Ultra Micro Grain Solid Carbide End Mill

EPDSE-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.

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.

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 maquina son inferiores, hay que ajustar el avance en proporción a las mismas.

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.

Ultra Micro Grain Solid Carbide End Mill

EPDSE-ATH | High Efficiency Cutting Conditions

Workpiece Material		I Carbon Steels. Alloy Steels (180~250HB)					II Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
0.1	0.3	0.006	0.05	51,500	0.011	1,133	0.005	0.05	46,350	0.011	1,020
	0.5	0.004	0.05	51,500	0.011	1,133	0.004	0.05	46,350	0.011	1,020
	1	0.003	0.05	49,440	0.010	989	0.003	0.05	44,496	0.010	890
0.2	0.5	0.02	0.1	46,350	0.016	1,483	0.018	0.1	41,715	0.016	1,335
	1	0.014	0.1	46,350	0.016	1,483	0.013	0.1	41,715	0.016	1,335
	1.5	0.008	0.1	41,715	0.014	1,168	0.007	0.1	37,544	0.014	1,051
	2	0.005	0.1	37,080	0.013	949	0.005	0.1	33,372	0.013	854
	3	0.003	0.1	37,080	0.011	831	0.003	0.1	33,372	0.011	748
0.3	1	0.021	0.15	41,200	0.016	1,318	0.019	0.15	37,080	0.016	1,187
	1.5	0.021	0.15	41,200	0.016	1,318	0.019	0.15	37,080	0.016	1,187
	2	0.012	0.15	37,080	0.014	1,038	0.011	0.15	33,372	0.014	934
	2.5	0.01	0.15	37,080	0.014	1,038	0.009	0.15	33,372	0.014	934
	3	0.008	0.15	37,080	0.014	1,038	0.007	0.15	33,372	0.014	934
0.4	1	0.04	0.2	32,960	0.021	1,384	0.036	0.2	29,664	0.021	1,246
	1.5	0.028	0.2	32,960	0.021	1,384	0.025	0.2	29,664	0.021	1,246
	2	0.028	0.2	32,960	0.021	1,384	0.025	0.2	29,664	0.021	1,246
	2.5	0.022	0.2	29,664	0.019	1,127	0.020	0.2	26,698	0.019	1,015
	3	0.016	0.2	29,664	0.019	1,127	0.014	0.2	26,698	0.019	1,015
	3.5	0.012	0.2	29,664	0.019	1,127	0.011	0.2	26,698	0.019	1,015
	4	0.01	0.2	29,664	0.019	1,127	0.009	0.2	26,698	0.019	1,015
	5	0.01	0.2	26,368	0.017	897	0.009	0.2	23,731	0.017	807
	6	0.006	0.2	26,368	0.017	897	0.005	0.2	23,731	0.017	807
	8	0.003	0.2	23,072	0.015	692	0.003	0.2	20,765	0.015	623
	10	0.002	0.2	19,776	0.012	471	0.002	0.2	17,798	0.012	424
0.5	1	0.05	0.25	32,960	0.021	1,384	0.045	0.25	29,664	0.021	1,246
	1.5	0.05	0.25	32,960	0.021	1,384	0.045	0.25	29,664	0.021	1,246
	2	0.035	0.25	32,960	0.021	1,384	0.032	0.25	29,664	0.021	1,246
	2.5	0.03	0.25	29,664	0.021	1,246	0.027	0.25	26,698	0.021	1,121
	3	0.02	0.25	29,664	0.019	1,127	0.018	0.25	26,698	0.019	1,015
	4	0.02	0.25	29,664	0.019	1,127	0.018	0.25	26,698	0.019	1,015
	5	0.013	0.25	29,664	0.019	1,127	0.012	0.25	26,698	0.019	1,015
	6	0.013	0.25	26,368	0.017	897	0.012	0.25	23,731	0.017	807
	8	0.008	0.25	26,368	0.017	897	0.007	0.25	23,731	0.017	807
	10	0.004	0.25	23,072	0.015	692	0.004	0.25	20,765	0.015	623
0.6	2	0.042	0.3	32,960	0.026	1,714	0.038	0.3	29,664	0.026	1,543
	3	0.035	0.3	29,664	0.024	1,424	0.032	0.3	26,698	0.024	1,281
	4	0.024	0.3	29,664	0.024	1,424	0.022	0.3	26,698	0.024	1,281
	5	0.02	0.3	29,664	0.024	1,424	0.018	0.3	26,698	0.024	1,281
	6	0.015	0.3	29,664	0.024	1,424	0.014	0.3	26,698	0.024	1,281
	7	0.015	0.3	26,368	0.021	1,107	0.014	0.3	23,731	0.021	997
	8	0.015	0.3	26,368	0.021	1,107	0.014	0.3	23,731	0.021	997
	9	0.012	0.3	26,368	0.021	1,107	0.011	0.3	23,731	0.021	997
	10	0.009	0.3	26,368	0.021	1,107	0.008	0.3	23,731	0.021	997
0.7	2	0.07	0.35	32,960	0.027	1,780	0.063	0.35	29,664	0.027	1,602
	4	0.049	0.35	29,664	0.024	1,424	0.044	0.35	26,698	0.024	1,281
	6	0.018	0.35	29,664	0.024	1,424	0.016	0.35	26,698	0.024	1,281
	8	0.018	0.35	26,368	0.021	1,107	0.016	0.35	23,731	0.021	997
	10	0.018	0.35	26,368	0.021	1,107	0.016	0.35	23,731	0.021	997
0.8	4	0.056	0.4	32,960	0.026	1,714	0.050	0.4	29,664	0.026	1,543
	6	0.032	0.4	29,664	0.024	1,424	0.029	0.4	26,698	0.024	1,281
	8	0.02	0.4	29,664	0.024	1,424	0.018	0.4	26,698	0.024	1,281
	10	0.02	0.4	26,368	0.021	1,107	0.018	0.4	23,731	0.021	997
	12	0.012	0.4	26,368	0.021	1,107	0.011	0.4	23,731	0.021	997
0.9	6	0.036	0.45	29,664	0.024	1,424	0.032	0.45	26,698	0.024	1,281
	8	0.023	0.45	29,664	0.024	1,424	0.021	0.45	26,698	0.024	1,281
	10	0.023	0.45	26,368	0.021	1,107	0.021	0.45	23,731	0.021	997
	12	0.023	0.45	26,368	0.021	1,107	0.021	0.45	23,731	0.021	997

High Efficient

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

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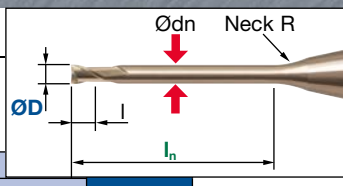

EPDSE-ATH | High Efficiency Cutting Conditions

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.004	0.05	43,775	0.009	770	0.003	0.05	38,625	0.008	595	0.002	0.05	36,050	0.007	476		0.3
0.003	0.05	43,775	0.009	770	0.002	0.05	38,625	0.008	595	0.002	0.05	36,050	0.007	476	0.1	0.5
0.002	0.05	42,024	0.008	672	0.002	0.05	37,080	0.007	519	0.001	0.05	34,608	0.006	415		1
0.014	0.1	39,398	0.013	1,009	0.010	0.1	34,763	0.011	779	0.008	0.1	32,445	0.010	623		0.5
0.010	0.1	39,398	0.013	1,009	0.007	0.1	34,763	0.011	779	0.006	0.1	32,445	0.010	623		1
0.006	0.1	35,458	0.011	794	0.004	0.1	31,286	0.010	613	0.003	0.1	29,201	0.008	491	0.2	1.5
0.004	0.1	31,518	0.010	645	0.003	0.1	27,810	0.009	498	0.002	0.1	25,956	0.008	399		2
0.002	0.1	31,518	0.009	565	0.002	0.1	27,810	0.008	436	0.001	0.1	25,956	0.007	349		3
0.015	0.15	35,020	0.013	897	0.011	0.15	30,900	0.011	692	0.008	0.15	28,840	0.010	554		1
0.015	0.15	35,020	0.013	897	0.011	0.15	30,900	0.011	692	0.008	0.15	28,840	0.010	554		1.5
0.008	0.15	31,518	0.011	706	0.006	0.15	27,810	0.010	545	0.005	0.15	25,956	0.008	436	0.3	2
0.007	0.15	31,518	0.011	706	0.005	0.15	27,810	0.010	545	0.004	0.15	25,956	0.008	436		2.5
0.006	0.15	31,518	0.011	706	0.004	0.15	27,810	0.010	545	0.003	0.15	25,956	0.008	436		3
0.028	0.2	28,016	0.017	941	0.020	0.2	24,720	0.015	727	0.016	0.2	23,072	0.013	581		1
0.020	0.2	28,016	0.017	941	0.014	0.2	24,720	0.015	727	0.011	0.2	23,072	0.013	581		1.5
0.020	0.2	28,016	0.017	941	0.014	0.2	24,720	0.015	727	0.011	0.2	23,072	0.013	581		2
0.015	0.2	25,214	0.015	767	0.011	0.2	22,248	0.013	592	0.009	0.2	20,765	0.011	473		2.5
0.011	0.2	25,214	0.015	767	0.008	0.2	22,248	0.013	592	0.006	0.2	20,765	0.011	473		3
0.008	0.2	25,214	0.015	767	0.006	0.2	22,248	0.013	592	0.005	0.2	20,765	0.011	473	0.4	3.5
0.007	0.2	25,214	0.015	767	0.005	0.2	22,248	0.013	592	0.004	0.2	20,765	0.011	473		4
0.007	0.2	22,413	0.014	610	0.005	0.2	19,776	0.012	471	0.004	0.2	18,458	0.010	377		5
0.004	0.2	22,413	0.014	610	0.003	0.2	19,776	0.012	471	0.002	0.2	18,458	0.010	377		6
0.002	0.2	19,611	0.012	471	0.002	0.2	17,304	0.011	363	0.001	0.2	16,150	0.009	291		8
0.001	0.2	16,810	0.010	320	0.001	0.2	14,832	0.008	247	0.001	0.2	13,843	0.007	198		10
0.035	0.25	28,016	0.017	941	0.025	0.25	24,720	0.015	727	0.020	0.25	23,072	0.013	581		1
0.035	0.25	28,016	0.017	941	0.025	0.25	24,720	0.015	727	0.020	0.25	23,072	0.013	581		1.5
0.025	0.25	28,016	0.017	941	0.018	0.25	24,720	0.015	727	0.014	0.25	23,072	0.013	581		2
0.021	0.25	25,214	0.017	847	0.015	0.25	22,248	0.015	654	0.012	0.25	20,765	0.013	523		2.5
0.014	0.25	25,214	0.015	767	0.010	0.25	22,248	0.013	592	0.008	0.25	20,765	0.011	473		3
0.014	0.25	25,214	0.015	767	0.010	0.25	22,248	0.013	592	0.008	0.25	20,765	0.011	473	0.5	4
0.009	0.25	25,214	0.015	767	0.007	0.25	22,248	0.013	592	0.005	0.25	20,765	0.011	473		5
0.009	0.25	22,413	0.014	610	0.007	0.25	19,776	0.012	471	0.005	0.25	18,458	0.010	377		6
0.006	0.25	22,413	0.014	610	0.004	0.25	19,776	0.012	471	0.003	0.25	18,458	0.010	377		8
0.003	0.25	19,611	0.012	471	0.002	0.25	17,304	0.011	363	0.002	0.25	16,150	0.009	291		10
0.029	0.3	28,016	0.021	1,165	0.021	0.3	24,720	0.018	900	0.017	0.3	23,072	0.016	720		2
0.025	0.3	25,214	0.019	968	0.018	0.3	22,248	0.017	748	0.014	0.3	20,765	0.014	598		3
0.017	0.3	25,214	0.019	968	0.012	0.3	22,248	0.017	748	0.010	0.3	20,765	0.014	598		4
0.014	0.3	25,214	0.019	968	0.010	0.3	22,248	0.017	748	0.008	0.3	20,765	0.014	598		5
0.011	0.3	25,214	0.019	968	0.008	0.3	22,248	0.017	748	0.006	0.3	20,765	0.014	598	0.6	6
0.011	0.3	22,413	0.017	753	0.008	0.3	19,776	0.015	581	0.006	0.3	18,458	0.013	465		7
0.011	0.3	22,413	0.017	753	0.008	0.3	19,776	0.015	581	0.006	0.3	18,458	0.013	465		8
0.008	0.3	22,413	0.017	753	0.006	0.3	19,776	0.015	581	0.005	0.3	18,458	0.013	465		9
0.006	0.3	22,413	0.017	753	0.005	0.3	19,776	0.015	581	0.004	0.3	18,458	0.013	465		10
0.049	0.35	28,016	0.022	1,210	0.035	0.35	24,720	0.019	934	0.028	0.35	23,072	0.016	748		2
0.034	0.35	25,214	0.019	968	0.025	0.35	22,248	0.017	748	0.020	0.35	20,765	0.014	598		4
0.013	0.35	25,214	0.019	968	0.009	0.35	22,248	0.017	748	0.007	0.35	20,765	0.014	598	0.7	6
0.013	0.35	22,413	0.017	753	0.009	0.35	19,776	0.015	581	0.007	0.35	18,458	0.013	465		8
0.013	0.35	22,413	0.017	753	0.009	0.35	19,776	0.015	581	0.007	0.35	18,458	0.013	465		10
0.039	0.4	28,016	0.021	1,165	0.028	0.4	24,720	0.018	900	0.022	0.4	23,072	0.016	720		4
0.022	0.4	25,214	0.019	968	0.016	0.4	22,248	0.017	748	0.013	0.4	20,765	0.014	598		6
0.014	0.4	25,214	0.019	968	0.010	0.4	22,248	0.017	748	0.008	0.4	20,765	0.014	598	0.8	8
0.014	0.4	22,413	0.017	753	0.010	0.4	19,776	0.015	581	0.008	0.4	18,458	0.013	465		10
0.008	0.4	22,413	0.017	753	0.006	0.4	19,776	0.015	581	0.005	0.4	18,458	0.013	465		12
0.025	0.45	25,214	0.019	968	0.018	0.45	22,248	0.017	748	0.014	0.45	20,765	0.014	598		6
0.016	0.45	25,214	0.019	968	0.012	0.45	22,248	0.017	748	0.009	0.45	20,765	0.014	598	0.9	8
0.016	0.45	22,413	0.017	753	0.012	0.45	19,776	0.015	581	0.009	0.45	18,458	0.013	465		10
0.016	0.45	22,413	0.017	753	0.012	0.45	19,776	0.015	581	0.009	0.45	18,458	0.013	465		12

Ø1

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

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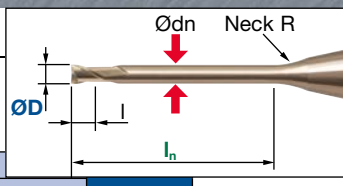
Workpiece Material		I Carbon Steels. Alloy Steels (180~250HB)					II Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
1	2	0.1	0.5	29,664	0.032	1,898	0.090	0.5	26,698	0.032	1,709
	3	0.085	0.5	29,664	0.032	1,898	0.077	0.5	26,698	0.032	1,709
	4	0.07	0.5	29,664	0.032	1,898	0.063	0.5	26,698	0.032	1,709
	5	0.055	0.5	29,664	0.032	1,898	0.050	0.5	26,698	0.032	1,709
	6	0.04	0.5	26,698	0.029	1,548	0.036	0.5	24,028	0.029	1,394
	7	0.04	0.5	26,698	0.029	1,548	0.036	0.5	24,028	0.029	1,394
	8	0.04	0.5	26,698	0.029	1,548	0.036	0.5	24,028	0.029	1,394
	9	0.033	0.5	26,698	0.029	1,548	0.030	0.5	24,028	0.029	1,394
	10	0.025	0.5	26,698	0.029	1,548	0.023	0.5	24,028	0.029	1,394
	12	0.025	0.5	23,731	0.025	1,187	0.023	0.5	21,358	0.025	1,068
	14	0.025	0.5	23,731	0.025	1,187	0.023	0.5	21,358	0.025	1,068
	16	0.015	0.5	23,731	0.022	1,044	0.014	0.5	21,358	0.022	940
	20	0.01	0.5	20,765	0.019	789	0.009	0.5	18,688	0.019	710
	25	0.005	0.5	17,304	0.016	554	0.005	0.5	15,574	0.016	498
1.2	6	0.084	0.6	26,368	0.032	1,688	0.076	0.6	23,731	0.032	1,519
	8	0.048	0.6	23,731	0.029	1,376	0.043	0.6	21,358	0.029	1,239
	10	0.03	0.6	23,731	0.029	1,376	0.027	0.6	21,358	0.029	1,239
	12	0.03	0.6	23,731	0.029	1,376	0.027	0.6	21,358	0.029	1,239
	16	0.02	0.6	21,094	0.026	1,097	0.018	0.6	18,985	0.026	987
1.4	6	0.1	0.7	23,072	0.032	1,477	0.090	0.7	20,765	0.032	1,329
	12	0.035	0.7	20,765	0.029	1,204	0.032	0.7	18,688	0.029	1,084
1.5	4	0.11	0.75	23,072	0.032	1,477	0.099	0.75	20,765	0.032	1,329
	6	0.11	0.75	23,072	0.032	1,477	0.099	0.75	20,765	0.032	1,329
	8	0.08	0.75	20,765	0.029	1,204	0.072	0.75	18,688	0.029	1,084
	10	0.06	0.75	20,765	0.029	1,204	0.054	0.75	18,688	0.029	1,084
	12	0.06	0.75	20,765	0.029	1,204	0.054	0.75	18,688	0.029	1,084
	14	0.038	0.75	20,765	0.029	1,204	0.034	0.75	18,688	0.029	1,084
	16	0.038	0.75	18,458	0.025	923	0.034	0.75	16,612	0.025	831
	18	0.038	0.75	18,458	0.025	923	0.034	0.75	16,612	0.025	831
	20	0.038	0.75	18,458	0.025	923	0.034	0.75	16,612	0.025	831
	25	0.023	0.75	13,843	0.022	609	0.021	0.75	12,459	0.022	548
	30	0.015	0.75	11,536	0.018	415	0.014	0.75	10,382	0.018	374
	35	0.01	0.75	11,536	0.018	415	0.009	0.75	10,382	0.018	374
	40	0.005	0.75	9,229	0.014	258	0.005	0.75	8,306	0.014	233
1.6	6	0.11	0.8	21,424	0.035	1,500	0.099	0.8	19,282	0.035	1,350
	8	0.11	0.8	21,424	0.035	1,500	0.099	0.8	19,282	0.035	1,350
1.8	6	0.13	0.9	21,424	0.035	1,500	0.117	0.9	19,282	0.035	1,350
	8	0.13	0.9	21,424	0.035	1,500	0.117	0.9	19,282	0.035	1,350
2	4	0.2	1	17,304	0.042	1,454	0.180	1	15,574	0.042	1,308
	6	0.2	1	17,304	0.042	1,454	0.180	1	15,574	0.042	1,308
	8	0.14	1	17,304	0.042	1,454	0.126	1	15,574	0.042	1,308
	10	0.14	1	17,304	0.042	1,454	0.126	1	15,574	0.042	1,308
	12	0.1	1	15,574	0.038	1,184	0.090	1	14,016	0.038	1,065
	14	0.08	1	15,574	0.038	1,184	0.072	1	14,016	0.038	1,065
	16	0.08	1	15,574	0.038	1,184	0.072	1	14,016	0.038	1,065
	18	0.05	1	15,574	0.038	1,184	0.045	1	14,016	0.038	1,065
	20	0.05	1	15,574	0.038	1,184	0.045	1	14,016	0.038	1,065
	25	0.05	1	13,843	0.034	941	0.045	1	12,459	0.034	847
	30	0.03	1	13,843	0.034	941	0.027	1	12,459	0.034	847
	35	0.02	1	12,113	0.030	727	0.018	1	10,902	0.030	654
	40	0.01	1	12,113	0.030	727	0.009	1	10,902	0.030	654
	50	0.005	1	10,382	0.026	540	0.005	1	9,344	0.026	486
2.5	8	0.18	1.25	14,832	0.053	1,572	0.162	1.25	13,349	0.053	1,415
	12	0.18	1.25	14,832	0.053	1,572	0.162	1.25	13,349	0.053	1,415
	16	0.1	1.25	13,349	0.048	1,281	0.090	1.25	12,014	0.048	1,153
	20	0.1	1.25	13,349	0.048	1,281	0.090	1.25	12,014	0.048	1,153
	30	0.06	1.25	11,866	0.043	1,020	0.054	1.25	10,679	0.043	918
	40	0.03	1.25	10,382	0.038	789	0.027	1.25	9,344	0.038	710
	50	0.01	1.25	10,382	0.038	789	0.009	1.25	9,344	0.038	710

High Efficient

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High Efficiency Cutting Conditions

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.070	0.5	25,214	0.026	1,291	0.050	0.5	22,248	0.022	997	0.040	0.5	20,765	0.019	797		2
0.060	0.5	25,214	0.026	1,291	0.043	0.5	22,248	0.022	997	0.034	0.5	20,765	0.019	797		3
0.049	0.5	25,214	0.026	1,291	0.035	0.5	22,248	0.022	997	0.028	0.5	20,765	0.019	797		4
0.039	0.5	25,214	0.026	1,291	0.028	0.5	22,248	0.022	997	0.022	0.5	20,765	0.019	797		5
0.028	0.5	22,693	0.023	1,053	0.020	0.5	20,023	0.020	813	0.016	0.5	18,688	0.017	650		6
0.028	0.5	22,693	0.023	1,053	0.020	0.5	20,023	0.020	813	0.016	0.5	18,688	0.017	650		7
0.028	0.5	22,693	0.023	1,053	0.020	0.5	20,023	0.020	813	0.016	0.5	18,688	0.017	650		8
0.023	0.5	22,693	0.023	1,053	0.017	0.5	20,023	0.020	813	0.013	0.5	18,688	0.017	650	1	9
0.018	0.5	22,693	0.023	1,053	0.013	0.5	20,023	0.020	813	0.010	0.5	18,688	0.017	650		10
0.018	0.5	20,172	0.020	807	0.013	0.5	17,798	0.018	623	0.010	0.5	16,612	0.015	498		12
0.018	0.5	20,172	0.020	807	0.013	0.5	17,798	0.018	623	0.010	0.5	16,612	0.015	498		14
0.011	0.5	20,172	0.018	710	0.008	0.5	17,798	0.015	548	0.006	0.5	16,612	0.013	439		16
0.007	0.5	17,650	0.015	537	0.005	0.5	15,574	0.013	414	0.004	0.5	14,535	0.011	331		20
0.004	0.5	14,708	0.013	377	0.003	0.5	12,978	0.011	291	0.002	0.5	12,113	0.010	233		25
0.059	0.6	22,413	0.026	1,148	0.042	0.6	19,776	0.022	886	0.034	0.6	18,458	0.019	709		6
0.034	0.6	20,172	0.023	936	0.024	0.6	17,798	0.020	723	0.019	0.6	16,612	0.017	578		8
0.021	0.6	20,172	0.023	936	0.015	0.6	17,798	0.020	723	0.012	0.6	16,612	0.017	578	1.2	10
0.021	0.6	20,172	0.023	936	0.015	0.6	17,798	0.020	723	0.012	0.6	16,612	0.017	578		12
0.014	0.6	17,930	0.021	746	0.010	0.6	15,821	0.018	576	0.008	0.6	14,766	0.016	461		16
0.070	0.7	19,611	0.026	1,004	0.050	0.7	17,304	0.022	775	0.040	0.7	16,150	0.019	620	1.4	6
0.025	0.7	17,650	0.023	819	0.018	0.7	15,574	0.020	632	0.014	0.7	14,535	0.017	506		12
0.077	0.75	19,611	0.026	1,004	0.055	0.75	17,304	0.022	775	0.044	0.75	16,150	0.019	620		4
0.077	0.75	19,611	0.026	1,004	0.055	0.75	17,304	0.022	775	0.044	0.75	16,150	0.019	620		6
0.056	0.75	17,650	0.023	819	0.040	0.75	15,574	0.020	632	0.032	0.75	14,535	0.017	506		8
0.042	0.75	17,650	0.023	819	0.030	0.75	15,574	0.020	632	0.024	0.75	14,535	0.017	506		10
0.042	0.75	17,650	0.023	819	0.030	0.75	15,574	0.020	632	0.024	0.75	14,535	0.017	506		12
0.027	0.75	17,650	0.023	819	0.019	0.75	15,574	0.020	632	0.015	0.75	14,535	0.017	506		14
0.027	0.75	15,689	0.020	628	0.019	0.75	13,843	0.018	485	0.015	0.75	12,920	0.015	388	1.5	16
0.027	0.75	15,689	0.020	628	0.019	0.75	13,843	0.018	485	0.015	0.75	12,920	0.015	388		18
0.027	0.75	15,689	0.020	628	0.019	0.75	13,843	0.018	485	0.015	0.75	12,920	0.015	388		20
0.016	0.75	11,767	0.018	414	0.012	0.75	10,382	0.015	320	0.009	0.75	9,690	0.013	256		25
0.011	0.75	9,806	0.014	282	0.008	0.75	8,652	0.013	218	0.006	0.75	8,075	0.011	174		30
0.007	0.75	9,806	0.014	282	0.005	0.75	8,652	0.013	218	0.004	0.75	8,075	0.011	174		35
0.004	0.75	7,844	0.011	176	0.003	0.75	6,922	0.010	136	0.002	0.75	6,460	0.008	109		40
0.077	0.8	18,210	0.028	1,020	0.055	0.8	16,068	0.025	787	0.044	0.8	14,997	0.021	630	1.6	6
0.077	0.8	18,210	0.028	1,020	0.055	0.8	16,068	0.025	787	0.044	0.8	14,997	0.021	630		8
0.091	0.9	18,210	0.028	1,020	0.065	0.9	16,068	0.025	787	0.052	0.9	14,997	0.021	630	1.8	6
0.091	0.9	18,210	0.028	1,020	0.065	0.9	16,068	0.025	787	0.052	0.9	14,997	0.021	630		8
0.140	1	14,708	0.034	988	0.100	1	12,978	0.029	763	0.080	1	12,113	0.025	610		4
0.140	1	14,708	0.034	988	0.100	1	12,978	0.029	763	0.080	1	12,113	0.025	610		6
0.098	1	14,708	0.034	988	0.070	1	12,978	0.029	763	0.056	1	12,113	0.025	610		8
0.098	1	14,708	0.034	988	0.070	1	12,978	0.029	763	0.056	1	12,113	0.025	610		10
0.070	1	13,238	0.030	805	0.050	1	11,680	0.027	621	0.040	1	10,902	0.023	497		12
0.056	1	13,238	0.030	805	0.040	1	11,680	0.027	621	0.032	1	10,902	0.023	497		14
0.056	1	13,238	0.030	805	0.040	1	11,680	0.027	621	0.032	1	10,902	0.023	497		16
0.035	1	13,238	0.030	805	0.025	1	11,680	0.027	621	0.020	1	10,902	0.023	497	2	18
0.035	1	13,238	0.030	805	0.025	1	11,680	0.027	621	0.020	1	10,902	0.023	497		20
0.035	1	11,767	0.027	640	0.025	1	10,382	0.024	494	0.020	1	9,690	0.020	395		25
0.021	1	11,767	0.027	640	0.015	1	10,382	0.024	494	0.012	1	9,690	0.020	395		30
0.014	1	10,296	0.024	494	0.010	1	9,085	0.021	382	0.008	1	8,479	0.018	305		35
0.007	1	10,296	0.024	494	0.005	1	9,085	0.021	382	0.004	1	8,479	0.018	305		40
0.004	1	8,825	0.021	367	0.003	1	7,787	0.018	283	0.002	1	7,268	0.016	227		50
0.126	1.25	12,607	0.042	1,069	0.090	1.25	11,124	0.037	825	0.072	1.25	10,382	0.032	660		8
0.126	1.25	12,607	0.042	1,069	0.090	1.25	11,124	0.037	825	0.072	1.25	10,382	0.032	660		12
0.070	1.25	11,346	0.038	871	0.050	1.25	10,012	0.034	673	0.040	1.25	9,344	0.029	538		16
0.070	1.25	11,346	0.038	871	0.050	1.25	10,012	0.034	673	0.040	1.25	9,344	0.029	538	2.5	20
0.042	1.25	10,086	0.034	694	0.030	1.25	8,899	0.030	536	0.024	1.25	8,306	0.026	429		30
0.021	1.25	8,825	0.030	537	0.015	1.25	7,787	0.027	414	0.012	1.25	7,268	0.023	331		40
0.007	1.25	8,825	0.030	537	0.005	1.25	7,787	0.027	414	0.004	1.25	7,268	0.023	331		50

Ø3

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

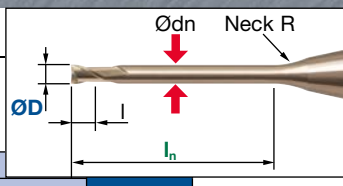
Ultra Micro Grain Solid Carbide End Mill

EPDSE-ATH | High Efficiency Cutting Conditions

Workpiece Material		I					II				
		Carbon Steels. Alloy Steels (180~250HB)					Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
3	8	0.3	1.5	13,184	0.053	1,398	0.270	1.5	11,866	0.053	1,258
	12	0.21	1.5	13,184	0.053	1,398	0.189	1.5	11,866	0.053	1,258
	16	0.15	1.5	11,866	0.048	1,139	0.135	1.5	10,679	0.048	1,025
	20	0.12	1.5	11,866	0.048	1,139	0.108	1.5	10,679	0.048	1,025
	25	0.08	1.5	11,866	0.048	1,139	0.072	1.5	10,679	0.048	1,025
	30	0.08	1.5	11,866	0.048	1,139	0.072	1.5	10,679	0.048	1,025
	40	0.05	1.5	10,547	0.043	907	0.045	1.5	9,492	0.043	816
	50	0.02	1.5	9,167	0.037	678	0.018	1.5	8,250	0.037	611
4	12	0.4	2	9,682	0.071	1,375	0.360	2	8,714	0.071	1,237
	16	0.28	2	9,682	0.071	1,375	0.252	2	8,714	0.071	1,237
	20	0.28	2	8,714	0.071	1,237	0.252	2	7,842	0.071	1,114
	25	0.16	2	8,714	0.064	1,115	0.144	2	7,842	0.064	1,004
	30	0.16	2	8,714	0.064	1,115	0.144	2	7,842	0.064	1,004
	35	0.1	2	7,842	0.064	1,004	0.090	2	7,058	0.064	903
	40	0.1	2	7,842	0.064	1,004	0.090	2	7,058	0.064	903
	50	0.06	2	6,777	0.050	678	0.054	2	6,100	0.050	610
5	20	0.3	2.5	7,737	0.071	1,099	0.270	2.5	6,964	0.071	989
	25	0.3	2.5	6,963	0.064	891	0.270	2.5	6,267	0.064	802
	30	0.2	2.5	6,963	0.064	891	0.180	2.5	6,267	0.064	802
	40	0.15	2.5	6,267	0.064	802	0.135	2.5	5,640	0.064	722
	50	0.1	2.5	6,267	0.050	627	0.090	2.5	5,640	0.050	564
6	20	0.5	3	6,367	0.079	1,006	0.450	3	5,731	0.079	905
	30	0.4	3	5,789	0.079	915	0.360	3	5,210	0.079	823
	40	0.3	3	5,789	0.071	822	0.270	3	5,210	0.071	740
	50	0.2	3	5,150	0.064	659	0.180	3	4,635	0.064	593

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High Efficiency Cutting Conditions

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.210	1.5	11,206	0.042	950	0.150	1.5	9,888	0.037	734	0.120	1.5	9,229	0.032	587	3	8
0.147	1.5	11,206	0.042	950	0.105	1.5	9,888	0.037	734	0.084	1.5	9,229	0.032	587		12
0.105	1.5	10,086	0.038	775	0.075	1.5	8,899	0.034	598	0.060	1.5	8,306	0.029	478		16
0.084	1.5	10,086	0.038	775	0.060	1.5	8,899	0.034	598	0.048	1.5	8,306	0.029	478		20
0.056	1.5	10,086	0.038	775	0.040	1.5	8,899	0.034	598	0.032	1.5	8,306	0.029	478		25
0.056	1.5	10,086	0.038	775	0.040	1.5	8,899	0.034	598	0.032	1.5	8,306	0.029	478		30
0.035	1.5	8,965	0.034	617	0.025	1.5	7,910	0.030	476	0.020	1.5	7,383	0.026	381		40
0.014	1.5	7,792	0.030	461	0.010	1.5	6,875	0.026	356	0.008	1.5	6,417	0.022	285		50
0.280	2	8,230	0.057	935	0.200	2	7,262	0.050	722	0.160	2	6,777	0.043	577	4	12
0.196	2	8,230	0.057	935	0.140	2	7,262	0.050	722	0.112	2	6,777	0.043	577		16
0.196	2	7,407	0.057	841	0.140	2	6,535	0.050	650	0.112	2	6,100	0.043	520		20
0.112	2	7,407	0.051	758	0.080	2	6,535	0.045	586	0.064	2	6,100	0.038	468		25
0.112	2	7,407	0.051	758	0.080	2	6,535	0.045	586	0.064	2	6,100	0.038	468		30
0.070	2	6,666	0.051	683	0.050	2	5,882	0.045	527	0.040	2	5,490	0.038	422		35
0.070	2	6,666	0.051	683	0.050	2	5,882	0.045	527	0.040	2	5,490	0.038	422		40
0.042	2	5,761	0.040	461	0.030	2	5,083	0.035	356	0.024	2	4,744	0.030	285		50
0.210	2.5	6,577	0.057	747	0.150	2.5	5,803	0.050	577	0.120	2.5	5,416	0.043	461	5	20
0.210	2.5	5,918	0.051	606	0.150	2.5	5,222	0.045	468	0.120	2.5	4,874	0.038	374		25
0.140	2.5	5,918	0.051	606	0.100	2.5	5,222	0.045	468	0.080	2.5	4,874	0.038	374		30
0.105	2.5	5,327	0.051	545	0.075	2.5	4,700	0.045	421	0.060	2.5	4,387	0.038	337		40
0.070	2.5	5,327	0.040	426	0.050	2.5	4,700	0.035	329	0.040	2.5	4,387	0.030	263		50
0.350	3	5,412	0.063	684	0.250	3	4,776	0.055	528	0.200	3	4,457	0.047	423	6	20
0.280	3	4,920	0.063	622	0.200	3	4,341	0.055	480	0.160	3	4,052	0.047	384		30
0.210	3	4,920	0.057	559	0.150	3	4,341	0.050	432	0.120	3	4,052	0.043	345		40
0.140	3	4,378	0.051	448	0.100	3	3,863	0.045	346	0.080	3	3,605	0.038	277		50

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

Ultra Micro Grain Solid Carbide End Mill

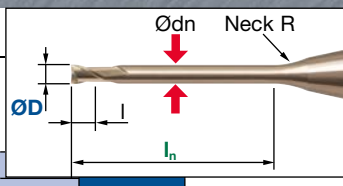
EPDSE-ATH | High Precision Cutting Conditions

Workpiece Material		I Carbon Steels. Alloy Steels (180~250HB)					II Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
0.1	0.3	0.006	0.01	51,500	0.009	906	0.005	0.01	46,350	0.009	816
	0.5	0.004	0.01	51,500	0.009	906	0.004	0.01	46,350	0.009	816
	1	0.003	0.01	49,440	0.008	791	0.003	0.01	44,496	0.008	712
0.2	0.5	0.02	0.02	46,350	0.013	1,187	0.018	0.02	41,715	0.013	1,068
	1	0.014	0.02	46,350	0.013	1,187	0.013	0.02	41,715	0.013	1,068
	1.5	0.008	0.02	41,715	0.011	934	0.007	0.02	37,544	0.011	841
	2	0.005	0.02	37,080	0.010	759	0.005	0.02	33,372	0.010	683
	3	0.003	0.02	37,080	0.009	664	0.003	0.02	33,372	0.009	598
0.3	1	0.021	0.03	41,200	0.013	1,055	0.019	0.03	37,080	0.013	949
	1.5	0.021	0.03	41,200	0.013	1,055	0.019	0.03	37,080	0.013	949
	2	0.012	0.03	37,080	0.011	831	0.011	0.03	33,372	0.011	748
	2.5	0.01	0.03	37,080	0.011	831	0.009	0.03	33,372	0.011	748
	3	0.008	0.03	37,080	0.011	831	0.007	0.03	33,372	0.011	748
0.4	1	0.04	0.04	32,960	0.017	1,107	0.036	0.04	29,664	0.017	997
	1.5	0.028	0.04	32,960	0.017	1,107	0.025	0.04	29,664	0.017	997
	2	0.028	0.04	32,960	0.017	1,107	0.025	0.04	29,664	0.017	997
	2.5	0.022	0.04	29,664	0.015	902	0.020	0.04	26,698	0.015	812
	3	0.016	0.04	29,664	0.015	902	0.014	0.04	26,698	0.015	812
	3.5	0.012	0.04	29,664	0.015	902	0.011	0.04	26,698	0.015	812
	4	0.01	0.04	29,664	0.015	902	0.009	0.04	26,698	0.015	812
	5	0.01	0.04	26,368	0.014	717	0.009	0.04	23,731	0.014	645
	6	0.006	0.04	26,368	0.014	717	0.005	0.04	23,731	0.014	645
	8	0.003	0.04	23,072	0.012	554	0.003	0.04	20,765	0.012	498
	10	0.002	0.04	19,776	0.010	377	0.002	0.04	17,798	0.010	339
0.5	1	0.05	0.05	32,960	0.017	1,107	0.045	0.05	29,664	0.017	997
	1.5	0.05	0.05	32,960	0.017	1,107	0.045	0.05	29,664	0.017	997
	2	0.035	0.05	32,960	0.017	1,107	0.032	0.05	29,664	0.017	997
	2.5	0.03	0.05	29,664	0.017	997	0.027	0.05	26,698	0.017	897
	3	0.02	0.05	29,664	0.015	902	0.018	0.05	26,698	0.015	812
	4	0.02	0.05	29,664	0.015	902	0.018	0.05	26,698	0.015	812
	5	0.013	0.05	29,664	0.015	902	0.012	0.05	26,698	0.015	812
	6	0.013	0.05	26,368	0.014	717	0.012	0.05	23,731	0.014	645
	8	0.008	0.05	26,368	0.014	717	0.007	0.05	23,731	0.014	645
	10	0.004	0.05	23,072	0.012	554	0.004	0.05	20,765	0.012	498
0.6	2	0.042	0.06	32,960	0.021	1,371	0.038	0.06	29,664	0.021	1,234
	3	0.035	0.06	29,664	0.019	1,139	0.032	0.06	26,698	0.019	1,025
	4	0.024	0.06	29,664	0.019	1,139	0.022	0.06	26,698	0.019	1,025
	5	0.02	0.06	29,664	0.019	1,139	0.018	0.06	26,698	0.019	1,025
	6	0.015	0.06	29,664	0.019	1,139	0.014	0.06	26,698	0.019	1,025
	7	0.015	0.06	26,368	0.017	886	0.014	0.06	23,731	0.017	797
	8	0.015	0.06	26,368	0.017	886	0.014	0.06	23,731	0.017	797
	9	0.012	0.06	26,368	0.017	886	0.011	0.06	23,731	0.017	797
	10	0.009	0.06	26,368	0.017	886	0.008	0.06	23,731	0.017	797
0.7	2	0.07	0.07	32,960	0.022	1,424	0.063	0.07	29,664	0.022	1,281
	4	0.049	0.07	29,664	0.019	1,139	0.044	0.07	26,698	0.019	1,025
	6	0.018	0.07	29,664	0.019	1,139	0.016	0.07	26,698	0.019	1,025
	8	0.018	0.07	26,368	0.017	886	0.016	0.07	23,731	0.017	797
	10	0.018	0.07	26,368	0.017	886	0.016	0.07	23,731	0.017	797
0.8	4	0.056	0.08	32,960	0.021	1,371	0.050	0.08	29,664	0.021	1,234
	6	0.032	0.08	29,664	0.019	1,139	0.029	0.08	26,698	0.019	1,025
	8	0.02	0.08	29,664	0.019	1,139	0.018	0.08	26,698	0.019	1,025
	10	0.02	0.08	26,368	0.017	886	0.018	0.08	23,731	0.017	797
	12	0.012	0.08	26,368	0.017	886	0.011	0.08	23,731	0.017	797
0.9	6	0.036	0.09	29,664	0.019	1,139	0.032	0.09	26,698	0.019	1,025
	8	0.023	0.09	29,664	0.019	1,139	0.021	0.09	26,698	0.019	1,025
	10	0.023	0.09	26,368	0.017	886	0.021	0.09	23,731	0.017	797
	12	0.023	0.09	26,368	0.017	886	0.021	0.09	23,731	0.017	797

High Efficient

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High Precision Cutting Conditions

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.004	0.01	43,775	0.007	616	0.003	0.01	38,625	0.006	476	0.002	0.01	36,050	0.005	381		0.3
0.003	0.01	43,775	0.007	616	0.002	0.01	38,625	0.006	476	0.002	0.01	36,050	0.005	381	0.1	0.5
0.002	0.01	42,024	0.006	538	0.002	0.01	37,080	0.006	415	0.001	0.01	34,608	0.005	332		1
0.014	0.02	39,398	0.010	807	0.010	0.02	34,763	0.009	623	0.008	0.02	32,445	0.008	498		0.5
0.010	0.02	39,398	0.010	807	0.007	0.02	34,763	0.009	623	0.006	0.02	32,445	0.008	498		1
0.006	0.02	35,458	0.009	635	0.004	0.02	31,286	0.008	491	0.003	0.02	29,201	0.007	392	0.2	1.5
0.004	0.02	31,518	0.008	516	0.003	0.02	27,810	0.007	399	0.002	0.02	25,956	0.006	319		2
0.002	0.02	31,518	0.007	452	0.002	0.02	27,810	0.006	349	0.001	0.02	25,956	0.005	279		3
0.015	0.03	35,020	0.010	717	0.011	0.03	30,900	0.009	554	0.008	0.03	28,840	0.008	443		1
0.015	0.03	35,020	0.010	717	0.011	0.03	30,900	0.009	554	0.008	0.03	28,840	0.008	443		1.5
0.008	0.03	31,518	0.009	565	0.006	0.03	27,810	0.008	436	0.005	0.03	25,956	0.007	349	0.3	2
0.007	0.03	31,518	0.009	565	0.005	0.03	27,810	0.008	436	0.004	0.03	25,956	0.007	349		2.5
0.006	0.03	31,518	0.009	565	0.004	0.03	27,810	0.008	436	0.003	0.03	25,956	0.007	349		3
0.028	0.04	28,016	0.013	753	0.020	0.04	24,720	0.012	581	0.016	0.04	23,072	0.010	465		1
0.020	0.04	28,016	0.013	753	0.014	0.04	24,720	0.012	581	0.011	0.04	23,072	0.010	465		1.5
0.020	0.04	28,016	0.013	753	0.014	0.04	24,720	0.012	581	0.011	0.04	23,072	0.010	465		2
0.015	0.04	25,214	0.012	613	0.011	0.04	22,248	0.011	473	0.009	0.04	20,765	0.009	379		2.5
0.011	0.04	25,214	0.012	613	0.008	0.04	22,248	0.011	473	0.006	0.04	20,765	0.009	379		3
0.008	0.04	25,214	0.012	613	0.006	0.04	22,248	0.011	473	0.005	0.04	20,765	0.009	379	0.4	3.5
0.007	0.04	25,214	0.012	613	0.005	0.04	22,248	0.011	473	0.004	0.04	20,765	0.009	379		4
0.007	0.04	22,413	0.011	488	0.005	0.04	19,776	0.010	377	0.004	0.04	18,458	0.008	301		5
0.004	0.04	22,413	0.011	488	0.003	0.04	19,776	0.010	377	0.002	0.04	18,458	0.008	301		6
0.002	0.04	19,611	0.010	377	0.002	0.04	17,304	0.008	291	0.001	0.04	16,150	0.007	233		8
0.001	0.04	16,810	0.008	256	0.001	0.04	14,832	0.007	198	0.001	0.04	13,843	0.006	158		10
0.035	0.05	28,016	0.013	753	0.025	0.05	24,720	0.012	581	0.020	0.05	23,072	0.010	465		1
0.035	0.05	28,016	0.013	753	0.025	0.05	24,720	0.012	581	0.020	0.05	23,072	0.010	465		1.5
0.025	0.05	28,016	0.013	753	0.018	0.05	24,720	0.012	581	0.014	0.05	23,072	0.010	465		2
0.021	0.05	25,214	0.013	678	0.015	0.05	22,248	0.012	523	0.012	0.05	20,765	0.010	419		2.5
0.014	0.05	25,214	0.012	613	0.010	0.05	22,248	0.011	473	0.008	0.05	20,765	0.009	379		3
0.014	0.05	25,214	0.012	613	0.010	0.05	22,248	0.011	473	0.008	0.05	20,765	0.009	379	0.5	4
0.009	0.05	25,214	0.012	613	0.007	0.05	22,248	0.011	473	0.005	0.05	20,765	0.009	379		5
0.009	0.05	22,413	0.011	488	0.007	0.05	19,776	0.010	377	0.005	0.05	18,458	0.008	301		6
0.006	0.05	22,413	0.011	488	0.004	0.05	19,776	0.010	377	0.003	0.05	18,458	0.008	301		8
0.003	0.05	19,611	0.010	377	0.002	0.05	17,304	0.008	291	0.002	0.05	16,150	0.007	233		10
0.029	0.06	28,016	0.017	932	0.021	0.06	24,720	0.015	720	0.017	0.06	23,072	0.012	576		2
0.025	0.06	25,214	0.015	775	0.018	0.06	22,248	0.013	598	0.014	0.06	20,765	0.012	478		3
0.017	0.06	25,214	0.015	775	0.012	0.06	22,248	0.013	598	0.010	0.06	20,765	0.012	478		4
0.014	0.06	25,214	0.015	775	0.010	0.06	22,248	0.013	598	0.008	0.06	20,765	0.012	478		5
0.011	0.06	25,214	0.015	775	0.008	0.06	22,248	0.013	598	0.006	0.06	20,765	0.012	478	0.6	6
0.011	0.06	22,413	0.013	602	0.008	0.06	19,776	0.012	465	0.006	0.06	18,458	0.010	372		7
0.011	0.06	22,413	0.013	602	0.008	0.06	19,776	0.012	465	0.006	0.06	18,458	0.010	372		8
0.008	0.06	22,413	0.013	602	0.006	0.06	19,776	0.012	465	0.005	0.06	18,458	0.010	372		9
0.006	0.06	22,413	0.013	602	0.005	0.06	19,776	0.012	465	0.004	0.06	18,458	0.010	372		10
0.049	0.07	28,016	0.017	968	0.035	0.07	24,720	0.015	748	0.028	0.07	23,072	0.013	598		2
0.034	0.07	25,214	0.015	775	0.025	0.07	22,248	0.013	598	0.020	0.07	20,765	0.012	478		4
0.013	0.07	25,214	0.015	775	0.009	0.07	22,248	0.013	598	0.007	0.07	20,765	0.012	478	0.7	6
0.013	0.07	22,413	0.013	602	0.009	0.07	19,776	0.012	465	0.007	0.07	18,458	0.010	372		8
0.013	0.07	22,413	0.013	602	0.009	0.07	19,776	0.012	465	0.007	0.07	18,458	0.010	372		10
0.039	0.08	28,016	0.017	932	0.028	0.08	24,720	0.015	720	0.022	0.08	23,072	0.012	576		4
0.022	0.08	25,214	0.015	775	0.016	0.08	22,248	0.013	598	0.013	0.08	20,765	0.012	478		6
0.014	0.08	25,214	0.015	775	0.010	0.08	22,248	0.013	598	0.008	0.08	20,765	0.012	478	0.8	8
0.014	0.08	22,413	0.013	602	0.010	0.08	19,776	0.012	465	0.008	0.08	18,458	0.010	372		10
0.008	0.08	22,413	0.013	602	0.006	0.08	19,776	0.012	465	0.005	0.08	18,458	0.010	372		12
0.025	0.09	25,214	0.015	775	0.018	0.09	22,248	0.013	598	0.014	0.09	20,765	0.012	478		6
0.016	0.09	25,214	0.015	775	0.012	0.09	22,248	0.013	598	0.009	0.09	20,765	0.012	478	0.9	8
0.016	0.09	22,413	0.013	602	0.012	0.09	19,776	0.012	465	0.009	0.09	18,458	0.010	372		10
0.016	0.09	22,413	0.013	602	0.012	0.09	19,776	0.012	465	0.009	0.09	18,458	0.010	372		12

Ø1

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

Ultra Micro Grain Solid Carbide End Mill

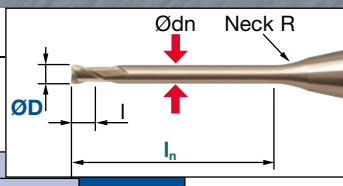
EPDSE-ATH | High Precision Cutting Conditions

High Efficient

Workpiece Material		I Carbon Steels. Alloy Steels (180~250HB)					II Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
1	2	0.1	0.1	29,664	0.026	1,519	0.090	0.1	26,698	0.026	1,367
	3	0.085	0.1	29,664	0.026	1,519	0.077	0.1	26,698	0.026	1,367
	4	0.07	0.1	29,664	0.026	1,519	0.063	0.1	26,698	0.026	1,367
	5	0.055	0.1	29,664	0.026	1,519	0.050	0.1	26,698	0.026	1,367
	6	0.04	0.1	26,698	0.023	1,239	0.036	0.1	24,028	0.023	1,115
	7	0.04	0.1	26,698	0.023	1,239	0.036	0.1	24,028	0.023	1,115
	8	0.04	0.1	26,698	0.023	1,239	0.036	0.1	24,028	0.023	1,115
	9	0.033	0.1	26,698	0.023	1,239	0.030	0.1	24,028	0.023	1,115
	10	0.025	0.1	26,698	0.023	1,239	0.023	0.1	24,028	0.023	1,115
	12	0.025	0.1	23,731	0.020	949	0.023	0.1	21,358	0.020	854
	14	0.025	0.1	23,731	0.020	949	0.023	0.1	21,358	0.020	854
	16	0.015	0.1	23,731	0.018	835	0.014	0.1	21,358	0.018	752
	20	0.01	0.1	20,765	0.015	631	0.009	0.1	18,688	0.015	568
	25	0.005	0.1	17,304	0.013	443	0.005	0.1	15,574	0.013	399
1.2	6	0.084	0.12	26,368	0.026	1,350	0.076	0.12	23,731	0.026	1,215
	8	0.048	0.12	23,731	0.023	1,101	0.043	0.12	21,358	0.023	991
	10	0.03	0.12	23,731	0.023	1,101	0.027	0.12	21,358	0.023	991
	12	0.03	0.12	23,731	0.023	1,101	0.027	0.12	21,358	0.023	991
	16	0.02	0.12	21,094	0.021	878	0.018	0.12	18,985	0.021	790
1.4	6	0.1	0.14	23,072	0.026	1,181	0.090	0.14	20,765	0.026	1,063
	12	0.035	0.14	20,765	0.023	963	0.032	0.14	18,688	0.023	867
1.5	4	0.11	0.15	23,072	0.026	1,181	0.099	0.15	20,765	0.026	1,063
	6	0.11	0.15	23,072	0.026	1,181	0.099	0.15	20,765	0.026	1,063
	8	0.08	0.15	20,765	0.023	963	0.072	0.15	18,688	0.023	867
	10	0.06	0.15	20,765	0.023	963	0.054	0.15	18,688	0.023	867
	12	0.06	0.15	20,765	0.023	963	0.054	0.15	18,688	0.023	867
	14	0.038	0.15	20,765	0.023	963	0.034	0.15	18,688	0.023	867
	16	0.038	0.15	18,458	0.020	738	0.034	0.15	16,612	0.020	664
	18	0.038	0.15	18,458	0.020	738	0.034	0.15	16,612	0.020	664
	20	0.038	0.15	18,458	0.020	738	0.034	0.15	16,612	0.020	664
	25	0.023	0.15	13,843	0.018	487	0.021	0.15	12,459	0.018	439
	30	0.015	0.15	11,536	0.014	332	0.014	0.15	10,382	0.014	299
	35	0.01	0.15	11,536	0.014	332	0.009	0.15	10,382	0.014	299
	40	0.005	0.15	9,229	0.011	207	0.005	0.15	8,306	0.011	186
1.6	6	0.11	0.16	21,424	0.028	1,200	0.099	0.16	19,282	0.028	1,080
	8	0.11	0.16	21,424	0.028	1,200	0.099	0.16	19,282	0.028	1,080
1.8	6	0.13	0.18	21,424	0.028	1,200	0.117	0.18	19,282	0.028	1,080
	8	0.13	0.18	21,424	0.028	1,200	0.117	0.18	19,282	0.028	1,080
2	4	0.2	0.2	17,304	0.034	1,163	0.180	0.2	15,574	0.034	1,047
	6	0.2	0.2	17,304	0.034	1,163	0.180	0.2	15,574	0.034	1,047
	8	0.14	0.2	17,304	0.034	1,163	0.126	0.2	15,574	0.034	1,047
	10	0.14	0.2	17,304	0.034	1,163	0.126	0.2	15,574	0.034	1,047
	12	0.1	0.2	15,574	0.030	947	0.090	0.2	14,016	0.030	852
	14	0.08	0.2	15,574	0.030	947	0.072	0.2	14,016	0.030	852
	16	0.08	0.2	15,574	0.030	947	0.072	0.2	14,016	0.030	852
	18	0.05	0.2	15,574	0.030	947	0.045	0.2	14,016	0.030	852
	20	0.05	0.2	15,574	0.030	947	0.045	0.2	14,016	0.030	852
	25	0.05	0.2	13,843	0.027	753	0.045	0.2	12,459	0.027	678
	30	0.03	0.2	13,843	0.027	753	0.027	0.2	12,459	0.027	678
	35	0.02	0.2	12,113	0.024	581	0.018	0.2	10,902	0.024	523
	40	0.01	0.2	12,113	0.024	581	0.009	0.2	10,902	0.024	523
	50	0.005	0.2	10,382	0.021	432	0.005	0.2	9,344	0.021	389
2.5	8	0.18	0.25	14,832	0.042	1,258	0.162	0.25	13,349	0.042	1,132
	12	0.18	0.25	14,832	0.042	1,258	0.162	0.25	13,349	0.042	1,132
	16	0.1	0.25	13,349	0.038	1,025	0.090	0.25	12,014	0.038	923
	20	0.1	0.25	13,349	0.038	1,025	0.090	0.25	12,014	0.038	923
	30	0.06	0.25	11,866	0.034	816	0.054	0.25	10,679	0.034	735
	40	0.03	0.25	10,382	0.030	631	0.027	0.25	9,344	0.030	568
	50	0.01	0.25	10,382	0.030	631	0.009	0.25	9,344	0.030	568

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High Precision Cutting Conditions

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.070	0.1	25,214	0.020	1,033	0.050	0.1	22,248	0.018	797	0.040	0.1	20,765	0.015	638		2
0.060	0.1	25,214	0.020	1,033	0.043	0.1	22,248	0.018	797	0.034	0.1	20,765	0.015	638		3
0.049	0.1	25,214	0.020	1,033	0.035	0.1	22,248	0.018	797	0.028	0.1	20,765	0.015	638		4
0.039	0.1	25,214	0.020	1,033	0.028	0.1	22,248	0.018	797	0.022	0.1	20,765	0.015	638		5
0.028	0.1	22,693	0.019	842	0.020	0.1	20,023	0.016	650	0.016	0.1	18,688	0.014	520		6
0.028	0.1	22,693	0.019	842	0.020	0.1	20,023	0.016	650	0.016	0.1	18,688	0.014	520		7
0.028	0.1	22,693	0.019	842	0.020	0.1	20,023	0.016	650	0.016	0.1	18,688	0.014	520		8
0.023	0.1	22,693	0.019	842	0.017	0.1	20,023	0.016	650	0.013	0.1	18,688	0.014	520	1	9
0.018	0.1	22,693	0.019	842	0.013	0.1	20,023	0.016	650	0.010	0.1	18,688	0.014	520		10
0.018	0.1	20,172	0.016	645	0.013	0.1	17,798	0.014	498	0.010	0.1	16,612	0.012	399		12
0.018	0.1	20,172	0.016	645	0.013	0.1	17,798	0.014	498	0.010	0.1	16,612	0.012	399		14
0.011	0.1	20,172	0.014	568	0.008	0.1	17,798	0.012	439	0.006	0.1	16,612	0.011	351		16
0.007	0.1	17,650	0.012	429	0.005	0.1	15,574	0.011	331	0.004	0.1	14,535	0.009	265		20
0.004	0.1	14,708	0.010	301	0.003	0.1	12,978	0.009	233	0.002	0.1	12,113	0.008	186		25
0.059	0.12	22,413	0.020	918	0.042	0.12	19,776	0.018	709	0.034	0.12	18,458	0.015	567		6
0.034	0.12	20,172	0.019	749	0.024	0.12	17,798	0.016	578	0.019	0.12	16,612	0.014	462		8
0.021	0.12	20,172	0.019	749	0.015	0.12	17,798	0.016	578	0.012	0.12	16,612	0.014	462	1.2	10
0.021	0.12	20,172	0.019	749	0.015	0.12	17,798	0.016	578	0.012	0.12	16,612	0.014	462		12
0.014	0.12	17,930	0.017	597	0.010	0.12	15,821	0.015	461	0.008	0.12	14,766	0.012	369		16
0.070	0.14	19,611	0.020	803	0.050	0.14	17,304	0.018	620	0.040	0.14	16,150	0.015	496	1.4	6
0.025	0.14	17,650	0.019	655	0.018	0.14	15,574	0.016	506	0.014	0.14	14,535	0.014	405		12
0.077	0.15	19,611	0.020	803	0.055	0.15	17,304	0.018	620	0.044	0.15	16,150	0.015	496		4
0.077	0.15	19,611	0.020	803	0.055	0.15	17,304	0.018	620	0.044	0.15	16,150	0.015	496		6
0.056	0.15	17,650	0.019	655	0.040	0.15	15,574	0.016	506	0.032	0.15	14,535	0.014	405		8
0.042	0.15	17,650	0.019	655	0.030	0.15	15,574	0.016	506	0.024	0.15	14,535	0.014	405		10
0.042	0.15	17,650	0.019	655	0.030	0.15	15,574	0.016	506	0.024	0.15	14,535	0.014	405		12
0.027	0.15	17,650	0.019	655	0.019	0.15	15,574	0.016	506	0.015	0.15	14,535	0.014	405		14
0.027	0.15	15,689	0.016	502	0.019	0.15	13,843	0.014	388	0.015	0.15	12,920	0.012	310	1.5	16
0.027	0.15	15,689	0.016	502	0.019	0.15	13,843	0.014	388	0.015	0.15	12,920	0.012	310		18
0.027	0.15	15,689	0.016	502	0.019	0.15	13,843	0.014	388	0.015	0.15	12,920	0.012	310		20
0.016	0.15	11,767	0.014	331	0.012	0.15	10,382	0.012	256	0.009	0.15	9,690	0.011	205		25
0.011	0.15	9,806	0.012	226	0.008	0.15	8,652	0.010	174	0.006	0.15	8,075	0.009	140		30
0.007	0.15	9,806	0.012	226	0.005	0.15	8,652	0.010	174	0.004	0.15	8,075	0.009	140		35
0.004	0.15	7,844	0.009	141	0.003	0.15	6,922	0.008	109	0.002	0.15	6,460	0.007	87		40
0.077	0.16	18,210	0.022	816	0.055	0.16	16,068	0.020	630	0.044	0.16	14,997	0.017	504	1.6	6
0.077	0.16	18,210	0.022	816	0.055	0.16	16,068	0.020	630	0.044	0.16	14,997	0.017	504		8
0.091	0.18	18,210	0.022	816	0.065	0.18	16,068	0.020	630	0.052	0.18	14,997	0.017	504	1.8	6
0.091	0.18	18,210	0.022	816	0.065	0.18	16,068	0.020	630	0.052	0.18	14,997	0.017	504		8
0.140	0.2	14,708	0.027	791	0.100	0.2	12,978	0.024	610	0.080	0.2	12,113	0.020	488		4
0.140	0.2	14,708	0.027	791	0.100	0.2	12,978	0.024	610	0.080	0.2	12,113	0.020	488		6
0.098	0.2	14,708	0.027	791	0.070	0.2	12,978	0.024	610	0.056	0.2	12,113	0.020	488		8
0.098	0.2	14,708	0.027	791	0.070	0.2	12,978	0.024	610	0.056	0.2	12,113	0.020	488		10
0.070	0.2	13,238	0.024	644	0.050	0.2	11,680	0.021	497	0.040	0.2	10,902	0.018	398		12
0.056	0.2	13,238	0.024	644	0.040	0.2	11,680	0.021	497	0.032	0.2	10,902	0.018	398		14
0.056	0.2	13,238	0.024	644	0.040	0.2	11,680	0.021	497	0.032	0.2	10,902	0.018	398		16
0.035	0.2	13,238	0.024	644	0.025	0.2	11,680	0.021	497	0.020	0.2	10,902	0.018	398	2	18
0.035	0.2	13,238	0.024	644	0.025	0.2	11,680	0.021	497	0.020	0.2	10,902	0.018	398		20
0.035	0.2	11,767	0.022	512	0.025	0.2	10,382	0.019	395	0.020	0.2	9,690	0.016	316		25
0.021	0.2	11,767	0.022	512	0.015	0.2	10,382	0.019	395	0.012	0.2	9,690	0.016	316		30
0.014	0.2	10,296	0.019	395	0.010	0.2	9,085	0.017	305	0.008	0.2	8,479	0.014	244		35
0.007	0.2	10,296	0.019	395	0.005	0.2	9,085	0.017	305	0.004	0.2	8,479	0.014	244		40
0.004	0.2	8,825	0.017	294	0.003	0.2	7,787	0.015	227	0.002	0.2	7,268	0.012	181		50
0.126	0.25	12,607	0.034	855	0.090	0.25	11,124	0.030	660	0.072	0.25	10,382	0.025	528		8
0.126	0.25	12,607	0.034	855	0.090	0.25	11,124	0.030	660	0.072	0.25	10,382	0.025	528		12
0.070	0.25	11,346	0.031	697	0.050	0.25	10,012	0.027	538	0.040	0.25	9,344	0.023	431		16
0.070	0.25	11,346	0.031	697	0.050	0.25	10,012	0.027	538	0.040	0.25	9,344	0.023	431	2.5	20
0.042	0.25	10,086	0.028	555	0.030	0.25	8,899	0.024	429	0.024	0.25	8,306	0.021	343		30
0.021	0.25	8,825	0.024	429	0.015	0.25	7,787	0.021	331	0.012	0.25	7,268	0.018	265		40
0.007	0.25	8,825	0.024	429	0.005	0.25	7,787	0.021	331	0.004	0.25	7,268	0.018	265		50

Ø3

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

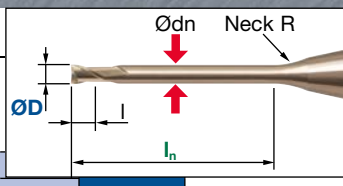
Ultra Micro Grain Solid Carbide End Mill

EPDSE-ATH | High Precision Cutting Conditions

	Workpiece Material		I					II				
			Carbon Steels. Alloy Steels (180~250HB)					Tool Steels (25~35HRC)				
	ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
	3	8	0.3	0.3	13,184	0.042	1,118	0.270	0.3	11,866	0.042	1,006
		12	0.21	0.3	13,184	0.042	1,118	0.189	0.3	11,866	0.042	1,006
		16	0.15	0.3	11,866	0.038	911	0.135	0.3	10,679	0.038	820
		20	0.12	0.3	11,866	0.038	911	0.108	0.3	10,679	0.038	820
		25	0.08	0.3	11,866	0.038	911	0.072	0.3	10,679	0.038	820
		30	0.08	0.3	11,866	0.038	911	0.072	0.3	10,679	0.038	820
		40	0.05	0.3	10,547	0.034	726	0.045	0.3	9,492	0.034	653
		50	0.02	0.3	9,167	0.030	543	0.018	0.3	8,250	0.030	488
High Efficient	4	12	0.4	0.4	9,682	0.057	1,100	0.360	0.4	8,714	0.057	990
		16	0.28	0.4	9,682	0.057	1,100	0.252	0.4	8,714	0.057	990
		20	0.28	0.4	8,714	0.057	990	0.252	0.4	7,842	0.057	891
		25	0.16	0.4	8,714	0.051	892	0.144	0.4	7,842	0.051	803
		30	0.16	0.4	8,714	0.051	892	0.144	0.4	7,842	0.051	803
		35	0.1	0.4	7,842	0.051	803	0.090	0.4	7,058	0.051	723
		40	0.1	0.4	7,842	0.051	803	0.090	0.4	7,058	0.051	723
		50	0.06	0.4	6,777	0.040	542	0.054	0.4	6,100	0.040	488
	5	20	0.3	0.5	7,737	0.057	879	0.270	0.5	6,964	0.057	791
		25	0.3	0.5	6,963	0.051	713	0.270	0.5	6,267	0.051	642
		30	0.2	0.5	6,963	0.051	713	0.180	0.5	6,267	0.051	642
		40	0.15	0.5	6,267	0.051	642	0.135	0.5	5,640	0.051	578
		50	0.1	0.5	6,267	0.040	501	0.090	0.5	5,640	0.040	451
	6	20	0.5	0.6	6,367	0.063	805	0.450	0.6	5,731	0.063	724
		30	0.4	0.6	5,789	0.063	732	0.360	0.6	5,210	0.063	659
		40	0.3	0.6	5,789	0.057	658	0.270	0.6	5,210	0.057	592
		50	0.2	0.6	5,150	0.051	527	0.180	0.6	4,635	0.051	475

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High Precision Cutting Conditions

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.210	0.3	11,206	0.034	760	0.150	0.3	9,888	0.030	587	0.120	0.3	9,229	0.025	470	3	8
0.147	0.3	11,206	0.034	760	0.105	0.3	9,888	0.030	587	0.084	0.3	9,229	0.025	470		12
0.105	0.3	10,086	0.031	620	0.075	0.3	8,899	0.027	478	0.060	0.3	8,306	0.023	383		16
0.084	0.3	10,086	0.031	620	0.060	0.3	8,899	0.027	478	0.048	0.3	8,306	0.023	383		20
0.056	0.3	10,086	0.031	620	0.040	0.3	8,899	0.027	478	0.032	0.3	8,306	0.023	383		25
0.056	0.3	10,086	0.031	620	0.040	0.3	8,899	0.027	478	0.032	0.3	8,306	0.023	383		30
0.035	0.3	8,965	0.028	493	0.025	0.3	7,910	0.024	381	0.020	0.3	7,383	0.021	305		40
0.014	0.3	7,792	0.024	369	0.010	0.3	6,875	0.021	285	0.008	0.3	6,417	0.018	228		50
0.280	0.4	8,230	0.045	748	0.200	0.4	7,262	0.040	577	0.160	0.4	6,777	0.034	462	4	12
0.196	0.4	8,230	0.045	748	0.140	0.4	7,262	0.040	577	0.112	0.4	6,777	0.034	462		16
0.196	0.4	7,407	0.045	673	0.140	0.4	6,535	0.040	520	0.112	0.4	6,100	0.034	416		20
0.112	0.4	7,407	0.041	607	0.080	0.4	6,535	0.036	468	0.064	0.4	6,100	0.031	375		25
0.112	0.4	7,407	0.041	607	0.080	0.4	6,535	0.036	468	0.064	0.4	6,100	0.031	375		30
0.070	0.4	6,666	0.041	546	0.050	0.4	5,882	0.036	422	0.040	0.4	5,490	0.031	337		35
0.070	0.4	6,666	0.041	546	0.050	0.4	5,882	0.036	422	0.040	0.4	5,490	0.031	337		40
0.042	0.4	5,761	0.032	369	0.030	0.4	5,083	0.028	285	0.024	0.4	4,744	0.024	228		50
0.210	0.5	6,577	0.045	598	0.150	0.5	5,803	0.040	461	0.120	0.5	5,416	0.034	369	5	20
0.210	0.5	5,918	0.041	485	0.150	0.5	5,222	0.036	374	0.120	0.5	4,874	0.031	299		25
0.140	0.5	5,918	0.041	485	0.100	0.5	5,222	0.036	374	0.080	0.5	4,874	0.031	299		30
0.105	0.5	5,327	0.041	436	0.075	0.5	4,700	0.036	337	0.060	0.5	4,387	0.031	270		40
0.070	0.5	5,327	0.032	341	0.050	0.5	4,700	0.028	263	0.040	0.5	4,387	0.024	211		50
0.350	0.6	5,412	0.051	547	0.250	0.6	4,776	0.044	423	0.200	0.6	4,457	0.038	338	6	20
0.280	0.6	4,920	0.051	498	0.200	0.6	4,341	0.044	384	0.160	0.6	4,052	0.038	307		30
0.210	0.6	4,920	0.045	447	0.150	0.6	4,341	0.040	345	0.120	0.6	4,052	0.034	276		40
0.140	0.6	4,378	0.041	359	0.100	0.6	3,863	0.036	277	0.080	0.6	3,605	0.031	221		50

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

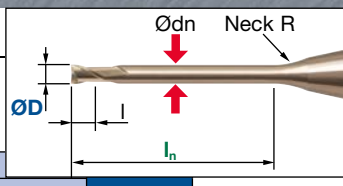
Ultra Micro Grain Solid Carbide End Mill

EPDSE-ATH | High efficiency Cutting Conditions for Rib Application

Workpiece Material		I Carbon Steels. Alloy Steels (180~250HB)					II Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
0.1	0.3	0.005	0.1	41,200	0.008	659	0.005	0.1	37,080	0.008	593
	0.5	0.003	0.1	41,200	0.008	659	0.003	0.1	37,080	0.008	593
	1	0.002	0.1	39,552	0.008	633	0.002	0.1	35,597	0.008	570
0.2	0.5	0.015	0.2	37,080	0.012	890	0.014	0.2	33,372	0.012	801
	1	0.011	0.2	37,080	0.012	890	0.010	0.2	33,372	0.012	801
	1.5	0.006	0.2	33,372	0.011	734	0.005	0.2	30,035	0.011	661
	2	0.004	0.2	29,664	0.010	593	0.004	0.2	26,698	0.010	534
	3	0.002	0.2	29,664	0.008	475	0.002	0.2	26,698	0.008	427
0.3	1	0.016	0.3	32,960	0.012	791	0.014	0.3	29,664	0.012	712
	1.5	0.016	0.3	32,960	0.012	791	0.014	0.3	29,664	0.012	712
	2	0.009	0.3	29,664	0.011	653	0.008	0.3	26,698	0.011	587
	2.5	0.008	0.3	29,664	0.011	653	0.007	0.3	26,698	0.011	587
	3	0.006	0.3	29,664	0.011	653	0.005	0.3	26,698	0.011	587
0.4	1	0.03	0.4	26,368	0.016	844	0.027	0.4	23,731	0.016	759
	1.5	0.021	0.4	26,368	0.016	844	0.019	0.4	23,731	0.016	759
	2	0.021	0.4	26,368	0.016	844	0.019	0.4	23,731	0.016	759
	2.5	0.017	0.4	23,731	0.014	664	0.015	0.4	21,358	0.014	598
	3	0.012	0.4	23,731	0.014	664	0.011	0.4	21,358	0.014	598
	3.5	0.009	0.4	23,731	0.014	664	0.008	0.4	21,358	0.014	598
	4	0.008	0.4	23,731	0.014	664	0.007	0.4	21,358	0.014	598
	5	0.008	0.4	21,094	0.013	548	0.007	0.4	18,985	0.013	494
	6	0.005	0.4	21,094	0.013	548	0.005	0.4	18,985	0.013	494
	8	0.002	0.4	18,458	0.011	406	0.002	0.4	16,612	0.011	365
	10	0.002	0.4	15,821	0.009	285	0.002	0.4	14,239	0.009	256
0.5	1	0.038	0.5	26,368	0.016	844	0.034	0.5	23,731	0.016	759
	1.5	0.038	0.5	26,368	0.016	844	0.034	0.5	23,731	0.016	759
	2	0.026	0.5	26,368	0.016	844	0.023	0.5	23,731	0.016	759
	2.5	0.023	0.5	23,731	0.016	759	0.021	0.5	21,358	0.016	683
	3	0.015	0.5	23,731	0.014	664	0.014	0.5	21,358	0.014	598
	4	0.015	0.5	23,731	0.014	664	0.014	0.5	21,358	0.014	598
	5	0.01	0.5	23,731	0.014	664	0.009	0.5	21,358	0.014	598
	6	0.01	0.5	21,094	0.013	548	0.009	0.5	18,985	0.013	494
	8	0.006	0.5	21,094	0.013	548	0.005	0.5	18,985	0.013	494
	10	0.003	0.5	18,458	0.011	406	0.003	0.5	16,612	0.011	365
0.6	2	0.032	0.6	26,368	0.020	1,055	0.029	0.6	23,731	0.020	949
	3	0.026	0.6	23,731	0.018	854	0.023	0.6	21,358	0.018	769
	4	0.018	0.6	23,731	0.018	854	0.016	0.6	21,358	0.018	769
	5	0.015	0.6	23,731	0.018	854	0.014	0.6	21,358	0.018	769
	6	0.011	0.6	23,731	0.018	854	0.010	0.6	21,358	0.018	769
	7	0.011	0.6	21,094	0.016	675	0.010	0.6	18,985	0.016	608
	8	0.011	0.6	21,094	0.016	675	0.010	0.6	18,985	0.016	608
	9	0.009	0.6	21,094	0.016	675	0.008	0.6	18,985	0.016	608
	10	0.007	0.6	21,094	0.016	675	0.006	0.6	18,985	0.016	608
0.7	2	0.053	0.7	26,368	0.020	1,055	0.048	0.7	23,731	0.020	949
	4	0.037	0.7	23,731	0.018	854	0.033	0.7	21,358	0.018	769
	6	0.014	0.7	23,731	0.018	854	0.013	0.7	21,358	0.018	769
	8	0.014	0.7	21,094	0.016	675	0.013	0.7	18,985	0.016	608
	10	0.014	0.7	21,094	0.016	675	0.013	0.7	18,985	0.016	608
0.8	4	0.042	0.8	26,368	0.020	1,055	0.038	0.8	23,731	0.020	949
	6	0.024	0.8	23,731	0.018	854	0.022	0.8	21,358	0.018	769
	8	0.015	0.8	23,731	0.018	854	0.014	0.8	21,358	0.018	769
	10	0.015	0.8	21,094	0.016	675	0.014	0.8	18,985	0.016	608
	12	0.009	0.8	21,094	0.016	675	0.008	0.8	18,985	0.016	608
0.9	6	0.027	0.9	23,731	0.018	854	0.024	0.9	21,358	0.018	769
	8	0.017	0.9	23,731	0.018	854	0.015	0.9	21,358	0.018	769
	10	0.017	0.9	21,094	0.016	675	0.015	0.9	18,985	0.016	608
	12	0.017	0.9	21,094	0.016	675	0.015	0.9	18,985	0.016	608

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High efficiency Cutting Conditions for Rib Application

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.004	0.05	35,020	0.006	448	0.003	0.05	30,900	0.006	346	0.002	0.05	28,840	0.005	277		0.3
0.002	0.05	35,020	0.006	448	0.002	0.05	30,900	0.006	346	0.001	0.05	28,840	0.005	277	0.1	0.5
0.001	0.05	33,619	0.006	430	0.001	0.05	29,664	0.006	332	0.001	0.05	27,686	0.005	266		1
0.011	0.1	31,518	0.010	605	0.008	0.1	27,810	0.008	467	0.006	0.1	25,956	0.007	374		0.5
0.008	0.1	31,518	0.010	605	0.006	0.1	27,810	0.008	467	0.004	0.1	25,956	0.007	374		1
0.004	0.1	28,366	0.009	499	0.003	0.1	25,029	0.008	385	0.002	0.1	23,360	0.007	308	0.2	1.5
0.003	0.1	25,214	0.008	403	0.002	0.1	22,248	0.007	311	0.002	0.1	20,765	0.006	249		2
0.001	0.1	25,214	0.006	323	0.001	0.1	22,248	0.006	249	0.001	0.1	20,765	0.005	199		3
0.011	0.15	28,016	0.010	538	0.008	0.15	24,720	0.008	415	0.006	0.15	23,072	0.007	332		1
0.011	0.15	28,016	0.010	538	0.008	0.15	24,720	0.008	415	0.006	0.15	23,072	0.007	332		1.5
0.006	0.15	25,214	0.009	444	0.005	0.15	22,248	0.008	343	0.004	0.15	20,765	0.007	274	0.3	2
0.006	0.15	25,214	0.009	444	0.004	0.15	22,248	0.008	343	0.003	0.15	20,765	0.007	274		2.5
0.004	0.15	25,214	0.009	444	0.003	0.15	22,248	0.008	343	0.002	0.15	20,765	0.007	274		3
0.021	0.2	22,413	0.013	574	0.015	0.2	19,776	0.011	443	0.012	0.2	18,458	0.010	354		1
0.015	0.2	22,413	0.013	574	0.011	0.2	19,776	0.011	443	0.008	0.2	18,458	0.010	354		1.5
0.015	0.2	22,413	0.013	574	0.011	0.2	19,776	0.011	443	0.008	0.2	18,458	0.010	354		2
0.012	0.2	20,172	0.011	452	0.009	0.2	17,798	0.010	349	0.007	0.2	16,612	0.008	279		2.5
0.008	0.2	20,172	0.011	452	0.006	0.2	17,798	0.010	349	0.005	0.2	16,612	0.008	279		3
0.006	0.2	20,172	0.011	452	0.005	0.2	17,798	0.010	349	0.004	0.2	16,612	0.008	279	0.4	3.5
0.006	0.2	20,172	0.011	452	0.004	0.2	17,798	0.010	349	0.003	0.2	16,612	0.008	279		4
0.006	0.2	17,930	0.010	373	0.004	0.2	15,821	0.009	288	0.003	0.2	14,766	0.008	230		5
0.004	0.2	17,930	0.010	373	0.003	0.2	15,821	0.009	288	0.002	0.2	14,766	0.008	230		6
0.001	0.2	15,689	0.009	276	0.001	0.2	13,843	0.008	213	0.001	0.2	12,920	0.007	171		8
0.001	0.2	13,448	0.007	194	0.001	0.2	11,866	0.006	150	0.001	0.2	11,075	0.005	120		10
0.027	0.25	22,413	0.013	574	0.019	0.25	19,776	0.011	443	0.015	0.25	18,458	0.010	354		1
0.027	0.25	22,413	0.013	574	0.019	0.25	19,776	0.011	443	0.015	0.25	18,458	0.010	354		1.5
0.018	0.25	22,413	0.013	574	0.013	0.25	19,776	0.011	443	0.010	0.25	18,458	0.010	354		2
0.016	0.25	20,172	0.013	516	0.012	0.25	17,798	0.011	399	0.009	0.25	16,612	0.010	319		2.5
0.011	0.25	20,172	0.011	452	0.008	0.25	17,798	0.010	349	0.006	0.25	16,612	0.008	279		3
0.011	0.25	20,172	0.011	452	0.008	0.25	17,798	0.010	349	0.006	0.25	16,612	0.008	279	0.5	4
0.007	0.25	20,172	0.011	452	0.005	0.25	17,798	0.010	349	0.004	0.25	16,612	0.008	279		5
0.007	0.25	17,930	0.010	373	0.005	0.25	15,821	0.009	288	0.004	0.25	14,766	0.008	230		6
0.004	0.25	17,930	0.010	373	0.003	0.25	15,821	0.009	288	0.002	0.25	14,766	0.008	230		8
0.002	0.25	15,689	0.009	276	0.002	0.25	13,843	0.008	213	0.001	0.25	12,920	0.007	171		10
0.022	0.3	22,413	0.016	717	0.016	0.3	19,776	0.014	554	0.013	0.3	18,458	0.012	443		2
0.018	0.3	20,172	0.014	581	0.013	0.3	17,798	0.013	449	0.010	0.3	16,612	0.011	359		3
0.013	0.3	20,172	0.014	581	0.009	0.3	17,798	0.013	449	0.007	0.3	16,612	0.011	359		4
0.011	0.3	20,172	0.014	581	0.008	0.3	17,798	0.013	449	0.006	0.3	16,612	0.011	359		5
0.008	0.3	20,172	0.014	581	0.006	0.3	17,798	0.013	449	0.004	0.3	16,612	0.011	359	0.6	6
0.008	0.3	17,930	0.013	459	0.006	0.3	15,821	0.011	354	0.004	0.3	14,766	0.010	284		7
0.008	0.3	17,930	0.013	459	0.006	0.3	15,821	0.011	354	0.004	0.3	14,766	0.010	284		8
0.006	0.3	17,930	0.013	459	0.005	0.3	15,821	0.011	354	0.004	0.3	14,766	0.010	284		9
0.005	0.3	17,930	0.013	459	0.004	0.3	15,821	0.011	354	0.003	0.3	14,766	0.010	284		10
0.037	0.35	22,413	0.016	717	0.027	0.35	19,776	0.014	554	0.021	0.35	18,458	0.012	443		2
0.026	0.35	20,172	0.014	581	0.019	0.35	17,798	0.013	449	0.015	0.35	16,612	0.011	359		4
0.010	0.35	20,172	0.014	581	0.007	0.35	17,798	0.013	449	0.006	0.35	16,612	0.011	359	0.7	6
0.010	0.35	17,930	0.013	459	0.007	0.35	15,821	0.011	354	0.006	0.35	14,766	0.010	284		8
0.010	0.35	17,930	0.013	459	0.007	0.35	15,821	0.011	354	0.006	0.35	14,766	0.010	284		10
0.029	0.4	22,413	0.016	717	0.021	0.4	19,776	0.014	554	0.017	0.4	18,458	0.012	443		4
0.017	0.4	20,172	0.014	581	0.012	0.4	17,798	0.013	449	0.010	0.4	16,612	0.011	359		6
0.011	0.4	20,172	0.014	581	0.008	0.4	17,798	0.013	449	0.006	0.4	16,612	0.011	359	0.8	8
0.011	0.4	17,930	0.013	459	0.008	0.4	15,821	0.011	354	0.006	0.4	14,766	0.010	284		10
0.006	0.4	17,930	0.013	459	0.005	0.4	15,821	0.011	354	0.004	0.4	14,766	0.010	284		12
0.019	0.45	20,172	0.014	581	0.014	0.45	17,798	0.013	449	0.011	0.45	16,612	0.011	359		6
0.012	0.45	20,172	0.014	581	0.009	0.45	17,798	0.013	449	0.007	0.45	16,612	0.011	359	0.9	8
0.012	0.45	17,930	0.013	459	0.009	0.45	15,821	0.011	354	0.007	0.45	14,766	0.010	284		10
0.012	0.45	17,930	0.013	459	0.009	0.45	15,821	0.011	354	0.007	0.45	14,766	0.010	284		12

Ø1

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

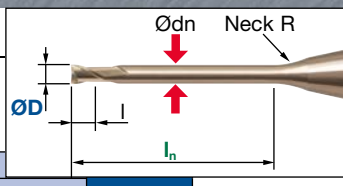
Ultra Micro Grain Solid Carbide End Mill

EPDSE-ATH | High efficiency Cutting Conditions for Rib Application

Workpiece Material		I Carbon Steels. Alloy Steels (180~250HB)					II Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
1	2	0.075	1	23,731	0.024	1,139	0.068	1	21,358	0.024	1,025
	3	0.064	1	23,731	0.024	1,139	0.058	1	21,358	0.024	1,025
	4	0.053	1	23,731	0.024	1,139	0.048	1	21,358	0.024	1,025
	5	0.041	1	23,731	0.024	1,139	0.037	1	21,358	0.024	1,025
	6	0.03	1	21,358	0.022	940	0.027	1	19,222	0.022	846
	7	0.03	1	21,358	0.022	940	0.027	1	19,222	0.022	846
	8	0.03	1	21,358	0.022	940	0.027	1	19,222	0.022	846
	9	0.025	1	21,358	0.022	940	0.023	1	19,222	0.022	846
	10	0.019	1	21,358	0.022	940	0.017	1	19,222	0.022	846
	12	0.019	1	18,985	0.019	721	0.017	1	17,086	0.019	649
	14	0.019	1	18,985	0.019	721	0.017	1	17,086	0.019	649
	16	0.011	1	18,985	0.017	645	0.010	1	17,086	0.017	581
	20	0.008	1	16,612	0.014	465	0.007	1	14,951	0.014	419
	25	0.004	1	13,843	0.012	332	0.004	1	12,459	0.012	299
1.2	6	0.063	1.2	21,094	0.024	1,013	0.057	1.2	18,985	0.024	911
	8	0.036	1.2	18,985	0.022	835	0.032	1.2	17,086	0.022	752
	10	0.023	1.2	18,985	0.022	835	0.021	1.2	17,086	0.022	752
	12	0.023	1.2	18,985	0.022	835	0.021	1.2	17,086	0.022	752
	16	0.015	1.2	16,876	0.020	675	0.014	1.2	15,188	0.020	608
1.4	6	0.075	1.4	18,458	0.024	886	0.068	1.4	16,612	0.024	797
	12	0.026	1.4	16,612	0.022	731	0.023	1.4	14,951	0.022	658
1.5	4	0.083	1.5	18,458	0.024	886	0.075	1.5	16,612	0.024	797
	6	0.083	1.5	18,458	0.024	886	0.075	1.5	16,612	0.024	797
	8	0.06	1.5	16,612	0.022	731	0.054	1.5	14,951	0.022	658
	10	0.045	1.5	16,612	0.022	731	0.041	1.5	14,951	0.022	658
	12	0.045	1.5	16,612	0.022	731	0.041	1.5	14,951	0.022	658
	14	0.029	1.5	16,612	0.022	731	0.026	1.5	14,951	0.022	658
	16	0.029	1.5	14,766	0.019	561	0.026	1.5	13,289	0.019	505
	18	0.029	1.5	14,766	0.019	561	0.026	1.5	13,289	0.019	505
	20	0.029	1.5	14,766	0.019	561	0.026	1.5	13,289	0.019	505
	25	0.017	1.5	11,075	0.017	377	0.015	1.5	9,967	0.017	339
	30	0.011	1.5	9,229	0.014	258	0.010	1.5	8,306	0.014	233
	35	0.008	1.5	9,229	0.014	258	0.007	1.5	8,306	0.014	233
	40	0.004	1.5	7,383	0.011	162	0.004	1.5	6,645	0.011	146
1.6	6	0.083	1.6	17,139	0.026	891	0.075	1.6	15,425	0.026	802
	8	0.083	1.6	17,139	0.026	891	0.075	1.6	15,425	0.026	802
1.8	6	0.098	1.8	17,139	0.026	891	0.088	1.8	15,425	0.026	802
	8	0.098	1.8	17,139	0.026	891	0.088	1.8	15,425	0.026	802
2	4	0.15	2	13,843	0.032	886	0.135	2	12,459	0.032	797
	6	0.15	2	13,843	0.032	886	0.135	2	12,459	0.032	797
	8	0.105	2	13,843	0.032	886	0.095	2	12,459	0.032	797
	10	0.105	2	13,843	0.032	886	0.095	2	12,459	0.032	797
	12	0.075	2	12,459	0.029	723	0.068	2	11,213	0.029	650
	14	0.06	2	12,459	0.029	723	0.054	2	11,213	0.029	650
	16	0.06	2	12,459	0.029	723	0.054	2	11,213	0.029	650
	18	0.038	2	12,459	0.029	723	0.034	2	11,213	0.029	650
	20	0.038	2	12,459	0.029	723	0.034	2	11,213	0.029	650
	25	0.038	2	11,075	0.026	576	0.034	2	9,967	0.026	518
	30	0.023	2	11,075	0.026	576	0.021	2	9,967	0.026	518
	35	0.015	2	9,690	0.023	446	0.014	2	8,721	0.023	401
	40	0.008	2	9,690	0.023	446	0.007	2	8,721	0.023	401
	50	0.004	2	8,306	0.020	332	0.004	2	7,475	0.020	299
2.5	8	0.135	2.5	11,866	0.040	949	0.122	2.5	10,679	0.040	854
	12	0.135	2.5	11,866	0.040	949	0.122	2.5	10,679	0.040	854
	16	0.075	2.5	10,679	0.036	769	0.068	2.5	9,611	0.036	692
	20	0.075	2.5	10,679	0.036	769	0.068	2.5	9,611	0.036	692
	30	0.045	2.5	9,492	0.032	608	0.041	2.5	8,543	0.032	547
	40	0.023	2.5	8,306	0.029	482	0.021	2.5	7,475	0.029	434
	50	0.008	2.5	8,306	0.029	482	0.007	2.5	7,475	0.029	434

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High efficiency Cutting Conditions for Rib Application

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.053	0.5	20,172	0.019	775	0.038	0.5	17,798	0.017	598	0.030	0.5	16,612	0.014	478	1	2
0.045	0.5	20,172	0.019	775	0.032	0.5	17,798	0.017	598	0.026	0.5	16,612	0.014	478		3
0.037	0.5	20,172	0.019	775	0.027	0.5	17,798	0.017	598	0.021	0.5	16,612	0.014	478		4
0.029	0.5	20,172	0.019	775	0.021	0.5	17,798	0.017	598	0.016	0.5	16,612	0.014	478		5
0.021	0.5	18,154	0.018	639	0.015	0.5	16,019	0.015	493	0.012	0.5	14,951	0.013	395		6
0.021	0.5	18,154	0.018	639	0.015	0.5	16,019	0.015	493	0.012	0.5	14,951	0.013	395		7
0.021	0.5	18,154	0.018	639	0.015	0.5	16,019	0.015	493	0.012	0.5	14,951	0.013	395		8
0.018	0.5	18,154	0.018	639	0.013	0.5	16,019	0.015	493	0.010	0.5	14,951	0.013	395		9
0.013	0.5	18,154	0.018	639	0.010	0.5	16,019	0.015	493	0.008	0.5	14,951	0.013	395		10
0.013	0.5	16,137	0.015	491	0.010	0.5	14,239	0.013	379	0.008	0.5	13,289	0.011	303		12
0.013	0.5	16,137	0.015	491	0.010	0.5	14,239	0.013	379	0.008	0.5	13,289	0.011	303		14
0.008	0.5	16,137	0.014	439	0.006	0.5	14,239	0.012	339	0.004	0.5	13,289	0.010	271		16
0.006	0.5	14,120	0.011	316	0.004	0.5	12,459	0.010	244	0.003	0.5	11,628	0.008	195		20
0.003	0.5	11,767	0.010	226	0.002	0.5	10,382	0.008	174	0.002	0.5	9,690	0.007	140		25
0.044	0.6	17,930	0.019	689	0.032	0.6	15,821	0.017	532	0.025	0.6	14,766	0.014	425	1.2	6
0.025	0.6	16,137	0.018	568	0.018	0.6	14,239	0.015	439	0.014	0.6	13,289	0.013	351		8
0.016	0.6	16,137	0.018	568	0.012	0.6	14,239	0.015	439	0.009	0.6	13,289	0.013	351		10
0.016	0.6	16,137	0.018	568	0.012	0.6	14,239	0.015	439	0.009	0.6	13,289	0.013	351		12
0.011	0.6	14,344	0.016	459	0.008	0.6	12,657	0.014	354	0.006	0.6	11,813	0.012	284		16
0.053	0.7	15,689	0.019	602	0.038	0.7	13,843	0.017	465	0.030	0.7	12,920	0.014	372	1.4	6
0.018	0.7	14,120	0.018	497	0.013	0.7	12,459	0.015	384	0.010	0.7	11,628	0.013	307		12
0.058	0.75	15,689	0.019	602	0.042	0.75	13,843	0.017	465	0.033	0.75	12,920	0.014	372	1.5	4
0.058	0.75	15,689	0.019	602	0.042	0.75	13,843	0.017	465	0.033	0.75	12,920	0.014	372		6
0.042	0.75	14,120	0.018	497	0.030	0.75	12,459	0.015	384	0.024	0.75	11,628	0.013	307		8
0.032	0.75	14,120	0.018	497	0.023	0.75	12,459	0.015	384	0.018	0.75	11,628	0.013	307		10
0.032	0.75	14,120	0.018	497	0.023	0.75	12,459	0.015	384	0.018	0.75	11,628	0.013	307		12
0.020	0.75	14,120	0.018	497	0.015	0.75	12,459	0.015	384	0.012	0.75	11,628	0.013	307		14
0.020	0.75	12,551	0.015	382	0.015	0.75	11,075	0.013	295	0.012	0.75	10,336	0.011	236		16
0.020	0.75	12,551	0.015	382	0.015	0.75	11,075	0.013	295	0.012	0.75	10,336	0.011	236		18
0.020	0.75	12,551	0.015	382	0.015	0.75	11,075	0.013	295	0.012	0.75	10,336	0.011	236		20
0.012	0.75	9,413	0.014	256	0.009	0.75	8,306	0.012	198	0.007	0.75	7,752	0.010	158		25
0.008	0.75	7,844	0.011	176	0.006	0.75	6,922	0.010	136	0.004	0.75	6,460	0.008	109		30
0.006	0.75	7,844	0.011	176	0.004	0.75	6,922	0.010	136	0.003	0.75	6,460	0.008	109		35
0.003	0.75	6,276	0.009	110	0.002	0.75	5,537	0.008	85	0.002	0.75	5,168	0.007	68		40
0.058	0.8	14,568	0.021	606	0.042	0.8	12,854	0.018	468	0.033	0.8	11,997	0.016	374	1.6	6
0.058	0.8	14,568	0.021	606	0.042	0.8	12,854	0.018	468	0.033	0.8	11,997	0.016	374		8
0.069	0.9	14,568	0.021	606	0.049	0.9	12,854	0.018	468	0.039	0.9	11,997	0.016	374	1.8	6
0.069	0.9	14,568	0.021	606	0.049	0.9	12,854	0.018	468	0.039	0.9	11,997	0.016	374		8
0.105	1	11,767	0.026	602	0.075	1	10,382	0.022	465	0.060	1	9,690	0.019	372	2	4
0.105	1	11,767	0.026	602	0.075	1	10,382	0.022	465	0.060	1	9,690	0.019	372		6
0.074	1	11,767	0.026	602	0.053	1	10,382	0.022	465	0.042	1	9,690	0.019	372		8
0.074	1	11,767	0.026	602	0.053	1	10,382	0.022	465	0.042	1	9,690	0.019	372		10
0.053	1	10,590	0.023	491	0.038	1	9,344	0.020	379	0.030	1	8,721	0.017	303		12
0.042	1	10,590	0.023	491	0.030	1	9,344	0.020	379	0.024	1	8,721	0.017	303		14
0.042	1	10,590	0.023	491	0.030	1	9,344	0.020	379	0.024	1	8,721	0.017	303		16
0.027	1	10,590	0.023	491	0.019	1	9,344	0.020	379	0.015	1	8,721	0.017	303		18
0.027	1	10,590	0.023	491	0.019	1	9,344	0.020	379	0.015	1	8,721	0.017	303		20
0.027	1	9,413	0.021	392	0.019	1	8,306	0.018	302	0.015	1	7,752	0.016	242		25
0.016	1	9,413	0.021	392	0.012	1	8,306	0.018	302	0.009	1	7,752	0.016	242		30
0.011	1	8,237	0.018	303	0.008	1	7,268	0.016	234	0.006	1	6,783	0.014	187		35
0.006	1	8,237	0.018	303	0.004	1	7,268	0.016	234	0.003	1	6,783	0.014	187		40
0.003	1	7,060	0.016	226	0.002	1	6,229	0.014	174	0.002	1	5,814	0.012	140		50
0.095	1.25	10,086	0.032	645	0.068	1.25	8,899	0.028	498	0.054	1.25	8,306	0.024	399	2.5	8
0.095	1.25	10,086	0.032	645	0.068	1.25	8,899	0.028	498	0.054	1.25	8,306	0.024	399		12
0.053	1.25	9,077	0.029	523	0.038	1.25	8,009	0.025	404	0.030	1.25	7,475	0.022	323		16
0.053	1.25	9,077	0.029	523	0.038	1.25	8,009	0.025	404	0.030	1.25	7,475	0.022	323		20
0.032	1.25	8,069	0.026	413	0.023	1.25	7,119	0.022	319	0.018	1.25	6,645	0.019	255		30
0.016	1.25	7,060	0.023	328	0.012	1.25	6,229	0.020	253	0.009	1.25	5,814	0.017	202		40
0.006	1.25	7,060	0.023	328	0.004	1.25	6,229	0.020	253	0.003	1.25	5,814	0.017	202		50

Ø3

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.

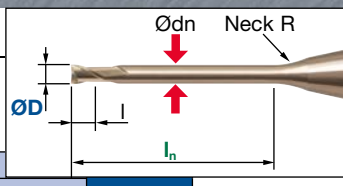
Ultra Micro Grain Solid Carbide End Mill

EPDSE-ATH | High efficiency Cutting Conditions for Rib Application

Workpiece Material		I Carbon Steels. Alloy Steels (180~250HB)					II Tool Steels (25~35HRC)				
ØD	l_n	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min
3	8	0.225	3	10,547	0.040	844	0.203	3	9,492	0.040	759
	12	0.158	3	10,547	0.040	844	0.142	3	9,492	0.040	759
	16	0.113	3	9,492	0.036	683	0.102	3	8,543	0.036	615
	20	0.09	3	9,492	0.036	683	0.081	3	8,543	0.036	615
	25	0.06	3	9,492	0.036	683	0.054	3	8,543	0.036	615
	30	0.06	3	9,492	0.036	683	0.054	3	8,543	0.036	615
	40	0.038	3	8,438	0.032	540	0.034	3	7,594	0.032	486
	50	0.015	3	7,334	0.028	411	0.014	3	6,600	0.028	370
4	12	0.3	4	7,746	0.053	821	0.270	4	6,971	0.053	739
	16	0.21	4	7,746	0.053	821	0.189	4	6,971	0.053	739
	20	0.21	4	6,971	0.053	739	0.189	4	6,274	0.053	665
	25	0.12	4	6,971	0.048	669	0.108	4	6,274	0.048	602
	30	0.12	4	6,971	0.048	669	0.108	4	6,274	0.048	602
	35	0.075	4	6,274	0.048	602	0.068	4	5,647	0.048	542
	40	0.075	4	6,274	0.048	602	0.068	4	5,647	0.048	542
	50	0.045	4	5,422	0.038	412	0.041	4	4,880	0.038	371
5	20	0.225	5	6,190	0.053	656	0.203	5	5,571	0.053	591
	25	0.225	5	5,570	0.048	535	0.203	5	5,013	0.048	481
	30	0.15	5	5,570	0.048	535	0.135	5	5,013	0.048	481
	40	0.113	5	5,013	0.048	481	0.102	5	4,512	0.048	433
	50	0.075	5	5,013	0.038	381	0.068	5	4,512	0.038	343
6	20	0.375	6	5,094	0.059	601	0.338	6	4,585	0.059	541
	30	0.3	6	4,631	0.059	546	0.270	6	4,168	0.059	492
	40	0.225	6	4,631	0.053	491	0.203	6	4,168	0.053	442
	50	0.15	6	4,120	0.048	396	0.135	6	3,708	0.048	356

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

Ultra Micro Grain Solid Carbide End Mill



EPDSE-ATH | High efficiency Cutting Conditions for Rib Application

III Tool Steels (35~45HRC)					IV Hardened Steels (45~55HRC)					V Hardened Steels (55~70HRC)						
a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	a_p mm	a_e mm	n min^{-1}	f_z mm/t	V_f mm/min	ØD	l_n
0.158	1.5	8,965	0.032	574	0.113	1.5	7,910	0.028	443	0.090	1.5	7,383	0.024	354	3	8
0.111	1.5	8,965	0.032	574	0.079	1.5	7,910	0.028	443	0.063	1.5	7,383	0.024	354		12
0.079	1.5	8,069	0.029	465	0.057	1.5	7,119	0.025	359	0.045	1.5	6,645	0.022	287		16
0.063	1.5	8,069	0.029	465	0.045	1.5	7,119	0.025	359	0.036	1.5	6,645	0.022	287		20
0.042	1.5	8,069	0.029	465	0.030	1.5	7,119	0.025	359	0.024	1.5	6,645	0.022	287		25
0.042	1.5	8,069	0.029	465	0.030	1.5	7,119	0.025	359	0.024	1.5	6,645	0.022	287		30
0.027	1.5	7,172	0.026	367	0.019	1.5	6,328	0.022	284	0.015	1.5	5,906	0.019	227		40
0.011	1.5	6,234	0.022	279	0.008	1.5	5,500	0.020	216	0.006	1.5	5,134	0.017	172		50
0.210	2	6,584	0.042	558	0.150	2	5,809	0.037	431	0.120	2	5,422	0.032	345	4	12
0.147	2	6,584	0.042	558	0.105	2	5,809	0.037	431	0.084	2	5,422	0.032	345		16
0.147	2	5,925	0.042	502	0.105	2	5,228	0.037	388	0.084	2	4,880	0.032	310		20
0.084	2	5,925	0.038	455	0.060	2	5,228	0.034	351	0.048	2	4,880	0.029	281		25
0.084	2	5,925	0.038	455	0.060	2	5,228	0.034	351	0.048	2	4,880	0.029	281		30
0.053	2	5,333	0.038	410	0.038	2	4,705	0.034	316	0.030	2	4,392	0.029	253		35
0.053	2	5,333	0.038	410	0.038	2	4,705	0.034	316	0.030	2	4,392	0.029	253		40
0.032	2	4,609	0.030	280	0.023	2	4,066	0.027	216	0.018	2	3,795	0.023	173		50
0.158	2.5	5,261	0.042	446	0.113	2.5	4,642	0.037	344	0.090	2.5	4,333	0.032	276	5	20
0.158	2.5	4,735	0.038	364	0.113	2.5	4,178	0.034	281	0.090	2.5	3,899	0.029	225		25
0.105	2.5	4,735	0.038	364	0.075	2.5	4,178	0.034	281	0.060	2.5	3,899	0.029	225		30
0.079	2.5	4,261	0.038	327	0.057	2.5	3,760	0.034	253	0.045	2.5	3,509	0.029	202		40
0.053	2.5	4,261	0.030	259	0.038	2.5	3,760	0.027	200	0.030	2.5	3,509	0.023	160		50
0.263	3	4,330	0.047	409	0.188	3	3,820	0.041	316	0.150	3	3,566	0.035	252	6	20
0.210	3	3,936	0.047	372	0.150	3	3,473	0.041	287	0.120	3	3,242	0.035	230		30
0.158	3	3,936	0.042	334	0.113	3	3,473	0.037	258	0.090	3	3,242	0.032	206		40
0.105	3	3,502	0.038	269	0.075	3	3,090	0.034	208	0.060	3	2,884	0.029	166		50

Die Modifizierung der Schnittwerte ist nach folgender Regel möglich: Umdrehung (n) und Vorschub (V_f) im gleichen Verhältnis steigern, jedoch den Vorschub pro Zahn (f_z) beibehalten.