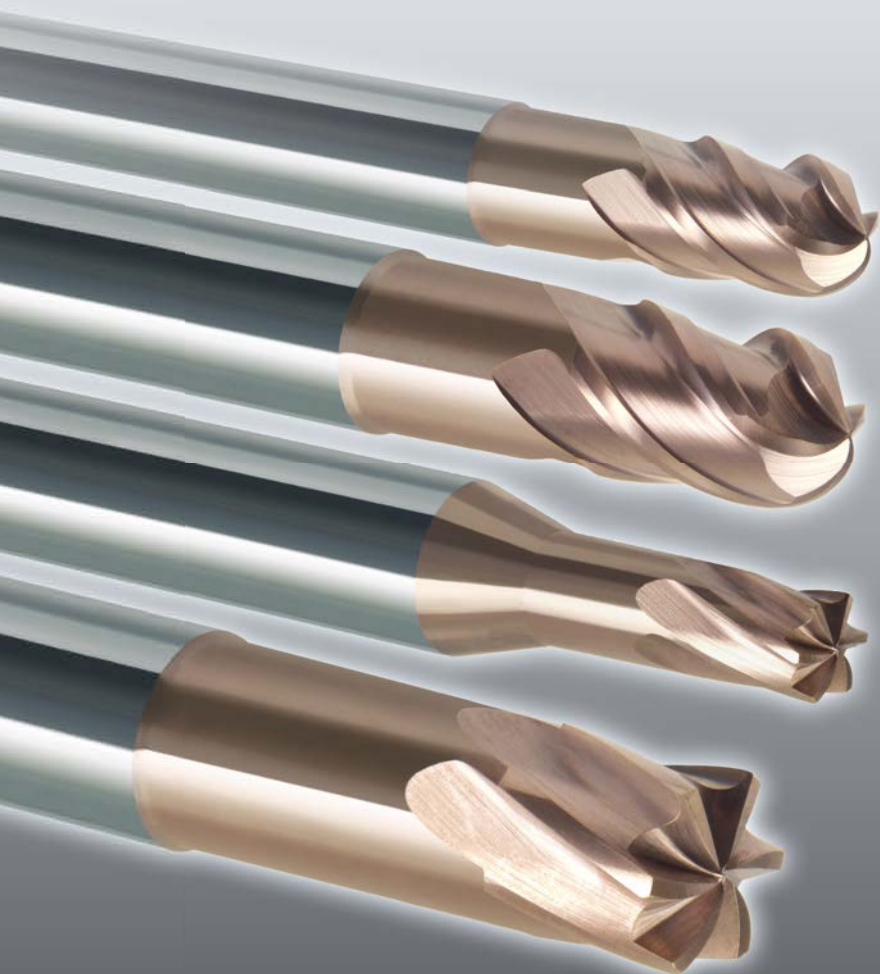


# ***EHHB / EHHR***

## ***Epoch High Hard Ball/Radius***

### ***Multi-purpose Ball Type/Corner Radius End Mill***



***D1mm ~ D12mm***

- ***For High Hardened Materials***  
***≤ 72HRC***

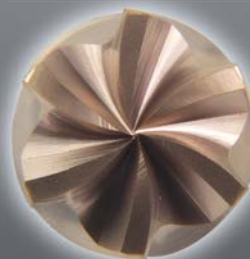
***EHHB: 4 flutes***

- ***Unequal pitch (vibration-free)***



***EHHR: 4 or 6 flutes***

- ***Peripheral clearance geometry (vibration-free)***



## EHHB-ATH | Epoch High Hard Ball ATH

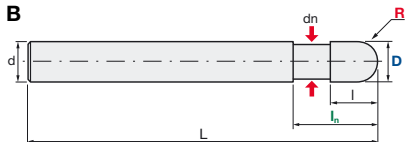
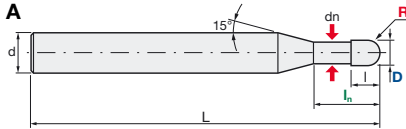
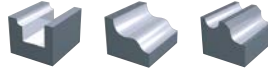
**V max**  
High Speed

**▽**  
Roughing

**▽▽**  
Semi-Finishing

**HRC**  
72

**No. of Teeth**  
4



**Carbide**  
Micro Grain

**TH60+**  
Nano-PVD Coating

**Rake Angle**  
Negative



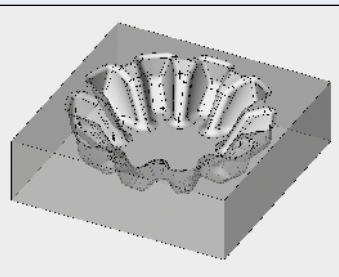
Helix Angle	R Tol. [mm]	D Tol. [mm]	d Tol.
40°	R0.5~R1.5: <b>+/-0.005</b>	R0.5~R1.5: <b>0/-0.01</b>	<b>h5</b>
	R2~R3: <b>+/-0.007</b>	R2~R3: <b>0/-0.014</b>	
	R4~R6: <b>+/-0.01</b>	R4~R6: <b>0/-0.02</b>	

ID Code	Item Code	Z	D	R	$l_n$	l	dn	L	d	Type
EP1340	EHHB-4010-S4-ATH	4	1	0.5	3	1.5	0.95	50	4	A
EP1341	EHHB-4010-S6-ATH								6	
EP1342	EHHB-4015-S4-ATH		1.5	0.75	4.5	2.5	1.43		4	
EP1343	EHHB-4015-S6-ATH								6	
EP1344	EHHB-4020-S4-ATH		2	1	6	3	1.9		4	
EP1345	EHHB-4020-S6-ATH								6	
EP1346	EHHB-4025-S4-ATH		2.5	1.25	7.5	4	2.38		4	
EP1347	EHHB-4025-S6-ATH								6	
EP1348	EHHB-4030-S4-ATH		3	1.5	9	4.5	2.9	70	4	
EP1349	EHHB-4030-S6-ATH								6	
EP1350	EHHB-4040-S4-ATH		4	2	12	6	3.9		4	B
EP1351	EHHB-4040-S6-ATH								6	A
EP1352	EHHB-4050-ATH		5	2.5	15	7.5	4.7	80	6	
EP1353	EHHB-4060-ATH		6	3	18	9	5.7	90	6	
EP1354	EHHB-4080-ATH		8	4	24	12	7.6	100	8	B
EP1355	EHHB-4100-ATH		10	5	30	15	9.5		10	
EP1356	EHHB-4120-ATH	12	6	36	18	11.5	110	12		

**NOTE:** For precise tool definition for the CAM system please download DXF data (QuickFinder) or contact your local MOLDINO Tool staff for more details.

### Roughing Application EHHB-ATH

Helical Milling + Trochoid milling + Z-constant milling -> Total cutting time: 22 min.



**Work geometry**  
Size: 80x80x20mm  
Material: 1.2379 (60HRC)



Used end mill –  
less and stable wear situation

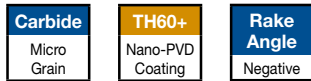
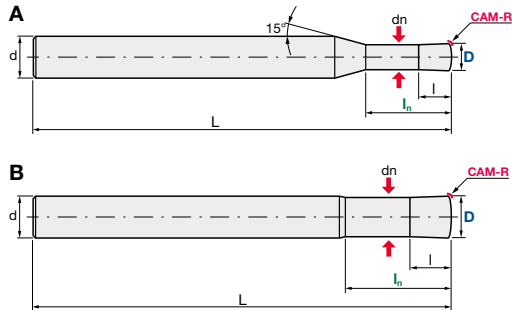


Work after roughing application

**Tool: D8 x 4Z (EHHB-4080-ATH)**

$n = 5,970 \text{ min}^{-1}$  ( $V_c = 150 \text{ m/min}$ )  
 $V_f = 2,860 \text{ mm/min}$  ( $f_z = 0.12 \text{ mm/tooth}$ )  
 $a_p = 9 \text{ mm}$ ,  $a_e = 0.5 \text{ mm (max)}$   
 $Q = 12.9 \text{ cm}^3/\text{min}$   
 Dry Air blow, (HSK-A63), OH=32mm

## EHHR-ATH | Epoch High Hard Radius ATH

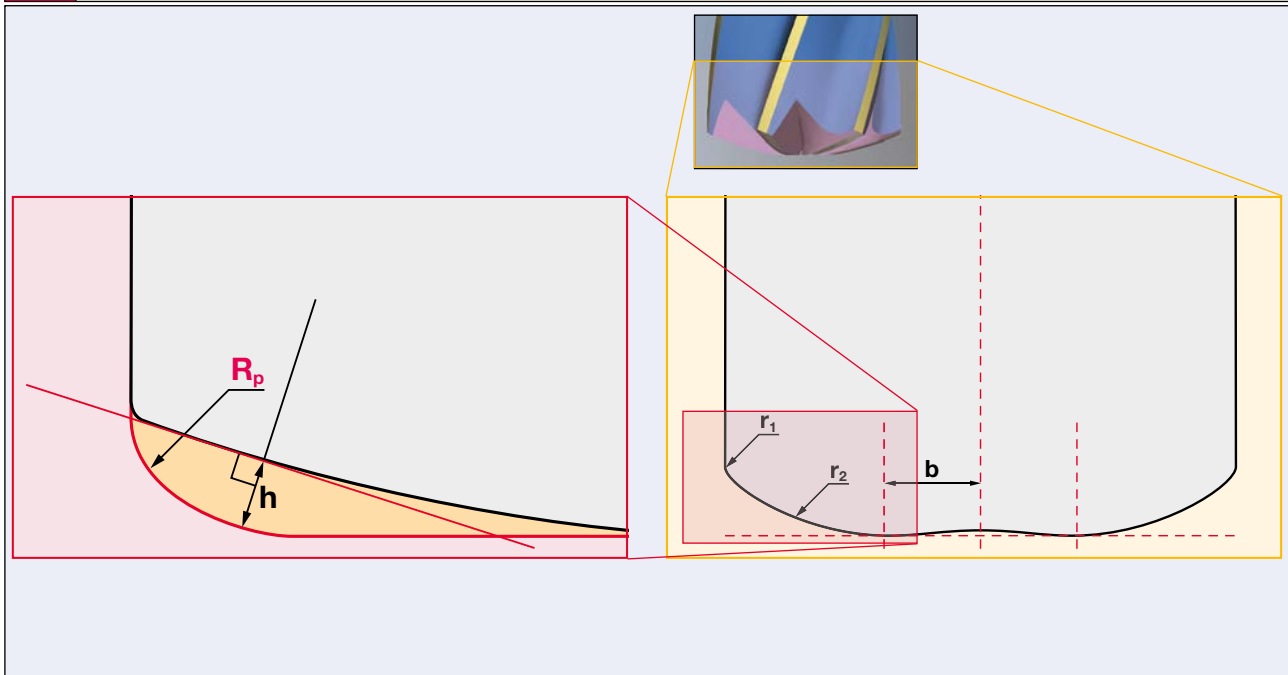


Helix Angle	D Tol. [mm]	d Tol.
20°	D1~D12: 0/-0.02	h5

ID Code	Item Code	Z	D	CAM-R (R <sub>p</sub> )	I <sub>n</sub>	I	dn	L	d	Type	Lowest point to centre (b)	Max. remaining stock (h)
EP1327	EHHR-4010-S4-ATH	4	1	0.134	3	1	0.95	50	4	A	0.14	0.026
EP1328	EHHR-4010-S6-ATH		2	0.194	6	2	1.9		6			
EP1329	EHHR-4020-S4-ATH		3	0.328	9	3	2.9		4			
EP1330	EHHR-4020-S6-ATH		4	0.387	12	4	3.9		6		0.28	0.068
EP1331	EHHR-4030-S4-ATH		5	0.521	15	5	4.7		4			
EP1332	EHHR-4030-S6-ATH		6	0.581	18	6	5.7		6			
EP1333	EHHR-6040-S4-ATH	6	4	0.387	12	4	3.9	60	4	B	0.56	0.136
EP1334	EHHR-6040-S6-ATH		5	0.521	15	5	4.7		6			
EP1335	EHHR-6050-ATH		6	0.581	18	6	5.7		4			
EP1336	EHHR-6060-ATH		8	0.849	24	8	7.6		8	B	1.12	0.255
EP1337	EHHR-6080-ATH		10	0.968	30	10	9.5		10			
EP1338	EHHR-6100-ATH		12	1.088	36	12	11.5		12			
EP1339	EHHR-6120-ATH											

### NOTE:

Please use **CAM-R** for your programming corner radius. For precise tool definition for the CAM system please download DXF data (QuickFinder) or contact your local MOLDINO Tool staff for more details.



## EHHB/EHHR-ATH | Recommended Cutting Conditions

### **RECOMMENDED CUTTING CONDITIONS**

1. Use a highly rigid and accurate machine as possible.
2. These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
3. If the rpm available is lower than recommended please reduce the feed rate to the same ratio.

### **EMPFOHLENE SCHNITTBEDINGUNGEN**

1. Benutzen Sie für die Bearbeitung jeweils die Maschine mit der höchsten Genauigkeit und der höchsten Stabilität.
2. Die angegebenen Schnittwerte stellen eine generelle Empfehlung dar. Die Werte sollten immer an die jeweilige Bearbeitung, deren Form und die verwendete Maschine angepasst werden.
3. Ist die Ihnen verfügbare Drehzahl niedriger als der in der Tabelle angegebene Wert, sollte der Vorschub im gleichen Verhältnis reduziert werden.

### **CONDICIONES DE CORTE RECOMENDADAS**

1. Utilizar la máquina más rígida y precisa posible.
2. Las condiciones de corte de la tabla son una orientación general. Para un trabajo específico hay que ajustar las condiciones en función de la geometría de la pieza, el resultado esperado y el tipo de máquina que vamos a utilizar.
3. Si las rpm máximas de la máquina son inferiores, hay que ajustar el avance en proporción a las mismas.

### **CONDIZIONI DI TAGLIO RACCOMANDATE**

1. Usate centri di lavoro più precisi e rigidi possibile
2. Le condizioni di taglio sono valori generali. Per ottimizzare il processo di lavoro rispettate le geometrie dello stampo e la macchina disponibile.
3. Quando i giri della macchina disponibili sono più bassi rispetto al valore espresso regolate l'avanzamento con lo stesso rapporto.

### **CONDITIONS DE COUPE RECOMMANDÉES**

1. Utiliser une machine aussi rigide et fiable que possible.
2. Ces conditions sont indicatives : en utilisation, ajuster les conditions en fonction de la machine et de la pièce usinée.
3. Si la rotation possible est inférieure à celle recommandée, ajuster l'avance dans la même proportion.

### **CONDIÇÕES DE CORTE RECOMENDADAS**

1. Use uma máquina rígida e o mais precisa possível.
2. Estas condições são para orientação geral, em condições de maquinação real ajustar os parâmetros de acordo com a sua máquina e com as condições das peças a maquinar.
3. Se o número de rotações disponível na máquina for menor do que o recomendado por favor reduza avanço na mesma proporção.



## EHHB-ATH | Recommended Cutting Conditions

	Workpiece Material		Hardened Steels Example: 1.2343 (52 ~ 57 HRC)						Hardened Steels Example: 1.2379 (58 ~ 62 HRC)					
	D	R	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm
	1	0.5	180	57,300	0.019	4,410	0.080	0.32	150	47,800	0.014	2,630	0.065	0.26
	1.5	0.75	180	38,200	0.026	4,010	0.120	0.48	150	31,800	0.019	2,390	0.098	0.39
	2	1	180	28,700	0.035	4,020	0.160	0.64	150	23,900	0.025	2,390	0.130	0.52
	2.5	1.25	180	22,900	0.041	3,770	0.200	0.8	150	19,100	0.029	2,240	0.163	0.65
	3	1.5	180	19,100	0.049	3,770	0.240	0.96	150	15,900	0.035	2,240	0.195	0.78
	4	2	180	14,300	0.067	3,800	0.320	1.28	150	11,900	0.048	2,260	0.260	1.04
	5	2.5	180	11,500	0.085	3,900	0.400	1.6	150	9,600	0.061	2,330	0.325	1.3
	6	3	180	9,600	0.102	3,910	0.480	1.92	150	8,000	0.073	2,330	0.390	1.56
	8	4	180	7,200	0.140	4,030	0.640	2.56	150	6,000	0.100	2,400	0.520	2.08
	10	5	180	5,700	0.175	3,990	0.800	3.2	150	4,800	0.125	2,400	0.650	2.6
	12	6	180	4,800	0.200	3,830	0.960	3.84	150	4,000	0.143	2,280	0.780	3.12

Roughing	Workpiece Material		Hardened Steels Example: HSS / PM (63 ~ 66 HRC)						Hardened Steels Example: HSS / PM (67 ~ 72 HRC)					
	D	R	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm
	1	0.5	120	38,200	0.012	1,790	0.055	0.22	100	31,800	0.010	1,220	0.040	0.16
	1.5	0.75	120	25,500	0.016	1,630	0.083	0.33	100	21,200	0.013	1,110	0.060	0.24
	2	1	120	19,100	0.021	1,620	0.110	0.44	100	15,900	0.018	1,110	0.080	0.32
	2.5	1.25	120	15,300	0.025	1,530	0.138	0.55	100	12,700	0.021	1,040	0.100	0.4
	3	1.5	120	12,700	0.030	1,520	0.165	0.66	100	10,600	0.025	1,050	0.120	0.48
	4	2	120	9,600	0.040	1,550	0.220	0.88	100	8,000	0.033	1,060	0.160	0.64
	5	2.5	120	7,600	0.052	1,570	0.275	1.1	100	6,400	0.042	1,090	0.200	0.8
	6	3	120	6,400	0.062	1,580	0.330	1.32	100	5,300	0.051	1,080	0.240	0.96
	8	4	120	4,800	0.085	1,630	0.440	1.76	100	4,000	0.070	1,120	0.320	1.28
	10	5	120	3,800	0.106	1,620	0.550	2.2	100	3,200	0.088	1,120	0.400	1.6
	12	6	120	3,200	0.121	1,550	0.660	2.64	100	2,700	0.100	1,080	0.480	1.92

	Workpiece Material		Hardened Steels Example: 1.2343 (52 ~ 57 HRC)						Hardened Steels Example: 1.2379 (58 ~ 62 HRC)					
	D	R	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm
	1	0.5	230	60,000	0.011	2,700	0.02 ~ 0.05	0.02	180	57,300	0.009	2,060	0.02 ~ 0.05	0.02
	1.5	0.75	230	48,800	0.017	3,290	0.02 ~ 0.07	0.03	180	38,200	0.014	2,060	0.02 ~ 0.07	0.03
	2	1	230	36,600	0.023	3,290	0.02 ~ 0.10	0.04	180	28,700	0.018	2,070	0.02 ~ 0.10	0.04
	2.5	1.25	230	29,300	0.029	3,440	0.05 ~ 0.12	0.05	180	22,900	0.024	2,150	0.05 ~ 0.12	0.05
	3	1.5	230	24,400	0.035	3,440	0.05 ~ 0.15	0.06	180	19,100	0.028	2,150	0.05 ~ 0.15	0.06
	4	2	230	18,300	0.048	3,480	0.05 ~ 0.20	0.08	180	14,300	0.038	2,170	0.05 ~ 0.20	0.08
	5	2.5	230	14,600	0.061	3,540	0.05 ~ 0.25	0.1	180	11,500	0.049	2,230	0.05 ~ 0.25	0.1
	6	3	230	12,200	0.073	3,550	0.05 ~ 0.3	0.12	180	9,600	0.058	2,230	0.05 ~ 0.3	0.12
	8	4	230	9,200	0.100	3,680	0.05 ~ 0.4	0.16	180	7,200	0.080	2,300	0.05 ~ 0.4	0.16
	10	5	230	7,300	0.125	3,650	0.05 ~ 0.5	0.2	180	5,700	0.1	2,280	0.05 ~ 0.5	0.2
	12	6	230	6,100	0.1425	3,480	0.05 ~ 0.6	0.24	180	4,800	0.114	2,190	0.05 ~ 0.6	0.24

Semi Finishing	Workpiece Material		Hardened Steels Example: HSS / PM (63 ~ 66 HRC)						Hardened Steels Example: HSS / PM (67 ~ 72 HRC)					
	D	R	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm
	1	0.5	160	51,000	0.007	1,490	0.02 ~ 0.05	0.02	140	44,600	0.006	1,100	0.02 ~ 0.05	0.02
	1.5	0.75	160	34,000	0.011	1,490	0.02 ~ 0.07	0.03	140	29,700	0.009	1,100	0.02 ~ 0.07	0.03
	2	1	160	25,500	0.015	1,490	0.02 ~ 0.10	0.04	140	22,300	0.012	1,100	0.02 ~ 0.10	0.04
	2.5	1.25	160	20,400	0.019	1,560	0.05 ~ 0.12	0.05	140	17,800	0.016	1,150	0.05 ~ 0.12	0.05
	3	1.5	160	17,000	0.023	1,560	0.05 ~ 0.15	0.06	140	14,900	0.019	1,160	0.05 ~ 0.15	0.06
	4	2	160	12,700	0.031	1,570	0.05 ~ 0.20	0.08	140	11,100	0.026	1,160	0.05 ~ 0.20	0.08
	5	2.5	160	10,200	0.039	1,610	0.05 ~ 0.25	0.1	140	8,900	0.033	1,190	0.05 ~ 0.25	0.1
	6	3	160	8,500	0.047	1,610	0.05 ~ 0.3	0.12	140	7,400	0.040	1,180	0.05 ~ 0.3	0.12
	8	4	160	6,400	0.065	1,660	0.05 ~ 0.4	0.16	140	5,600	0.055	1,230	0.05 ~ 0.4	0.16
	10	5	160	5,100	0.0813	1,660	0.05 ~ 0.5	0.2	140	4,500	0.0688	1,240	0.05 ~ 0.5	0.2
	12	6	160	4,200	0.0926	1,560	0.05 ~ 0.6	0.24	140	3,700	0.0784	1,160	0.05 ~ 0.6	0.24

**Note:** For finishing and precise tool definition for the CAM system please download DXF data (QuickFinder), or contact your local MOLDINO Tool staff for more details. Please set up ramping angle to less than 0.5°. Please set up hole diameter of interpolation cutting in the range of 0.5D to 0.8D for safety. For side milling please take V<sub>c</sub> & f<sub>z</sub> same with above standard cutting condition, and setup a<sub>p</sub>=1 x D, a<sub>e</sub>=0.01 ~ 0.04 x D. **We recommend air blow as first choice for cooling system.**

**Achtung:** Bitte laden Sie sich für die Schlichtbearbeitung die DXF Daten herunter (QuickFinder) oder wenden Sie sich an Ihren MOLDINO Anwendungstechniker. Bitte setzen Sie den Rampenwinkel auf ≤ 0,5°. Zum Interpolationsfräsen setzen Sie den Bohrdurchmesser zur Sicherheit auf 0,5D ~ 0,8D. Zum seitlichen Fräsen mit hoher a<sub>p</sub> und kleiner a<sub>e</sub> benutzen Sie bitte für V<sub>c</sub> & f<sub>z</sub> die gleichen Schnittdaten wie in der Tabelle mit einer a<sub>p</sub> = 1 x D & a<sub>e</sub> = 0,01 ~ 0,04 x D **Zum Kühlen empfehlen wir Druckluft.**

**Nota:** Per lavorazioni di finitura e per una precisa e corretta definizione del profilo dell'utensile per l'utilizzo CAM si prega di richiedere file DXF tramite QuickFinder o rivolgendosi al personale MOLDINO Tool. Utilizzare angoli di rampa minori o uguali a 0,5°. Per una lavorazione più stabile e sicura utilizzare un diametro foro per fresatura ad interpolazione tra un 0,5xD e 0,8xD. Per fresatura a spallamento inserire V<sub>c</sub> e f<sub>z</sub> come indicato nelle soprastanti condizioni di taglio e settare ap= 1xD, ae = 0,01/0,04 xD. **Come sistema di raffreddamento raccomandiamo l'utilizzo di aria.**

**Nota:** En procesos de acabado y para una más precisa definición de la herramienta en el sistema de CAM por favor solicite los ficheros DXF (QuickFinder), o póngase en contacto con MOLDINO Tool para obtener más detalles.

Por favor utilice un ángulo de entrada menor de 0,5°. Por favor configure un diámetro de agujero para interpolar en el rango de 0,5D hasta 0,8D para un proceso seguro y estable.

Para el fresado lateral por favor utilice la misma V<sub>c</sub> y f<sub>z</sub> estándar indicadas arriba, y configure la ap = 1 x D, ae = 0.01 ~ 0.04 x D.

**Recomendamos refrigeración por aire como primera opción.**

**Remarque:** Pour les opérations de finition et une définition précise de l'outil dans votre système FAO, demandez nous le fichier DXF des outils, téléchargez les via notre logiciel QuickFinder, ou contactez votre interlocuteur commercial pour plus de détails.

Veillez utiliser un angle de plongée inférieur à 0,5°. Pour le fraisage en interpolation hélicoïdale, veuillez paramétrer une plage d'utilisation entre 0.5 et 0.8 x Ø, pour des raisons de stabilité et de sécurité.

En contourage, utilisez les mêmes paramètres V<sub>c</sub> & f<sub>z</sub> que dans les conditions standards ci-dessus et utilisez : a<sub>p</sub> = 1 x D / a<sub>e</sub> = 0.01-0.04 x D. **Nous recommandons l'utilisation du soufflage d'air en premier lieu.**


**Nota:** Para o acabamento e precisão assim como melhor definição da ferramenta para o sistema CAM por favor solicitar dados DXF (QuickFinder), ou entre em contato com sua equipe de ferramentas MOLDINO local para obter mais detalhes. Defina o ângulo de rampa para menos de 0,5°. Por favor configure o diâmetro do furo de corte por interpolação no intervalo de 0,5 D e 0,8 D para a segurança e estabilidade. Para fresagem lateral por favor use V<sub>c</sub> & f<sub>z</sub> para condições corte gerais e configurar o ap = 1 x D, ae = 0,01 ~ 0,04 x D. **Recomendamos ar como primeira escolha para o sistema de arrefecimento e limpeza.**



## EHR-ATH | Recommended Cutting Conditions


<div><div></div><div></div></div>	Workpiece Material		Hardened Steels Example: 1.2343 (52 ~ 57 HRC)						Hardened Steels Example: 1.2379 (58 ~ 62 HRC)					
	D	Z	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm
	1	4	80	25,500	0.036	3,670	0.040	0.55	60	19,100	0.023	1,720	0.023	0.55
	2		80	12,700	0.072	3,660	0.080	1.1	60	9,600	0.045	1,730	0.046	1.1
	3		80	8,500	0.113	3,840	0.120	1.65	60	6,400	0.071	1,800	0.069	1.65
	4	6	80	6,400	0.152	5,840	0.160	2.2	60	4,800	0.095	2,740	0.092	2.2
	5		80	5,100	0.194	5,940	0.200	2.75	60	3,800	0.121	2,760	0.115	2.75
	6		80	4,200	0.233	5,870	0.240	3.3	60	3,200	0.146	2,790	0.138	3.3
	8		80	3,200	0.320	6,140	0.320	4.4	60	2,400	0.200	2,880	0.184	4.4
	10		80	2,500	0.400	6,000	0.400	5.5	60	1,900	0.250	2,850	0.230	5.5
12	80		2,100	0.456	5,750	0.480	6.6	60	1,600	0.285	2,740	0.276	6.6	
<div><div></div><div></div></div> <div>Standard</div>	Workpiece Material		Hardened Steels Example: HSS / PM (63 ~ 66 HRC)						Hardened Steels Example: HSS / PM (67 ~ 72 HRC)					
	D	Z	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm
	1	4	50	15,900	0.017	1,070	0.019	0.55	40	12,700	0.011	570	0.013	0.5
	2		50	8,000	0.034	1,080	0.038	1.1	40	6,400	0.023	580	0.026	1
	3		50	5,300	0.053	1,120	0.057	1.65	40	4,200	0.035	590	0.039	1.5
	4	6	50	4,000	0.071	1,710	0.076	2.2	40	3,200	0.048	910	0.052	2
	5		50	3,200	0.091	1,750	0.095	2.75	40	2,500	0.061	910	0.065	2.5
	6		50	2,700	0.109	1,770	0.114	3.3	40	2,100	0.073	920	0.078	3
	8		50	2,000	0.150	1,800	0.152	4.4	40	1,600	0.100	960	0.104	4
	10		50	1,600	0.188	1,800	0.190	5.5	40	1,300	0.125	980	0.130	5
12	50		1,300	0.214	1,670	0.228	6.6	40	1,100	0.143	940	0.156	6	

<div><div>▽</div><div>➡</div><div>High Efficient</div></div>	Workpiece Material		Hardened Steels Example: 1.2343 (52 ~ 57 HRC)						Hardened Steels Example: 1.2379 (58 ~ 62 HRC)					
	D	Z	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm
	1	4	100	31,880	0.037	4,730	0.038	0.7	70	22,280	0.023	2,070	0.022	0.7
	2		100	15,880	0.074	4,710	0.076	1.4	70	11,200	0.046	2,080	0.044	1.4
	3		100	10,630	0.116	4,940	0.114	2.1	70	7,470	0.073	2,170	0.066	2.1
	4	6	100	8,000	0.157	7,510	0.152	2.8	70	5,600	0.098	3,290	0.087	2.8
	5		100	6,380	0.200	7,650	0.190	3.5	70	4,430	0.125	3,320	0.109	3.5
	6		100	5,250	0.240	7,550	0.228	4.2	70	3,730	0.150	3,350	0.131	4.2
	8		100	4,000	0.330	7,910	0.304	5.6	70	2,800	0.206	3,460	0.175	5.6
	10		100	3,130	0.412	7,740	0.380	7	70	2,220	0.258	3,430	0.219	7
	12		100	2,630	0.470	7410	0.456	8.4	70	1,870	0.294	3,290	0.262	8.4
Workpiece Material		Hardened Steels Example: HSS / PM (63 ~ 66 HRC)						Hardened Steels Example: HSS / PM (67 ~ 72 HRC)						
D	Z	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	V <sub>c</sub> m/min	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	a <sub>e</sub> mm	
1	4	60	19,080	0.017	1,330	0.018	0.7	50	15,880	0.012	740	0.012	0.6	
2		60	9,600	0.035	1,330	0.036	1.4	50	8,000	0.023	740	0.025	1.2	
3		60	6,360	0.054	1,390	0.054	2.1	50	5,250	0.036	760	0.037	1.8	
4	6	60	4,800	0.073	2,110	0.072	2.8	50	4,000	0.049	1,170	0.049	2.4	
5		60	3,840	0.094	2,160	0.090	3.5	50	3,130	0.062	1,170	0.062	3	
6		60	3,240	0.112	2,190	0.108	4.2	50	2,630	0.075	1,180	0.074	3.6	
8		60	2,400	0.155	2,220	0.144	5.6	50	2,000	0.103	1,240	0.099	4.8	
10		60	1,920	0.193	2,220	0.181	7	50	1,630	0.129	1,260	0.124	6	
12		60	1,560	0.220	2,060	0.217	8.4	50	1,380	0.147	1,220	0.148	7.2	

 **Note:** Please use **CAM-R** for your programming corner radius. For precise tool definition for the CAM system please download DXF data (QuickFinder) or contact your local MOLDINO Tool staff for more details.


Please set up ramping angle to less than 0.5°. This tool is only recommended for z-constant roughing.

**We recommend air blow as first choice for cooling system.**

 **Achtung:** Bitte benutzen Sie **CAM-R** für die Programmierung des Eckenradius. Für präzise Werkzeugdefinition im CAM-System laden Sie sich bitte die DXF-Daten herunter (QuickFinder) oder kontaktieren Sie einen MOLDINO Tool-Mitarbeiter für weitere Details.


Bitte benutzen Sie einen Rampen- oder Helixwinkel von < 0,5°. Dieses Werkzeug ist ausschließlich für Z-konstantes Schruppen/ Planfräsen geeignet.

**Zum Kühlen empfehlen wir Druckluft.**

 **Nota:** Utilizzare raggio **CAM-R** per la programmazione del raggio torico. Per una precisa e corretta definizione del profilo dell'utensile per l'utilizzo CAM si prega di richiedere file DXF tramite QuickFinder o rivolgendosi al personale MOLDINO Tool


Utilizzare angoli di rampa minori o uguali a 0,5°. Questo utensile è da utilizzare solo per lavorazioni a Z costante.

**Come sistema di raffreddamento raccomandiamo l'utilizzo di aria.**

 **Nota:** En procesos de acabado y para una más precisa definición de la herramienta en el sistema de **CAM-R** por favor solicite los ficheros DXF (QuickFinder), o póngase en contacto con MOLDINO Tool para obtener más detalles.


Por favor utilice un ángulo de entrada menor de 0,5°. Esta herramienta sólo está recomendada para desbaste en Z-Constante.

**Recomendamos refrigeración por aire como primera opción.**

 **Remarque:** Veuillez utiliser **CAM-R** pour la programmation du rayon de tore. Pour une définition précise de l'outil dans votre système FAO, demandez nous le fichier DXF des outils, téléchargez les via notre logiciel QuickFinder, ou contactez votre interlocuteur commercial pour plus de détails.

Veuillez utiliser un angle de plongée inférieur à 0,5°. Cet outil n'est recommandé que pour des opérations d'ébauche par niveaux.

**Nous recommandons l'utilisation du soufflage d'air en premier lieu.**

 **Nota:** Por favor, use o **CAM-R** para programação do raio de canto. Para a definição da ferramenta mais correcta para o sistema CAM por favor solicitar dados DXF (QuickFinder) ou entre em contato com sua equipe de ferramentas MOLDINO local para obter mais detalhes.







Defina o ângulo de rampa para menos de 0,5°. Esta ferramenta é recomendada apenas para desbaste em z-constante.

**Recomendamos ar como primeira escolha para o sistema de arrefecimento e limpeza.**

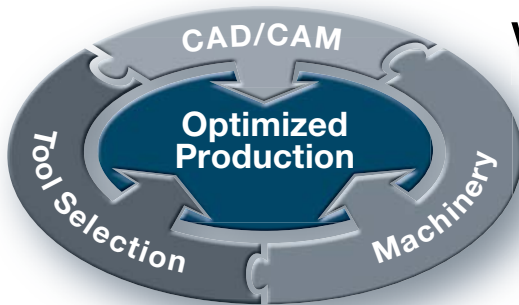
**EHHB/EHHR-ATH** | Epoch High Hard Ball/Radius ATH

## Cutting Conditions




-  **Please check always newest Cutting Conditions in our P50QF!**
-  **Bitte prüfen Sie immer die neuesten Schnittbedingungen in unserem P50QF!**
-  **Per cortesia verificate sempre le condizioni di taglio più attuali tramite il nostro P50QF!**
-  **Por favor, compruebe siempre las últimas condiciones de corte en nuestro P50QF!**
-  **Veillez, S.V.P., toujours vérifier nos toutes dernières conditions de coupe dans notre logiciel P50QF !**
-  **Por favor verifique sempre as condições de corte mais recentes no seu P50QF!**


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 **Note:** For finishing and precise tool definition for the CAM system please download DXF data (QuickFinder), or contact your local MOLDINO Tool staff for more details.

 **Nota:** Per lavorazioni di finitura e per una precisa e corretta definizione del profilo dell'utensile per l'utilizzo CAM si prega di richiedere file DXF tramite QuickFinder o rivolgendosi al personale MOLDINO Tool.

 **Remarque :** Pour les opérations de finition et une définition précise de l'outil dans votre système FAO, demandez nous le fichier DXF des outils, téléchargez les via notre logiciel QuickFinder, ou contactez votre interlocuteur commercial pour plus de détails.

 **Achtung:** Bitte laden Sie sich für die Schlichtbearbeitung und die präzise Definition der Werkzeuge die DXF Daten herunter (QuickFinder) oder wenden Sie sich an Ihren MOLDINO Anwendungstechniker.

 **Nota:** En procesos de acabado y para una más precisa definición de la herramienta en el sistema de CAM por favor solicite los ficheros DXF (QuickFinder), o póngase en contacto con MOLDINO Tool para obtener más detalles.

 **Nota:** Para o acabamento e precisão assim como melhor definição da ferramenta para o sistema CAM por favor solicite dados DXF (QuickFinder), ou entre em contato com sua equipe de ferramentas MOLDINO local para obter mais detalhes.

**Always up to date: Please check our P50 QuickFinder**



### **Attentions on Safety**

#### **1. Cautions regarding handling**

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

#### **2. Cautions regarding mounting**

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (3) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

#### **3. Cautions during use**

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. Please caution of fire while using oil base coolant, fire prevention is necessary.
- (5) Do not use the tool for any purpose other than that for which it is intended.

#### **4. Cautions regarding regrinding**

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

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**Specifications for the products listed in this catalog are subject to change without notice due to replacement or modification.**

## **MOLDINO Tool Engineering Europe GmbH**

Itterpark 12 · 40724 Hilden · Germany · Phone +49 (0) 21 03-24 82-0 · Fax +49 (0) 21 03-24 82-30

E-Mail [info@moldino.eu](mailto:info@moldino.eu) · Internet [www.moldino.eu](http://www.moldino.eu)

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