

## **Multi-functional endmill**

# **EVX**

**with centre cutting edge for plunge milling**



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### Features

Modern machining processes demand for flexible application and highest productivity. Tungaloy set a sign and developed a new tool concept. The multi-functional EVX endmill is the result of an elaborate market analysis carried out amongst a carefully chosen and well balanced circle of end-users from the Die and Mould industry, machine tool industry and fixture construction but also machine construction industry and repair shops.

The innovative EVX endmill is a double cutting endmill with centre cutting edge best suited for a multitude of different applications. These are next to conventional milling operations as shoulder milling and slotting also plunging operations into the full material.

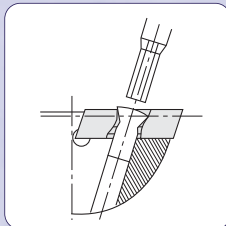
Especially the effective double clamping mechanism of the insert by clamp screw and form fit extraordinarily compensates cutting forces developing from different

sources and directs these into the insert seat. The result is higher stability of the whole tool system and an optimised complete machining process.

### Benefits

#### ■ Double clamping

Insert is fixed with clamp screw and form fit for highest stability. Optimal fixing through the inclination of the clamping screw



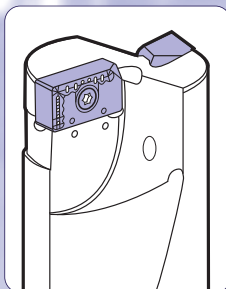
#### ■ Maximal rigidity

New Torx-Plus clamp screw for 20 % increase of clamp torque



#### ■ Unique

Special marks on inserts and cutter body for easy indexing






#### ■ Air hole

Efficient coolant supply (cooling lubricant or compressed air)

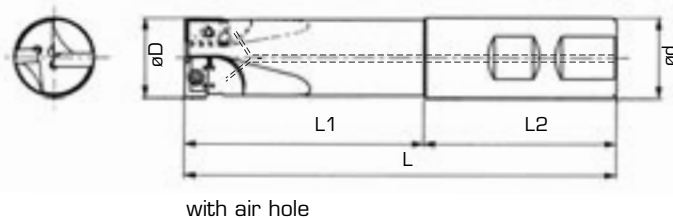
- Wide range of applications
- Centre cutting edge for plunge milling
- One geometry for internal and peripheral cutting edge
- Torx-Plus clamp screw for maximal rigidity

## Grade

<p><b>AH120</b> TiAlN-PVD</p> <p> P30 - P40</p> <p> K15 - K25</p> <p>Coated fine grain carbide for milling of steels, alloy steels and cast irons. The TiAlN-PVD coating provides for application in medium to high cutting speed operations.</p>	<p><b>AH140</b> TiAlN-PVD</p> <p> M35 - M40</p> <p>High toughness for medium finishing and roughing of stainless steels at low cutting speeds</p>
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## Specifications: EVX endmill

- Standard stock in Europe
- Standard stock in Japan

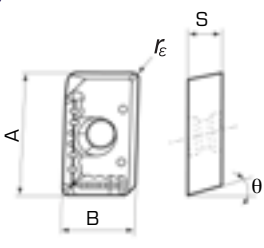


EVX type: ø 16 - 32 mm  
 Rake angle  
 A.R. = 2° ~ 5°  
 R.R. = -10° ~ -3.5°

Type	Item code	Stock	No. of teeth	Dimensions (mm)					Shank	Inserts	Replacement parts		
				øD	L	L1	L2	ød			Clamping screw	Wrench	
Standard	EVX08016RSA-E	●	2	16	85	30	55	16	Weldon	XXMU08T204PR-MJ	CSPB-2.2	IP-7D	
	EVX10020RSA-E	●		20	90		60	20		XXMU10H308PR-MJ	CSPB-2.5	IP-8D	
	EVX12025RSA-E	●		25	100	60	25	XXMU12X408PR-MJ		CSPD-3	IP-10D		
	EVX16032RSA-E	●		32	110	50	25	XXMU16X508PR-MJ		CSPB-3.5	IP-15D		
Long	EVX08016RLA-E	●		16	105	60	55	16		XXMU08T204PR-MJ	CSPB-2.2	IP-7D	
	EVX10020RLA-E	●		20	120		60	20		XXMU10H308PR-MJ	CSPB-2.5	IP-8D	
	EVX12025RLA-E	●		25	135	75	60	25		XXMU12X408PR-MJ	CSPD-3	IP-10D	
	EVX16032RLA-E	●		32	155	95	60	25		XXMU16X508PR-MJ	CSPB-3.5	IP-15D	
Extra long	EVX08016RLA	○		16	175	135	150	16		Cylindrical	XXMU08T204PR-MJ	CSPB-2.2	IP-7D
	EVX10020RLA	○		20	185			50			20	XXMU10H308PR-MJ	CSPB-2.5
	EVX12025RLA	○		25	220	70	150	25			XXMU12X408PR-MJ	CSPD-3	IP-10D
	EVX16032RLA	○		32	255	80	175	32			XXMU16X508PR-MJ	CSPB-3.5	IP-15D

## Specifications: Inserts

- Standard stock in Europe
- Standard stock in Japan

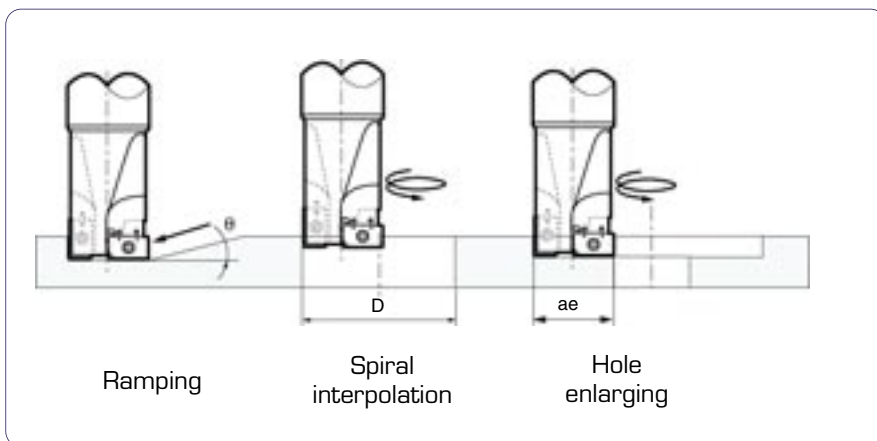
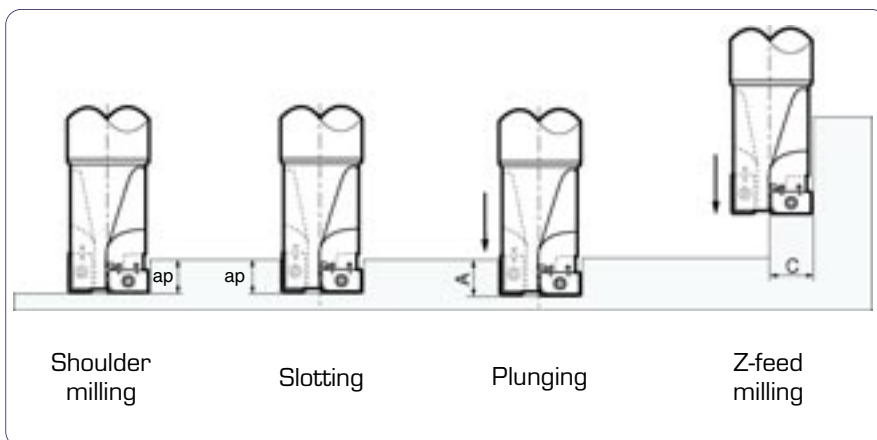
	Item code	Tolerance	Honing	Dimensions (mm)					Grade	
				A	B	S	$r_{\epsilon}$	$\theta$	AH120	AH140
	XXMU08T204PR-MJ	M	with	8.2	5.6	2.78	0.4	10°	●	●
	XXMU10H308PR-MJ			10.6	6.8	3.50	0.8	11°	●	●
	XXMU12X408PR-MJ			13.2	7.9	4.20	0.8	11°	●	●
	XXMU16X508PR-MJ			16.8	11.1	5.00	0.8	11°	●	●

## Cutting conditions

Work materials	Grade	EVX type (Ø16 - Ø20)			EVX type (Ø25 - Ø32)		
		Cutting speed Vc (m/min)	Feed rate ft (mm/tooth)		Cutting speed Vc (m/min)	Feed rate ft (mm/tooth)	
			Shoulder milling slotting	Plunging		Shoulder milling slotting	Plunging
<b>Carbon steel</b> Ck50 etc. < 300HB	<b>AH120</b>	100 - 180	0.05 - 0.20	0.03 - 0.08	120 - 200	0.08 - 0.25	0.05 - 0.10
<b>Alloy steel</b> 42CrMo4, 16MnCr5 etc. < 300HB	<b>AH120</b>	80 - 160	0.05 - 0.15	0.03 - 0.08	100 - 180	0.08 - 0.20	0.05 - 0.10
<b>Die steel</b> X96CrMoV12 etc. < 300HB	<b>AH120</b>	60 - 120	0.05 - 0.13	0.03 - 0.06	80 - 150	0.08 - 0.15	0.03 - 0.08
<b>Cast irons</b> GG25 etc.	<b>AH120</b>	100 - 180	0.05 - 0.25	0.03 - 0.10	120 - 200	0.08 - 0.25	0.05 - 0.10
<b>Stainless steel</b> X8CrNiS18-9 etc. < 250HB	<b>AH140</b>	70 - 140	0.05 - 0.15	0.03 - 0.08	90 - 160	0.08 - 0.20	0.03 - 0.08

Notes: Calculation of feed rate Ø16 - Ø32  
 Effective no. of teeth = 2 / for plunging = 1  
 For plunging feed rate has to be interrupted every 0.5 – 1.0 mm

## Applications

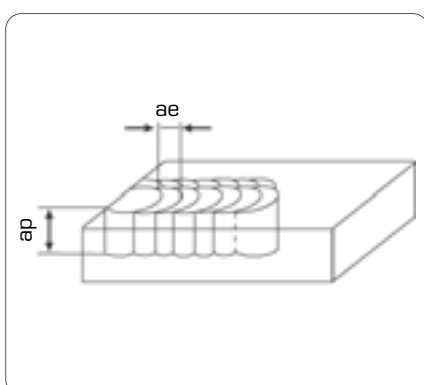


### Notes:

- when using the long shank type (RLA-E type) endmills, cutting speed and feed should be reduced to 60 - 80 % of the values shown in the standard cutting conditions to prevent chatter. (page 4)
- for slotting, partial plunging and spiral interpolation the lower values of the standard cutting conditions shown in the table (page 4) should be used.

Item code		Tool $\varnothing$ (mm)	Max. cutting edge length (ap)	Max. drilling depth (A)	Max. cutting width for plunging (C)	Max. ramping angle ( $\theta$ )	Min. hole- $\varnothing$ spiral interpolation (D)	Max. hole- $\varnothing$ spiral interpolation (D)	Max. cutting width for enlarging (ae)
Standard / long	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

## Practical example



### Z-feed milling

Work materials: Die steel (1.2311)  
 Machine: CNC machining centre (12 kW)  
 Milling cutter: EVX10020RLA-E  
 Insert: XXMU10H308PR-MJ  
 Grade: AH120  
 Cutting speed.:  $V_c = 120$  m/min  
 Feed rate:  $f_t = 0.2$  mm/tooth  
 Line feed:  $a_e = 5$  mm  
 Cutting depth:  $a_p = 4.0$  mm

### Result:

Compared to conventional milling strategies, which means machining on constant z-levels, the manufacturing time is reduced to 60 %. Thus production costs will also be decreased!



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