	60	150	32	●
EB322280	28	70	60	150	32	●
EB322300	30	80	70	180	32	●
EB322320	32	90	70	190	32	●
EB322350	35	100	70	200	32	●
EB322380	38	120	70	220	32	●
EB322400	40	120	70	220	32	●
EB322450	45	120	80	230	32	●

EB324



4 FLUTE, LONG LENGTH - BRAZED TYPE

EDP. No.	D	L ₁	L ₂	OAL	D ₃	STOCK
EB324140	14	50	60	130	16	●
EB324150	15	50	60	130	16	●
EB324160	16	60	60	140	16	●
EB324180	18	65	60	145	20	●
EB324200	20	65	60	145	20	●
EB324220	22	65	60	145	25	●
EB324240	24	70	60	150	25	●
EB324250	25	70	60	150	25	●
EB324260	26	70	60	150	32	●
EB324280	28	70	60	150	32	●
EB324300	30	80	70	180	32	●
EB324320	32	90	70	190	32	●
EB324350	35	100	70	200	32	●
EB324380	38	120	70	220	32	●
EB324400	40	120	70	220	32	●
EB324450	45	120	80	230	32	●

Tolerance of Mill Dia. (mm)

0 ~ -0.05

Tolerance of Shank Dia.

h7

※ For the items produced from 1st. 2010, apply to these tolerance.

Tolerance of Mill Dia. (mm)

0 ~ -0.05

Tolerance of Shank Dia.

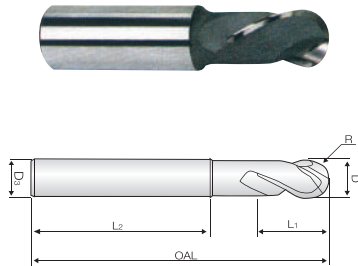
h7

※ For the items produced from 1st. 2010, apply to these tolerance.

STANDARD ENDMILL SERIES

METRIC

BB302



2 FLUTE, BALL NOSE REGULAR LENGTH - BRAZED TYPE

EDP. No.	D	R	L ₂	L ₁	L ₃	OAL	STOCK
BB302150	15	7.5	55	28	16	100	
BB302160	16	8	55	28	16	100	
BB302180	18	9	55	29	20	110	
BB302200	20	10	55	29	20	110	
BB302220	22	11	60	36	25	110	
BB302240	24	12	60	37	25	110	
BB302250	25	12.5	60	38	25	120	
BB302280	28	14	65	40	32	120	
BB302300	30	15	65	46	32	130	
BB302320	32	16	65	47	32	140	

Tolerance of Mill Dia. (mm)

0 ~ -0.05

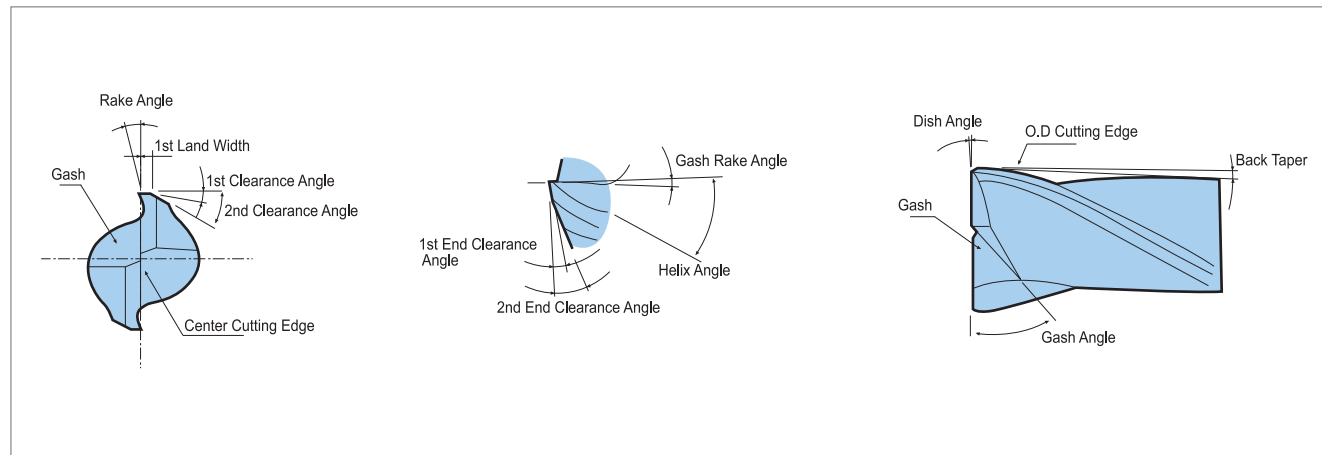
Tolerance of Shank Dia.

h7

※ For the items produced from 1st. 2010, apply to these tolerance.

TECHNICAL DATA

Nomenclature of Endmill



Application range of Grade

WORKPIECE	GRADE
Carbon Steel, Alloy Steel, Tool Steel, Metal Mold Steel	• Micro Grain Carbide • P30
Cast Iron, Ductile	• Micro Grain Carbide • K10
Heat Treatment Steel(HRC 40-60)	• Ultrafinest Carbide
Aluminium, Nonferrous Material	• Micro Grain Carbide • K10

Formula of Endmilling

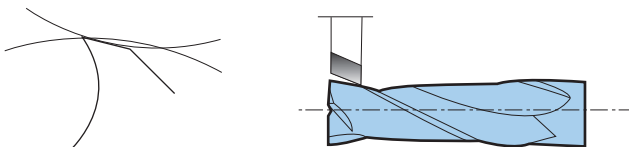
1) Cutting Speed $V = \frac{\pi \times D \times N}{1000}$ (m/min)	V : Cutting Speed (m/min) D : Diameter of End Mill (mm) N : End Mill revolution (RPM)
2) Feed per tooth $fz = \frac{F}{Z \times N}$ (mm/tooth)	fz : Feed per tooth (mm/tooth) Z : No. of teeth N : End Mill revolution (RPM)
3) Table Feed rate $F = fz \times Z \times N$	F : Feed rate (mm/min) fz : Feed per tooth (mm/tooth) Z : No. of teeth N : End Mill revolution (RPM)
4) Cutting Time $Tc = \frac{L}{F}$	Tc: Cutting Time (min) F : Table feed rate (m/min) L : Length of cut (workpiece Length + Diameter of Endmill + α)

For Regrinding

1. Regrinding range

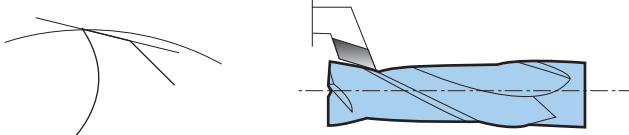
APPLICATION RANGE	CUTTER Dia.	AMOUNT OF FLANK WEAR
Finish Machining	~ Ø10	0.05 ~ 0.1
	Ø11 ~ Ø30	0.1 ~ 0.25
	Ø31 ~ Ø50	0.2 ~ 0.35
Rough Machining	~ Ø10	0.08 ~ 0.15
	Ø11 ~ Ø30	0.15 ~ 0.35
	Ø31 ~ Ø50	0.3 ~ 0.45

2. Regrinding Method of Relief



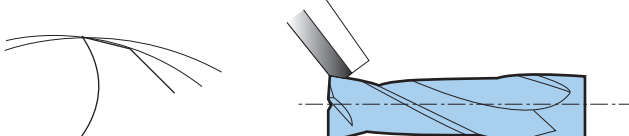
(1) Concave method

- In case when precise outer Diameter dimension is required.
- In case of aluminium machining.



(2) Flat method

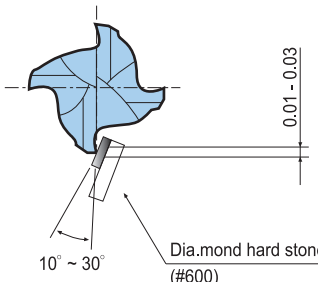
- Excellent machinability
- Applicable to ball end mill and taper end mill.
- Secondary clearance angle work is required.
- When Diameter is large.



(3) Eccentric method

- Excellent toughness and surface roughness.
- Secondary clearance angle work is not required.

3. Honing



- 1) Recommend honing for machining mold metal and high hardness workpiece.
- The amount of honing shall be less than that of feed per blade.
- 2) When using end mill without honing, machine for 10 to 30 seconds at feed rate of less than 0.01 mm/blade and then machine at normal feed rate.
- 3) Honing is not required for machining aluminium and non-ferrous metal.

TECHNICAL DATA

Trouble Shooting for Endmilling

Problems Cause			Solution	Cutting Conditions					Tool shape					Grade		The Others			
				Cutting Speed	Feed Rate	Depth of Cut	Coolant	Up & Down Cut	Relief Angle	Lead Angle	Cutting Length	Numbers of Teeth	Honing	Chip Pocket	Toughness	Hardness	Machanical Rigidity	Machanical Chattering	Workpiece Setting
Cutting edge breakage	Excessive wear on periphery	• Improper cutting conditions	▼	▲		⊙									▲				
	Chipping	• Improper cutting conditions • Generation of built-up edge • Improper tool grade		▼			▼	▼				⊙		▲			▼	▲	▼
	Breakage while cutting	• Improper cutting conditions • Excessive cutting load • Excessive overhang		▼	▼					▼			▲			▲		▲	▼
Poor surface finish		• Generation of built-up edge	▲	▲		⊙			▲			⊙							
		• Generation of chattering	▼			○	▼			▼						▲	⊙	▲	▼
		• Surface Squarence		▼	▼		▲		▲	▼									▼
Oversize or undersize	• Improper cutting conditions • Improper choice of endmill type	▲	▼			▼				▼	▲				▲	▼			▼
Poor chip control	• Excessive cutting rate • Improper chip Pocket • Improper cutting conditions		▼	▼							▼		▲						

▲ : Increase

▼ : Decrease

○ : Application

⊙ : Proper application

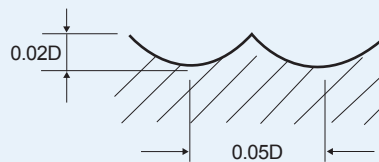
TECHNICAL DATA

Recommendation of Cutting Conditions

DA702

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1/64×1/32	50000	188.98	50000	165.35	45000	149.61	40000	118.11	35000	102.36	35000	90.55
R1/32×1/16	49700	224.41	47800	188.98	40000	157.48	35000	124.02	32000	110.24	28500	90.55
R3/64×3/32	49700	224.41	47800	188.98	40000	157.48	35000	124.02	32000	110.24	28500	90.55
R1/16×1/8	33100	236.22	31800	208.66	26500	157.48	23500	124.02	21000	110.24	19000	90.55
R3/32×3/16	18600	228.35	17800	192.91	15000	147.64	13500	120.08	11500	100.39	10500	82.68
R1/8×1/4	13900	190.94	13400	161.42	11000	122.05	10000	98.43	8800	84.65	8000	68.90
R5/32×5/16	11100	165.35	10700	137.80	9000	106.30	8000	84.65	7000	72.83	6500	61.02
R3/16×3/8	9300	145.67	8900	122.05	7500	94.49	6600	74.80	5800	64.96	5300	54.33
R1/4×1/2	6950	116.14	6680	98.43	5600	74.80	5000	61.02	4400	49.21	4000	41.34

RPM : Revolution Per Min
FEED : inch / min

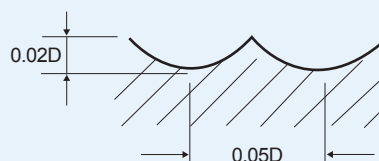


※ The feed, in long & extra long types, should be reduced by around 50%

DB702

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	50000	4800	50000	4200	45000	3800	40000	3000	35000	2600	35000	2300
2	49700	5700	47800	4800	40000	4000	35000	3150	32000	2800	28500	2300
3	33100	6000	31800	5300	26500	4000	23500	3150	21000	2800	19000	2300
4	24900	6000	23900	5300	20000	4000	17500	3150	16000	2800	14500	2300
5	18600	5800	17800	4900	15000	3750	13500	3050	11500	2550	10500	2100
6	13900	4850	13400	4100	11000	3100	10000	2500	8800	2150	8000	1750
8	11100	4200	10700	3500	9000	2700	8000	2150	7000	1850	6500	1550
10	9300	3700	8900	3100	7500	2400	6600	1900	5800	1650	5300	1380
12	6950	2950	6680	2500	5600	1900	5000	1550	4400	1250	4000	1050
16	5570	2650	5350	2200	4500	1700	4000	1350	3500	1000	3200	850
20	4450	2350	4300	1950	3600	1500	3200	1200	2800	800	2550	660

RPM = rev. / min.
FEED = mm / min.



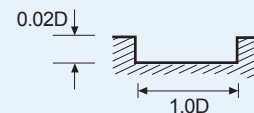
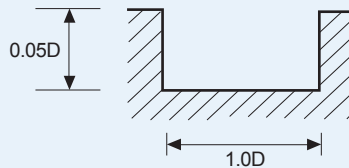
TECHNICAL DATA

Recommendation of Cutting Conditions

ZE702, ZE752, ZE712 - Slotting

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48000	750	38000	570	25500	360	20500	215	16000	135	12500	85
2	33300	850	26000	680	17500	420	14500	260	11000	160	9500	115
3	21800	850	17300	680	11500	420	9500	260	7500	160	6400	115
4	16700	880	13200	700	8800	440	7200	270	5600	170	4750	118
5	15700	1000	12500	805	8300	500	6400	285	5100	180	4450	132
6	13100	950	10350	770	6900	480	5300	280	4200	180	3700	130
8	9880	930	7800	720	5200	445	4000	255	3200	165	2800	120
10	7800	850	6150	680	4100	415	3200	240	2550	155	2200	112
12	6650	850	5250	680	3500	415	2650	240	2100	155	1860	112
16	4900	730	3900	580	2600	365	2000	210	1600	135	1400	95
20	3900	660	3100	525	2050	335	1600	195	1300	125	1100	85

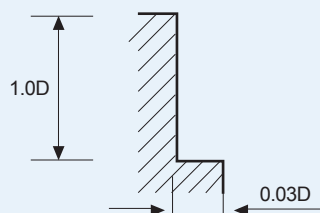
RPM = rev. / min.
FEED = mm / min.



ZE702, ZE752, ZE712 - Side Cutting

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48000	1050	38000	820	25500	510	20500	310	16000	190	12500	125
2	33300	1200	26000	970	17500	600	14500	370	11000	230	9500	165
3	21800	1200	17300	970	11500	600	9500	370	7500	230	6400	165
4	16700	1250	13200	1000	8800	625	7200	385	5600	240	4750	170
5	15700	1450	12500	1150	8300	710	6400	410	5100	260	4450	190
6	13100	1350	10350	1100	6900	690	5300	400	4200	255	3700	185
8	9880	1320	7800	1030	5200	635	4000	365	3200	235	2800	170
10	7800	1200	6150	970	4100	590	3200	340	2550	220	2200	160
12	6650	1200	5250	970	3500	590	2650	340	2100	220	1860	160
16	4900	1050	3900	840	2600	520	2000	300	1600	190	1400	140
20	3900	950	3100	750	2050	475	1600	275	1300	175	1100	125

RPM = rev. / min.
FEED = mm / min.



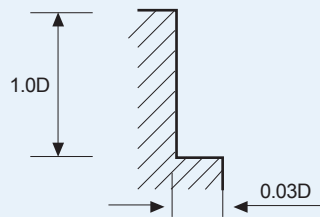
TECHNICAL DATA

Recommendation of Cutting Conditions

ZE704, ZE754, ZE714 - Side Cutting

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48000	1480	38000	1050	25500	710	20500	430	16000	270	12500	175
2	33300	1750	26000	1250	17500	840	14500	520	11000	320	9500	230
3	21800	1750	17300	1250	11500	840	9500	520	7500	320	6400	230
4	16700	1800	13200	1300	8800	880	7200	540	5600	335	4750	240
5	15700	2000	12500	1500	8300	1000	6400	580	5100	370	4450	270
6	13100	1950	10350	1400	6900	950	5300	560	4200	350	3700	260
8	9880	1880	7800	1350	5200	900	4000	520	3200	330	2800	240
10	7800	1750	6150	1260	4100	840	3200	480	2550	310	2200	220
12	6650	1750	5250	1260	3500	840	2650	480	2100	300	1860	220
16	4900	1500	3900	1100	2600	730	2000	420	1600	270	1400	200
20	3900	1300	3100	970	2050	650	1600	380	1300	250	1100	180

RPM = rev. / min.
FEED = mm / min.



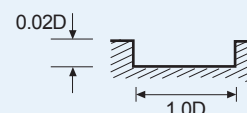
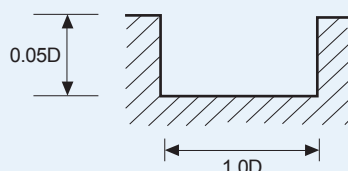
TECHNICAL DATA

Recommendation of Cutting Conditions

ZR702 - Slotting

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33300	680	26000	544	17500	336	14500	208	11000	128	9500	92
3	21800	680	17300	544	11500	336	9500	208	7500	128	6400	92
4	16700	704	13200	560	8800	352	7200	216	5600	136	4750	94
5	15700	800	12500	644	8300	400	6400	228	5100	144	4450	106
6	13100	760	10350	616	6900	384	5300	224	4200	144	3700	104
8	9880	744	7800	576	5200	356	4000	204	3200	132	2800	96
10	7800	680	6150	544	4100	332	3200	192	2550	124	2200	90
12	6650	680	5250	544	3500	332	2650	192	2100	124	1860	90
16	4900	584	3900	464	2600	292	2000	168	1600	108	1400	78
20	3900	528	3100	420	2050	268	1600	168	1300	100	1100	70

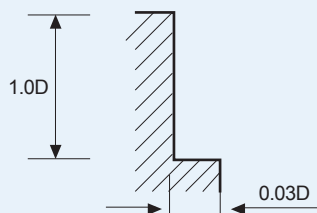
RPM = rev. / min.
FEED = mm / min.



ZR702 - Side Cutting

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33300	960	26000	776	17500	480	14500	296	11000	184	9500	132
3	21800	960	17300	776	11500	480	9500	296	7500	184	6400	132
4	16700	1000	13200	800	8800	500	7200	308	5600	192	4750	136
5	15700	1160	12500	920	8300	568	6400	328	5100	208	4450	152
6	13100	1080	10350	880	6900	552	5300	320	4200	204	3700	148
8	9880	1056	7800	824	5200	508	4000	292	3200	188	2800	136
10	7800	960	6150	776	4100	472	3200	272	2550	176	2200	128
12	6650	960	5250	776	3500	472	2650	272	2100	176	1860	128
16	4900	840	3900	672	2600	416	2000	240	1600	152	1400	112
20	3900	760	3100	600	2050	380	1600	220	1300	140	1100	100

RPM = rev. / min.
FEED = mm / min.



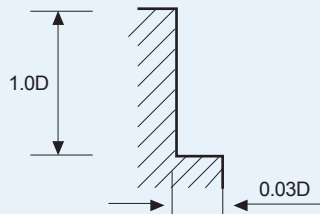
TECHNICAL DATA

Recommendation of Cutting Conditions

ZS104, ZS204 - Side Cutting

MATERIAL	HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	17200	1690	11440	1140	9360	700	7280	430	6170	310
6	13450	1820	8970	1230	6890	720	5460	450	4810	330
8	9100	1750	6760	1170	5200	670	4160	420	3640	310
10	8000	1630	5330	1090	4160	620	3320	400	2860	280
12	6830	1630	4550	1010	3450	580	2730	370	2420	260

RPM = rev. / min.
FEED = mm / min.

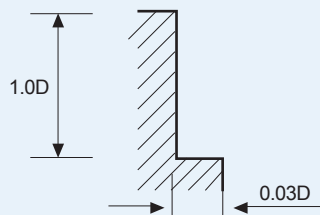


Endmill & Drill

ZR704, ZR724

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	21800	1400	17300	1000	11500	672	9500	416	7500	256	6400	184
4	16700	1440	13200	1040	8800	704	7200	432	5600	268	4750	192
5	15700	1600	12500	1200	8300	800	6400	464	5100	296	4450	216
6	13100	1560	10350	1120	6900	760	5300	448	4200	280	3700	208
8	9880	1504	7800	1080	5200	720	4000	416	3200	264	2800	192
10	7800	1400	6150	1008	4100	672	3200	384	2550	248	2200	176
12	6650	1400	5250	1008	3500	672	2650	384	2100	240	1860	176
16	4900	1200	3900	880	2600	584	2000	336	1600	216	1400	160
20	3900	1040	3100	776	2050	520	1600	304	1300	200	1100	144

RPM = rev. / min.
FEED = mm / min.



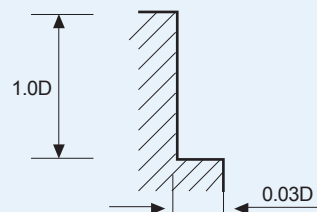
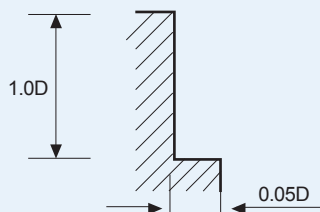
TECHNICAL DATA

Recommendation of Cutting Conditions

ZR706, ZE716

MATERIAL	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65		HRc 65 ~ HRc 70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	24800	5350	23500	4900	16000	4900	13500	3300	10500	2100	8000	1450
8	20000	5500	19000	5000	12000	4600	10000	3100	8000	2000	6000	1400
10	16000	4900	15500	4500	9500	4100	8000	2900	6400	1800	4800	1300
12	13000	4500	12500	4100	8000	3800	6600	2500	5300	1600	4000	1150
16	10000	4000	9700	3700	6000	3400	5000	2300	4000	1250	3000	870
20	8000	3350	7800	3400	4800	3200	4000	2100	3200	1020	2400	690

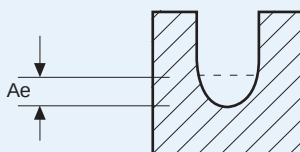
RPM = rev. / min.
FEED = mm / min.



ZSLNB

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS			HARDENED STEELS			COPPER		
HARDNESS	HRc 30 ~ HRc 45			HRc 45 ~ HRc 55			HRc 55 ~ HRc 65					
DIAMETER(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)
0.5	34100~49500	600~870	0.007~0.028	31900~35200	490~540	0.005~0.023	31900~35200	440~480	0.005~0.021	49000~50000	1100~1400	0.010~0.042
0.6	28600~40700	590~850	0.007~0.034	26400~29700	480~540	0.006~0.028	26400~29700	400~480	0.006~0.025	42000~50000	1100~1700	0.011~0.050
0.8	22000~30800	640~890	0.016~0.064	19800~22000	490~550	0.013~0.052	19800~22000	440~500	0.012~0.048	31000~50000	1100~2250	0.024~0.096
1.0	17600~24200	600~850	0.008~0.080	15400~17600	470~540	0.007~0.065	15400~17600	440~500	0.006~0.060	24000~49500	1100~2200	0.012~0.120
1.2	14300~18700	590~780	0.024~0.032	12000~14000	480~540	0.020~0.026	12000~14000	420~480	0.018~0.024	28500~38500	1480~1950	0.036~0.048
1.5	11000~14300	580~760	0.031~0.048	10000~11500	480~540	0.025~0.039	10000~11500	420~480	0.023~0.036	17000~28500	1100~1950	0.046~0.072
2.0	8500~11000	590~800	0.024~0.160	7900~8800	470~530	0.020~0.130	7900~8800	440~480	0.018~0.120	12600~24000	1100~2150	0.036~0.240
3.0	5700~8200	730~1000	0.064~0.24	5300~5800	590~650	0.052~0.195	5300~5800	550~620	0.048~0.120	11900~17000	1850~2700	0.096~0.360
4.0	4300~6200	680~990	0.080~0.320	3950~4400	550~620	0.065~0.260	3850~4400	530~570	0.060~0.240	6600~12500	1260~2500	0.120~0.480

RPM = rev. / min.
FEED = mm / min.



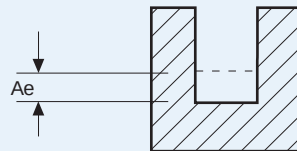
TECHNICAL DATA

Recommendation of Cutting Conditions

ZSLNS

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS			HARDENED STEELS			COPPER		
HARDNESS	HRc 30 ~ HRc 45			HRc 45 ~ HRc 55			HRc 55 ~ HRc 65					
DIAMETER(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)
0.4	34100~50000	350~590	0.005~0.028	30500~35200	295~340	0.003~0.020	18300~24600	120~200	0.002~0.012	48000~50000	790~920	0.008~0.048
0.5	25650~33000	370~470	0.006~0.035	23750~26000	285~315	0.004~0.025	14200~18000	115~130	0.003~0.015	44000~50000	800~1150	0.010~0.060
0.6	20900~35200	330~560	0.007~0.030	19900~22000	260~290	0.005~0.021	11900~15500	100~120	0.003~0.013	37500~50000	770~1250	0.011~0.051
0.8	16150~26400	360~590	0.009~0.040	15200~16700	280~310	0.006~0.028	9000~11700	110~125	0.004~0.017	28500~47000	770~1300	0.015~0.068
1.0	12300~18700	350~540	0.011~0.028	10500~11500	250~280	0.008~0.020	6300~8050	100~115	0.005~0.012	22500~34000	810~1300	0.018~0.048
1.2	10450~17600	350~590	0.025~0.070	9100~10000	250~280	0.015~0.042	5400~7000	100~115	0.009~0.026	22500~31500	950~1350	0.036~0.101
1.5	9100~17600	430~830	0.017~0.077	7000~8000	250~280	0.012~0.055	4300~5500	100~115	0.007~0.033	14500~25000	770~1320	0.028~0.132
2.0	6350~10550	340~570	0.021~0.140	6100~6700	270~300	0.015~0.100	3600~4700	100~120	0.009~0.060	11500~18500	770~1250	0.036~0.240
3.0	4300~7050	550~900	0.056~0.210	3990~4600	445~515	0.040~0.150	2400~3200	105~310	0.024~0.090	9000~13000	1400~2110	0.096~0.360
4.0	3200~5300	400~675	0.074~0.280	3000~3400	335~380	0.053~0.200	1800~2400	75~230	0.032~0.120	6750~9750	1050~1575	0.128~0.480

RPM = rev. / min.
FEED = mm / min.



TECHNICAL DATA

Recommendation of Cutting Conditions

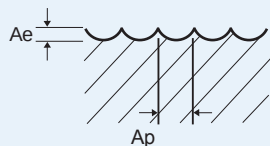
DA412 - General Speed Cutting

MATERIAL	HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 45 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65	
STRENGTH	1500 ~ 1750N/mm ²		1750 ~ 2000N/mm ²		2000 ~ 2080N/mm ²		2080N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1/16×1/8	12700	43.30	12300	41.30	11800	39.40	8400	26.00
R3/32×3/16	9400	43.30	9050	41.30	8600	37.40	5600	26.80
R1/8×1/4	8600	45.30	8250	43.30	7850	37.40	4850	27.60
R5/32×5/16	7000	41.30	6700	39.40	6350	37.40	3800	25.60
R3/16×3/8	6050	39.40	5800	37.80	5450	35.40	3200	24.40
R1/4×1/2	5450	39.40	5200	37.80	4900	35.40	2750	24.40
R5/16×5/8	4350	34.30	4150	32.70	3900	32.30	2150	10.40
R3/8×3/4	3500	27.20	3300	25.60	3150	24.80	1700	8.70
R1/2×1	2800	27.20	2650	25.60	2520	24.80	1360	8.70

RPM = rev. / min.
FEED = inch / min.

Ae : D1/8=.006
D3/16 ~
D5/16=.010
D3/8 ~ D1=.012

Ap : 0.1×D



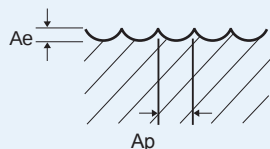
DA412 - High Speed Cutting

MATERIAL	HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 45 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	1500 ~ 1750N/mm ²		1750 ~ 2000N/mm ²		2000 ~ 2080N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16×1/8	12700	68.90	12300	65.70	11800	39.90
R3/32×3/16	9400	65.00	9050	61.80	8600	29.50
R1/8×1/4	8600	68.90	8250	65.70	7850	27.60
R5/32×5/16	7000	61.00	6700	57.50	6350	25.60
R3/16×3/8	6050	57.10	5800	53.50	5450	24.40
R1/4×1/2	5450	55.90	5200	52.40	4900	24.00
R5/16×5/8	4350	48.40	4150	44.50	3900	10.40
R3/8×3/4	3500	39.40	3300	35.40	3150	8.70
R1/2×1	2800	39.40	2640	35.40	2520	8.70

RPM = rev. / min.
FEED = inch / min.

Ae : D1/8=.006
D3/16 ~
D5/16=.010
D3/8 ~ D1=.012

Ap : 0.1×D



RPM = rev. / min.
FEED = mm / min.

TECHNICAL DATA

Recommendation of Cutting Conditions

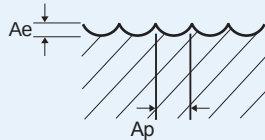
DB412

MATERIAL	HARDENED STEELS		HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 45 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 60		HRc 60 ~ HRc 65	
STRENGTH	1500 ~ 1750N/mm ²		1750 ~ 2000N/mm ²		2000 ~ 2080N/mm ²		2080N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	20000	460	20000	400	20000	350	20000	240
1.5	16300	640	16100	580	16000	570	14200	360
2	14500	800	14200	740	13850	760	11300	465
2.5	13400	950	13000	890	12600	920	9600	560
3	12700	1100	12300	1050	11800	1000	8400	660
4	10600	1100	10300	1050	9800	1000	6650	650
5	9400	1100	9050	1050	8600	950	5600	680
6	8600	1150	8250	1100	7850	950	4850	700
8	7000	1050	6700	1000	6350	950	3800	650
10	6050	1000	5800	960	5450	900	3200	620
12	5450	1000	5200	960	4900	900	2750	610

RPM = rev. / min.
FEED = mm / min.

Ae : D1 ~ D4=0.05×D
D5 ~ D8=0.025mm
D10 ~ D20=0.30mm

Ap : D1 ~ D20=0.1×D

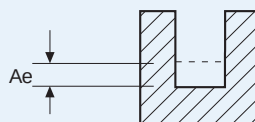


RPM = rev. / min.
FEED = mm / min.

DB602, DB302

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON			ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS		
HARDNESS	~ HRc 30			HRc 30 ~ HRc 45			HRc 45 ~ HRc 55		
STRENGTH	~ 1000N/mm ²			1000 ~ 1500N/mm ²			1500 ~ 2000N/mm ²		
DIAMETER(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)
0.5	33000~42000	200~540	0.023~0.045	24000~30000	100~300	0.023~0.045	15000~19000	100~2000	0.005~0.009
0.6	33000~42000	250~700	0.027~0.054	24000~30000	120~385	0.027~0.054	15000~19000	120~250	0.005~0.011
0.8	33000~42000	250~700	0.036~0.072	24000~30000	120~385	0.036~0.072	15000~19000	120~250	0.007~0.014
1.0	30000~38000	275~770	0.045~0.090	22000~27000	140~430	0.045~0.090	13500~17500	140~280	0.009~0.018
1.2	25000~32000	275~860	0.055~0.100	18000~23000	140~430	0.055~0.100	11500~14500	140~280	0.010~0.022
1.4	22000~27000	275~860	0.062~0.125	16000~19000	140~430	0.062~0.125	10000~12500	140~280	0.012~0.025
1.5	20000~25000	275~860	0.070~0.135	14500~18500	140~430	0.070~0.135	9500~11500	140~280	0.014~0.028
1.6	19000~25000	275~860	0.075~0.145	14000~17500	140~430	0.075~0.145	9000~11000	140~280	0.015~0.030
1.8	18000~23000	275~860	0.080~0.160	12500~16000	140~430	0.080~0.160	8000~10000	140~280	0.016~0.032
2	16000~20000	275~860	0.090~0.180	11500~14500	140~430	0.090~0.180	7500~9000	140~280	0.018~0.035
3	11000~14000	275~860	0.135~0.270	7500~9500	140~430	0.135~0.270	5000~6000	140~280	0.028~0.055
4	9000~12000	275~860	0.180~0.360	6100~8200	140~430	0.180~0.360	4000~5000	140~280	0.035~0.070

RPM = rev. / min.
FEED = mm / min.



RPM = rev. / min.
FEED = mm / min.

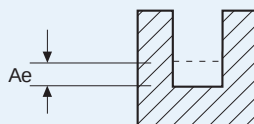
TECHNICAL DATA

Recommendation of Cutting Conditions

ZE602, ZE302 - Rib Processing

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON			ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS		
HARDNESS	~ HRC 30			HRC 30 ~ HRC 45			HRC 45 ~ HRC 55		
STRENGTH	~ 1000N/mm ²			1000 ~ 1500N/mm ²			1500 ~ 2000N/mm ²		
DIAMETER(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)
0.4	33000~42000	220~490	0.007~0.018	24000~30000	100~375	0.007~0.018	15000~18000	35~100	0.004~0.008
0.5	33000~42000	220~190	0.009~0.022	24000~30000	100~375	0.009~0.022	15000~18000	35~100	0.004~0.009
0.6	33000~42000	275~630	0.011~0.026	24000~30000	120~485	0.011~0.026	15000~18000	45~120	0.005~0.011
0.7	33000~42000	275~630	0.012~0.031	24000~30000	120~485	0.012~0.031	15000~18000	45~120	0.006~0.013
0.8	28500~37000	310~700	0.014~0.035	20500~26000	130~530	0.014~0.035	13000~15500	50~140	0.007~0.015
0.9	26000~33000	310~800	0.030~0.060	19000~24000	180~600	0.030~0.060	11500~13500	60~145	0.008~0.016
1.0	24000~30000	310~900	0.045~0.090	16500~21000	210~660	0.045~0.090	10500~13500	75~145	0.009~0.018
1.2	19500~24000	310~990	0.055~0.100	14000~17000	210~660	0.055~0.100	9000~11000	75~145	0.010~0.022
1.4	17000~21000	310~990	0.062~0.125	12000~15000	210~660	0.062~0.125	7500~9500	75~145	0.012~0.025
1.5	15500~20000	310~990	0.070~0.135	11000~14500	210~660	0.070~0.135	7000~8500	75~145	0.014~0.028
1.6	15000~19000	310~990	0.075~0.145	11000~13500	210~660	0.075~0.145	6500~8500	75~145	0.015~0.030
1.8	14000~18000	310~990	0.080~0.160	10000~12000	210~660	0.080~0.160	6000~7500	75~145	0.016~0.032
2.0	12500~15500	310~990	0.090~0.180	9000~11000	210~660	0.090~0.180	5500~7000	75~145	0.018~0.035
2.5	10000~13000	310~990	0.112~0.235	7000~9000	210~660	0.112~0.235	4500~5500	75~145	0.022~0.045
3.0	8500~10500	310~990	0.135~0.270	6000~7500	210~660	0.135~0.270	3500~4500	75~145	0.028~0.055
4.0	6500~8000	310~990	0.180~0.360	4500~5500	210~660	0.180~0.360	2700~3500	75~145	0.036~0.072

RPM = rev. / min.
FEED = mm / min.



TECHNICAL DATA

Recommendation of Cutting Conditions

DA512, DA302 - General Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		1500N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/64×1/32	15760	9.80	12720	7.80	5800	3.80
R1/32×1/16	15760	13.80	12140	1.60	5320	4.70
R3/64×3/32	14400	29.50	10700	19.30	4680	5.90
R1/16×1/8	13100	26.70	10000	18.10	4520	5.90
R3/32×3/16	9140	32.30	7300	22.80	3680	7.10
R1/8×1/4	7780	33.00	6300	24.80	3160	7.50
R5/32×5/16	5260	37.50	4420	26.00	2100	7.50
R3/16×3/8	4620	40.10	3780	28.00	1780	7.50
R1/4×1/2	3780	35.40	2940	26.00	1360	7.50
R5/16×5/8	2740	36.20	2320	26.00	1160	7.50
R3/8×3/4	2100	33.00	1900	25.00	840	7.50

RPM = rev. / min.
FEED = inch / min.

Ae : D1/32 ~ D1/4=.008inch
D5/16 ~ D3/4=.012inch

Ap : 0.2×D

Ae : D1/32 ~ D1/4=.008inch
D5/16 ~ D3/4=.012inch

Ap : 0.1×D

RPM = rev. / min.
FEED = mm / min.

DA512, DA302 - High Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS	
HARDNESS	~ HRc 45		HRc 45 ~ HRc 65	
STRENGTH	~ 1500N/mm ²		1500N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
R1/64×1/32	25000	25.60	25000	15.70
R1/32×1/16	23000	27.50	23000	16.90
R3/64×3/32	21000	34.60	19000	19.30
R1/16×1/8	21000	39.40	17000	20.50
R3/32×3/16	21000	70.90	12000	23.60
R1/8×1/4	21000	90.90	10500	24.80
R5/32×5/16	15760	111.80	7880	29.10
R3/16×3/8	13660	120.00	6300	33.00
R1/4×1/2	10500	103.50	5260	33.00
R5/16×5/8	8200	103.50	3780	28.00
R3/8×3/4	6300	99.00	2940	20.80

RPM = rev. / min.
FEED = inch / min.

Ae : D1/32 ~ D1/4=.008inch
D5/16 ~ D3/4=.012inch

Ap : 0.05×D

RPM = rev. / min.
FEED = mm / min.

TECHNICAL DATA

Recommendation of Cutting Conditions

DA514 - General Speed Cutting

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		~ 1500N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16×1/8	13100	40.10	10000	27.00	4520	8.85
R3/32×3/16	9140	48.50	7300	34.00	3680	10.50
R1/8×1/4	7780	49.50	6300	37.00	3160	11.25
R5/32×5/16	5260	56.00	4420	39.00	2100	11.25
R3/16×3/8	4620	60.00	3780	42.00	1780	11.25
R1/4×1/2	3780	53.00	2940	39.00	1360	11.25
R5/16×5/8	2740	54.50	2320	38.50	1160	11.25

RPM = rev. / min.
FEED = inch / min.

Ae : D1/8 ~ D1/4=.008inch
D5/16 ~ D5/8=.012inch

Ap : 0.02×D

Ae : D1/8 ~ D1/4=.008inch
D5/16 ~ D5/8=.012inch

Ap : 0.1×D

RPM = rev. / min.
FEED = mm / min.

DA514 - High Speed Cutting

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS	
HARDNESS	~ HRc 45		HRc 45 ~ HRc 65	
STRENGTH	~ 1500N/mm ²		~ 1500N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
R1/16×1/8	21000	59.00	17000	30.50
R3/32×3/16	21000	106.25	12000	35.50
R1/8×1/4	21000	136.50	10500	37.00
R5/32×5/16	15760	167.50	7800	43.50
R3/16×3/8	13660	180.00	6300	49.50
R1/4×1/2	10500	155.50	5260	49.50
R5/16×5/8	8200	155.50	3780	42.00

RPM = rev. / min.
FEED = inch / min.

Ae : D1/8 ~ D1/4=.008inch
D5/16 ~ D5/8=.012inch

Ap : 0.05×D

RPM = rev. / min.
FEED = mm / min.

TECHNICAL DATA

Recommendation of Cutting Conditions

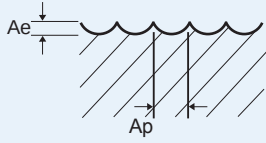
DA522 - General Speed Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 45 ~ HRc 50		HRc 50 ~ HRc 55	
STRENGTH	1000 ~ 1250N/mm ²		1500 ~ 1750N/mm ²		1750 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16×1/8	10000	18.10	12700	43.30	12300	41.30
R3/32×3/16	7300	22.80	9400	43.30	9050	41.30
R1/8×1/4	6300	24.80	8600	45.30	8250	43.30
R5/32×5/16	4420	26.00	7000	41.30	6700	39.40
R3/16×3/8	3780	28.00	6050	39.40	5800	37.80
R1/4×1/2	2940	26.00	5450	39.40	5200	37.80
R5/16×5/8	2320	26.00	4350	34.30	4150	32.70
R3/8×3/4	1900	25.00	3500	27.20	3300	25.60
R1/2×1	1520	25.00	2800	27.20	2650	25.60

RPM = rev. / min.
FEED = inch / min.

Ae : D1/8 ~ D1/4=.008
D5/16 ~ D1=.012

Ap : 0.2×D



Ae : D1/8=.006
D3/16 ~ D5/16=.010
D3/8 ~ D1=.012

Ap : 0.1×D

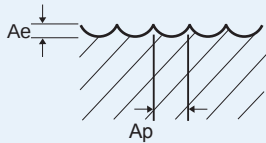
DA522 - High Speed Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 45 ~ HRc 50		HRc 50 ~ HRc 55	
STRENGTH	1000 ~ 1250N/mm ²		1500 ~ 1750N/mm ²		1750 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16×1/8	21000	39.40	12700	68.90	12300	65.70
R3/32×3/16	21000	70.90	9400	65.00	9050	61.80
R1/8×1/4	21000	90.90	8600	69.00	8250	65.70
R5/32×5/16	15760	111.80	7000	61.00	6700	57.50
R3/16×3/8	13660	120.10	6050	57.10	5800	53.50
R1/4×1/2	10500	103.50	5450	55.90	5200	52.40
R5/16×5/8	8200	103.50	4350	48.40	4150	44.50
R3/8×3/4	6300	99.20	3500	39.40	3300	35.40
R1/2×1	5040	99.20	2800	39.40	2650	35.40

RPM = rev. / min.
FEED = inch / min.

Ae : D1/8 ~ D1/4=.008
D5/16 ~ D1=.012

Ap : 0.05×D



Ae : D1/8=.006
D3/16 ~ D5/16=.010
D3/8 ~ D1=.012

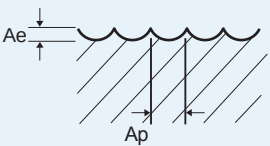
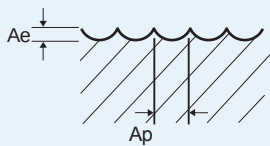
Ap : 0.05×D

TECHNICAL DATA

Recommendation of Cutting Conditions

MD502

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH	1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
R.012×.024	30000	23.60	30000	11.80
R.0155×.031	27000	25.60	27000	15.00
R.020×.040	25000	25.60	25000	15.70
R.0235×.047	24000	26.40	24000	16.50
R.031×.062	23000	27.60	23000	16.90

RPM = rev. / min. FEED = inch / min. $D < .040$ $A_e : 0.05 \times D$ $A_p : 0.15 \times D$ $D \geq .040$ $A_e : 0.075 \times D$ $A_p : 0.15 \times D$		$D < .040$ $A_e : 0.05 \times D$ $A_p : 0.1 \times D$ $D \geq .040$ $A_e : 0.05 \times D$ $A_p : 0.15 \times D$	
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TECHNICAL DATA

Recommendation of Cutting Conditions

DA542 - General Speed Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55	
STRENGTH	1000 ~ 1250N/mm ²		1250 ~ 1750N/mm ²		1750 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/32×1/16	97000	8.30	13800	19.90	13600	17.90
R1/16×1/8	8000	14.60	10200	34.60	9800	33.50
R3/32×3/16	5840	18.10	7500	34.60	7200	33.50
R1/8×1/4	5040	19.70	6900	36.20	6500	34.60
R5/32×5/16	3540	20.90	5600	33.10	5300	31.50
R3/16×3/8	3020	22.40	4850	31.50	4650	30.30
R1/4×1/2	2350	20.90	4350	31.50	4150	30.30

RPM = rev. / min.
FEED = inch / min.

Ae : D1/16 ~ D1/4=.008
D5/16 ~ D1/2=.012

Ap : 0.2×D

Ae : D1/16 ~ D1/8=0.05×D
D3/16 ~ D5/16=.010
D3/8 ~ D1/2=.012

Ap : 0.1×D

DA542 - High Speed Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 45		HRc 45 ~ HRc 50		HRc 50 ~ HRc 55	
STRENGTH	1500N/mm ²		1250 ~ 1750N/mm ²		1750 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/32×1/16	18400	21.90	13800	28.90	13600	30.10
R1/16×1/8	16800	31.50	10200	55.10	9800	51.20
R3/32×3/16	16800	56.70	7500	52.00	7200	49.20
R1/8×1/4	16800	72.80	6900	55.10	6500	53.10
R5/32×5/16	12600	89.40	5600	49.20	5300	45.30
R3/16×3/8	10930	96.10	4850	45.30	4650	43.30
R1/4×1/2	8400	82.70	4350	44.50	4150	41.30

RPM = rev. / min.
FEED = inch / min.

Ae : D1/16 ~ D1/4=.008
D5/16 ~ D1/2=.012

Ap : 0.052×D

Ae : D1/16 ~ D1/8=0.052×D
D3/16 ~ D5/16=.010
D3/8 ~ D1/2=.012

Ap : 0.052×D

TECHNICAL DATA

Recommendation of Cutting Conditions

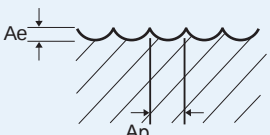
DA552 - General Speed Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 55	
STRENGTH	1000 ~ 1250N/mm ²		1250 ~ 1750N/mm ²		1750 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R3/32×3/16	4670	14.50	6000	27.70	5760	26.80
R1/8×1/4	4030	15.80	5520	29.00	5200	27.70
R5/32×5/16	2830	16.70	4480	26.50	4240	25.20
R3/16×3/8	2420	17.90	3880	25.20	3720	24.20
R1/4×1/2	1880	16.70	3480	25.20	3320	24.20

RPM = rev. / min.
FEED = inch / min.

Ae : D3/16 ~ D1/4=.008
D5/16 ~ D1/2=.012

Ap : 0.22×D



Ae : D3/16 ~ D5/16=.010
D3/8 ~ D1/2=.012

Ap : 0.12×D

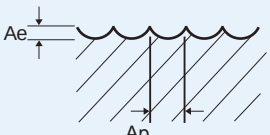
DA552 - High Speed Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	HRc 45		HRc 45 ~ HRc 50		HRc 50 ~ HRc 55	
STRENGTH	~ 1500N/mm ²		1250 ~ 1750N/mm ²		1750 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R3/32×3/16	13440	45.40	6000	41.60	5760	39.40
R1/8×1/4	13440	58.20	5520	44.10	5200	42.50
R5/32×5/16	10080	71.50	4480	39.40	4240	36.20
R3/16×3/8	8740	76.90	3880	36.30	3720	34.60
R1/4×1/2	6720	66.20	3480	35.60	3320	33.00

RPM = rev. / min.
FEED = inch / min.

Ae : D3/16 ~ D1/4=.008
D5/16 ~ D1/2=.012

Ap : 0.52×D



Ae : D3/16 ~ D5/16=.010
D3/8 ~ D1/2=.012

Ap : 0.052×D

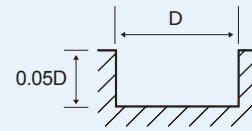
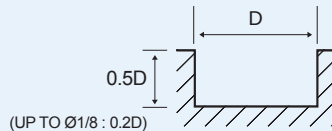
TECHNICAL DATA

Recommendation of Cutting Conditions

ZA502, ZA302

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		STAINLESS STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45				HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²				1500 ~ 2000N/mm ²		2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/16	11560	7.50	7560	4.70	6300	3.55	5040	1.40		
1/8	8920	8.25	5560	5.50	4620	4.70	3360	1.55	1900	1.55
3/16	6300	12.60	3780	7.50	3160	6.30	2320	1.95	1260	1.55
1/4	5560	13.80	3360	8.65	2840	7.10	2000	2.15	1100	1.55
5/16	4200	14.95	2520	7.85	2100	7.10	1680	2.95	840	1.55
3/8	3260	13.00	2000	6.30	1680	6.30	1360	2.35	680	1.40
1/2	2740	11.00	1680	5.10	1360	5.10	1160	2.15	560	1.40
5/8	2200	8.65	1360	4.30	1060	4.30	900	1.55	440	0.80
3/4	1680	6.70	1060	3.15	840	3.15	680	1.20	320	0.80
1	1360	5.10	840	2.75	680	2.35	540	0.80	260	0.60

RPM = rev. / min.
FEED = inch / min.

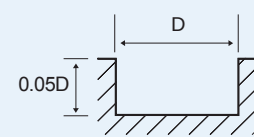
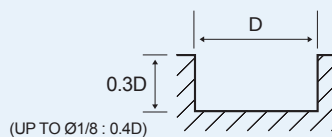


Endmill & Drill

ZA522

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 55	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
1/8	4410	7.8	3570	2.4	2200	1.2
3/16	3050	4.1	2420	3.3	1580	1.6
1/4	2630	4.9	2100	4.1	1370	2.0
5/16	2000	5.3	1580	4.1	1050	2.0
3/8	1680	5.3	1370	4.1	840	2.0
1/2	1370	4.1	1160	3.7	700	1.6
5/8	1160	3.7	890	3.0	560	1.4
3/4	840	2.8	680	2.0	420	1.0
1	610	2.0	540	1.6	330	0.7

RPM = rev. / min.
FEED = inch / min.



TECHNICAL DATA

Recommendation of Cutting Conditions

MZ502

MATERIAL	ALLOY STEELS TOOL STEELS		ALLOY STEELS TOOL STEELS	
HARDNESS	HRc 30 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH	1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
.016	30000	7.10	23000	3.90
.031	24000	11.80	18000	5.10
.040	20000	12.60	15000	5.90
.047	16000	12.60	12000	5.90
.062	12000	11.80	9000	5.50

RPM = rev. / min.
FEED = inch / min.

$D < .040$
 $\text{Depth} = 0.15 \times D$
 $D \geq .040$
 $\text{Depth} = 0.25 \times D$

$D < .040$
 $\text{Depth} = 0.02 \times D$
 $D \geq .040$
 $\text{Depth} = 0.05 \times D$

ZA504, ZA304

MATERIAL	CARBON STEELS ALLOY STEELS - CAST IRON		ALLOY STEELS TOOL STEELS		STAINLESS STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45				HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²				1500 ~ 2000N/mm ²		2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/16	11560	11.00	7560	6.70	6300	5.50	5040	1.95		
1/8	8920	12.60	5560	7.85	4620	6.70	3360	2.35	1900	2.35
3/16	6300	23.60	3780	14.15	3160	11.80	2320	2.75	1260	2.35
1/4	5560	26.00	3360	16.15	2840	13.00	2000	3.15	1100	2.35
5/16	4200	27.95	2520	14.95	2100	13.80	1680	4.30	840	2.35
3/8	3260	24.00	2000	11.80	1680	11.80	1360	3.55	680	1.95
1/2	2740	20.50	1680	9.85	1360	9.45	1160	3.15	560	1.95
5/8	2200	16.15	1360	7.85	1060	7.85	900	2.35	440	1.20
3/4	1680	12.60	1060	6.30	840	5.90	680	1.55	320	1.20
1	1360	9.85	840	5.10	680	4.70	540	1.20	260	0.80

RPM = rev. / min.
FEED = inch / min.

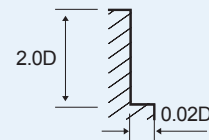
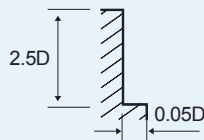
TECHNICAL DATA

Recommendation of Cutting Conditions

ZA524

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²		2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/8	4410	4.5	3570	3.9	2200	2.2	1890	1.2
3/16	3050	7.1	2420	5.5	1580	2.8	1260	1.6
1/4	2630	8.5	2100	7.1	1370	3.5	1160	2.0
5/16	2000	9.1	1580	7.1	1050	3.5	840	2.0
3/8	1680	9.1	1370	7.1	840	3.5	670	2.0
1/2	1370	7.1	1160	6.3	700	2.8	560	1.6
5/8	1160	6.3	890	4.9	560	2.4	440	1.4
3/4	840	4.5	680	3.5	420	1.8	340	1.0
1	670	4.5	540	3.5	340	1.8	270	1.0

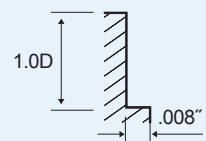
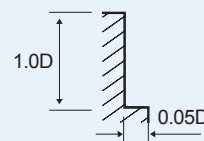
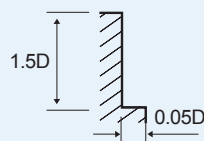
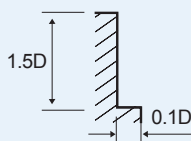
RPM = rev. / min.
FEED = inch / min.



ZA506(8) - General Speed Cutting

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 50 ~ HRc 55		HRc 60 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1750N/mm ²		1750 ~ 2080N/mm ²		2080N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	5560	79.00	3880	54.00	1580	8.25	1100	5.10
5/16	4200	79.00	2940	54.00	1160	8.25	840	5.10
3/8	3360	79.00	2320	54.00	1000	8.25	680	5.10
1/2	2840	66.00	2000	46.00	840	7.10	560	4.35
5/8	2100	50.00	1480	35.00	640	5.10	420	2.75
3/4	1680	40.00	1160	27.00	500	4.35	320	2.35
1	1260	25.00	870	17.50	375	3.00	240	1.54

RPM = rev. / min.
FEED = inch / min.



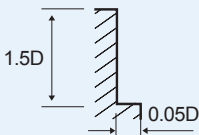
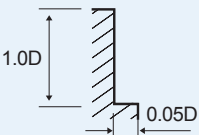
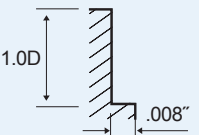
TECHNICAL DATA

Recommendation of Cutting Conditions

ZA506(8) - High Speed Cutting

MATERIAL	CARBON STEELS TOOL STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 50		HRc 50 ~ HRc 60		HRc 60	
STRENGTH	1750N/mm ²		1750 ~ 2080N/mm ²		2080N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
1/4	16800	240.00	8400	120.00	4200	58.00
5/16	12600	240.00	6300	120.00	3160	58.00
3/8	9980	235.00	5040	120.00	2520	58.00
1/2	8400	199.00	4200	100.00	2100	50.00
5/8	6300	149.00	3160	75.00	1580	37.00
3/4	5040	120.00	2520	58.00	1260	30.00
1	3790	75.00	1890	38.00	950	19.00

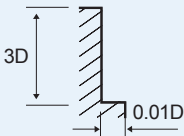
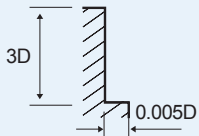
RPM = rev. / min.
FEED = inch / min.

ZA526(8)

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 40		HRc 40 ~ HRc 50		HRc 50 ~ HRc 60		HRc 60 ~ HRc 65	
STRENGTH	~ 1250N/mm ²		1250 ~ 1750N/mm ²		1750 ~ 2080N/mm ²		2080N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	2230	19.00	1670	14.00	1390	10.00	1110	8.00
5/16	1670	18.00	1250	13.00	1050	9.50	840	7.00
3/8	1330	17.00	1000	12.00	840	9.00	680	6.30
1/2	1110	16.00	840	11.00	690	8.50	560	6.00
5/8	840	13.00	630	9.00	530	6.50	420	5.00
3/4	670	11.00	500	8.00	420	6.00	320	4.70
1	540	9.50	400	6.50	340	5.00	270	3.70

RPM = rev. / min.
FEED = inch / min.

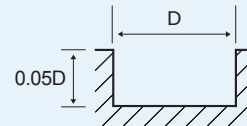
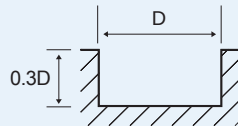
TECHNICAL DATA

Recommendation of Cutting Conditions

ZR502A, ZR522A, ZR532A

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 38		HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1200N/mm ²		1400 ~ 2000N/mm ²		2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	2630	4.90	2100	4.20	1370	2.00	1160	1.40
5/16	2000	5.30	1580	4.20	1050	2.00	840	1.40
3/8	1680	5.30	1370	4.20	840	2.00	670	1.40
1/2	1370	4.20	1160	3.80	700	1.50	550	1.00

RPM = rev. / min.
FEED = inch / min.

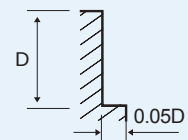
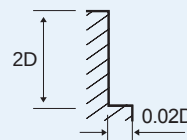
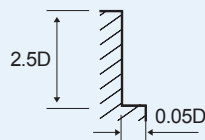


Endmill & Drill

ZR504A, ZR524A, ZR534A

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 50		HRc 50 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1750N/mm ²		1750 ~ 2000N/mm ²		2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	2630	8.50	2100	7.10	1370	3.30	1160	2.00
5/16	2000	9.00	1580	7.10	1050	3.30	840	2.00
3/8	1680	9.00	1370	7.10	840	3.30	670	2.00
1/2	1370	7.10	1160	6.30	700	2.80	550	1.50

RPM = rev. / min.
FEED = inch / min.



TECHNICAL DATA

Recommendation of Cutting Conditions

ZR506(8)A - High Speed Cutting

MATERIAL	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS	
HARDNESS	~ HRc 50		HRc 50 ~ HRc 60		HRc 60 ~ HRc 65	
STRENGTH	1750N/mm ²		1750N/mm ²		2080N/mm ² ~	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
1/4	16800	240.00	8400	120.00	4200	58.00
5/16	12600	240.00	6300	120.00	3200	58.00
3/8	10000	235.00	5000	120.00	2500	58.00
1/2	8400	200.00	4200	100.00	2100	50.00
5/8	6300	150.00	3150	75.00	1600	37.00
3/4	5000	120.00	2500	58.00	1260	30.00

RPM = rev. / min.
FEED = inch / min.

ZR506(8)A

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 38		HRc 38 ~ HRc 45		HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1200N/mm ²		1200 ~ 1400N/mm ²		1400 ~ 2000N/mm ²		2000N/mm ²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	15600	91.35	12400	33.10	8400	22.45	3400	10.25	2400	7.50
5/16	11600	91.35	9200	33.10	6300	22.45	2400	9.50	1800	7.10
3/8	9200	91.35	7600	33.10	5100	22.45	2000	11.40	1300	7.50
1/2	8000	94.50	6000	31.50	4200	22.45	1680	10.25	1200	7.50
5/8	6000	94.50	4800	29.90	3300	20.05	1200	6.30	800	4.35
3/4	5200	91.35	4400	28.35	2700	16.55	1100	5.90	700	3.95
1	4800	85.05	3600	22.05	2400	14.15	1000	5.90	660	3.95

TECHNICAL DATA

Recommendation of Cutting Conditions

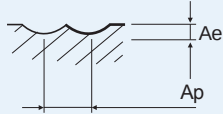
DB512, DB502, DB522, DB312 - General Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		1500N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	16500	290	13300	230	6100	105
1.5	16500	405	12700	310	5590	140
2	15100	865	11200	565	4900	175
2.5	15100	865	11200	565	4900	175
3	13800	780	10500	530	4750	175
4	11000	850	8800	610	4410	205
5	9600	945	7600	665	3860	205
6	8900	1150	7200	955	3340	220
8	7500	1500	6050	1060	2590	255
10	6700	1750	5300	1170	2140	260
12	6150	2000	4900	1280	1840	280
16	5000	1950	3900	1220	1420	280
20	4350	1900	3400	1200	1170	290

RPM = rev. / min.
FEED = mm / min.

Ae : D1 ~ D6=0.2mm
D8 ~ D20=0.3mm

Ap : 0.2×D



Ae : D1 ~ D6=0.2mm
D8 ~ D20=0.3mm

Ap : 0.1×D

• Please reduce cutting speed around 20~30% above the table in case of DB522 series.

DB512, DB502, DB522, DB312 - High Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS	
HARDNESS	~ HRc 45		HRc 30 ~ HRc 40	
STRENGTH	~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED
1	26000	1500	26000	920
1.5	24000	1600	24000	990
2	22000	1700	22000	1080
2.5	22000	2000	20000	1130
3	22000	2300	17800	1200
4	22000	3350	14300	1300
5	22000	4150	12600	1380
6	22000	4600	11000	1440
8	17500	4600	8800	1440
10	14700	4450	7350	1380
12	12800	4450	6400	1330
16	10000	4000	5000	1150
20	8350	3650	4150	1060

RPM = rev. / min.
FEED = mm / min.

Ae : D1 ~ D6=0.2mm
D8 ~ D20=0.3mm

Ap : 0.2×D



• Please reduce cutting speed around 20~30% above the table in case of DB522 series.

TECHNICAL DATA

Recommendation of Cutting Conditions

DB514 - General Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		~ 1500N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	13100	1020	10000	690	4520	220
4	10500	1110	8400	800	4200	270
5	9140	1230	7300	870	3680	270
6	7780	1260	6300	950	3160	280
8	5260	1430	4420	990	2100	280
10	4620	1530	3780	1070	1780	280
12	3780	1350	2940	990	1360	280
16	2740	1380	2320	980	1160	280
20	2100	1260	1900	950	840	280

RPM = rev. / min.
FEED = mm / min.

Ae : D1 ~ D6=0.2mm
D8 ~ D20=0.3mm

Ap : 0.2×D

Ae : D1 ~ D6=0.2mm
D8 ~ D20=0.3mm

Ap : 0.1×D

DB514 - High Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS	
HARDNESS	~ HRc 45		HRc 45 ~ HRc 65	
STRENGTH	~ 1500N/mm ²		~ 1500N/mm ² ~	
DIAMETER(mm)	RPM	FEED	RPM	FEED
3	21000	1500	17000	780
4	21000	2210	13660	870
5	21000	2700	12000	900
6	21000	3470	10500	940
8	15760	4260	7880	1110
10	13660	4580	6300	1260
12	10500	3950	5260	1260
16	8200	3950	3780	1060
20	6300	3780	2940	790

RPM = rev. / min.
FEED = mm / min.

Ae : D1 ~ D6=0.2mm
D8 ~ D20=0.3mm

Ap : 0.05×D

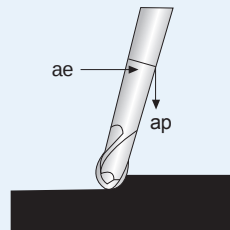
TECHNICAL DATA

Recommendation of Cutting Conditions

DB532 - General Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		1500N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	35000	2800	33000	2600	12000	900
4	26000	2300	25000	2200	9000	800
5	21000	2100	20000	2000	7000	700
6	17000	1900	16000	1800	6000	650
8	13000	1700	12000	1600	4500	550
10	10500	1450	10000	1400	3500	500
12	9000	1400	8000	1300	3000	450
16	6000	1200	5500	1100	2000	400

RPM = rev. / min.
FEED = mm / min.



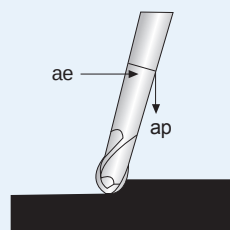
ae: 0.05×d1

ap: 0.02×d1

DB532 - High Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		1500N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	47000	3700	44000	3500	17000	1400
4	35000	3200	33000	3000	13000	1200
5	28000	2800	27000	2600	10000	1100
6	23000	2600	22000	2400	8000	950
8	18000	2300	17000	2100	6000	850
10	14000	2000	13000	1900	5000	750
12	12000	1800	11000	1800	4000	700
16	9000	1600	8000	1500	3300	600

RPM = rev. / min.
FEED = mm / min.



ae: 0.05×d1

ap: 0.02×d1

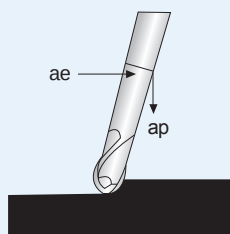
TECHNICAL DATA

Recommendation of Cutting Conditions

DB534 - General Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		1500N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
5	21000	4000	20000	4000	7000	1400
6	17000	4000	16000	3500	6000	1300
8	13000	3500	12000	3000	4500	1100
10	10500	3000	10000	2500	3500	1000
12	9000	2800	8000	2500	3000	950
16	6000	2800	5500	2200	2000	800

RPM = rev. / min.
FEED = mm / min.



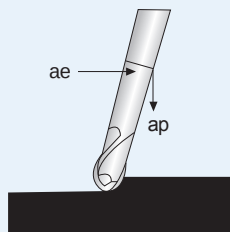
ae: 0.05×d1

ap: 0.02×d1

DB534 - High Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 40		HRc 45 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1250N/mm ²		1500N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
5	28000	5600	27000	5300	11000	2100
6	23000	5100	22000	4900	9000	1900
8	18000	4600	17000	4300	7000	1700
10	14000	3900	13000	3700	5000	1400
12	12000	3700	11000	3500	4500	1300
16	9000	3100	8000	3000	3300	1100

RPM = rev. / min.
FEED = mm / min.



ae: 0.05×d1

ap: 0.02×d1

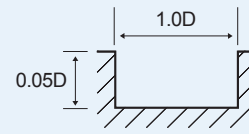
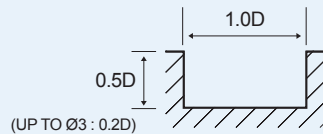
TECHNICAL DATA

Recommendation of Cutting Conditions

ZE502, ZE522, ZE302, ZE322 - General Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 40 ~ HRc 55			
STRENGTH	1000 ~ 1250N/mm ²		1250 ~ 1750N/mm ²		1750 ~ 2000N/mm ²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	9700	220	6350	135	2500	46	5300	105
3	7500	240	4670	160	2000	46	3880	135
4	6350	345	3880	205	1550	46	3250	175
5	5300	370	3170	220	1320	46	2650	185
6	4670	405	2830	255	1150	46	2380	205
8	3530	435	2120	230	880	46	1760	205
10	2730	380	1680	185	715	40	1420	185
12	2310	320	1420	150	590	40	1140	150
16	1850	255	1140	125	460	23	890	125
20	1420	195	890	90	335	23	705	90
25	1150	150	705	80	275	17	580	70

RPM = rev. / min.
FEED = mm / min.

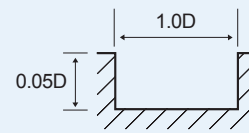
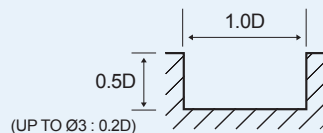


• Please reduce cutting speed around 20~30% from the above table in case of ZE522, ZE322 series.

ZE502, ZE522, ZE302, ZE322 - High Speed Cutting

MATERIAL	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	HRc 30 ~ HRc 40		HRc 40 ~ HRc 50		HRc 40 ~ HRc 55			
STRENGTH	1000 ~ 1250N/mm ²		1250 ~ 1750N/mm ²		1750 ~ 2000N/mm ²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	18000	665	11800	415	8700	175	9800	345
3	11000	655	6800	435	5600	185	6200	370
4	10300	725	6300	430	4300	185	5300	370
5	9350	715	5570	420	3700	185	4620	355
6	8200	750	4930	470	3250	185	4100	390
8	6300	770	3780	410	2470	185	3120	355
10	4830	750	2940	360	2000	160	2470	310
12	4100	750	2520	345	1680	160	2100	300
16	3260	715	2000	355	1890	150	1940	290
20	2520	665	1580	310	1680	150	1630	275
25	2000	635	1260	340	1570	150	1420	290

RPM = rev. / min.
FEED = mm / min.



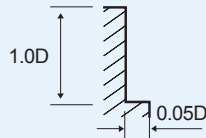
TECHNICAL DATA

Recommendation of Cutting Conditions

ZE503 - Side Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45				HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²				1500 ~ 2000N/mm ²		2000N/mm ² ~	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	5560	500	3360	310	2840	250	2000	60	1100	45
8	4200	530	2520	290	2100	265	1680	80	840	45
10	3260	460	2000	230	1680	230	1360	70	680	35
12	2740	390	1680	190	1360	180	1160	60	560	35
16	2200	310	1360	150	1060	150	900	45	440	20
18	1940	280	1210	135	950	130	790	35	380	20
20	1680	240	1060	120	840	115	680	30	320	20

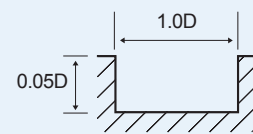
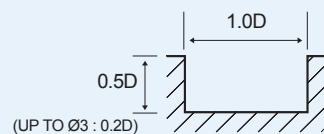
RPM = rev. / min.
FEED = mm / min.



ZE503 - Slotting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45				HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²				1500 ~ 2000N/mm ²		2000N/mm ² ~	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	5560	310	3360	200	2840	160	2000	50	1100	35
8	4200	340	2520	180	2100	160	1680	65	840	35
10	3260	300	2000	140	1680	145	1360	55	680	30
12	2740	250	1680	120	1360	120	1160	50	560	30
16	2200	200	1360	100	1060	100	900	35	440	20
18	1940	175	1210	85	950	85	790	30	380	20
20	1680	150	1060	70	840	70	680	25	320	20

RPM = rev. / min.
FEED = mm / min.



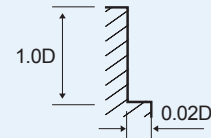
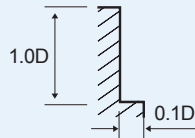
TECHNICAL DATA

Recommendation of Cutting Conditions

ZE504, ZE524, ZE304, ZE324 - General Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55			
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	12100	320	7900	195	2700	47	6600	160
3	9400	370	5840	230	2000	58	4850	195
4	7900	655	4850	405	1500	58	4070	320
5	6600	690	3970	415	1300	58	3320	345
6	5830	760	3530	470	1150	58	2980	380
8	4410	815	2650	435	880	58	2200	405
10	3420	700	2100	345	720	46	1760	345
12	2880	600	1760	290	590	46	1430	275
16	2310	470	1430	230	460	29	1150	230
20	1760	370	1110	185	340	29	880	175
25	1430	290	880	150	270	23	715	140

RPM = rev. / min.
FEED = mm / min.

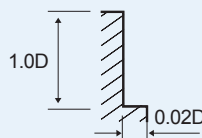


• Please reduce cutting speed around 20~30% from the above table in case of ZE524, ZE324 series.

ZE504, ZE524, ZE304, ZE324 - High Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55			
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	31400	1230	23500	520	12600	275	21600	465
3	19300	1210	13600	735	8900	390	13500	660
4	18100	1330	12600	865	7090	465	11800	775
5	16400	1310	11100	1010	6040	530	10300	910
6	14400	1380	9900	1100	5300	580	9100	990
8	11000	1430	7600	1090	3990	575	6900	980
10	8500	1380	5880	1110	3150	580	5420	1000
12	7200	1380	5040	1090	2620	575	4600	985
16	5700	1320	3990	1010	2000	535	3590	910
20	4400	1270	3150	930	1580	490	2840	840
25	3500	1170	2520	755	1260	390	2270	680

RPM = rev. / min.
FEED = mm / min.



TECHNICAL DATA

Recommendation of Cutting Conditions

ZE506 - General Speed Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 50		HRc 50 ~ HRc 60		HRc 60 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1750N/mm ²		1750 ~ 2080N/mm ²		2080N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	5560	2000	3880	1370	1580	210	1100	130
8	4200	2000	2940	1370	1160	210	840	130
10	3360	2000	2320	1370	1000	210	680	130
12	2840	1680	2000	1160	840	180	560	110
16	2100	1260	1480	880	640	130	420	70
20	1680	1010	1160	690	500	110	320	60
25	1500	900	1100	600	430	90	260	50

RPM = rev. / min.
FEED = mm / min.

ZE506 - High Speed Cutting

MATERIAL	HEAT RESISTANT STEELS HARDENED STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 50		HRc 50 ~ HRc 60		HRc 60 ~ HRc 65	
STRENGTH	~ 1750N/mm ²		1750 ~ 2080N/mm ²		2080N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	16800	6090	8400	3050	4200	1470
8	12600	6090	6300	3050	3160	1470
10	9980	5990	5040	3050	2520	1470
12	8400	5040	4200	2520	2100	1260
16	6300	3780	3160	1890	1580	950
20	5040	3050	2520	1470	1260	760
25	4500	2750	2200	1300	1120	670

RPM = rev. / min.
FEED = mm / min.

• Please reduce cutting speed around 20~30% from the above table in case of Extra long series.

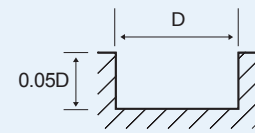
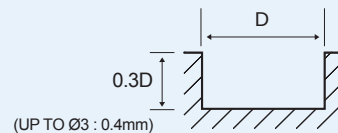
TECHNICAL DATA

Recommendation of Cutting Conditions

ZM502, ZM522

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2	6300	60	5040	50	3150	25
3	4410	70	3570	60	2200	30
4	3570	85	2840	70	1790	35
5	3050	105	2420	85	1580	40
6	2630	125	2100	105	1370	50
8	2000	135	1580	105	1050	50
10	1680	135	1370	105	840	50
12	1370	105	1160	95	700	40
16	1160	95	890	75	560	35
20	840	70	680	50	420	25

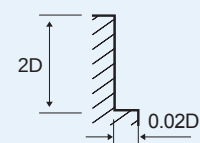
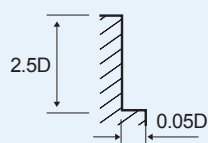
RPM = rev. / min.
FEED = mm / min.



ZM504, ZM524

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²		2000N/mm ² ~	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	6300	100	5040	80	3150	45		
3	4410	115	3570	100	2200	55	1890	30
4	3570	140	2840	115	1790	60	1470	35
5	3050	180	2420	140	1580	70	1260	40
6	2630	215	2100	180	1370	90	1160	50
8	2000	230	1580	180	1050	90	840	50
10	1680	230	1370	180	840	90	670	50
12	1370	180	1160	160	700	70	560	40
16	1160	160	890	125	560	60	440	35
20	840	115	680	90	420	45	340	25

RPM = rev. / min.
FEED = mm / min.



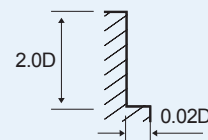
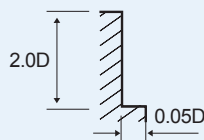
TECHNICAL DATA

Recommendation of Cutting Conditions

ZR502, ZR512, ZR522, ZR322 - Side Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6950	195	4500	150	3300	100
4	5600	240	3600	170	2700	105
5	4800	250	3050	210	2350	125
6	4150	250	2650	210	2050	125
8	3150	265	2000	210	1600	125
10	2150	265	1700	210	1250	125
12	1800	210	1500	185	1050	105
16	1800	185	1100	140	840	90
20	1300	130	860	105	625	65

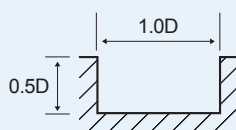
RPM = rev. / min.
FEED = mm / min.



ZR502, ZR512, ZR522, ZR322 - Slotting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6950	160	4500	80	3300	55
4	5600	195	3600	100	2700	60
5	4800	240	3050	115	2350	75
6	4150	290	2650	145	2050	90
8	3150	210	2000	145	1600	90
10	2150	250	1700	140	1250	90
12	1800	200	1500	135	1050	75
16	1800	215	1100	100	840	60
20	1300	160	860	70	625	45

RPM = rev. / min.
FEED = mm / min.



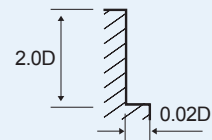
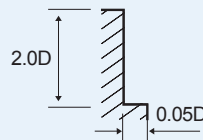
TECHNICAL DATA

Recommendation of Cutting Conditions

ZR504, ZR514, ZR524, ZR324

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6950	195	4500	150	3300	100
4	5600	240	3600	170	2700	105
5	4800	250	3050	210	2350	125
6	4150	250	2650	210	2050	125
8	3150	265	2000	210	1600	125
10	2150	265	1700	210	1250	125
12	1800	210	1500	185	1050	105
16	1880	185	1100	140	840	90
20	1300	130	860	105	625	65

RPM = rev. / min.
FEED = mm / min.

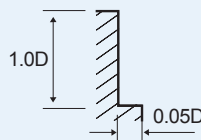


Endmill & Drill

ZR304H, ZR324H

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH	~ 1000N/mm ²		1000 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	7000	910	4200	560	3000	140
8	5300	980	3200	530	2500	190
10	4100	840	2500	410	2050	165
12	3500	730	2100	340	1700	140

RPM = rev. / min.
FEED = mm / min.



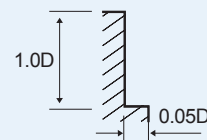
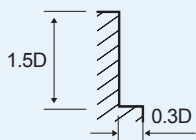
TECHNICAL DATA

Recommendation of Cutting Conditions

ZF60, ZF61

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		HARDENED STEELS		HARDENED STEELS	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 38		HRc 38 ~ HRc 45		HRc 45 ~ HRc 55		HRc 55 ~ HRc 65	
STRENGTH	1000N/mm ²		1000 ~ 1200N/mm ²		1200 ~ 1400N/mm ²		1400 ~ 2000N/mm ²		2000N/mm ² ~	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	15600	2320	12400	840	8400	570	3400	260	2400	190
8	11600	2320	9200	840	6300	570	2400	240	1800	180
10	9200	2320	7600	840	5100	570	2000	290	1300	190
12	8000	2400	6000	800	4200	570	1680	260	1200	190
14	6800	2400	5200	840	3600	570	1400	200	900	130
16	6000	2400	4800	760	3300	510	1200	160	800	110
18	5200	2320	4400	720	2700	420	1100	150	700	100
20	4800	2160	3600	560	2400	360	1000	150	660	100
25	4300	2150	3200	620	2160	410	900	160	600	100

RPM = rev. / min.
FEED = mm / min.



TECHNICAL DATA

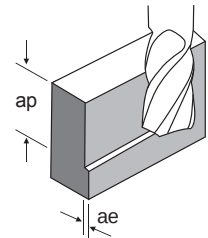
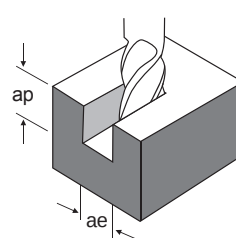
Recommendation of Cutting Conditions

PK503

MATERIAL		Alloy Steels · High Carbon Steels			Prehardened Steels · Tool Steels			
HARDNESS					HRc 30 ~ 40			
(V)m/min		130 ~ 150			100 ~ 120			
DIAMETER (mm)	(r.p.m.)	fz			(r.p.m.)	fz		
		Slot	Side Cutting	Slot		Slot	Side Cutting	Slot
6	7,400	0.030	0.045	0.018	5,800	0.025	0.030	0.012
8	5,600	0.035	0.062	0.025	4,400	0.030	0.045	0.018
10	4,600	0.045	0.075	0.030	3,500	0.040	0.048	0.019
12	3,700	0.050	0.087	0.035	3,000	0.045	0.052	0.020
14	3,200	0.055	0.090	0.036	2,500	0.053	0.056	0.022
16	2,800	0.055	0.090	0.036	2,200	0.060	0.060	0.024
20	2,200	0.080	0.095	0.038	1,800	0.066	0.066	0.026
	ap	1.0D	1.0D	0.5D		1.0D	1.0D	0.5D
	ae	1.0D	0.5D	1.0D		1.0D	0.3D	1.0D

Endmill & Drill

MATERIAL		SUS304 · 316 · Prehardened Steels			Titanium Alloy			
HARDNESS		HRc 40 ~ 45						
(V)m/min		130 ~ 150			100 ~ 120			
DIAMETER (mm)	(r.p.m.)	fz			(r.p.m.)	fz		
		Slot	Side Cutting	Slot		Slot	Side Cutting	Slot
6	3,200	0.020	0.030	0.012	2,100	0.017	0.020	0.008
8	2,400	0.030	0.040	0.016	1,600	0.025	0.025	0.010
10	1,900	0.040	0.055	0.022	1,300	0.035	0.040	0.016
12	1,600	0.045	0.065	0.026	1,100	0.040	0.050	0.020
14	1,360	0.048	0.070	0.028	900	0.043	0.053	0.021
16	1,200	0.050	0.075	0.030	800	0.045	0.055	0.022
20	1,000	0.052	0.083	0.033	600	0.050	0.057	0.023
	ap	0.5D	1.0D	0.5D		0.5D	1.0D	0.5D
	ae	1.0D	0.5D	1.0D		1.0D	0.3D	1.0D



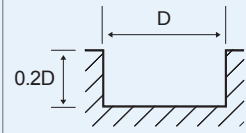
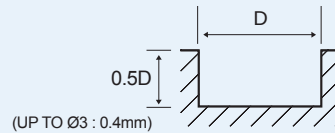
TECHNICAL DATA

Recommendation of Cutting Conditions

SM503 - Slotting

MATERIAL	CARBON STEELS ALLOY STEELS · TOOL STEELS						CAST IRON		STAINLESS STEELS		COOOER ALLOYS		TITANIUM ALLOYS		INCONEL	
HARDNESS	~ HRC20		HRC20 ~ HRC30		HRC30 ~ HRC45											
STRENGTH	1000N/mm²		800~1000N/mm²		1000~1500N/mm²											
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	10080	950	7750	740	5550	395	6700	520	5550	320	8300	360	5550	395	2200	100
4	7550	1400	5850	1100	4200	595	5050	550	4200	320	6200	400	4200	595	1650	105
6	5050	1650	3850	1250	2800	700	3350	660	2800	370	4100	440	2800	700	1150	130
8	3750	1700	2950	1330	2100	710	2500	665	2100	375	3100	500	2100	710	850	120
10	3050	1650	2300	1250	1650	655	2000	630	1650	355	2500	530	1650	665	650	120
12	2500	1500	2000	1200	1350	605	1650	570	1350	320	2000	550	1350	605	555	110

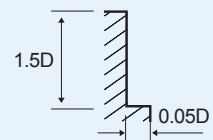
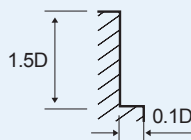
RPM = rev. / min.
FEED = mm / min.



SM503 - Side Cutting

MATERIAL	CARBON STEELS ALLOY STEELS · TOOL STEELS						CAST IRON		STAINLESS STEELS		COOOER ALLOYS		TITANIUM ALLOYS		INCONEL	
HARDNESS	~ HRC20		HRc20 ~ HRc30		HRc30 ~ HRc45											
STRENGTH	1000N/mm²		800~1000N/mm²		100~1500N/mm²											
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	10080	1080	7750	850	5550	450	6700	605	5550	365	8300	390	5550	450	2200	110
4	7550	1630	5850	1260	4200	680	5050	630	4200	365	6200	440	4200	680	1650	125
6	5050	1910	3850	1470	2800	810	3350	755	2800	430	4100	490	2800	810	1150	150
8	3750	1950	2950	1500	2100	810	2500	770	2100	430	3100	550	2100	810	850	140
10	3050	1890	2300	1400	1650	775	2000	720	1650	415	2500	570	1650	775	650	140
12	2500	1700	2000	1340	1350	700	1650	665	1350	365	2000	620	1350	700	555	125

RPM = rev. / min.
FEED = mm / min.



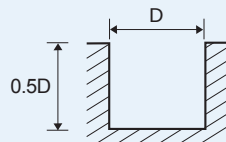
TECHNICAL DATA

Recommendation of Cutting Conditions

SM504

MATERIAL	ALLOY STEELS · CAST IRON		STAINLESS STEELS 300 SERIES TITANIUM		STAINLESS STEELS 400 SERIES	
HARDNESS	~ HB230					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	13500	275	6690	105	9350	145
4	10100	370	5050	135	7000	185
5	8090	410	4050	165	5600	230
6	6750	480	3350	190	4700	265
8	5050	620	2500	250	3500	340
10	4050	780	2050	320	2800	430
12	3370	750	1680	310	2350	435
14	2890	670	1400	280	2000	405
16	2500	630	1250	265	1750	370
18	2250	630	1100	260	1550	365
20	2000	620	1000	260	1400	365

RPM = rev. / min.
FEED = mm / min.

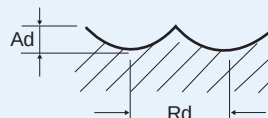


Endmill & Drill

BC502

MATERIAL		UNALLOYED COPPER			
R	DIAMETER(mm)	RPM	FEED	RPM	FEED
0.5	1	41000	1660	0.040	0.063
0.75	1.5	27000	1830	0.068	0.087
1	2	20000	1780	0.089	0.112
1.25	2.5	16000	1840	0.115	0.090
1.5	3	13000	2220	0.171	0.168
2	4	10000	2080	0.208	0.200
2.5	5	8300	1990	0.240	0.200
3	6	6900	1940	0.281	0.250
4	8	5720	1000	0.175	0.400
5	10	4550	700	0.154	0.500
6	12	3770	600	0.159	0.600

RPM = rev. / min.
FEED = mm / min.



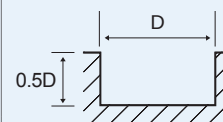
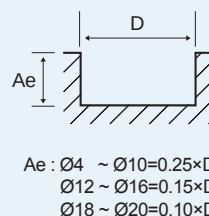
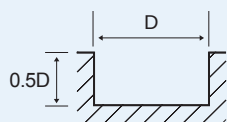
TECHNICAL DATA

Recommendation of Cutting Conditions

ZF62 - Slotting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		INCONEL	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45					
STRENGTH	1000N/mm ²		1000 ~ 1500N/mm ²					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	16380	2680	13020	970	8820	670	3000	285
8	12180	2680	9660	970	6615	670	2250	270
10	9660	2680	7980	970	5355	660	1625	285
12	8400	2770	6300	925	4410	660	1500	285
16	6300	2770	5040	880	3465	590	1000	165
20	5040	2495	3780	650	2520	415	825	150

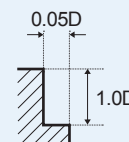
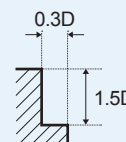
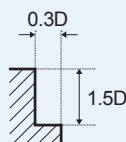
RPM = rev. / min.
FEED = mm / min.



ZF62 - Side Cutting

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		INCONEL	
HARDNESS	~ HRc 30		HRc 30 ~ HRc 45					
STRENGTH	1000N/mm ²		1000 ~ 1500N/mm ²					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	16380	2680	13020	970	8820	670	3000	285
8	12180	2680	9660	970	6615	670	2250	270
10	9660	2680	7980	970	5355	660	1625	285
12	8400	2770	6300	925	4410	660	1500	285
16	6300	2770	5040	880	3465	590	1000	165
20	5040	2495	3780	650	2520	415	825	150

RPM = rev. / min.
FEED = mm / min.



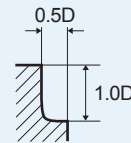
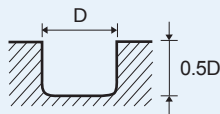
TECHNICAL DATA

Recommendation of Cutting Conditions

RC502

MATERIAL	UNALLOYED COPPER			
DIAMETER(mm)	RPM	FEED	RPM	FEED
3	44500	2350	50000	3700
4	33400	2100	50000	4700
6	22300	2100	33400	4900
8	16700	2100	25000	4700
10	13370	2100	20000	4800
12	11100	2100	16700	4700

RPM = rev. / min.
FEED = mm / min.

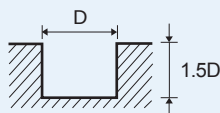


Endmill & Drill

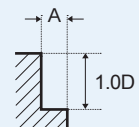
AE302

MATERIAL	ALLOY STEELS · CAST IRON		ALUMINUM	
HARDNESS	~ HB230			
DIAMETER(mm)	RPM	FEED	RPM	FEED
1.0	16870	505	16870	845
1.5	13150	525	13150	790
2.0	11300	565	11300	790
2.5	10565	635	10565	845
3.0	10000	700	10000	900
4.0	10000	900	10000	1100
5.0	10000	1000	10000	1300
6.0	10000	1200	10000	1500
7.0	8850	1240	8850	1505
8.0	8000	1400	8000	1800
9.0	8000	1550	8000	1680
10.0	8000	1700	8000	2100
12.0	8000	2100	8000	2600
14.0	6000	1800	6000	2200
16.0	6000	1900	6000	2400
18.0	4000	1400	4000	1800
20.0	4000	1600	4000	1900

RPM = rev. / min.
FEED = mm / min.



Ae : Ø3 ~ Ø10=0.25×D
Ø12 ~ Ø20=0.5×D



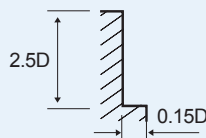
TECHNICAL DATA

Recommendation of Cutting Conditions

AE303, AE323 - Side Cutting

MATERIAL	ALUMINUM · NONFERROUS METALS	
DIAMETER(mm)	RPM	FEED
3	7000	455
4	7000	546
5	7000	651
6	7000	756
8	5600	861
10	5600	1050
12	5600	882
14	4200	1106
16	4200	1211
18	2800	910
20	2800	956

RPM = rev. / min.
FEED = mm / min.

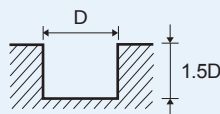


• Please reduce cutting speed around 20~30% from the above table in case of AE303 series.

AE303, AE323 - Slotting

MATERIAL	ALUMINUM · NONFERROUS METALS	
DIAMETER(mm)	RPM	FEED
3	7000	350
4	7000	441
5	7000	504
6	7000	606
8	5600	700
10	5600	854
12	5600	1050
14	4200	903
16	4200	945
18	2800	700
20	2800	805

RPM = rev. / min.
FEED = mm / min.



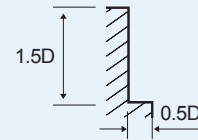
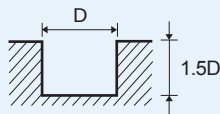
TECHNICAL DATA

Recommendation of Cutting Conditions

AF303, AF313 - Slotting

MATERIAL	ALUMINUM · NONFERROUS METALS			
DIAMETER(mm)	RPM	FEED	RPM	FEED
6	10500	800	13500	1050
8	8000	700	10500	900
10	6500	750	8500	950
12	5250	800	6800	1050
16	4000	800	5200	1050
20	3200	800	4200	1050

RPM = rev. / min.
FEED = mm / min.



Endmill & Drill

G

MATERIAL	GRAPHITE	
DIAMETER(mm)	RPM	FEED
R0.5	16000	480
R0.75	16000	640
R1	16000	800
R1.5	16000	1450
R2	16000	2100
R3	15000	2950
R4	13000	3000
R5	11500	3050
R6	10500	3150
R8	8555	2960

RPM = rev. / min.
FEED = mm / min.

