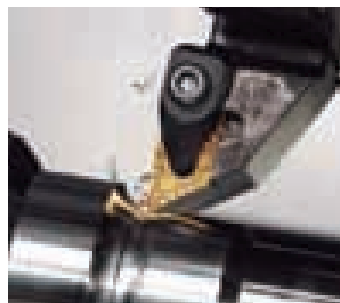


2007

Cutting Tools



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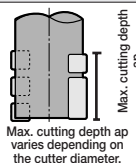
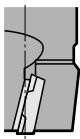
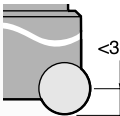
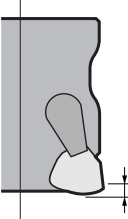
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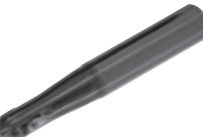
TAC Endmills

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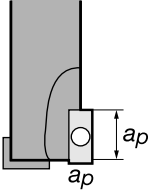
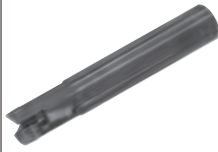
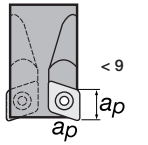
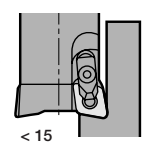
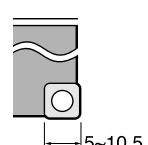
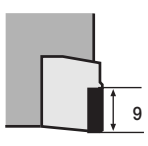
List of TAC Endmills

Operation	Work materials	Shape	Max. cutting depth ap (mm)	Cat. No.	Stock		No. of inserts	Cutter dia. (mm)	Features	Applicable inserts	Page
					R	L					
Square shoulder milling	Steel, Stainless steels and Cast irons	ELP-A		ELP13025RA ELP17032RA ELP21040RAS40	● ● ●		2 2 2	25 32 40	• Usable for slotting as deep as a tool diameter • Two flute type • Highly rigid tool body	ADMT□□□□□PR-MJ APMT□□□□□PN-MJ	361
			Rake angle A.R. — R.R. —								
		EPE		EPE4020R-E EPE4025R-E EPE5030R-E EPE5035R-E EPE5040R-E EPE6050R-E EPE6063R-E	● ● ● ● ● ● ●		1 2 2 2 2 3 4	20 25 30 35 40 50 63	• Due to the circular-arc shaped peripheral edges, although high-rake geometry, these cutter can produce a precision square-shoulder and wall face. Attainable straightness: Within 5 μm/edge length Attainable perpendicularity: Within 20 μm/edge length • Economical M-class inserts are also available for roughing operations.	AEC/MW1403PE□R AEC/MW16T3PE□R AEC/MW1804PE□R	362
			Rake angle A.R. +12°~17° R.R. -10°~0°								
		ERF6000		ERF6050R-E ERF6063R-E	● ●		3 4	50 63	• Designed for efficient milling of super alloys, such as Inconel, titanium alloys as well as high-speed milling of stainless steels. • Specially designed round inserts with unique flattened flanks allow the cutter to be used for a wide range of applications from roughing to finishing.	RFEN2004ZFNT RFEN2004M0TN	365
			Rake angle A.R. +19° R.R. +3°								
		High-feed milling	Steel, Stainless steels and Cast irons	EXP		EXP05020RS EXP05021RS EXP06025RS EXP06026RS EXP06032RS EXP06033RS EXP06040RS EXP08040RSA EXP06032RSB EXP06033RSB EXP05020RL EXP05021RL EXP06025RL EXP06026RL EXP06032RL EXP06033RL EXP06040RL EXP08040RLA EXP06032RLB EXP06033RLB EXP05020RLL EXP05021RLL EXP06025RLL EXP06026RLL EXP06032RLL EXP06033RLL EXP06040RLL EXP08040RLL	● ●				

List of TAC Endmills

Operation	Work-materials	Shape	Max. cutting depth ap (mm)	Cat. No.	Stock		No. of inserts	Cutter dia. (mm)	Features	Applicable inserts	Page
					R	L					
Die and mould	Steel and Cast irons	HWD		HWD05010R HWD05012R HWD05015R HWD05020R HWD05025R HWD07015R HWD07020R HWD07025R HWD10020R HWD10025R	●	●	2 3 4 5 6 3 4 5 2 3	10 12 15 20 25 15 20 25 20 25	- Carbide Reinforcement (rotation-symmetric brazed) - Anti-vibration (best performance at large overhang) - Fine metric thread (stable screw connection)	RDMW0501M0 RDMW0702M0 RDMW1003M0	368
		EBP		EBP020SD-E EBP025SD-E EBP032SD-E EBP020MDE-E EBP025MDE-E EBP032MDE-E EBP020MME-E EBP025MME-E EBP032MME-E	●	●	2 2 2 2+2 2+2 2+2 2+2 2+2 2+2	20 25 32 20 25 32 20 25 32	Strong insert shape and improved clamping stability allow highly productive machining.	ZPET2004-MJ DCMW070204TN ZPET2505-MJ DCMW11T304TN ZPET3206-MJ DCMW11T304TN	370
		EBD		EBD040SD-E EBD040MME-E EBD050SDE-E EBD050MME-E	●	●	2 2 2 2	40 40 50 50	The three dimensional curved cutting edge provides enough cutting edge strength even under severe conditions and reduces vibration during cutting.	ZDMT4005-MJ SCMT09T308-23 ZDMT5006-MJ SCMT120408-23	369
		ERD4000		ERD4020R-E ERD4032R-E ERD4040R-E ERD4050R-E	●	●	1 2 3 3	20 32 40 50	- Used for rough curvature milling. - Used at small cutting depths and high feed rates.	RDCM1203□N RDMA1203□N	372
		TBN1000		TBN1100S-E TBN1120S-E TBN1160S-E TBN1200S-E TBN1250S-E TBN1300S-E	●	●	1 1 1 1 1 1	10 12 16 20 25 30	- Simple-construction ball endmill. - Used for finishing to medium finishing.	ZNCA1002FN2 ZNCA1203FN ZNCA1603FN ZNCA2004FN ZNCA2505FN ZNCA3005FN ZNMM2004EN ZNMM2505EN ZNMM3005EN	373
		TBF1000		TBF1320S-E TBF1400S-E TBF1500S-E TBF1600S-E	●	●	1 1 1 1	32 40 50 60	- TAC ball endmill used for medium finishing to roughing. 3 or 4 inserts designed to share the cut perform well-balanced and highly- efficient machining.	ZDKA0704T/FN ZDKA0804T/FN ZDKA1105T/FN ZDKA0704T/FN ZDKA0804T/FN ZDKA1105T/FN ZDKA1705T/FN	374

List of TAC Endmills

Operation	Work-materials	Shape	Max. cutting depth a_p (mm)	Cat. No.	Stock		No. of inserts	Cutter dia. (mm)	Features	Applicable inserts	Page
					R	L					
Multi-functional	Steel, Stainless steels and Cast irons	EVX 	 EVX08 < 7 EVX10 < 9 EVX12 < 11.5 EVX16 < 15 Rake angle A.R. +2°~+5° R.R. -10°~-3.5°	EVX08016RSA-E EVX10020RSA-E EVX12025RSA-E EVX16032RSA-E EVX08016RLA-E EVX10020RLA-E EVX12025RLA-E EVX16032RLA-E EVX08016RLA EVX10020RLA EVX12025RLA EVX16032RLA	● ● ● ● ● ● ● ● ○ ○ ○ ○		2 2 2 2 2 2 2 2 2 2 2 2	16 20 25 32 16 20 25 32 16 20 25 32	• Double-sided insert design. • The same shape inserts can be used for both peripheral and center cutting edges.	XXMU08T204PR-MJ XXMU10H308PR-MJ XXMU12X408PR-MJ XXMU16X508PR-MJ	375
	Steel and Aluminum alloys	ESD10 	 Rake angle A.R. +8.5°~+10° R.R. -10°~-5°	ESD10020RS-E ESD10025RS-E ESD10032RS-E	● ● ●		1 2 2	20 25 32	• Provided with freer cutting action, widely used for three-dimensional roughing such as plunging, ramping and helical feed milling.	GDMT10H3PDPR-MJ	377
	Steel and Cast irons	ESD5000 	 Rake angle A.R. +5° R.R. -5°	ESD5040RS-E ESD5040RL-E ESD5050RS-E ESD5050RL-E	● ● ● ●		2 2 2 2	40 40 50 50	• By utilizing the helical interpolation function of CNC machines, the cutter can be used for high-efficiency deep pocket milling and large-diameter hole making. • Also applicable for a wide variety of milling operations including Z-feed milling.	EDKW53ZTR EDKW53ZFR	379
Counter milling	Steel and Cast irons	TCB 	 Rake angle A.R. Pos. R.R. Neg.	TCB-140 TCB-175 TCB-200 TCB-230 TCB-260 TCB-290 TCB-320 TCB-350 TCB-390 TCB-430 TCB-480	● ● ● ● ● ● ● ● ● ● ●		1 2 2 2 2 2 2 2 2 2 2	14 17.5 20 23 26 29 32 35 39 43 48	• TAC counter boring cutter. • Suitable for counter boring of seats for hexagonal socket head bolts. (Applicable bolt sizes: M8 ~ M30)	SPMP831DS SPMP042ERD SPMM322ERD SPMM432ERD	381
	Non-ferrous metals	EDPD15 	 Rake angle A.R. +7° R.R. 0°	EDPD15050R/L EDPD15063R/L			3 4	50 63	• All PCD tipped TAC endmills used for high-speed and high-accuracy milling of aluminium alloys and other non-ferrous metals.	YDEN1505PDFR/L-D YDEN1505PDFR/L-WD	382

List of TAC Milling Inserts (E Series)

Shape	Cat. No. (Inch)	ISO Cat. No. (Metric)	Accuracy	Honing	Stocked grades														Applicable TAC mills (pages)	
					CVD		PVD Coated				Cermet			Uncoated						
					T3030	T1015	GH330	GH340	AH330	AH120	AH140	NS530	NS540	NS740	KS05F	TH10	UX30	KS20		TU40
	AECW1403PESR AECW16T3PESR AECW1804PESR AECW1804PEFR	AECW1403PESR AECW16T3PESR AECW1804PESR AECW1804PEFR	C	With Without			● ● ●			○ ○ ○			△ △ △	○ ○ ○		○ ○ ○				EPE (P. 362)
	AEMW1403PETR AEMW16T3PETR AEMW1804PETR AEMW1804PEFR	AEMW1403PETR AEMW16T3PETR AEMW1804PETR AEMW1804PEFR	M	With Without			● ● ●						△ △ △	○ ○ ○		○ ○ ○				
	ADMT130308PR-MJ ADMT17T308PR-MJ ADMT210408PR-MJ	ADMT130308PR-MJ ADMT17T308PR-MJ ADMT210408PR-MJ	M	With	○ ○ ○					● ● ●	○ ○ ○									ELP-A (P. 361)
	APMT070308PN-MJ APMT09T308PN-MJ APMT120408PN-MJ	APMT070308PN-MJ APMT09T308PN-MJ APMT120408PN-MJ	M	With	○ ○ ○	○ ○ ○				● ● ●	○ ○ ○									
	ASGT11T304PDRF-AJ ASGT11T308PDRF-AJ ASGT170504PDRF-AJ ASGT170508PDRF-AJ	ASGT11T304PDRF-AJ ASGT11T308PDRF-AJ ASGT170504PDRF-AJ ASGT170508PDRF-AJ	G	Without											● ● ● ●					EPS11•17 (P. 358)
	ASMT11T304PDPR-MJ ASMT11T308PDPR-MJ ASMT11T312PDPR-MJ ASMT11T316PDPR-MJ ASMT11T320PDPR-MJ ASMT11T330PDPR-MJ ASMT170504PDPR-MJ ASMT170508PDPR-MJ ASMT170512PDPR-MJ ASMT170516PDPR-MJ ASMT170520PDPR-MJ ASMT170530PDPR-MJ ASMT170532PDPR-MJ	ASMT11T304PDPR-MJ ASMT11T308PDPR-MJ ASMT11T312PDPR-MJ ASMT11T316PDPR-MJ ASMT11T320PDPR-MJ ASMT11T330PDPR-MJ ASMT170504PDPR-MJ ASMT170508PDPR-MJ ASMT170512PDPR-MJ ASMT170516PDPR-MJ ASMT170520PDPR-MJ ASMT170530PDPR-MJ ASMT170532PDPR-MJ	M	With	● ● ● ● ●	● ● ● ● ●				● ● ● ● ● ●					● ● ●					
	ASMT11T304PDPR-MS ASMT170508PDPR-MS	ASMT11T304PDPR-MS ASMT170508PDPR-MS	M	With							● ●									EPN09•14 (P. 363)
	ANMT09T3PPPR-MJ ANMT1404PPPR-MJ	ANMT09T3PPPR-MJ ANMT1404PPPR-MJ	M	With	● ●	● ●	● ●		● ●	● ●			● ●							
	ANMT09T3PPPR-ML ANMT1404PPPR-ML	ANMT09T3PPPR-ML ANMT1404PPPR-ML			● ●	● ●			● ●											
	EDKW53ZTR	EDKW1504EDTR	K	With			○										●			
	GDMT10H3PDPR-MJ GDGT10H3PDRF-AJ	GDMT10H3PDPR-MJ GDGT10H3PDRF-AJ	M G	With Without					● ●	● ●							○			ESD10 (P. 377)
	RDCM1203TN RDCM1203FN RDMA1203TN RDMA1203FN	RDCM1203TN RDCM1203FN RDMA1203TN RDMA1203FN	C M	With Without													● ●			
	RDMW0501M0 RDMW0702M0 RDMW1003M0	RDMW0501M0 RDMW0702M0 RDMW1003M0	M	With						● ● ●										HWD (P. 368)
	RFEN2004M0TN RFEN2004ZFTN	RFEN2004M0TN RFEN2004ZFTN	E	With			○ ○			● ●								● ●	○ ○	
	SDMT1204AFPN-MJ SDMT1204AFPNE-MJ SDMT1204AFTN-MJ SDGT1204AFTN-MJ	SDMT1204AFPN-MJ SDMT1204AFPNE-MJ SDMT1204AFTN-MJ SDGT1204AFTN-MJ	M M G	With With	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●		● ●	△ △	○ ○						EAD12
	SDMT1204AFPN-MS	SDMT1204AFPN-MS	M	With						●										
	SDMT1204AFPN-ML	SDMT1204AFPN-ML	M	With					● ●	● ●										
	SDGT1204AFFN-AJ	SDGT1204AFFN-AJ	G	Without													●			
	SDMT1204PDSR-MJ SDMT1204PDTR-MJ SDGT1204PDTR-MJ	SDMT1204PDSR-MJ SDMT1204PDTR-MJ SDGT1204PDTR-MJ	M G	With With	● ● ●	● ● ●	● ● ●		● ● ●	● ● ●		● ●								

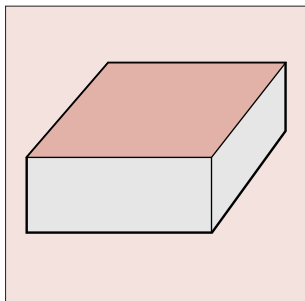
List of TAC Milling Inserts (E Series)

Shape	Cat. No. (Inch)	ISO Cat. No. (Metric)	Accuracy	Honing	Stocked grades														Applicable TAC mills (pages)		
					Coated							Cermet		Uncoated			PCD				
					T3030	T1015	GH330	GH340	AH330	AH120	AH140	T313W	NS740	NS540	GT540	TH10		UX30		TX25	TX30
	SDMT1204PDPR-MS	SDMT1204PDPR-MS	K	With								●									EPD12
	SDMT1204PDPR-ML	SDMT1204PDPR-ML	K	With					●	●											
	SDGT1204PDFR-AJ	SDGT1204PDFR-AJ	M	Without											●						
	SEKN1203AFTN SEKN42AFFN SEKN42AFTN16	SEKN1203AFTN SEKN1203AFFN SEKN1203AFTN-16	K	With Without With	●	●	●		●	○	●		●	△	△		●				—
	SEKR42AFSR-MJ	SEKR1203AFSR-MJ	K	With	●	●	●		●												
	SPMP831DS SPMP042ERD SPMM322ERD SPMM432ERD	SPMT060204-DS SPMP080308ER-D SPMT090308ER-D SPMT120408ER-D	M	With								● ● ● ●									TCB (P. 381)
	XXMU08T204PR-MJ XXMU10H308PR-MJ XXMU12X408PR-MJ XXMU16X508PR-MJ	XXMU08T204PR-MJ XXMU10H308PR-MJ XXMU12X408PR-MJ XXMU16X508PR-MJ	M	With						● ● ● ●	● ● ● ●										
	YDEN1505PDFR-D YDEN1505PDFR-WD	YDEN1505PDFR-D YDEN1505PDFR-WD	E	Without															● ●	EDPD (P. 382)	
	YPMT0902ZER YPMT1203ZER YPMT15T3ZER	YPMT0902ZER YPMT1203ZER YPMT1503ZER	M	With			● ● ●										● ● ●				EVP1000
	CPMW050208EN CPMW06T208EN CPMT080308EN	CPMW050208EN CPMW06T208EN CPMT080308EN	M	With			● ● ●										● ● ●				
	WPMW05H315ZPR WPMW06X415ZPR WPMT05H315ZPR-MH WPMT05H315ZPR-ML WPMT06X415ZPR-MH WPMT06X415ZPR-ML WPMT080615ZSR WPMT080615ZSR-MH WPMT080615ZSR-ML	WPMW05H315ZPR WPMW06X415ZPR WPMT05H315ZPR-MH WPMT05H315ZPR-ML WPMT06X415ZPR-MH WPMT06X415ZPR-ML WPMT080615ZSR WPMT080615ZSR-MH WPMT080615ZSR-ML	M	With	● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ●			● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ●											EXP05•06•08 (P. 366)
	ZDKA0704TN ZDKA0804TN ZDKA1105TN	ZDKA0704TN ZDKA0804TN ZDKA1105TN	K	With													● ● ●			TBF1000 (P. 374)	
	ZDCA0704TN ZDCA0804TN ZDCA1105TN ZDCA1705TN	ZDCA0704TN ZDCA0804TN ZDCA1105TN ZDCA1705TN	C	With													○ ○ ○ ●				
	BBS-32	BBS-32	C	With														●		TBN1000 (P. 373)	
	ZNCA1002FN2	ZNCA1002FN2	C	Without													●	●			
	ZNCA1203FN ZNCA1603FN ZNCA2004FN ZNCA2505FN ZNCA3005FN	ZNCA1203FN ZNCA1603FN ZNCA2004FN ZNCA2505FN ZNCA3005FN	C	Without													● ● ● ● ●	● ● ● ● ●			
	ZNMM2004EN ZNMM2505EN ZNMM3005EN	ZNMM2004EN ZNMM2505EN ZNMM3005EN	M	With													● ● ●			EBD (P. 369)	
	ZDMT4005-MJ ZDMT5006-MJ	ZDMT4005-MJ ZDMT5006-MJ	M	With					● ●												
	SCMT09T308-23 SCMT120408-23	SCMT09T308-23 SCMT120408-23	M	With					● ●												EBP (P. 370)
	ZPET2004-MJ ZPET2505-MJ ZPET3206-MJ	ZPET2004-MJ ZPET2505-MJ ZPET3206-MJ	E	With					● ● ●	● ● ●											
	DCMW070204TN DCMW11T304TN	DCMW070204TN DCMW11T304TN	M	With					● ●	● ●											

Selection Guides for TAC Endmills

■ Selecting from operation and work material

Face milling



TAC Endmills are listed in order of recommendation from top to bottom

Steels, Stainless steel and Cast irons



Rake angle: A.R. $+5^{\circ}$
R.R. $-4^{\circ} \sim -6^{\circ}$

EXP05•06•08

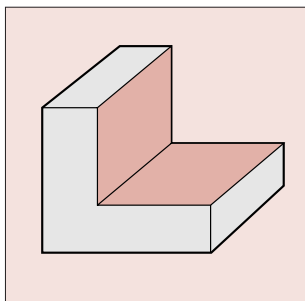
Difficult-to-cut materials



Rake angle: A.R. $+19^{\circ}$
R.R. $+3^{\circ}$

ERF6000

Square shoulder milling



TAC Endmills are listed in order of recommendation from top to bottom

Steels and Stainless steel



Rake angle: A.R. $9^{\circ} \sim 14^{\circ}$
R.R. $-9^{\circ} \sim -20^{\circ}$

**EPS11•17 +
-MJ, -MS**



Rake angle: A.R. $-4^{\circ} \sim +5^{\circ}$
R.R. $-28^{\circ} \sim -11^{\circ}$

**EPN09•14 +
-MJ, -ML**

Cast irons



Rake angle: A.R. $9^{\circ} \sim 14^{\circ}$
R.R. $-9^{\circ} \sim -20^{\circ}$

**EPS11•17 +
-MJ**



Rake angle: A.R. $-4^{\circ} \sim +5^{\circ}$
R.R. $-28^{\circ} \sim -11^{\circ}$

**EPN09•14 +
-MJ**

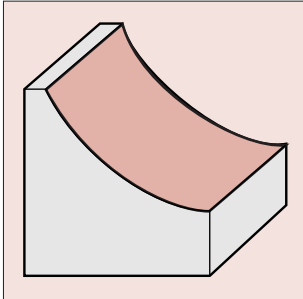
Aluminium alloys



Rake angle: A.R. $-4^{\circ} \sim +5^{\circ}$
R.R. $-28^{\circ} \sim -11^{\circ}$

**EPS +
-AJ**

High-feed milling



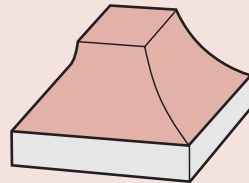
TAC Endmills are listed in order of recommendation from top to bottom



Rake angle: A.R. +5°
R.R. -4° ~ -6°

EXP05•06•08

Die and mould



TAC Endmills are listed in order of recommendation from top to bottom



Rake angle: A.R. -
R.R. -

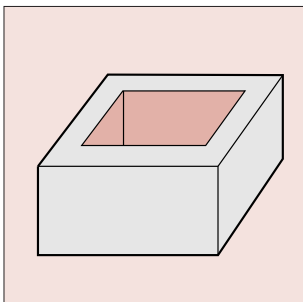
EBP



Rake angle: A.R. -
R.R. -

EBD

Multi-functional milling



TAC Endmills are listed in order of recommendation from top to bottom



Rake angle: A.R. +2° ~ 5°
R.R. -10° ~ -3.5°

EVX



Rake angle: A.R. +8.5° ~ 10°
R.R. -10° ~ -5°

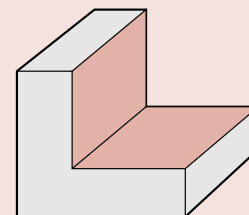
ESD10



Rake angle: A.R. +5°
R.R. -4° ~ -6°

EXP05•06•08

Square shoulder milling



TAC Endmills are listed in order of recommendation from top to bottom



Rake angle: A.R. -
R.R. -

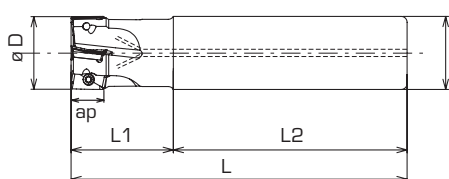
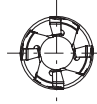
ELP-A

EPS11•17

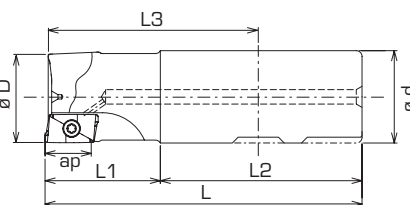
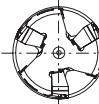
High precision 90° endmills



Cylindrical



Weldon



Rake angle

EPS11: A.R. +9° ~ +17.5° R.R. -20° ~ -7°

EPS17: A.R. +11° ~ +17.5° R.R. +14.5° ~ -7°

ASMT11T3** max. ap: 10.5 (mm)

ASMT1705** max. ap: 16.0 (mm)

Cat. No.		Stock	No. of inserts	Dimensions (mm)						Inserts	Replacement parts			
				ø D	L	L1	L2	L3	ø d		Clamping screw	Wrench		
														
Cylindrical - Standard	EPS11012RS	●	1	12	85	25	60	-	16	AS*T11T3**PDPR-**	CSPB-2.5S	IP-8D		
	EPS11016RS	●	2	16										
	EPS11018RS	●		18										
	EPS11020RS	●		20	100	30	70	-	20					
	EPS11020RSB	●	3										21	
	EPS11021RSB	●												
	EPS11025RS	●		25	115	35	-	25	CSPB-2.5					
	EPS11025RSB	●	4								26			
	EPS11026RSB	●												
	EPS11032RS	●		32	120	40		-					32	
	EPS11032RSB	●	5								33			
	EPS11033RSB	●												
	EPS17025RS	●		25	115	35	-		25	AS*T1705**PDPR-**		CSPB-4S	IP-15D	
	EPS17026RS	●	2								26			
	EPS17032RS	●												32
	EPS17032RSB	●		3	33									
	EPS17033RSB	●												
	Cylindrical - long	EPS11012RL	●			1		12	125		30			95
EPS11016RL		●	2	16	145	40	105							
EPS11018RL		●		18										
EPS11020RL		●		20	185	50	135	-	20					
EPS11021RL		●		21										
EPS11025RL		●		25	220	70	150	-	25					
EPS11026RL		●		26										
EPS11032RL		●		32	255	80	175	-	32					
EPS11033RL		●		33										
EPS17025RL		●		25	220	70	150	-	25					
EPS17026RL		●		26										
EPS17032RL		●		32	255	80	175	-	32	AS*T1705**PDPR-**	CSPB-4S	IP-15D		
EPS17033RL		●		33										
Weldon		EPS11012RS-E		●	1	12	80	25	55	56	16	AS*T11T3**PDPR-**	CSPB-2.5S	IP-8D
	EPS11016RS-E	●	2	16	85	60	65		20					
	EPS11020RSB-E	●	3	20	90			30		63	25			
	EPS11025RSB-E	●	4	25	95			35						
	EPS11032RSB-E	●	5	32	110			40					70	
	EPS17025RS-E	●	2	25	95	35	60	63	25				AS*T1705**PDPR-**	
	EPS17032RSB-E	●	3	32	110	40	70	74	32					

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Reference
guide

Technical data
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Specifications: Inserts

-MJ				-MS				-AJ				
										● Standard stock in Europe		
Item code	Grade						Accuracy	Honing	Dimensions (mm)			
	PVD		CVD		Cermet	Carbide			A	B	S	R
	AH120	AH140	T1015	T3030	NS740	KS05F						
ASMT11T304PDPR-MJ	●		●	●	●		M	with	11.6	6.7	3.7	0.4
ASMT11T304PDPR-MS		●						without				
ASGT11T304PDFR-AJ						●	G	without				
ASMT11T308PDPR-MJ	●		●	●	●		M	with				
ASGT11T308PDFR-AJ						●	G	without	11.6	6.7	3.7	0.8
ASMT11T312PDPR-MJ	●			●			M	with				1.2
ASMT11T316PDPR-MJ	●		●	●	●							1.6
ASMT11T320PDPR-MJ	●											2.0
ASMT11T330PDPR-MJ	●											3.0
ASMT170504PDPR-MJ	●		●	●	●		M	with	16.9	9.8	5.6	0.4
ASGT170504PDFR-AJ						●	G	without				
ASMT170508PDPR-MJ	●		●	●	●		M	with				0.8
ASMT170508PDPR-MS		●										
ASGT170508PDFR-AJ						●	G	without	16.9	9.8	5.6	1.2
ASMT170512PDPR-MJ	●			●			M	with				1.6
ASMT170516PDPR-MJ	●		●	●	●							2.0
ASMT170520PDPR-MJ	●											3.0
ASMT170530PDPR-MJ	●											3.2
ASMT170532PDPR-MJ*	●		●	●	●							

* Note: Inserts with corner radius R 3.2 are not recommended for spiral interpolation.

Cutting conditions

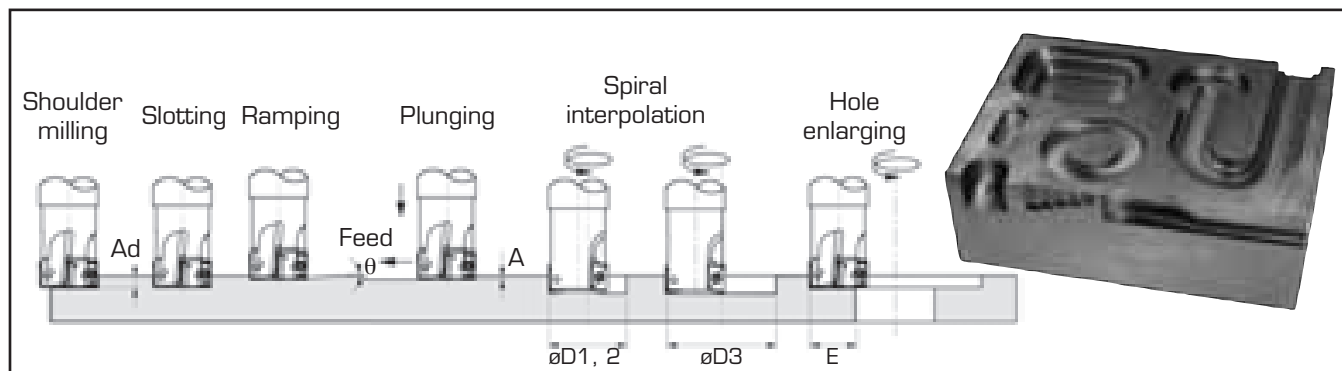
Work materials	Grade	Chip-breaker	Cutting-parameter	Tool diameter (mm)		
				ø 12	ø 16 - ø 21	ø 25 - ø 63
Low alloy steels St42, C45E etc. < 250HB	NS740	-MJ	Vc (m/min)	80 - 100	100 - 120	100 - 150
			ft (mm/t)	0.05 - 0.08	0.05 - 0.12	0.05 - 0.15
	AH120	-MJ	Vc (m/min)	80 - 100	100 - 150	100 - 150
			ft (mm/t)	0.05 - 0.10	0.12 - 0.20	0.12 - 0.20
Alloy steels 42CrMo4, 16MnCr5 etc. < 300HB	NS740	-MJ	Vc (m/min)	80 - 100	80 - 100	80 - 120
			ft (mm/t)	0.05 - 0.08	0.05 - 0.08	0.05 - 0.10
	T3030	-MJ	Vc (m/min)	80 - 100	80 - 120	100 - 200
			ft (mm/t)	0.05 - 0.10	0.10 - 0.15	0.10 - 0.20
Die steels X96CrMoV12 etc. < 300HB	T3030	-MJ	Vc (m/min)	80 - 100	80 - 120	100 - 150
			ft (mm/t)	0.05 - 0.10	0.10 - 0.15	0.12 - 0.20
Stainless steels X8CrNiS18-9 etc. < 250HB	AH140	-MS	Vc (m/min)	80 - 100	100 - 150	100 - 200
			ft (mm/t)	0.05 - 0.10	0.12 - 0.15	0.12 - 0.20
Cast irons GG25 etc.	T1015	-MJ	Vc (m/min)	80 - 100	100 - 150	100 - 200
			ft (mm/t)	0.08 - 0.12	0.12 - 0.20	0.15 - 0.25
Aluminium alloy Si < 12 %	KS05F	-AJ	Vc (m/min)	300 - 1000		
			ft (mm/t)	0.05 - 0.20		
Aluminium alloy Si > 12 %	KS05F	-AJ	Vc (m/min)	100 - 200		
			ft (mm/t)	0.05 - 0.20		
Copper alloy	KS05F	-AJ	Vc (m/min)	200 - 500		
			ft (mm/t)	0.05 - 0.20		

Features
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Reference
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Applications

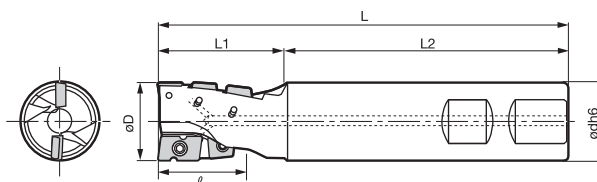


Cat. No.	Tool ø (mm)	Max. cutting depth Ad (mm)	Max. ramping angle (θ)	Max. plunging A (mm)	Min. machining øD1 (mm)	Max. machining øD2 (mm)	* Max. machining øD3 (mm)	Max. cutting width for enlarging E (mm)
EPS11012R**	12	11.0	6°	0.5	15	23	21 - 23	11.5
EPS11016R**	16	10.9	5°		20	31	29 - 31	15.5
EPS11018R**	18		4°		26	35	33 - 34	17.5
EPS11020R**	20		3°		28	39	37 - 39	19.5
EPS11021R**	21	30			41	39 - 41	20.5	
EPS11025R**	25	10.8	2°		38	49	47 - 49	24.5
EPS11026R**	26				40	51	49 - 51	25.5
EPS11032R**	32	10.7	1° 30'		52	63	61 - 63	31.5
EPS11033R**	33				54	65	63 - 65	32.5
EPS17025R**	25	16.3	5°	1.0	32	48	46 - 48	24.0
EPS17026R**	26				34	51	49 - 51	25.0
EPS17032R**	32	16.2	3° 30'		46	62	60 - 62	31.0
EPS17033R**	33				48	65	63 - 65	32.0

* Plain bore hole bottom

ELP-A

For slotting with large cutting depth of steels and cast irons



Max. cutting depth:

ELP13: 28 mm

ELP17: 35 mm

ELP21: 44 mm

Specifications

Cat. No.	Stock	Inserts	Effective No. of inserts (No. of inserts)	Dimensions (mm)						Parts	
				øD	L	L ₁	L ₂	ød	ℓ	Clamping screw	Wrench
ELP13025RA	●	APMT070308PN-MJ ADMT130308PR-MJ	2 (5)	25	130	40	90	25	28	CSPB-2.5 CSPD-3	IP-8D IP-10D
ELP17032RA	●	APMT09T308PN-MJ ADMT17T308PR-MJ		32	140	50		32	35	CSPD-3 CSPB-4S	IP-10D IP-15D
ELP21040RAS40	●	APMT120408PN-MJ ADMT210408PR-MJ		40	150	60		40	44	CSPB-4 CSTB-5	IP-15D T-20D

Inserts

(Used for end cutting edge)

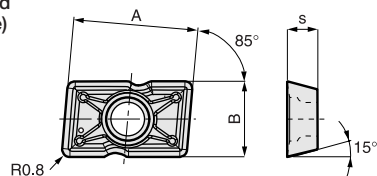


Fig. 1

(Used for both end and peripheral edges)

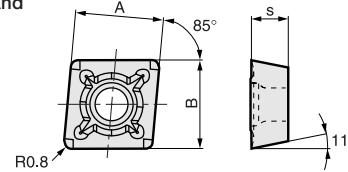


Fig. 2

Cat. No.	Accuracy	Honing	Grade			Dimensions (mm)			Fig.
			AH120	AH140	T3030	A	B	s	
ADMT130308PR-MJ	M	With	●	○	○	13.1	7.94	3.18	1
ADMT17T308PR-MJ			●	○	○	16.6	9.525	3.97	
ADMT210408PR-MJ			●	○	○	20.6	12.7	4.76	
APMT070308PN-MJ			●	○	○	7.94	7.94	3.18	2
APMT09T308PN-MJ			●	○	○	9.525	9.525	3.97	
APMT120408PN-MJ			●	○	○	12.7	12.7	4.76	

Standard cutting conditions

Work materials	Grade	Cutter diameter (mm)					
		ø25		ø32		ø40	
		Vc (m/min)	ft (mm/tooth)	Vc (m/min)	ft (mm/tooth)	Vc (m/min)	ft (mm/tooth)
Mild steels, Low carbon steels	T3030(AH120)	60 ~ 150	0.08 ~ 0.2	60 ~ 150	0.1 ~ 0.3	60 ~ 150	0.1 ~ 0.3
High carbon steels, Alloy steels	T3030(AH120)	60 ~ 120		60 ~ 120		60 ~ 120	
Die steels	T3030(AH120)	60 ~ 100		60 ~ 100		60 ~ 100	
Stainless steels	AH140	70 ~ 120		70 ~ 120		70 ~ 120	
Cast irons	AH120	60 ~ 150		60 ~ 150		60 ~ 150	

- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

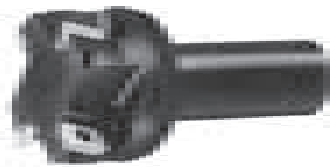
• Vc: Cutting speed

• ft: Feed per tooth (Feed per revolution is ft x 2 as effective number of teeth is equal to two)

Notes: • To get the best of the tool's performance, use of a high-accuracy, side-lock type toolholder or milling chuck which has a high gripping force is recommended.
• Excessive tool overhang from the toolholder should be avoided to prevent chatter.

Features	Reference guide	Technical data
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“Laser-Mill”

EPE

High-precision square shoulder milling

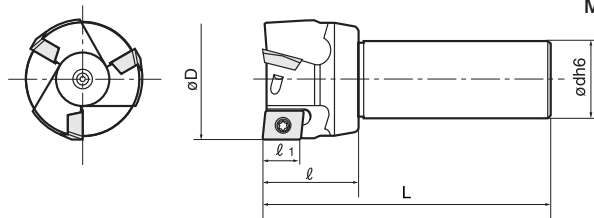
Rake angle: A.R. +12° ~ +17° R.R. -10° ~ 0°

Max. cutting depth:

EPE40: 12 mm

EPE50: 14 mm

EPE60: 16 mm



■ Specifications

● EPE4000

Cat. No.	Stock	Inserts	No. of inserts	Dimensions (mm)					Clamping screw	Wrench
				øD	ød	l ₁	l	L		
EPE4020RE	●	AECW1403PES/FR	1	20	20	12	30	100	CSTB-3S	T-9D
EPE4025RE	●	AEMW1403PET/FR	2	25	25		35	115		

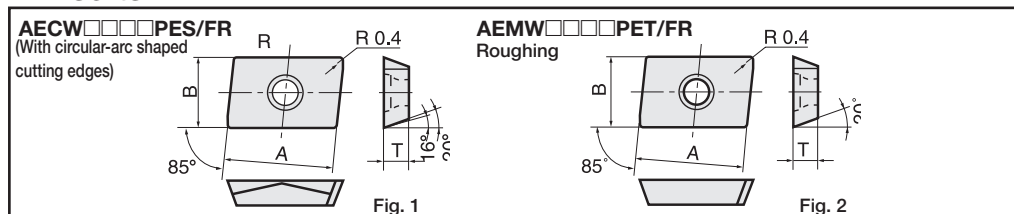
● EPE5000

Cat. No.	Stock	Inserts	No. of inserts	Dimensions (mm)					Clamping screw	Wrench
				øD	ød	l ₁	l	L		
EPE5030RE	●	AECW16T3PES/FR AEMW16T3PET/FR	2	30	32	14	45	125	CSTB-4S	T-15D
EPE5035RE				35						
EPE5040RE	●			40						

● EPE6000

Cat. No.	Stock	Inserts	No. of inserts	Dimensions (mm)					Clamping screw	Wrench
				øD	ød	l ₁	l	L		
EPE6050RE	●	AECW1804PES/FR	3	50	32	16	40	120	CSTB-4M	T-15D
EPE6063RE	●	AEMW1804PET/FR	4	63			45	125		

■ Inserts



Cat. No. (Metric)	Accuracy	Honing	PVD Coated		Cermet	Uncoated		Dimensions (mm)				Fig.	Application
			GH330	AH120		TH10	UX30	A	B	T	R		
AECW1403PESR	C	with	●	○	○	○	○	14	9	3.18	with 1	1	Steels, cast irons
AECW1403PEFR		without	●	○	○	○	○	16		3.97			Light alloys
AECW16T3PESR		with	●	○	○	○	○	16	12				Steels, cast irons
AECW16T3PEFR		without	●	○	○	○	○	18		4.76			Light alloys
AECW1804PESR	M	with	●	○	○	○	○	14	8.9	3.18	without 2	2	Steels, cast irons
AECW1804PEFR		without	●	○	○	○	○	16		3.97			Light alloys
AEMW1403PETR		with	●	○	○	○	○	16	11.9				Steels, cast irons
AEMW1403PEFR		without	●	○	○	○	○	18		4.76			Light alloys

• When high-precision wall straightness is not required, use AEMW□□□□PET/FR type inserts.

■ Standard cutting conditions

Work materials	Insert grades	Cutting speed Vc (m/min)		Feed per tooth ft (mm/t)
		ø20 ~ 35	ø40 ~ 63	
Mild steels · Unhardened steels ($< 180\text{HB}$)	GH330, AH120	80 ~ 150	130 ~ 230	0.1 ~ 0.20
	NS740	100 ~ 150	130 ~ 180	0.1 ~ 0.15
	UX30	80 ~ 150	100 ~ 150	0.1 ~ 0.20
Carbon steels · Alloy steels ($< 300\text{HB}$)	GH330, AH120	80 ~ 100	100 ~ 200	0.1 ~ 0.20
	NS740	80 ~ 100	100 ~ 150	0.1 ~ 0.15
	UX30	80 ~ 100	80 ~ 120	0.1 ~ 0.20
Cast irons	TH10	80 ~ 100	80 ~ 100	0.1 ~ 0.15
	UX30	80 ~ 100	80 ~ 100	0.1 ~ 0.20

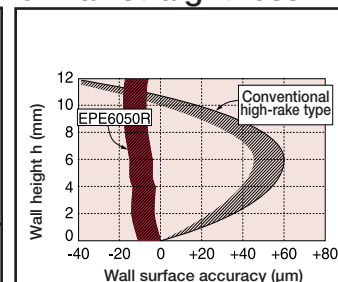
• No. of revolutions n (rpm) = Cutting speed Vc (m/min) $\times$ 1000 $\div$ 3.14 $\div$ Cutter ø (mm)

• Table feed Vf (mm/min) = n (rpm) $\times$ Feed per tooth ft (mm/t) $\times$ t (No. of inserts)

Work materials	Insert grades	Cutting speed Vc (m/min)		Feed per tooth ft (mm/t)
		ø20 ~ 35	ø40 ~ 63	
Stainless steels ($< 250\text{HB}$)	GH330 AH120	100 ~ 120	120 ~ 150	0.1 ~ 0.20
Die steels ($< 300\text{HB}$)	AH120 NS740	80 ~ 100	100 ~ 120	0.1 ~ 0.15
Aluminium alloys (Si $< 10\%$)	TH10	200 ~ 300	300 ~ 500	0.1 ~ 0.25

• Dry cutting is recommended except for aluminium alloys.

● Wall straightness



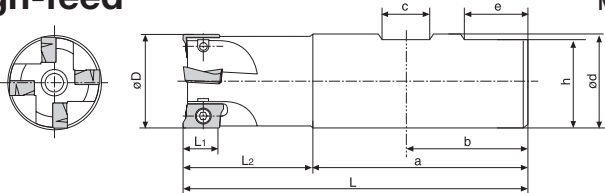
Work materials: Ck50 (210HB)
Cutting speed Vc: 100 m/min
Feed per tooth ft: 0.1 mm/t
Cutting depth ap: 14 mm
Cutting width ae: 10 mm
(AECW1804PESR used)

“Top- Feed Mill”

EPN 09.14



For high-speed and high-feed

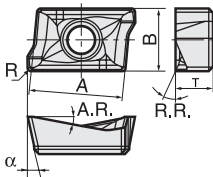


Specifications

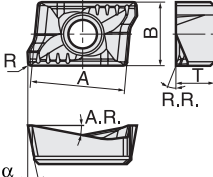
Cat. No.	Stock	Inserts	No. of inserts	Dimensions (mm)										Clamping screw	Wrench
				øD	ød	L ₁	L ₂	L	a	b	c	e	h		
EPN09010R-E	●	ANMT09T3PPPR-**	1	10	16	9	25	80	55	24	10	-	14	CSTB-2.5S	T-8D
EPN09012R-E	●		1	12	16	9	25	80	55	24	10	-	14		
EPN09016R-E	●		2	16	16	9	25	85	60	24	10	-	14	CSTB-2.5	
EPN09020R-E	●		3	20	20	9	30	90	60	25	11	-	18		
EPN09025R-E	●		4	25	25	9	35	95	60	32	12	17	23		
EPN09032R-E	●		5	32	25	9	35	95	60	32	12	17	23		
EPN14025R-E	●	ANMT1404PPPR-**	2	25	25	14	35	95	60	32	12	17	23	CSTB-3	T-9D
EPN14032R-E	●		3	32	32	14	40	110	70	36	14	19	30		
EPN14040R-E	●		4	40	32	14	40	115	75	36	14	19	30		

Applicable inserts

ANMT□□□□PPPR-MJ



ANMT□□□□PPPR-ML



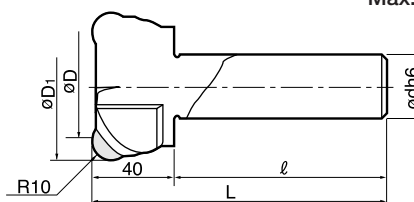
Cat. No.	Grade							Dimensions (mm)						Rake angle		Application	
	PVD Coated				CVD Coated		Cermet	A	B	T	α	β	R	I.A.R	I.R.R		
	AH330	AH120	GH330	GH340	T3030	T1015	NS530										
ANMT09T3PPPR-MJ	●	●	●		●	●	●	9.525	6.5	3.97	+11°	0°	0.4	+11°	+20°	Steels Cast irons	
ANMT1404PPPR-MJ	●	●	●		●	●	●	14.0	9.525	4.76	+11°	0°	0.8	+11°	+20°		
ANMT09T3PPPR-ML		●		●				9.525	6.5	3.97	+11°	0°	0.4	+11°	+25°		
ANMT1404PPPR-ML		●		●				14.0	9.525	4.76	+11°	0°	0.8	+11°	+25°		

TAC Endmills

■ Standard cutting conditions

Work materials	Insert	Cutting parameter	Cutter diameter (mm)			
			ø10 ~ ø12	ø16	ø20	ø25 ~
Carbon steel, alloy steel (< 300HB) Ck50, 42CrMo4	T3030 MJ	vc (m/min) ft (mm/tooth)	60 ~ 100 0.05 ~ 0.1	80 ~ 120 0.1 ~ 0.15	100 ~ 200 0.1 ~ 0.2	100 ~ 200 0.1 ~ 0.2
Mild steel, low carbon steel (< 250HB) USt42-2, Ck25	AH120 ML		80 ~ 100 0.05 ~ 0.1	100 ~ 150 0.1 ~ 0.15	100 ~ 200 0.12 ~ 0.2	100 ~ 200 0.12 ~ 0.2
Die steels (< 300HB) X155CrVMo12-1	T3030 MJ		60 ~ 100 0.05 ~ 0.1	80 ~ 120 0.1 ~ 0.15	100 ~ 150 0.1 ~ 0.2	80 ~ 150 0.1 ~ 0.2
Stainless steels (< 250HB) 1.4301, 1.4401	AH120 ML		80 ~ 100 0.05 ~ 0.1	100 ~ 150 0.1 ~ 0.15	100 ~ 200 0.1 ~ 0.2	100 ~ 200 0.1 ~ 0.2
Grey and Ductile cast iron GG25	AH120 MJ		80 ~ 100 0.08 ~ 0.12	100 ~ 150 0.12 ~ 0.2	100 ~ 200 0.15 ~ 0.25	100 ~ 200 0.15 ~ 0.25

- Notes:
- When machining general steels and die steels where the surface roughness is important, GH330 grade is recommended.
 - When using the smaller side of the cutter diameter or cutting at a large cutting depth or a large cutting width, use the lower sides of “vc” and “ft” values shown in the table.
 - Dry cutting (including air-blowing) is generally recommended.
 - EPN-type TAC endmills cannot be used for axial-feed cutting such as ramping, plungin, and drilling.
- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

ERF6000**For difficult-to-cut materials**
 Rake angle: A.R. +19° R.R. +3°
 Max. cutting depth: 3 mm
**Specifications**

Cat. No.	Stock	No. of inserts	Dimensions (mm)					Locator	Insert locking wedge	Wedge fixing screw	Locator fixing screw	T-handle wrench
			øD	øD ₁	ød	L	l					
ERF6050RE	●	3	50	70	32	120	80	LF602R	WF602R	FDS-6Z	CM4×0.7×20	TP-3A
ERF6063RE	●	4	63	83								

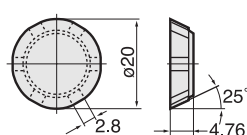
InsertsRFEN2004ZFTN
(With flattened flanks)

Fig. 1

RFEN2004M0TN

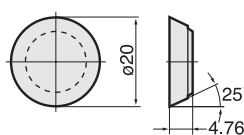


Fig. 2

Cat. No. (Metric)	Accuracy	Honing	Grade					Fig.	Application
			PVD Coated		Uncoated				
			AH120	GH330	KS20	UX30	TU40		
RFEN2004ZFTN	E	with	●	○	●	●	○	1	Medium finishing
RFEN2004M0TN	E	with	●	○	○	●	○	2	For roughing through boring

Notes : • RFEN2004M0TN type inserts should not be used for finishing requiring surface finish better than 12S.
 • RFEN2004ZFTN type inserts can be used for both finishing and roughing at cutting depth up to 3 mm.

Standard cutting conditions

Work materials		Recommended insert grades	Cutting depth ap: 1 ~ 3 mm		Cutting depth ap: 0.4 ~ 1 mm		Cutting fluid
			Vc (m/min)	ft (mm/t)	Vc (m/min)	ft (mm/t)	
Super alloys Inconel, Hastelloy, etc.		AH120	20 ~ 40	0.1 ~ 0.15	20 ~ 60	0.2 ~ 0.4	Water insoluble type
Titanium alloys TiAl6V4 etc.		AH120	40 ~ 60	0.15 ~ 0.35	40 ~ 70	0.2 ~ 0.5	Water soluble type or dry cutting
Stainless steels	Austenitic Ferritic 1.4301, X6Cr17 (< 300HB)	UX30	150 ~ 230	0.2 ~ 0.35	180 ~ 250	0.2 ~ 0.5	Dry cutting
							Water soluble type
	Precipitation hardening X5CrNiCuNb17-4-4 (< 35HRC)	UX30	130 ~ 180	0.15 ~ 0.3	150 ~ 200	0.2 ~ 0.4	Dry cutting
							Water soluble type
Hard materials (40 ~ 50HRC)		AH120	20 ~ 50	0.05 ~ 0.1	20 ~ 50	0.05 ~ 0.2	Water insoluble type

• No. of revolutions n (rpm) = Cutting speed V_c (m/min) $\times 1000 \div 3.14 \div$ Cutter ϕ (mm)
 • Table feed V_f (mm/min) = n (rpm) $\times$ Feed per tooth f_t (mm/t) $\times t$ (No. of inserts)

Features
 P. 350 ~ 353

Reference guide
Technical data
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EXP05•06•08

Super high feed milling of curvature

Rake angle: A.R. +5° R.R. -4° ~ -6°
Max. cutting depth ap: 1.5 mm



Cylindrical shank with air hole

Cat. No.		Stock	No. of inserts	Dimensions (mm)					Inserts	Replacement parts		
				ø D	ø d	L	L1	L2		Clamping screw	Clamp-set	Wrench
												 
Standard	EXP05020RS	●	2	20	20	130	50	80	WPM*05H315ZPR-**	CSPB-3.5S	-	IP-15D
	EXP05021RS	●		21								
	EXP06025RS	●		25								
	EXP06026RS	●		26								
	EXP06032RS	●	3	32	32	150	70		WPM*06X415ZPR-**	CSPB-4S	CSY-15	IP-15D
	EXP06032RSB	●										
	EXP06033RS	●	2	33								
	EXP06033RSB	●	3									
	EXP06040RS	●	40	50				100				
	EXP08040RSA	●							2	WPMT080615Z*R-**	CSTB-5	CSX20
Long	EXP05020RL	●	2	20	20	180	100	80	WPM*05H315ZPR-**	CSPB-3.5S	-	IP-15D
	EXP05021RL	●		21								
	EXP06025RL	●		25								
	EXP06026RL	●		26								
	EXP06032RL	●	3	32	200	120	WPM*06X415ZPR-**		CSPB-4S	CSY-15	IP-15D	
	EXP06032RLB	●										
	EXP06033RL	●	2	33								
	EXP06033RLB	●	3									
	EXP06040RL	●	40	250			50	200				
	EXP08040RLA	●							2	WPMT080615Z*R-**	CSTB-5	CSX20
Extra long	EXP05020RLL	●	2	20	20	250	130	120	WPM*05H315ZPR-**	CSPB-3.5S	-	IP-15D
	EXP05021RLL	●		21			50	200				
	EXP06025RLL	●		25			180	120	WPM*06X415ZPR-**	CSPB-4S	CSY-15	IP-15D
	EXP06026RLL	●		26			60	240				
	EXP06032RLL	●	3	32	300	180	120					
	EXP06033RLL	●				70	230					
	EXP06040RLL	●	3	40		50	250					
	EXP08040RLL	●	2					WPMT080615Z*R-**	CSTB-5	CSX20	T-20T	

Specifications: Inserts

WPMW type	Cat. No.	Tolerance	Honing	Dimensions (mm)			Grade			
				a	t	B	PVD coated		CVD coated	
							AH120	AH140	T3030	T1015
	WPMW05H315ZPR	M	with	5	3.50	7.94	●	●	●	●
	WPM*05H315ZPR-MH						●	●		
	WPM*05H315ZPR-ML						●	●	●	
	WPMW06X415ZPR			6	4.20	9.525	●	●	●	●
	WPM*06X415ZPR-MH						●	●		
	WPM*06X415ZPR-ML						●	●	●	
	WPM*080615ZSR			8	6.35	12.7	●	●	●	●
	WPM*080615ZSR-MH						●	●		
	WPM*080615ZPR-ML						●	●	●	

Features
P. 350 ~ 353

Reference
guide

Technical data
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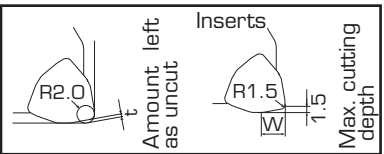
Cutting data
EXP 05 / 06 type

Work materials	Grade	Cutting speed Vc (m/min)	Feed per tooth ft (mm/t)	Recommended cutting conditions			
				ø 20, ø 21 t = 2	ø 25, ø 26 t = 2	ø 32, ø 33 t = 2 - 3	ø 40 t = 3
Carbon steels Ck45 etc. < 300HB	T3030 (AH120)	100 - 250	0.5 - 2.0	Vc = 150 m/min, ft = 0.8 mm/t ap = 1.0 mm, ae = 1.0 x D mm Z-axis plunging: ft = 0.2 mm/t			
Alloy steels 42CrMo4, 16MnCr5 etc. < 300HB	T3030 (AH120)	100 - 200	0.5 - 2.0	Vc = 130 m/min, ft = 0.8 mm/t Vc = 130 m/min, ft = 1.0 mm/t ap = 1.0 mm, ae = 1.0 x D mm Z-axis plunging: ft = 0.2 mm/t			
Die steels X96CrMoV12 etc. < 300HB	AH120 (T3030)	80 - 150	0.5 - 1.0	Vc = 100 m/min, ft = 0.5 mm/t ap = 1.0 mm, ae = 1.0 x D mm Z-axis plunging: ft = 0.1 mm/t			
Stainless steels X5CrNi1810 etc. < 250HB	AH140	100 - 200	0.5 - 2.0	Vc = 130 m/min, ft = 0.8 mm/t Vc = 130 m/min, ft = 1.0 mm/t ap = 1.0 mm, ae = 1.0 x D mm Z-axis plunging: ft = 0.2 mm/t			
Cast irons GG25 etc.	T1015	100 - 250	0.8 - 2.5	Vc = 150 m/min, ft = 1.0 mm/t Vc = 180 m/min, ft = 1.5 mm/t ap = 1.0 mm, ae = 1.0 x D mm Z-axis plunging: ft = 0.2 mm/t			

EXP08 type

Work materials	Grade	Cutting speed Vc (m/min)	Feed per tooth ft (mm/t)	Recommended cutting conditions	
				ø 40, t = 2	
Carbon steels Ck45 etc. < 300HB	T3030 (AH120)	150 - 250	0.5 - 2.0	Vc = 180 m/min, ft = 1.0 mm/t ap = 1.0 mm, ae = 40 mm Z-axis plunging: ft = 0.2 mm/t	
Alloy steels 42CrMo4, 16MnCr5 etc. < 300HB	T3030 (AH120)	100 - 200	0.5 - 2.0	Vc = 130 m/min, ft = 1.0 mm/t ap = 1.0 mm, ae = 40 mm Z-axis plunging: ft = 0.2 mm/t	
Die steels X96CrMoV12 etc. < 300HB	AH120 (T3030)	80 - 150	0.5 - 1.0	Vc = 100 m/min, ft = 0.5 mm/t ap = 1.0 mm, ae = 40 mm Z-axis plunging: ft = 0.1 mm/t	
Stainless steels X5CrNi1810 etc. < 250HB	AH140	100 - 200	0.5 - 2.0	Vc = 130 m/min, ft = 1.0 mm/t ap = 1.0 mm, ae = 40 mm Z-axis plunging: ft = 0.2 mm/t	
Cast irons GG25 etc.	T1015	150 - 250	0.8 - 2.5	Vc = 180 m/min, ft = 1.5 mm/t ap = 1.0 mm, ae = 40 mm Z-axis plunging: ft = 0.2 mm/t	

Tool geometry on programming

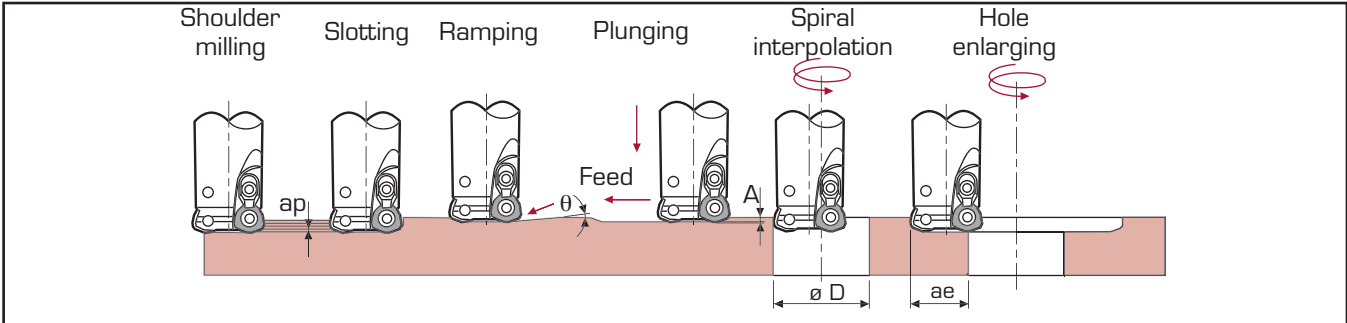


Milling type	W (mm)	t (mm)	R (mm)
EXP05	3.8	0.5	2.0
EXP06	4.3	0.7	2.5
EXP08	5.7	0.7	2.0

When programming the machine path, a theoretical radius (R) and the residual amount (t) should be calculated.

*The recommended cutting parameter are merely a starting guideline and should be optimised according to individual machining requirements

Application

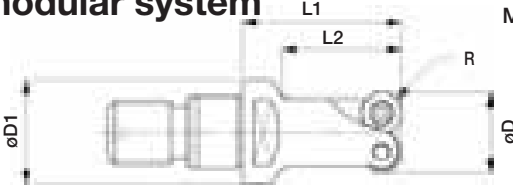


Cat. No.	Tool ø (mm)	Max. cutting depth ap (mm)	Max. ramping angle (θ)	Max. plunging A (mm)	Min. machining ø D (mm)	Max. machining ø D (mm)	Max. cutting width for enlarging ae (mm)
EXP05020RS/L/LL	20	1.5	3°	0.5	30	37	16
EXP05021RS/L/LL	21		2° 30'		32	39	17
EXP06025RS/L/LL	25		5°		33	47	20
EXP06026RS/L/LL	26		4° 30'	35	49	21	
EXP06032RS/L/LL	32		3° 30'	47	61	27	
EXP06033RS/L/LL	33		3°	49	63	28	
EXP06040RS/L/LL	40		2°	63	77	35	
EXP08040R/L/LL			6°	53		34	

HWD•TMS



HWD-type cutting heads + T-BAR modular system



Max. cutting depth:
HWD05: 2.5 mm
HWD07: 3.5 mm
HWD10: 5.0 mm

Specifications

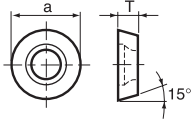
Insert ø	Cat. No.	Stock	No. of inserts	Dimensions (mm)				Thread	Inserts	Extensions	Screw
				øD	øD1	L1	L2				
5.0	HWD05010R	●	2	10	13	20	15	M8 x 1	RDMW0501M0	HD01520L110T	CSTD-1.8
	HWD05012R	●	3	12							
	HWD05015R	●	4	15							
	HWD05020R	●	5	20	18	25	-	M12 x 1.5		HD02025L150T	
	HWD05025R	●	6	25	23			25		M14 x 1.5	
7.0	HWD07015R	●	3	15	13	20		M8 x 1	RDMW0702M0	HD01520L110T	CSTB-2.5S
	HWD07020R	●	4	20	18			M12 x 1.5		HD02025L150T	
	HWD07025R	●	5	25	23			25		M14 x 1.5	
10.0	HWD10020R	●	2	20	18	20	M12 x 1.5	RDMW1003M0	HD02025L150T	CSTB-3.5H	
	HWD10025R	●	3	25	23	25	M14 x 1.5		HD02532L170T		

T-Bar extension



Cat. No.	Dimensions (mm)				
	ød1	L3	L4	L5	øD1
HD01520L110T	20	50	60	10	13
HD02025L150T	25	70	80	20	18
HD02532L170T	32	90	80	20	23

Inserts



Cat. No.	Grade	Dimensions (mm)	
	AH120	a	T
RDMW0501M0	●	5.0	1.40
RDMW0702M0	●	7.0	2.38
RDMW1003M0	●	10.0	3.18

Standard cutting conditions

Work materials	Grade	Cutting speed Vc (m/min)	Feed per tooth ft (mm/t)	Cutting depth: ap (mm)		
				ø 10, 12	ø 15, 20	ø 25
Carbon steels < 300HB	AH120	200 ~ 500	0.15 ~ 0.45	~ 0.5	~ 0.7	~ 1.0
Alloy steels < 300 HB		120 ~ 350	0.15 ~ 0.35			
Die steels		100 ~ 300	0.10 ~ 0.30			
Hardened steels < 40HRC		70 ~ 200	0.10 ~ 0.25			
Cast irons		200 ~ 500	0.20 ~ 0.50			

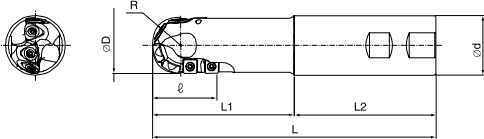
- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

Ball Endmill

EBD



Medium to rough die engraving

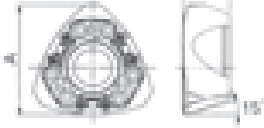


Specifications

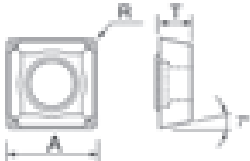
Cat. No.	Stock	No. of inserts	Dimensions (mm)							Inserts
			øD	L	L1	L2	L eff.	R	ød	
EBD040SDE-E	●	4 + 3	40	170	100	70	45	20	40	ZDMT4005-MJ
EBD040MME-E	●	4 + 3	40	170	120	109	45	20	MK4	SCMT09T308-23
EBD050SDE-E	●	4 + 3	50	229	100	70	59	25	40	ZDMT5006-MJ
EBD050MME-E	●	4 + 3	50	256	120	136	59	25	MK5	SCMT120408-23

Inserts

ZDMT
R-edge



SCMT
Peripheral edge

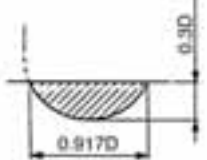


Replacement parts

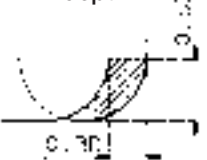
Cutter Cat. No.	Clamping screw	Wrench
EBD040__-E	CSTB-4M	T-15T
EBD050__-E	CSTB-5	T-20T

Machining types

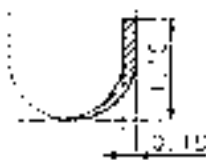
(1) Grooving



(2) Shouldering at shallow cutting depth



(3) Shouldering at deep cutting depth



Notes: • Cutting speeds shown in the left table are of the most outer diameter of the tool.
• When using the tool at the upper side of cutting depths shown in the table, use the lower side of the values shown in the table.
• When using MME-type cutters, the cutting speed and feed should be reduced to 60% ~ 80% of the values shown in the table.

Standard cutting conditions

Work materials	Grade	Machining type	Cutting speed Vc (m/min)	Table feed Vf (mm/min)	
				ø 40 mm	ø 50 mm
Carbon steels (< 300HB)	AH120	(1)	180 (150 ~ 210)	760 (610 ~ 910)	610 (460 ~ 760)
		(2)	200 (170 ~ 230)	1100 (900 ~ 1300)	880 (680 ~ 1080)
		(3)	160 (130 ~ 190)	570 (420 ~ 720)	460 (310 ~ 610)
Alloy steels (< 300HB)	AH120	(1)	160 (130 ~ 190)	680 (530 ~ 830)	550 (400 ~ 700)
		(2)	180 (150 ~ 210)	1000 (800 ~ 1200)	800 (600 ~ 1000)
		(3)	140 (110 ~ 170)	510 (360 ~ 660)	400 (250 ~ 550)
Die steels (< 300HB)	AH120	(1)	140 (110 ~ 170)	570 (420 ~ 720)	460 (310 ~ 610)
		(2)	160 (130 ~ 190)	860 (660 ~ 1060)	690 (490 ~ 890)
		(3)	120 (90 ~ 150)	410 (260 ~ 560)	330 (180 ~ 480)
Cast irons	AH120	(1)	200 (170 ~ 230)	950 (800 ~ 1000)	760 (610 ~ 910)
		(2)	220 (190 ~ 250)	1200 (900 ~ 1400)	1000 (700 ~ 1200)
		(3)	180 (150 ~ 210)	570 (420 ~ 720)	460 (310 ~ 610)
Hardened Prehardened steels (< 45 HRC)	AH120	(1)	90 (70 ~ 110)	250 (150 ~ 350)	200 (100 ~ 300)
		(2)	100 (80 ~ 120)	310 (160 ~ 460)	250 (100 ~ 400)
		(3)	60 (50 ~ 90)	190 (140 ~ 240)	150 (100 ~ 200)

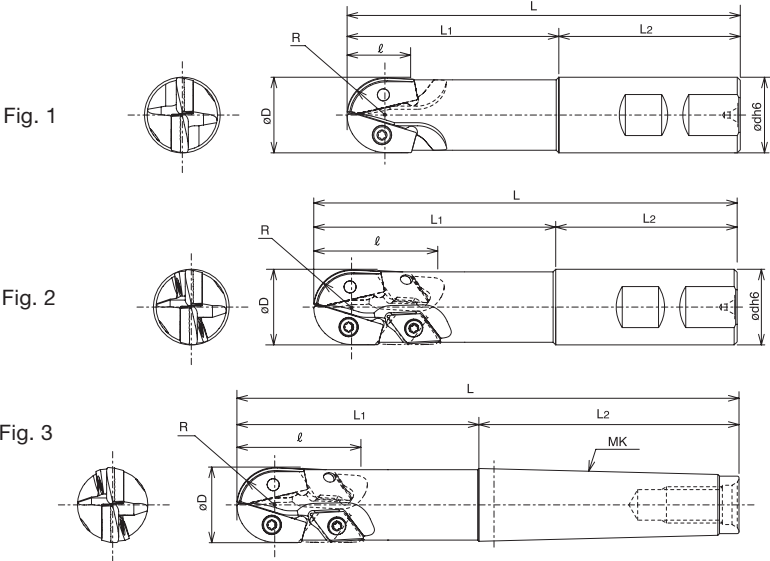
• No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
• Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

Ball Endmill

EBP



Medium to finish die engraving



Specifications

Cat. No.	Stock	No. of inserts	Dimensions (mm)								Fig.	Inserts		
			øD	L	L1	L2	ℓ	ød	R	MK				
EBP020SD-E	●	2	20	116	60	56	16	20	10	-	1	ZPET2004-MJ	—	
EBP020MDE-E	●	2+2		126	70	69	29.5	-		MK2	2		DCMW070204TN	
EBP020MME-E	●	2+2		139			21	25	12.5	-	3		ZPET2505-MJ	—
EBP025SD-E	●	2	25	130	80	86	41	-	16	-	1	ZPET3206-MJ		—
EBP025MDE-E	●	2+2		140			25	32		-	2			DCMW11T304TN
EBP025MME-E	●	2+2		166	100	109	60	46	32	16	-		2	ZPET3206-MJ
EBP032SD-E	●	2	140	46							-	16	-	
EBP032MDE-E	●	2+2	160				32	16	-	MK4				
EBP032MME-E	●	2+2	209	3							DCMW11T304TN			

Note: SD-E Type: Single cutting edge, DIN shank
MD-E Type: Multiple cutting edge, DIN shank
MM-E Type: Multiple cutting edge, Morse Taper shank

Inserts

ZPET
R-edge



DCMW
Peripheral edge

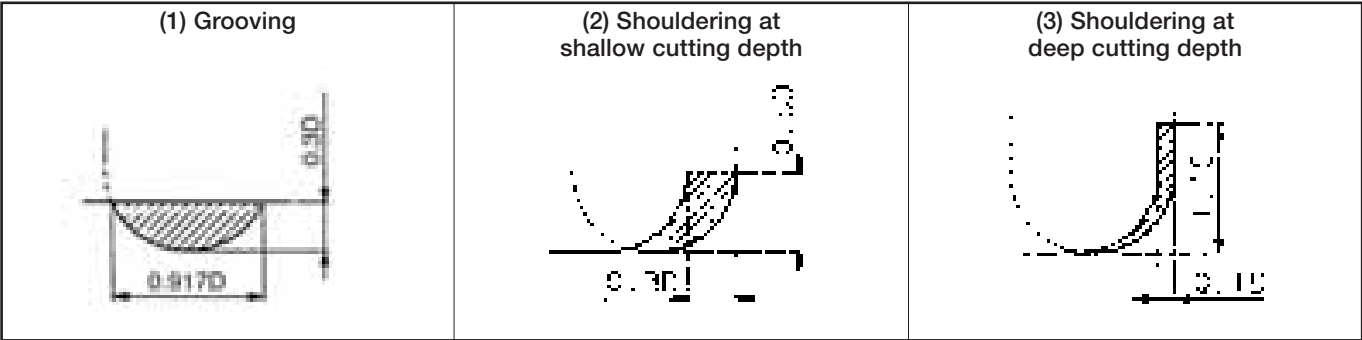


Cat. No.	Accuracy	Honing	Grades		Dimensions (mm)			
			AH120	AH330	A	T	R	
ZPET2004-MJ	E	With	●	●	-	4.5	10	
ZPET2505-MJ			●	●		4.625	12.5	
ZPET3206-MJ			●	●		6.75	16	
DCMW070204TN	M		●	●	6.35	2.38	0.4	
DCMW11T304TN			●	●	9.525	3.97	0.4	

■ Replacement parts

Cutter Cat. No.	for ZPET		for DCMW	
	Clamping screw	Wrench	Clamping screw	Wrench
EBP020SD-E	CSTD-3T	T-10D	—	—
EBP020MDE-E			CSTB-2.5S	T-8D
EBP020MME-E				
EBP025SD-E	CSTB-4S	T-15D	—	—
EBP025MDE-E			CSTB-4S	T-15D
EBP025MME-E				
EBP032SD-E	CSTB-5	T-20D	—	—
EBP032MDE-E			CSTB-4S	T-15D
EBP032MME-E				

■ Machining types



- Notes:
- Cutting speeds shown in the table are of the most outer diameter of the tool.
 - When using the tool at the upper side of cutting depths shown in the table, use the lower side of the values shown in the table.
 - When using MDE / MME type cutters, the cutting speed and feed should be reduced to 60 % ~ 80 % of the values shown in the table.

■ Standard cutting conditions

Work materials	Grades	Machining type	Cutting speed Vc (m/min)	Table feed Vf (mm/min)		
				ø 20 mm	ø 25 mm	ø 32 mm
Carbon steels (< 300HB)	AH120	(1)	200 (170 ~ 230)	760 (610 ~ 910)	610 (460 ~ 760)	510 (360 ~ 660)
		(2)	230 (200 ~ 260)	1100 (900 ~ 1300)	880 (680 ~ 1080)	730 (530 ~ 930)
		(3)	180 (150 ~ 200)	570 (420 ~ 720)	460 (310 ~ 610)	380 (230 ~ 530)
Alloy steels (< 300HB)	AH120	(1)	180 (150 ~ 210)	680 (530 ~ 830)	550 (400 ~ 700)	450 (300 ~ 600)
		(2)	210 (180 ~ 240)	1000 (800 ~ 1200)	800 (600 ~ 1000)	670 (470 ~ 870)
		(3)	160 (130 ~ 180)	510 (360 ~ 660)	400 (250 ~ 550)	340 (190 ~ 490)
Die steels (< 300HB)	AH330	(1)	150 (120 ~ 180)	570 (420 ~ 720)	460 (310 ~ 610)	380 (230 ~ 530)
		(2)	180 (150 ~ 210)	860 (660 ~ 1060)	690 (490 ~ 890)	570 (370 ~ 770)
		(3)	130 (100 ~ 150)	410 (260 ~ 560)	330 (180 ~ 480)	280 (130 ~ 430)
Cast irons	AH120	(1)	200 (170 ~ 230)	950 (800 ~ 1000)	760 (610 ~ 910)	640 (490 ~ 790)
		(2)	230 (200 ~ 260)	1200 (900 ~ 1400)	1000 (700 ~ 1200)	830 (530 ~ 1030)
		(3)	180 (150 ~ 200)	570 (420 ~ 720)	460 (310 ~ 610)	380 (230 ~ 530)
Hardened Prehardened steels (< 45 HRC)	AH120	(1)	80 (60 ~ 100)	250 (150 ~ 350)	200 (100 ~ 300)	160 (100 ~ 260)
		(2)	100 (70 ~ 130)	310 (160 ~ 460)	250 (100 ~ 400)	210 (100 ~ 360)
		(3)	60 (40 ~ 80)	190 (140 ~ 240)	150 (100 ~ 200)	130 (80 ~ 180)

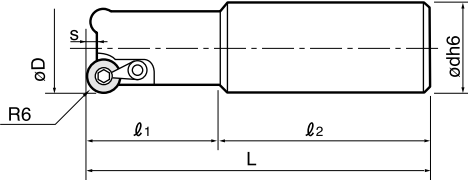
- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

ERD4000



Rough profiling

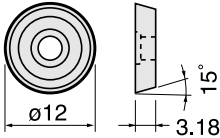
Rake angle: A.R. +5° ~ 8° R.R. -2° ~ -3°
Max. cutting depth: 6 mm



Specifications

Cat. No.	Stock	No. of inserts	Dimensions (mm)						Clamping screw	Clamping set	Wrench
			øD	ød	ℓ 1	ℓ 2	S	L			
ERD4020RE	●	1	20	25	40	80	2.4	130	CSTB - 4S	CSW - 0T	T -15D
ERD4032RE	●	2	32	32	60	90	3	140			
ERD4040RE	●	3	40		65			155			
ERD4050RE	●		50		75		3.5	165			

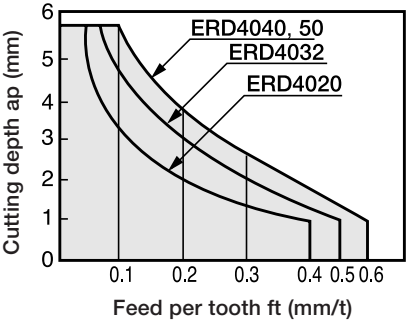
Inserts



Cat. No. (Metric)	Accuracy	Honing	Grades		Chipbreaker	Application		
			Uncoated					
			TH10	UX30				
RDCM1203TN RDCM1203FN	C	with without		●	with (Low cutting forces)	Steels Cast irons		
RDMA1203TN RDMA1203FN	M	with without		●	without			

Recommended cutting conditions

TAC Endmills

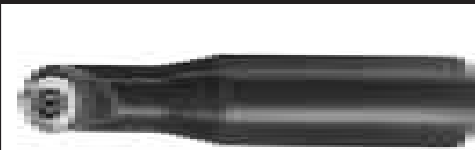


Work materials	Grades	Cutting speed Vc (m/min)
Cast irons (< 300HB)	TH10	90 ~ 11
Carbon steels · Alloy steels (< 300HB)	UX30	100 ~ 120
Die steels (< 300HB)	UX30	70 ~ 90

- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

Ball Endmill

TBN1000



For medium finishing of dies

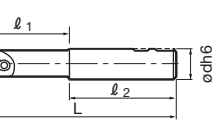
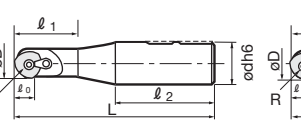
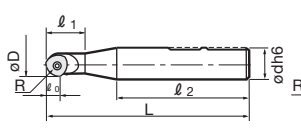


Fig. 1Fig. 2Fig. 3

Specifications

Cat. No.	Stock	Insert	Dimensions (mm)							Fig.	Clamping screw	Clamp	Clamping screw	Wrench
			øD	R	L	l ₀	l ₁	l ₂	ød					
TBN1100SE	●	ZNCA1002FN2	10	5	90	5	15	60	16	1	CSTB-2.5B	-	-	T-8D
TBN1120SE	●	ZNCA1203FN	12	6	110	6	20	70	16		CSTB-3S			T-9D
TBN1160SE	●	ZNCA1603FN	16	8	130	8	25	85	20		CSTB-4S			T-15D
TBN1200SE	●	ZNCA2004FN ZNMM2004EN	20	10	160	10	35	100	25		CSTA-5S			T-15D
TBN1250SE	●	ZNCA2505FN ZNMM2505EN	25	12.5	175	12.5	45	100	32	2	CSTA-5S	CP536	DS-6T	T-15D
TBN1300SE	●	ZNCA3005FN ZNMM3005EN	30	15	190	15	90	100	32	3				

Inserts

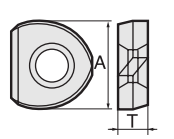
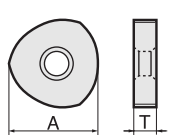
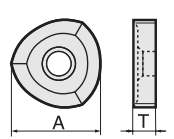


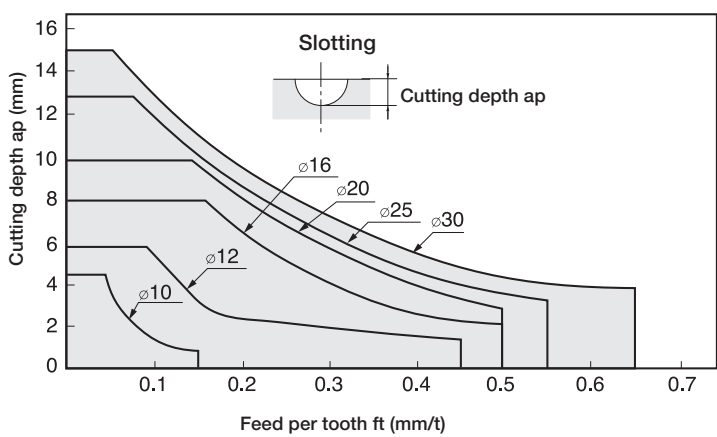
Fig. 1Fig. 2Fig. 3

Note: Type-B inserts, used for the cutter smaller than ø16 mm, are single-sided type.

Cat. No. (Metric system)	Accu- racy	Grades Uncoated		Dimensions(mm)		No. of cutting edges per insert	Fig.	Application
		TH10	UX30	A	T			
ZNCA1002FN2	C	●	●	7.958	2.5	2	3	UX30 grade for steels
ZNCA1203FN		●	●	9.735	3.0	3		
ZNCA1603FN		●	●	12.772	3.5	3		
ZNCA2004FN		●	●	15.862	4.0	6		
ZNCA2505FN		●	●	19.826	5.0	6		
ZNCA3005FN		●	●	23.618	5.5	6		
ZNMM2004EN	M	●	●	15.862	4.0	3	1	TH10 grade for cast irons, light alloys
ZNMM2505EN		●	●	19.826	5.0	3		
ZNMM3005EN		●	●	23.618	5.5	3		

Note : M-class inserts are mainly used for medium finishing and C-class inserts are best suitable for finishing.

Guidelines for selecting cutting depth and feed



- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

Standard cutting conditions for finishing

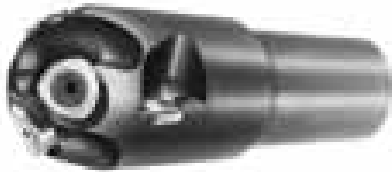
Work materials: Cast iron, carbon steels and alloy steels

Cat. No.	Grades	No. of rev. (rpm)	Pick feed If (mm)	Table-feed Vf (mm/min)
TBN1100SE	UX30 TH10	3200	0.3	480
TBN1120SE		2700	0.3	540
TBN1160SE		2000	0.5	650
TBN1200SE		1600	0.5	700
TBN1250SE		1300	0.5	580
TBN1300SE		1100	0.5	550

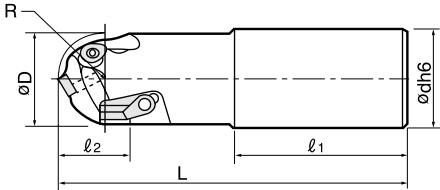
Note: For die steels, reduce the spindle speed to 80% and the feed to 75 - 85% respectively of the values shown above.

Ball Endmill with Multiple Cutting Edges

TBF1000



Medium to rough profile milling
of dies and moulds



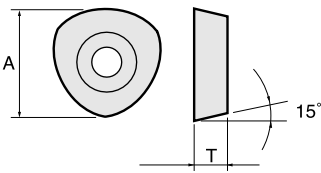
$l_2 = \text{eff.}$

Specifications

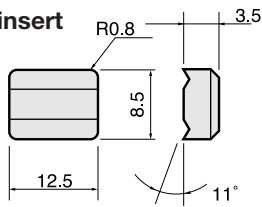
Cat. No.	Stock	Inserts				Dimensions (mm)						Main insert Clamping screw	Clamp	Clamping screw	Wrench for main insert	Wrench for peripheral insert
		Main cutting edge	No. of inserts	Peripheral cutting edge	No. of inserts	D	R	L	l ₁	l ₂	d					
TBF1320SE	●	ZDK/CA0704TN	4	—	0	32	16	150	80	26	32	CSTB-4	—	—	T-15D	—
TBF1400SE	●	ZDK/CA0804TN	3	—	—	40	20	160	80	30	40	CSTA-5S	—	—	T-15D	—
TBF1500SE	●	ZDK/CA1105TN	3	BBS-32	1	50	25	170	80	35	40	CST-5S	CP536	DS-6	T-25D	P-3
TBF1600SE	●		4			60	30	180	90	40	40					

Inserts

Main insert



Peripheral insert



Cat. No.	Accu- racy	Honing	Grades		Dimensions (mm)		Application
			TU40	UX30	A	T	
ZDKA0704TN	K	with		●	11.79	4.0	Steels Cast irons
ZDKA0804TN		with		●	12.90	4.76	
ZDKA1105TN		with	○	●	16.69	5.5	
ZDCA0704TN	C	with	○	○	11.79	4.0	
ZDCA0804TN		with	○		12.90	4.76	
ZDCA1105TN		with	○		16.69	5.5	
*ZDCA1705TN		with	●		16.63	5.5	

Cat. No.	Accu- racy	Honing	Uncoated TX25	Application
BBS-32	C	—	●	Steels, cast irons

Note: * marked inserts are used for cutters of ø70 mm diameter or more.

Standard cutting conditions

Work materials	Grades	Cutting speed Vc (m/min)	Feed f (mm/rev)
Cast irons	UX30	130	< 0.3
Carbon steels	UX30	80 ~ 120	< 0.25
Die steels	UX30	70 ~ 80	< 0.15

Note: For Z-axis and ramp feed, reduce the feed to 1/2 times the values shows above. And use pick feed whenever possible.

- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

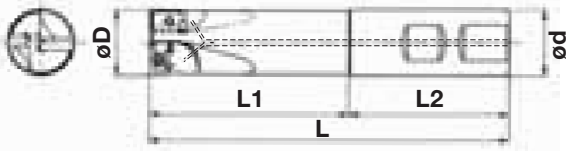
Features	Reference guide	Technical data
P. 350 ~ 353		P. 476 ~ 479

Endmill with center cutting edge

EVX



3-dimensional milling, drilling and cavity enlarging (with air hole)

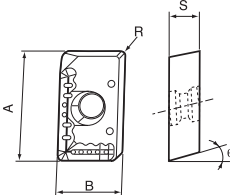


Rake angle:
A.R. 2° ~ 5°
R.R. -10° ~ -3.5°
Max. cutting depth:
see next page

Specifications

Type	Cat. No.	Stock	No. of inserts	Dimensions (mm)					Shank	Inserts
				øD	L	L1	L2	ød		
Standard	EVX08016RSA-E	●	2	16	85	30	55	16	Weldon	XXMU08T204PR-MJ
Long	EVX08016RLA-E	●			105	50	55		Cylindrical	
Extra-long	EVX08016RLA	○			175	40	135			
Standard	EVX10020RSA-E	●	2	20	90	30	60	20	Weldon	XXMU10H308PR-MJ
Long	EVX10020RLA-E	●			120	60	60		Cylindrical	
Extra-long	EVX10020RLA	○			185	50	135			
Standard	EVX12025RSA-E	●	2	25	100	40	60	25	Weldon	XXMU12X408PR-MJ
Long	EVX12025RLA-E	●			135	75	60		Cylindrical	
Extra-long	EVX12025RLA	○			220	70	150			
Standard	EVX16032RSA-E	●	2	32	110	50	60	25	Weldon	XXMU16X508PR-MJ
Long	EVX16032RLA-E	●			155	95	60		Cylindrical	
Extra-long	EVX16032RLA	○			255	80	175			

Applicable inserts



Inserts	Accuracy	Honing	Grade		Dimensions (mm)				
			AH120	AH140	A	B	S	R	θ
XXMU08T204PR-MJ	M	with	●	●	8.2	5.6	2.78	0.4	10°
XXMU10H308PR-MJ	M	with	●	●	10.6	6.8	3.50	0.8	11°
XXMU12X408PR-MJ	M	with	●	●	13.2	7.9	4.20	0.8	11°
XXMU16X508PR-MJ	M	with	●	●	16.8	11.1	5.00	0.8	11°

Replacement parts

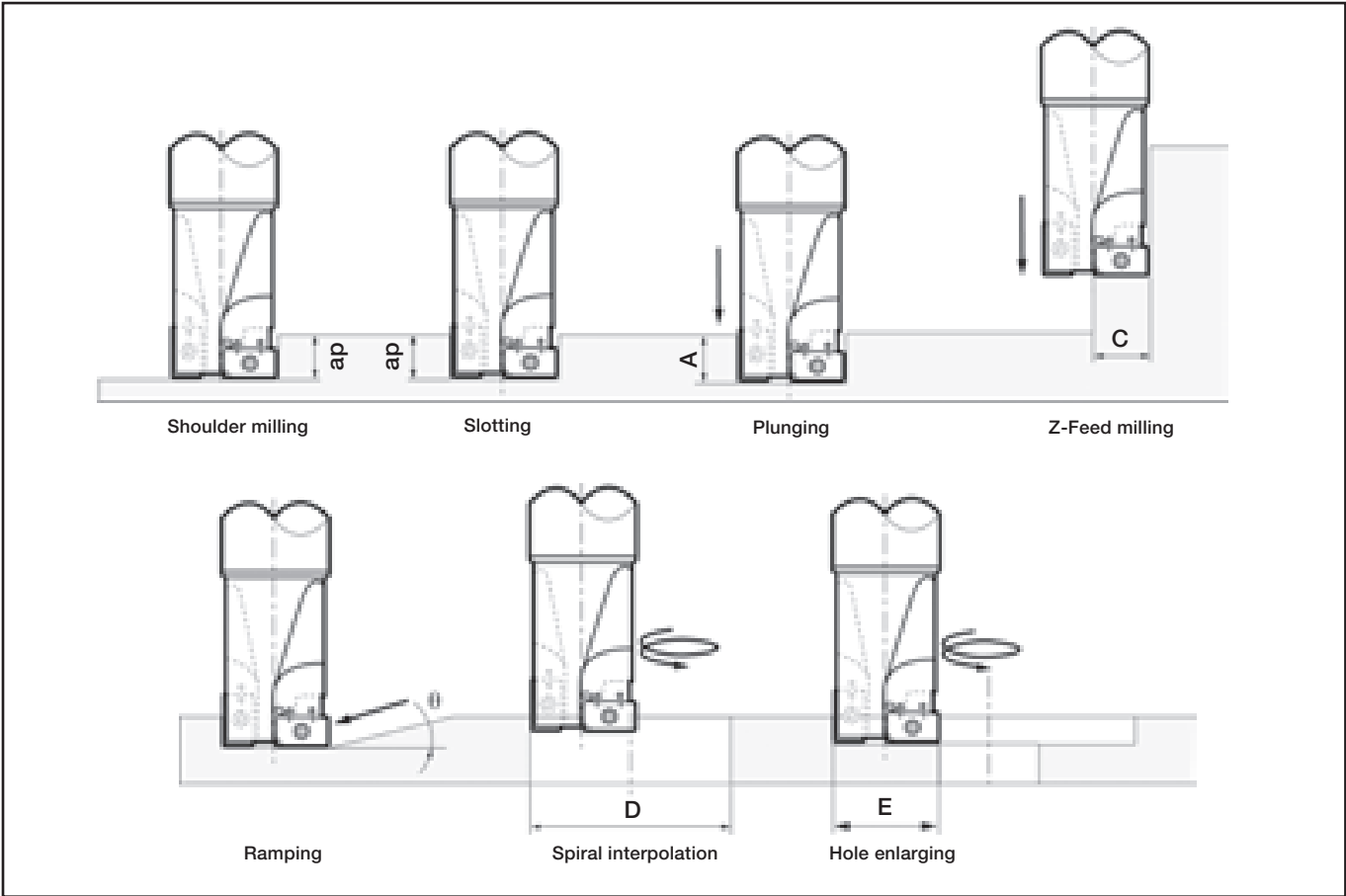
Cat. No.	Clamping screw	Wrench
EVX08016RSA-E EVX08016RLA-E EVX08016RLA	CSPB-2.2	IP-7D
EVX10020RSA-E EVX10020RLA-E EVX10020RLA	CSPB-2.5	IP-8D
EVX12025RSA-E EVX12025RLA-E EVX12025RLA	CSPD-3	IP-10D
EVX16032RSA-E EVX16032RLA-E EVX16032RLA	CSPB-3.5	IP-15D

Standard cutting conditions

Work materials	Grade	EVX type (ø 16 - 20)			EVX type (ø 25 - 32)		
		Cutting speed Vc (m/min)	Feed rate ft (mm/tooth)		Cutting speed Vc (m/min)	Feed rate ft (mm/tooth)	
			Shouldering and slotting	Z-Feed		Shouldering and slotting	Z-Feed
Carbon steel (Ck50, etc.) (< 300HB)	AH120	100 ~ 180	0.05 ~ 0.20	0.03 ~ 0.08	120 ~ 200	0.08 ~ 0.25	0.05 ~ 0.10
Alloy steel (42CrMo4, etc.) (< 300HB)	AH120	80 ~ 160	0.05 ~ 0.15	0.03 ~ 0.08	100 ~ 180	0.08 ~ 0.20	0.05 ~ 0.10
Die steel (X96CrMoV12, etc.) (< 300HB)	AH120	60 ~ 120	0.05 ~ 0.13	0.03 ~ 0.06	80 ~ 150	0.08 ~ 0.15	0.03 ~ 0.08
Cast iron (GG25 etc.)	AH120	100 ~ 180	0.05 ~ 0.25	0.03 ~ 0.10	120 ~ 200	0.08 ~ 0.25	0.05 ~ 0.10
Stainless steel X8CrNiS18-9 etc. (< 250HB)	AH140	70 ~ 140	0.05 ~ 0.15	0.03 ~ 0.08	90 ~ 160	0.08 ~ 0.20	0.03 ~ 0.08

• No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
• Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

■ Main applications



Cat. No.		Tool ø (mm)	Max. cutting edge length (ap)	Max. depth (A)	Max. width (C)	Max. ramping angle (θ)	Min. hole machining diameter (D)	Max. hole machining diameter (D)	Max. cutting width for enlarging (E)
Standard/ long/extra	EVX08016RS/LA-E	16.0	7.0	8.0	8.0	90°	19.2	30.0	14.0
	EVX10020RS/LA-E	20.0	9.0	10.0	10.0		24.0	38.0	18.0
	EVX12025RS/LA-E	25.0	11.5	12.5	12.5		30.0	48.0	23.0
	EVX16032RS/LA-E	32.0	15.0	16.0	16.0		38.4	62.0	30.0

- Notes:
- When using the long shank type (RL-E) endmills, cutting speed and feed should be reduced to 60 - 80 % of the values shown in the standard cutting conditions to prevent chatter.
 - For grooving (B), partial plunging (C) and spiral interpolation (E) the lower values of the standard cutting conditions should be used.

TAC Endmills

ESD 10



3-dimensional milling such as plunging with small depth and ramping



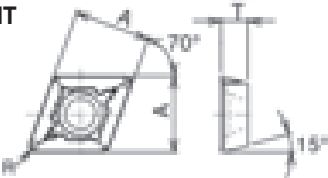
Max. cutting depth:
see next page

Specifications

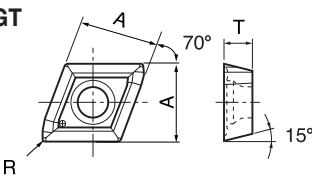
Cat. No.	Stock	Inserts	No. of inserts	Dimensions (mm)					Clamping screw	Wrench
				øD	ød	L	L1	L2		
ESD10020RS-E	●	GDMT10H3PDPR-MJ GDGT10H3PDFR-AJ	1	20	20	80	30	50	CSTB-3.5H	T-15D
ESD10025RS-E	●		2	25	25	96	40	56		
ESD10032RS-E	●		2	32	32	110	50	60		

Inserts

GDMT



GDGT



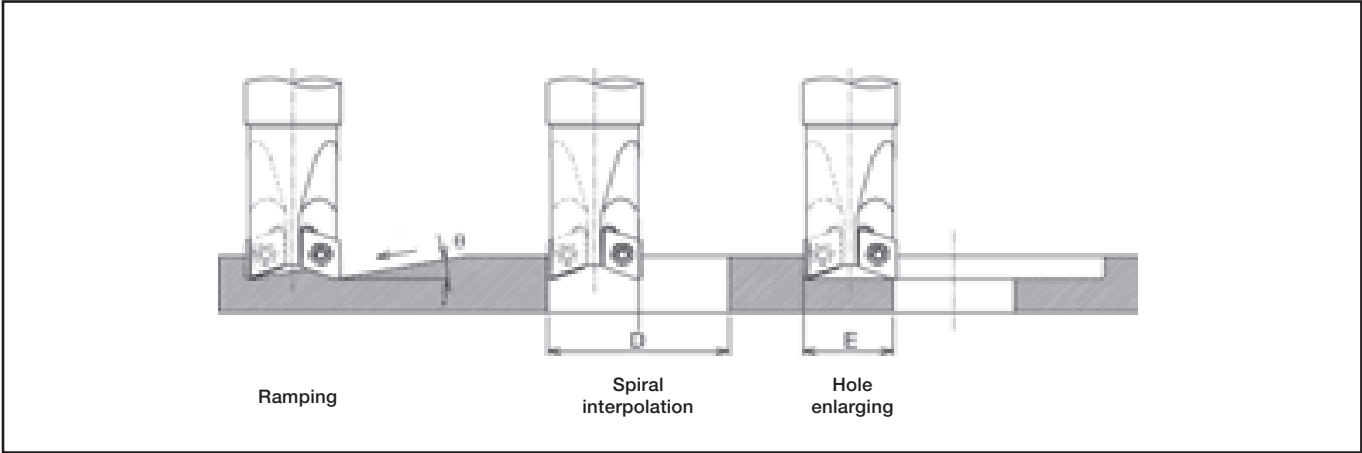
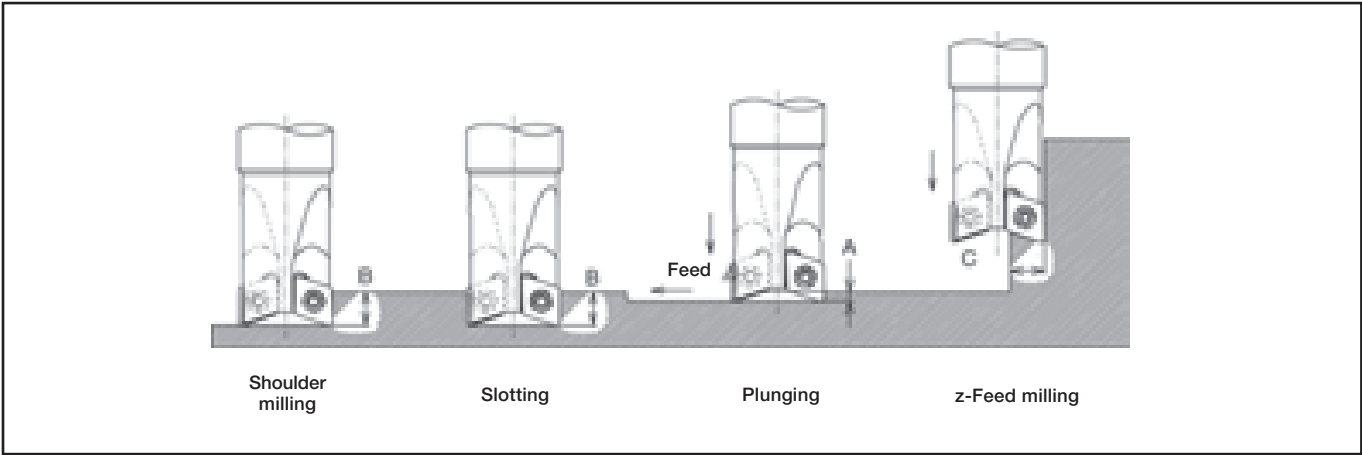
Cat. No.	Accuracy	Honing	Grades				Dimensions (mm)		
			Uncoated		PVD Coated		A	T	R
GDMT10H3PDPR-MJ	M	with	TH10	UX30	AH120	AH330	10	3.5	0.8
GDGT10H3PDFR-AJ	G	without	○				10	3.5	0.4

Standard cutting conditions

Work materials	Grades	ESD10 (ø20 - ø32)		
		Cutting speed Vc (m/min)	Feed rate ft (mm/tooth)	
			Shouldering and groove machining	Drilling
Carbon steel (Ck50, etc.) < 300HB	AH120	100 ~ 180	0.05 ~ 0.20	0.03 ~ 0.10
	AH330	120 ~ 230	0.05 ~ 0.15	0.03 ~ 0.08
Alloy steel (42CrMo4, etc.) < 300HB	AH120	80 ~ 160	0.05 ~ 0.15	0.03 ~ 0.08
	AH330	120 ~ 230	0.05 ~ 0.13	0.03 ~ 0.06
Die steel (X96CrMoV12, etc.) < 300HB	AH120	60 ~ 120	0.05 ~ 0.13	0.03 ~ 0.06
	AH330	80 ~ 160	0.05 ~ 0.10	0.03 ~ 0.05
Cast iron (GG25, etc.)	AH120	100 ~ 180	0.05 ~ 0.25	0.03 ~ 0.10
	AH330	120 ~ 230	0.05 ~ 0.20	0.03 ~ 0.08

- No. of revolutions n (rpm) = Cutting speed Vc (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

■ Main applications



Cat. No.	Tool ϕ (mm)	Max cutting edge length (B)	Max. plunging depth (A)	Max. cutting width z-Feed (C)	Max. ramping angle (θ)	Min. hole machining diameter (D)	Max. hole machining diameter (D)	Max. cutting width for enlarging (E)
ESD10020RS-E	20	9	2.5	8	10°	24	38	18
ESD10025RS-E	25	9	2.5	9	10°	32	48	23
ESD10032RS-E	32	9	2.5	9	6° 30'	46	62	30

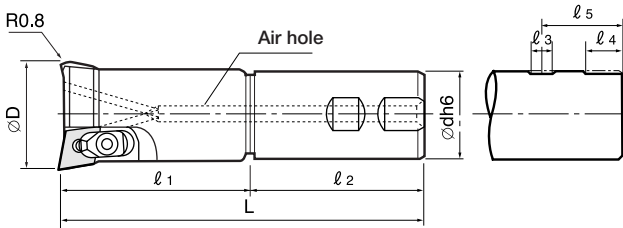
SF Endmill

ESD5000



Large pocket milling

Max. cutting depth:
see next page

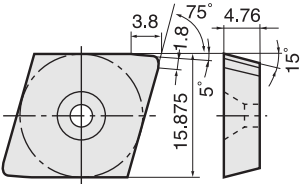


Specifications

Cat. No.	Stock	No. of inserts	Dimensions (mm)								Clamp	Clamping screw	Wrench
			ØD	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄	ℓ ₅	L	ød			
ESD5040RSE	●	2	40	100	90	14	19	40	190	40	CP724	RT-1	P-4
ESD5040RLE	●	2	40	150	90	14	19	40	240	40			
ESD5050RSE	●	2	50	100	90	14	19	40	190	40			
ESD5050RLE	●	2	50	150	90	14	19	40	240	40			

Inserts

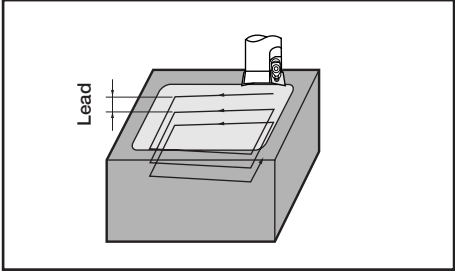
Note: The final letter of each Cat. No. shows: S = Short type and L = Long type.



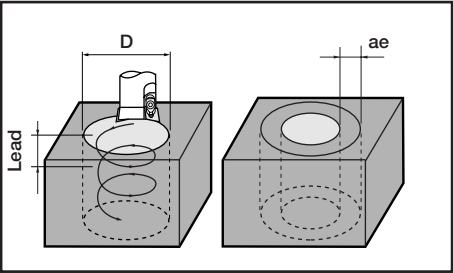
Cat. No. (Inch)	Cat. No. (Metric)	Accuracy	Honing	Grades		Application
				Coated GH330	Uncoated UX30	
EDKW53ZTR	EDKW1504EDTR	K	With	○	●	Steels, cast irons

Main applications

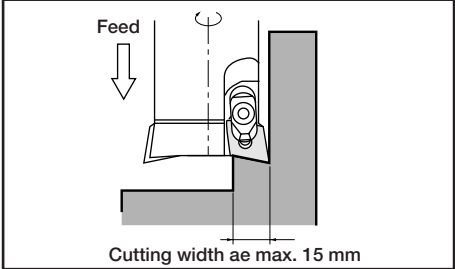
Ramping



Peripheral interpolation

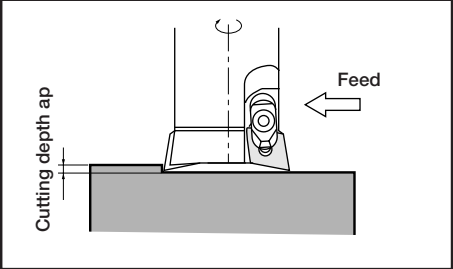


Z-Feed milling



Note : In Z-axis plunging, radial cutting depth should be limited within 15 mm (when using short type).

Milling



Note : When requiring a precision shoulder face, the axial cutting depth should be limited within 3 mm.

- Standard cutting conditions
- When milling high-carbon steels

Cutter type		Ramping and milling					Z-feed milling				
		Cutting speed V _c (m/min)		Feed ft (mm/tooth)	Lead or cutting depth a _p (mm)	Ramping angle (°)	Cutting speed V _c (m/min)		Feed ft (mm/tooth)	Cutting depth a _p (mm)	Cutting width a _e (mm)
		UX30	GH330				UX30	GH330			
ESD5040R (ø40 mm)	S	80 ~	100 ~	0.15 ~ 0.25	~ 15	~ 1.5°	80 ~	100 ~	0.1 ~ 0.25	~ 15	~ 30
	L			0.10 ~ 0.15	~ 6	~ 1°				~ 10	
ESD5050R (ø50 mm)	S	100	140	0.10 ~ 0.25	~ 15	~ 1.5°	120	180		~ 15	~ 40
	L			0.10 ~ 0.15	~ 6	~ 1°				~ 10	

- When milling die steels and alloy steels
- Above conditions can be generally applied to machining of these materials, but the cutting speeds should be reduced by 10 ~ 15 % from the values shown in the table.

- Cautionary points in use
- Because the ESD5000 type endmills are not provided with a center cutting edge, the cutter cannot be used for plunging.
 - When chips tend to stay in cutting area, use an air blast to remove them.
And, especially when pocketing a deep cavity, use of air blast through the air hole integrated in the shank is effective.
 - When drilling a hole, use the helical interpolation function (G02, G03) of the CNC controller. The max. and min. machinable diameter are shown in the table below.
 - Use of a side-lock type toolholder or milling chuck which has a high gripping force is recommended.
 - When indexing or changing the insert, after removing all foreign matter in the insert pocket with use of an air blast, carefully mount the insert not so as to leave a gap between the insert and pocket face.

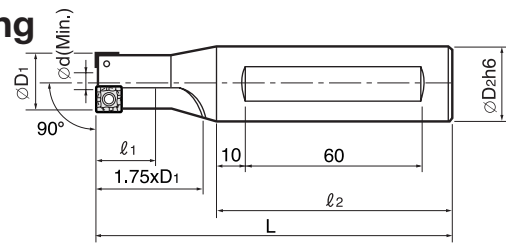
Cat. No.	Peripheral interpolation		Hole enlarging
	Min. bore ø (mm)	Max. bore ø (mm)	Max. cutting width ae (mm)
ESD5040RS/L	ø50	ø80	40
ESD5050RS/L	ø70	ø100	50

- No. of revolutions n (rpm) = Cutting speed V_c (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Table feed Vf (mm/min) = n (rpm) × Feed per tooth ft (mm/t) × t (No. of inserts)

Counter Milling Cutters

TCB

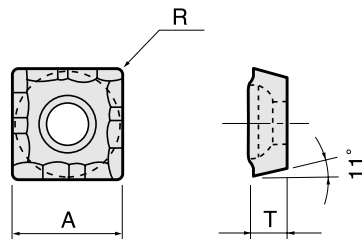
Counter milling



Specifications

Cat. No.	Stock	Inserts	No. of inserts	Dimensions (mm)						Applicable screw size	Clamping screw	Wrench
				ϕD_1	ϕD_2	ϕd	ℓ_1	ℓ_2	L			
TCB-140	●	SPMP831DS	1	14	25	4.0	14	80	117	M8	CSTB-2.2	T-7D
TCB-175	●			17.5		7.1	17.5		115	M10	CSTB-2.2S	
TCB-200	●			20		8.2	20		120	M12		
TCB-230	●	SPMP042ERD	2	23	32	11.0	23	80	126	(M14)	CSTA-NO3	T-9D
TCB-260	●			26		14.0	26		132	M16		
TCB-290	●			29			29		138	(M18)		
TCB-320	●	SPMM322ERD	2	32	42	16.9	32	85	144	M20	CSTA-NO5	T-15D
TCB-350	●			35		14.0	35		150	(M22)		
TCB-390	●			39		17.9	39		158	M24		
TCB-430		SPMM432ERD	2	43	48	21.7	43	85	171	(M27)	CSTA-4	T-15D
TCB-480				48		26.7	48		181	M30		

Inserts



Cat. No.	Accuracy	Grade	Dimensions (mm)		
		T313W	A	T	R
SPMP831DS	M	●	6.35	2.38	0.4
SPMP042ERD		●	7.938	3.18	0.8
SPMM322ERD		●	9.525		
SPMM432ERD		●	12.70	4.76	

Note: No dimples on SPMP831DS type inserts

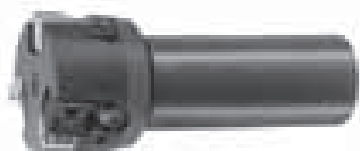
Standard cutting conditions (for TCB-200)

Work materials	Grade	Cutting speed Vc (m/min)	Feed f (mm/rev)	Cutting fluid
Carbon steels	T313W	80 ~ 150	0.12 ~ 0.24	Water soluble type or dry cutting
Stainless steels · Mild steels	T313W	150 ~ 200	0.05 ~ 0.12	Water soluble type
Cast irons	T313W	70 ~ 130	0.20 ~ 0.4	Water soluble type or dry cutting

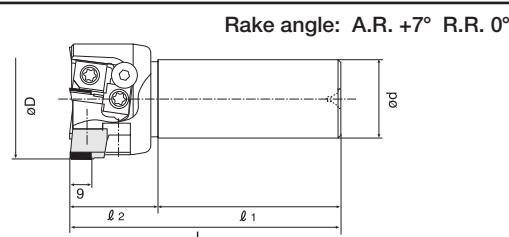
- Notes :
- For cutter under $\phi 20$ mm diameter, be sure to use a cutting fluid and select lower cutting speeds than shown above.
 - For TCB-140 type, reduce the feeds to 1/2 of the values shown in the table.
 - No. of revolutions n (rpm) = Cutting speed Vc (m/min) $\times$ 1000 $\div$ 3.14 $\div$ Cutter ϕ (mm)
 - Table feed Vf (mm/min) = n (rpm) $\times$ Feed per tooth ft (mm/t) $\times$ t (No. of inserts)

All-diamond Tipped TAC Endmills

EDPD15



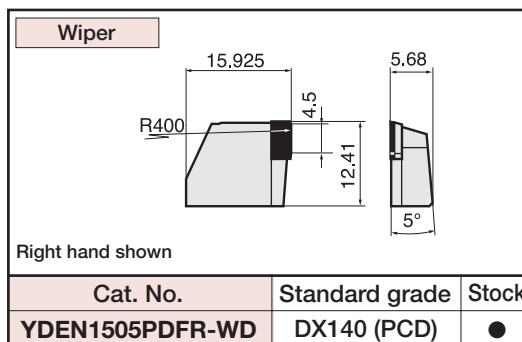
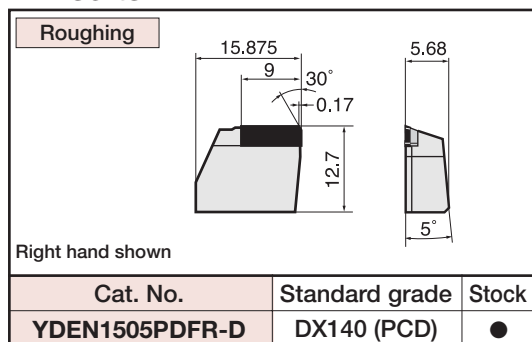
For high-speed and precision milling



■ Specifications

Cat. No.	Stock	No. of inserts	Dimensions (mm)					Insert locking wedge	Locator adjusting wedge	Screw for preventing wedge from flying out	Wedge fixing screw	Adjusting wedge fixing screw	Wrench
			øD	ød	ℓ 1	ℓ 2	L						
EDPD15050R/L		3	50										
EDPD15063R/L		4	63	32.0	80	35	115	FW304R/L-D	FW325R/L-D	BHM611-GT	FDS-8SST	FDS-8SST	T-27

■ Inserts



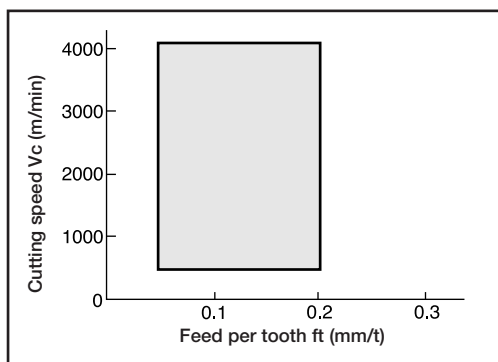
■ Standard cutting conditions

Cutter diameter (mm)	50	63
Cutting speed Vc (m/min)	500 ~ 3100	500 ~ 3900
Feed per tooth ft (mm/tooth)	0.05 ~ 0.2	
Cutting depth ap (mm)	~ 7	

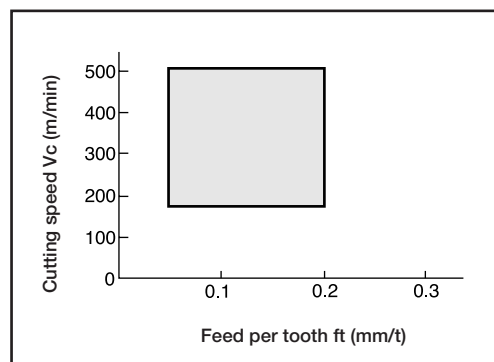
- No. of revolutions n (rpm) = Cutting speed V_c (m/min) $\times 1000 \div 3.14 \div$ Cutter ϕ (mm)
- Table feed V_f (mm/min) = n (rpm) $\times$ Feed per tooth f_t (mm/t) $\times t$ (No. of inserts)

■ Guidelines for selecting cutting speed and feed

Aluminium alloys (Si < 12%) (Grade: DX140 (PCD))



Aluminium alloys (Si > 13%) (Grade: DX140 (PCD))



- Wet cutting is recommended.
- Dry cutting is also possible. But chip control and obtainable surface integrity are inferior to wet cutting.