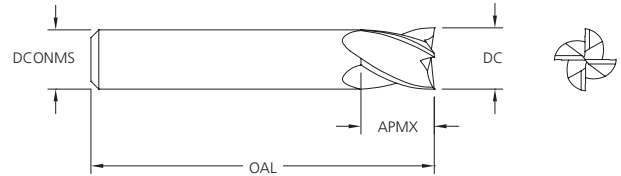
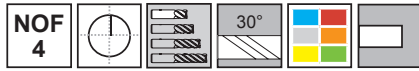


TuffCut® GP - Series 163

Designed for aggressive milling of most materials with reduced deflection, improved tool life and overall economy.



- Micro sizes available.

Series 163 coated tools on page 205.

Uncoated		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16300500	16302			.0050	1/8		1-1/2		.010	
16300600	16304			.0060	1/8		1-1/2		.012	
16300700	16306			.0070	1/8		1-1/2		.014	
16300800	16308			.0080	1/8		1-1/2		.016	
16300900	16312			.0090	1/8		1-1/2		.018	
16301000	16314			.0100	1/8		1-1/2		.020	
16301100	16318			.0110	1/8		1-1/2		.022	
16301200	16320			.0120	1/8		1-1/2		.024	
16301300	16328			.0130	1/8		1-1/2		.026	
16301400	16330			.0140	1/8		1-1/2		.028	
16301500	16334			.0150	1/8		1-1/2		.030	
16301560	16300	1/64		.0156	1/8		1-1/2		.023	
16301600	16338			.0160	1/8		1-1/2		.032	
16301700	16340			.0170	1/8		1-1/2		.034	
16301800	16344			.0180	1/8		1-1/2		.036	
16301900	16346			.0190	1/8		1-1/2		.038	
16302000	16348			.0200	1/8		1-1/2		.040	
16302100	16350			.0210	1/8		1-1/2		.042	
16302200	16352			.0220	1/8		1-1/2		.044	
16302300	16354			.0230	1/8		1-1/2		.046	
16302400	16356			.0240	1/8		1-1/2		.048	
16302500	16358			.0250	1/8		1-1/2		.050	
16302600	16360			.0260	1/8		1-1/2		.052	
16302700	16362			.0270	1/8		1-1/2		.054	
16302800	16364			.0280	1/8		1-1/2		.056	
16302900	16366			.0290	1/8		1-1/2		.058	
16303000	16368			.0300	1/8		1-1/2		.060	

Inch		Metric (mm)	
DC	Tolerance	DC	Tolerance (h10)
1/64	+ .000/- .001	1.00 - 3.00	+ .000/- .040
1/32 - 1/4	+ .000/- .002	>3.00 - 6.00	+ .000/- .048
>1/4 - 3/4	+ .000/- .003	>6.00 - 10.00	+ .000/- .058
DC Micro Sizes*	Tolerance	>10.00 - 18.00	+ .000/- .070
.005 - .060	+ .0005/- .0005	>18.00 - 20.00	+ .000/- .084

* Inch decimal size range
.005 - .060* only.





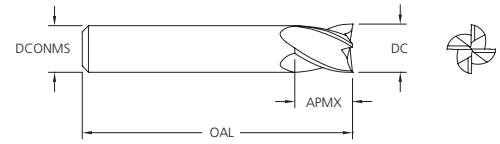
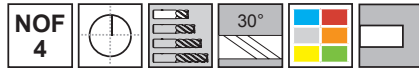
Uncoated		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16303100	16370			.0310	1/8		1-1/2		.062	
16303120	16301	1/32		.0312	1/8		1-1/2		1/16	
16303200	16372			.0320	1/8		1-1/2		.064	
16303300	16373			.0330	1/8		1-1/2		.066	
16303400	16374			.0340	1/8		1-1/2		.068	
16303500	16375			.0350	1/8		1-1/2		.070	
16303600	16376			.0360	1/8		1-1/2		.072	
16303700	16377			.0370	1/8		1-1/2		.074	
16303800	16378			.0380	1/8		1-1/2		.076	
16303900	16379			.0390	1/8		1-1/2		.078	
16303940	16303		1.0	.0394		3.0		38		2.0
16304000	16380			.0400	1/8		1-1/2		.080	
16304100	16381			.0410	1/8		1-1/2		.082	
16304200	16382			.0420	1/8		1-1/2		.084	
16304300	16383			.0430	1/8		1-1/2		.086	
16304400	16384			.0440	1/8		1-1/2		.088	
16304500	16385			.0450	1/8		1-1/2		.090	
16304600	16386			.0460	1/8		1-1/2		.092	
16304680	16305	3/64		.0468	1/8		1-1/2		3/32	
16304700	16387			.0470	1/8		1-1/2		.094	
16304800	16388			.0480	1/8		1-1/2		.096	
16304900	16389			.0490	1/8		1-1/2		.098	
16305000	16390			.0500	1/8		1-1/2		.100	
16305100	16391			.0510	1/8		1-1/2		.102	
16305200	16392			.0520	1/8		1-1/2		.104	
16305300	16393			.0530	1/8		1-1/2		.106	
16305400	16394			.0540	1/8		1-1/2		.108	
16305500	16395			.0550	1/8		1-1/2		.110	
16305600	16396			.0560	1/8		1-1/2		.112	
16305700	16397			.0570	1/8		1-1/2		.114	
16305800	16398			.0580	1/8		1-1/2		.116	
16305900	16399			.0590	1/8		1-1/2		.118	
16305910	16307		1.5	.0591		3.0		38		3.0
16306000	16324			.0600	1/8		1-1/2		.120	
16306250	16309	1/16		.0625	1/8		1-1/2		1/8	
16307810	16310	5/64		.0781	1/8		1-1/2		5/32	
16307870	16311		2.0	.0787		3.0		38		4.0
16309370	16313	3/32		.0937	1/8		1-1/2		3/16	
16309840	16315		2.5	.0984		3.0		38		5.0
16310930	16316	7/64		.1093	1/8		1-1/2		7/32	
16311810	16317		3.0	.1181		3.0		38		6.0
16312500	16319	1/8		.1250	1/8		1-1/2		1/4	
16313780	16321		3.5	.1378		4.0		51		7.0
16314060	16322	9/64		.1406	3/16		2		5/16	
16315620	16323	5/32		.1562	3/16		2		5/16	



Series 163 coated tools on page 205.



TuffCut® GP - Series 163 *Continued*



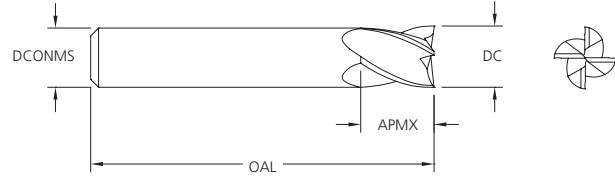
Uncoated		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16315750	16325		4.0	.1575		4.0		51		8.0
16317180	16326	11/64		.1718	3/16		2		3/8	
16317720	16327		4.5	.1772		5.0		51		9.0
16318750	16329	3/16		.1875	3/16		2		3/8	
16319680	16331		5.0	.1968		5.0		51		11.0
16320310	16332	13/64		.2031	1/4		2		1/2	
16321650	16333		5.5	.2165		6.0		51		12.0
16321870	16335	7/32		.2187	1/4		2		1/2	
16323430	16336	15/64		.2343	1/4		2		1/2	
16323620	16337		6.0	.2362		6.0		51		13.0
16325000	16339	1/4		.2500	1/4		2		1/2	
16327560	16341		7.0	.2756		8.0		51		13.0
16328120	16342	9/32		.2812	5/16		2		1/2	
16331250	16343	5/16		.3125	5/16		2		1/2	
16331500	16345		8.0	.3150		8.0		51		13.0
16335430	16347		9.0	.3543		9.0		51		14.0
16337500	16349	3/8		.3750	3/8		2		5/8	
16339370	16351		10.0	.3937		10.0		51		14.0
16343310	16353		11.0	.4331		11.0		64		16.0
16343750	16355	7/16		.4375	7/16		2-1/2		5/8	
16347240	16357		12.0	.4724		12.0		64		16.0
16350000	16359	1/2		.5000	1/2		2-1/2		5/8	
16355120	16361		14.0	.5512		14.0		70		18.0
16362500	16363	5/8		.6250	5/8		3		3/4	
16362990	16365		16.0	.6299		16.0		76		20.0
16370870	16367		18.0	.7087		18.0		76		25.0
16375000	16369	3/4		.7500	3/4		3		1	
16378740	16371		20.0	.7874		20.0		76		25.0

Series 163 coated tools on page 205.



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TuffCut® GP - Series 163 Coated



TiN		ALtima®		TiCN		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Tool No.	EDP	Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16311810T	56300	16311810A	56333	16311810C	56366		3.0	.1181		3.0		38		6.0
16312500T	56301	16312500A	56334	16312500C	56367	1/8		.1250	1/8		1-1/2		1/4	
16315750T	56305	16315750A	56338	16315750C	56371		4.0	.1575		4.0		51		8.0
16318750T	56308	16318750A	56341	16318750C	56374	3/16		.1875	3/16		2		3/8	
16319680T	56309	16319680A	56342	16319680C	56375		5.0	.1968		5.0		51		11.0
16323620T	56314	16323620A	56347	16323620C	56380		6.0	.2362		6.0		51		13.0
16325000T	56315	16325000A	56348	16325000C	56381	1/4		.2500	1/4		2		1/2	
16331250T	56318	16331250A	56351	16331250C	56384	5/16		.3125	5/16		2		1/2	
16331500T	56319	16331500A	56352	16331500C	56385		8.0	.3150		8.0		51		13.0
16337500T	56321	16337500A	56354	16337500C	56387	3/8		.3750	3/8		2		5/8	
16339370T	56322	16339370A	56355	16339370C	56388		10.0	.3937		10.0		51		14.0
16343750T	56324	16343750A	56357	16343750C	56390	7/16		.4375	7/16		2-1/2		5/8	
16347240T	56325	16347240A	56358	16347240C	56391		12.0	.4724		12.0		64		16.0
16350000T	56326	16350000A	56359	16350000C	56392	1/2		.5000	1/2		2-1/2		5/8	
16362500T	56328	16362500A	56361	16362500C	56394	5/8		.6250	5/8		3		3/4	
16362990T	56329	16362990A	56362	16362990C	56395		16.0	.6299		16.0		76		20.0
16375000T	56331	16375000A	56364	16375000C	56397	3/4		.7500	3/4		3		1	
16378740T	56332	16378740A	56365	16378740C	56398		20.0	.7874		20.0		76		25.0

Series 163 uncoated tools on page 202.



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TuffCut® End Mills
Series 163 Coated