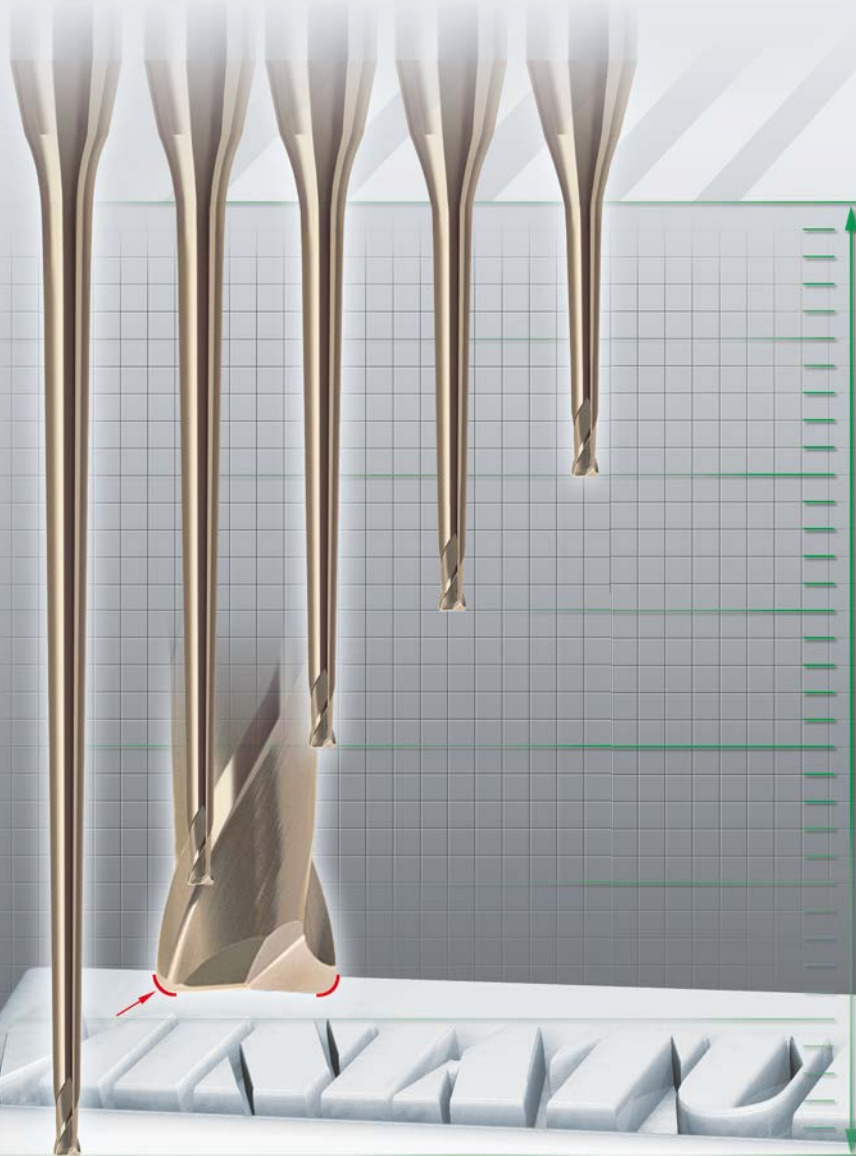


# **EPDRP** *Epoch Deep Radius Pencil Neck*

## **High Speed Deep Precision Machining**

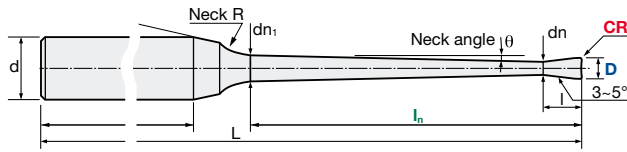


**D0.2mm ~ D3mm**

- For Materials  $\leq 69\text{HRC}$
- CR: **0.05 | 0.1 | 0.2 | 0.5**
- Available with:
  - $l_n$  2~35xD
  - Neck Angle  $0.4^\circ/0.9^\circ$
- Compound Neck Shape

*Carbide End Mills · Nano PVD Coated*

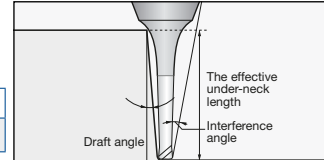
## EPDRP | Recommended Cutting Conditions



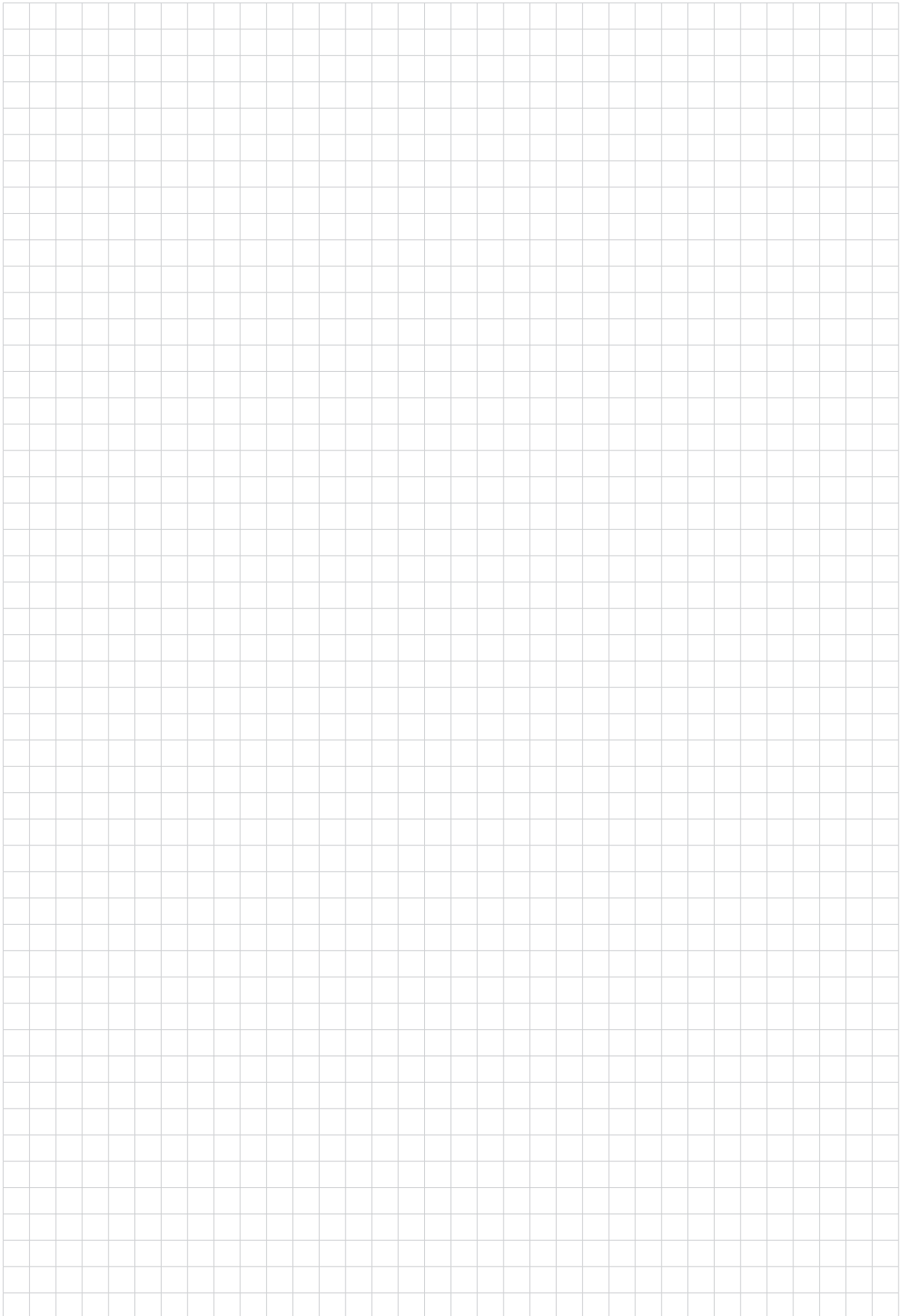
※ Back Draft is not available for Diameters 4–6 mm

Carbide	TH45+	Rake Angle
Micro Grain	Nano-PVD Coating	Negative

Helix Angle	R Tol. [mm]	D Tol. [mm]	d Tol.
30°	+/- 0.005	0/-0.015	h5





Size													Actual Effective Length in Incline angles					
ID Code	Item Code	Z	D	CR	I <sub>n</sub>	Neck angle θ	I	dn	dn <sub>1</sub>	Neck R	L	d	0°	0.5°	1°	2°	3°	
EP437	EPDRP-2002-2-09005	2	0.2	0.05	2	0.9	0.15	0.17	0.228	10	50	4	1.10	2.34	2.82	3.44	3.93	
EP438	EPDRP-2004-4-0901		0.4	0.1	4		0.3	0.37	0.486				1.25	2.69	4.90	5.74	6.37	
EP439	EPDRP-2004-5-0901		0.5		5		0.3		0.518				1.25	2.69	5.92	6.87	7.55	
EP440	EPDRP-2005-5-0901				6		0.35	0.47	0.616				1.30	2.81	5.93	6.88	7.55	
EP441	EPDRP-2005-8-0901				8				0.710				1.30	2.81	9.00	10.21	11.02	
EP442	EPDRP-2005-10-0901		10		0.4		0.57	0.773	1.30				2.81	11.04	12.40	13.28		
EP443	EPDRP-2006-12-0901		12	0.934		1.35		2.92	13.08	14.57	15.52							
EP444	EPDRP-2006-15-0901		15	1.029		1.35		2.92	16.14	17.81	18.84							
EP445	EPDRP-2008-6-0402		0.8	6	0.4	0.5	0.77	0.847	50	2.64	6.68	7.16	7.82	8.34				
EP446	EPDRP-2008-12-0902			12	0.9			1.131		1.45	3.02	13.08	14.57	15.51				
EP447	EPDRP-2010-8-0402		1	0.2	8	0.4	0.8	0.94	1.041	10	60	75	6	5.09	8.87	9.39	10.11	10.66
EP448	EPDRP-2010-10-0902				10	1.229			7					2.70	5.84	11.24	12.48	13.34
EP449	EPDRP-2010-15-0902				15	1.386			7					2.70	5.84	16.32	17.88	18.88
EP450	EPDRP-2010-20-0902				20	1.543								2.70	5.84	21.39	23.21	24.78
EP451	EPDRP-2010-25-0902				25	1.700			70					2.70	5.84	26.46	28.51	30.93
EP452	EPDRP-2010-30-0902				30	1.857			7					2.70	5.84	31.53	33.78	37.07
EP453	EPDRP-2010-35-0902		35	2.015	80	2.70	5.84	36.59		39.03	43.22							
EP454	EPDRP-2015-15-0902		1.5	0.2	15	1.35	1.42	1.849	70	75	80	90	100	3.89	8.51	16.47	17.95	18.93
EP455	EPDRP-2015-25-0902	25			2.163			3.89						8.51	26.60	28.57	31.04	
EP456	EPDRP-2015-30-0902	2.320			3.89			8.51						31.66	33.83	37.19		
EP457	EPDRP-2020-30-0902	2	0.5	30	0.9	1.7	1.92	2.809	10	70	80	90	4.24	9.30	31.69	33.84	37.22	
EP458	EPDRP-2020-30-0905			0.5									4.24	8.93	31.66	33.82	37.13	
EP459	EPDRP-2020-40-0902			0.2									4.24	9.30	41.80	44.66	x	
EP460	EPDRP-2020-40-0905			0.5									4.24	8.93	41.77	44.60	x	
EP461	EPDRP-2020-50-0902			0.2									4.24	9.30	51.90	55.74	x	
EP462	EPDRP-2020-50-0905			0.5									4.24	8.93	51.87	55.68	x	
EP463	EPDRP-2030-40-0902	3	0.5	40	2.5	2.86	4.038	4.352	4.667	80	90	100	6.95	15.40	42.04	x	x	
EP464	EPDRP-2030-40-0905			0.5									6.95	15.02	42.01	x	x	
EP465	EPDRP-2030-50-0902			0.2									6.95	15.40	52.13	x	x	
EP466	EPDRP-2030-50-0905			0.5									6.95	15.02	52.10	x	x	
EP467	EPDRP-2030-60-0902			0.2									6.95	15.40	62.21	x	x	
EP468	EPDRP-2030-60-0905			0.5									6.95	15.02	62.19	x	x	





## EPDRP | Recommended Cutting Conditions


Workpiece Material			I				II				III			
			Carbon Steels, Alloy Steels (180~250HB)				Tool Steels (25~35HRC)				Tool Steels (35~45HRC)			
			Copper (Cu): n + 20% / f <sub>z</sub> + 20%											
D	CR	I <sub>n</sub>	a <sub>p</sub> mm	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min
0.2	0.05	2	0.007	49500	0.016	1540	0.006	44550	0.016	1386	0.006	42075	0.016	1309
0.4	0.1	4	0.007	39600	0.021	1642	0.008	35640	0.021	1478	0.007	33660	0.021	1396
		5	0.007	35200	0.018	1298	0.006	31680	0.018	1168	0.006	29920	0.016	965
0.5	0.1	8	0.013	38016	0.025	1892	0.012	34214	0.025	1703	0.010	32314	0.020	1307
		10	0.008	30413	0.019	1177	0.007	27372	0.019	1059	0.006	25851	0.016	813
0.6	0.1	12	0.007	22810	0.019	883	0.006	20529	0.019	795	0.006	19388	0.016	610
		15	0.010	25471	0.027	1373	0.009	22924	0.027	1236	0.008	21650	0.022	948
0.8	0.1	15	0.006	20909	0.027	1127	0.005	18818	0.027	1015	0.005	17772	0.022	779
		6	0.045	39600	0.024	1882	0.041	35640	0.024	1694	0.036	33660	0.024	1600
1	0.2	12	0.020	35200	0.023	1622	0.018	31680	0.023	1460	0.016	29920	0.020	1206
		8	0.040	35640	0.036	2540	0.036	32076	0.036	2286	0.032	30294	0.036	2159
1	0.2	10	0.035	35640	0.039	2771	0.032	32076	0.039	2494	0.028	30294	0.039	2356
		15	0.028	31680	0.035	2190	0.025	28512	0.035	1971	0.022	26928	0.030	1629
1.5	0.2	20	0.020	23760	0.030	1437	0.018	21384	0.030	1293	0.016	20196	0.028	1134
		25	0.017	19800	0.030	1198	0.015	17820	0.030	1078	0.014	16830	0.028	945
1.5	0.2	30	0.017	19800	0.030	1198	0.015	17820	0.030	1078	0.014	16830	0.028	945
		15	0.010	19800	0.030	1198	0.009	17820	0.030	1078	0.008	16830	0.028	945
2	0.5	25	0.045	24640	0.035	1703	0.041	22176	0.035	1533	0.036	20944	0.030	1267
		30	0.032	18480	0.030	1118	0.029	16632	0.030	1006	0.026	15708	0.028	882
2	0.5	30	0.028	15400	0.030	931	0.025	13860	0.030	838	0.022	13090	0.028	735
		40	0.045	16800	0.065	2177	0.041	15120	0.065	1960	0.036	14280	0.057	1619
2	0.5	40	0.045	16800	0.072	2419	0.041	15120	0.072	2177	0.036	14280	0.063	1799
		50	0.035	12600	0.057	1429	0.032	11340	0.057	1286	0.028	10710	0.053	1128
3	0.5	50	0.035	12600	0.063	1588	0.032	11340	0.063	1429	0.028	10710	0.059	1253
		60	0.017	10500	0.057	1191	0.015	9450	0.057	1072	0.014	8925	0.053	940
3	0.5	60	0.017	10500	0.063	1323	0.015	9450	0.063	1191	0.014	8925	0.059	1044
		40	0.070	12800	0.065	1659	0.063	11520	0.065	1493	0.056	10880	0.057	1234
3	0.5	40	0.070	12800	0.072	1843	0.063	11520	0.072	1659	0.056	10880	0.063	1371
		50	0.050	9600	0.057	1089	0.045	8640	0.057	980	0.040	8160	0.053	859
3	0.5	50	0.050	9600	0.063	1210	0.045	8640	0.063	1089	0.040	8160	0.059	955
		60	0.030	8000	0.057	907	0.027	7200	0.057	816	0.024	6800	0.053	716
3	0.5	60	0.030	8000	0.063	1008	0.027	7200	0.063	907	0.024	6800	0.059	796


 **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.

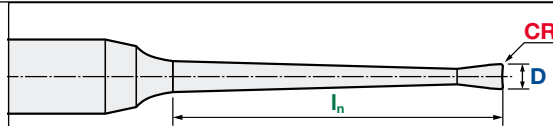
 **Nota:** Per lavorazioni di finitura e per una precisa e corretta definizione del profilo dell'utensile per l'utilizzo CAM si prega di richiedere file DXF tramite QuickFinder o rivolgendosi al personale MOLDINO Tool.

 **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 solicitar dados DXF (QuickFinder), ou entre em contato com sua equipe de ferramentas MOLDINO local para obter mais detalhes.



IV				V				Workpiece Material		
Hardened Steels (45~55HRC)				Hardened Steels (55~70HRC)				D	CR	l <sub>n</sub>
a <sub>p</sub> mm	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min	a <sub>p</sub> mm	n min <sup>-1</sup>	f <sub>z</sub> mm/t	V <sub>f</sub> mm/min			
0.005	37125	0.014	1026	0.004	34650	0.012	838	0.2	0.05	2
0.006	29700	0.018	1095	0.005	27720	0.016	894	0.4		4
0.005	26400	0.016	852	0.004	24640	0.014	681			5
0.008	28512	0.017	976	0.008	26611	0.015	786	0.5	0.1	8
0.005	22810	0.013	607	0.005	21289	0.011	489			10
0.005	17107	0.013	455	0.004	15967	0.011	367	0.6		12
0.007	19103	0.019	708	0.006	17830	0.016	571			15
0.004	15682	0.019	581	0.004	14636	0.016	469	0.8		6
0.029	29700	0.021	1255	0.027	27720	0.018	1025			12
0.013	26400	0.020	1064	0.012	24640	0.017	852			8
0.026	26730	0.032	1694	0.024	24948	0.028	1383			10
0.023	26730	0.035	1848	0.021	24948	0.030	1509			15
0.018	23760	0.030	1437	0.017	22176	0.026	1150	1	0.2	15
0.013	17820	0.026	924	0.012	16632	0.022	719			20
0.011	14850	0.026	770	0.010	13860	0.022	599			25
0.011	14850	0.026	770	0.010	13860	0.022	599			30
0.007	14850	0.026	770	0.006	13860	0.022	599			35
0.029	18480	0.030	1118	0.027	17248	0.026	894	1.5		15
0.021	13860	0.026	719	0.019	12936	0.022	559			25
0.018	11550	0.026	599	0.017	10780	0.022	466			30
0.029	12600	0.057	1429	0.027	11760	0.049	1143			
0.029	12600	0.063	1588	0.027	11760	0.054	1270	2	0.5	40
0.023	9450	0.049	919	0.021	8820	0.041	714		0.2	
0.023	9450	0.054	1021	0.021	8820	0.045	794		0.5	50
0.011	7875	0.049	765	0.010	7350	0.041	595		0.2	40
0.011	7875	0.054	851	0.010	7350	0.045	662		0.5	50
0.046	9600	0.057	1089	0.042	8960	0.049	871		0.2	40
0.046	9600	0.063	1210	0.042	8960	0.054	968		0.5	50
0.033	7200	0.049	700	0.030	6720	0.041	544	3	0.2	50
0.033	7200	0.054	778	0.030	6720	0.045	605		0.5	60
0.020	6000	0.049	583	0.018	5600	0.041	454		0.2	
0.020	6000	0.054	648	0.018	5600	0.045	504		0.5	

A modification of the cutting conditions is possible at following rules: Rotation (n/r.p.m.) and feed (V<sub>f</sub>) increasing in same ratio, but feed per tooth (f<sub>z</sub>) should be kept.

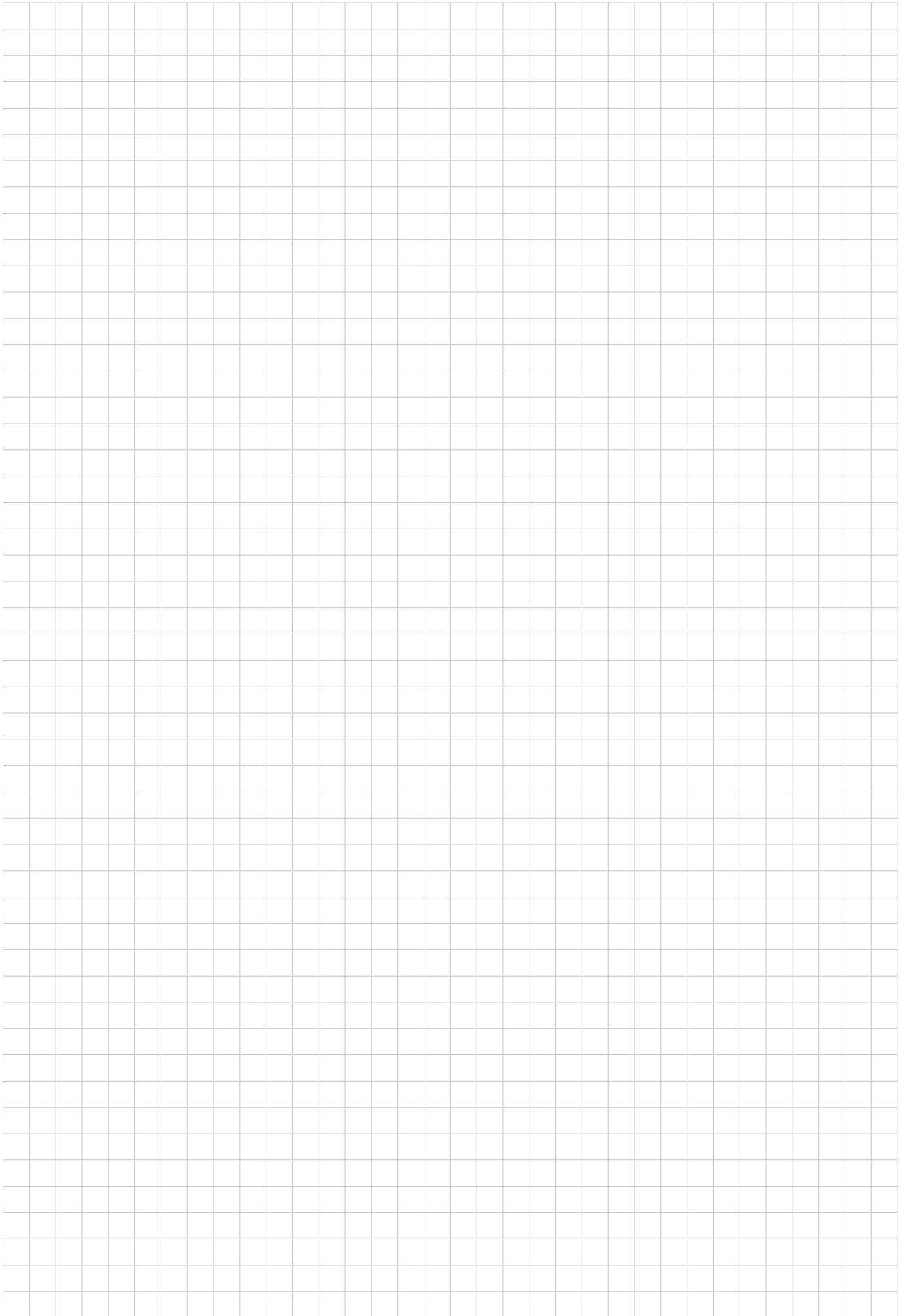
E' possibile modificare le condizioni di taglio seguendo le seguenti regole: aumentare rotazione (n/r.p.m.) ed avanzamento con la stessa proporzione mantenendo fisso l'avanzamento al dente f<sub>z</sub>

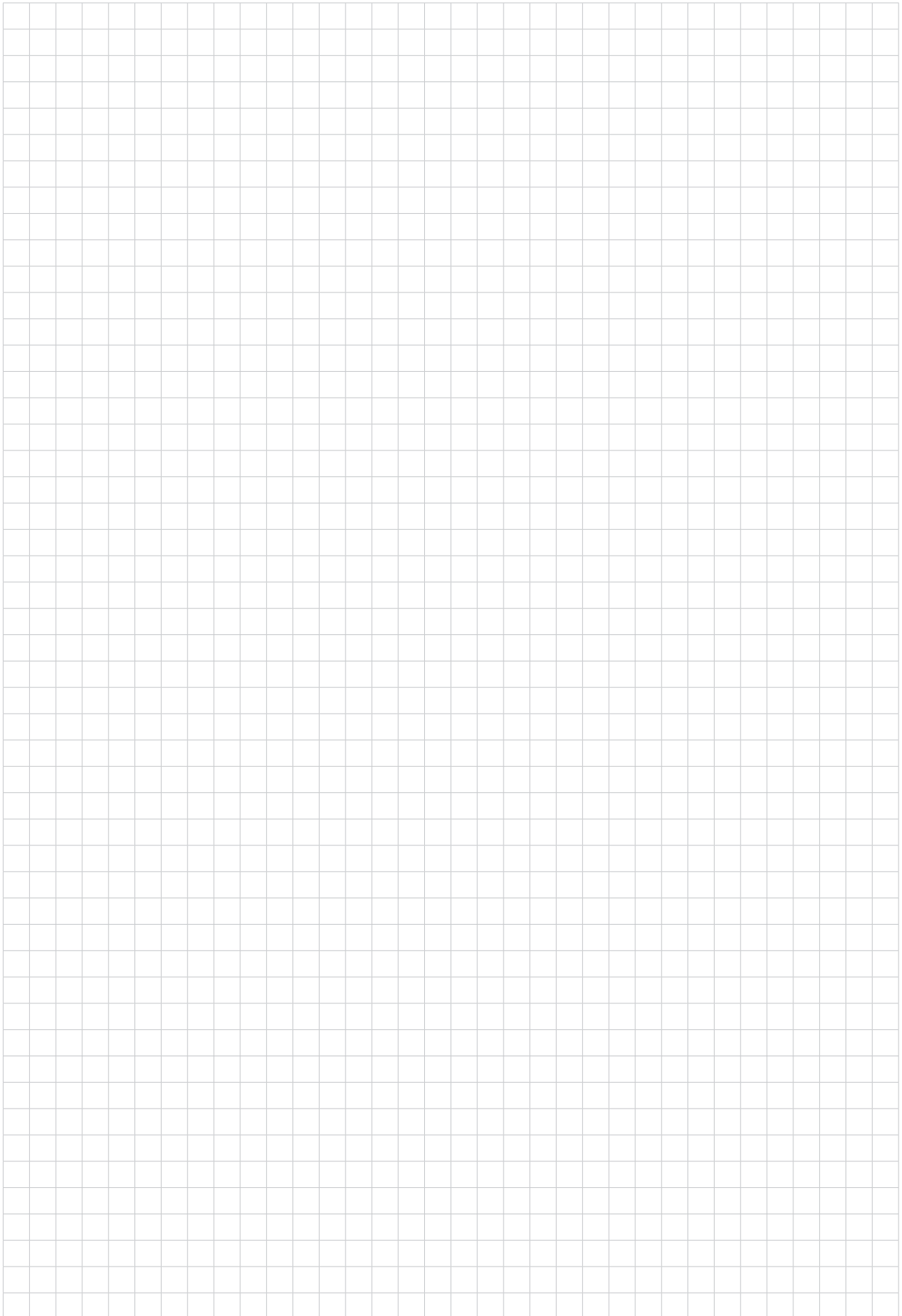
Il est possible de modifier les paramètres de coupe en suivant la règle suivante : Rotation (n/r.p.m.) et avance (V<sub>f</sub>) augmentées du même ratio, cependant, l'avance par dent (f<sub>z</sub>) doit être conservée à l'identique.

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V<sub>f</sub>) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f<sub>z</sub>) beibehalten.

Modificar las condiciones de corte es posible si respetamos la siguiente regla: Las revoluciones (rpm) y el avance (V<sub>f</sub>) se pueden incrementar o reducir en igual proporción, manteniendo el avance por diente (f<sub>z</sub>).

A modificação das condições de corte é possível nas seguintes regras: Rotação (n/ r.p.m) e avanço (V<sub>f</sub>) incrementar na mesma proporção, mas o avanço por dente (f<sub>z</sub>) deve ser mantido.





**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.**

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