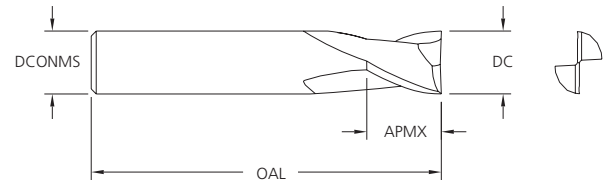
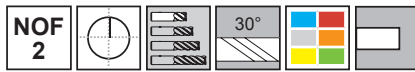


TuffCut® GP - Series 164

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



- Micro sizes available.

Uncoated		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16400500	16468			.0050	1/8		1-1/2		.010	
16400600	16469			.0060	1/8		1-1/2		.012	
16400700	16470			.0070	1/8		1-1/2		.014	
16400780	16402		0.2	.0078		3.0		38		0.4
16400800	16471			.0080	1/8		1-1/2		.016	
16400900	16472			.0090	1/8		1-1/2		.018	
16401000	16473			.0100	1/8		1-1/2		.020	
16401100	16474			.0110	1/8		1-1/2		.022	
16401180	16404		0.3	.0118		3.0		38		0.6
16401200	16475			.0120	1/8		1-1/2		.024	
16401300	16476			.0130	1/8		1-1/2		.026	
16401400	16477			.0140	1/8		1-1/2		.028	
16401500	16478			.0150	1/8		1-1/2		.030	
16401560	16400	1/64		.0156	1/8		1-1/2		.023	
16401570	16406		0.4	.0157		3.0		38		0.8
16401600	16479			.0160	1/8		1-1/2		.032	
16401700	16480			.0170	1/8		1-1/2		.034	
16401800	16481			.0180	1/8		1-1/2		.036	
16401900	16482			.0190	1/8		1-1/2		.038	
16401960	16408		0.5	.0196		3.0		38		1.0
16402000	16483			.0200	1/8		1-1/2		.040	
16402100	16484			.0210	1/8		1-1/2		.042	

Series 164 coated tools on page 233.

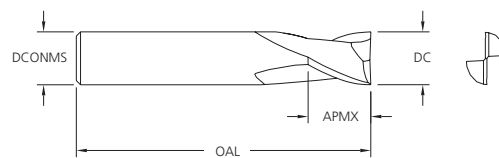
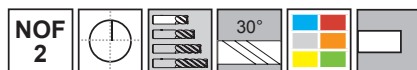
Inch		Metric (mm)	
DC	Tolerance	DC	Tolerance (h10)
1/64	+ .000/- .001	0.20 - 0.50	+ .000/- .025
1/32 - 1/4	+ .000/- .002	0.60 - 3.00	+ .000/- .040
> 1/4 - 3/4	+ .000/- .003	> 3.00 - 6.00	+ .000/- .048
DC Micro Sizes*	Tolerance	> 6.00 - 10.00	+ .000/- .058
.005 - .060	+ .0005/- .0005	> 10.00 - 18.00	+ .000/- .070
		> 18.00 - 20.00	+ .000/- .084

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



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TuffCut® GP - Series 164 *Continued*



Uncoated		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16402200	16485			.0220	1/8		1-1/2		.044	
16402300	16486			.0230	1/8		1-1/2		.046	
16402360	16412		0.6	.0236		3.0		38		1.2
16402400	16487			.0240	1/8		1-1/2		.048	
16402500	16488			.0250	1/8		1-1/2		.050	
16402600	16489			.0260	1/8		1-1/2		.052	
16402700	16490			.0270	1/8		1-1/2		.054	
16402750	16414		0.7	.0275		3.0		38		1.4
16402800	16491			.0280	1/8		1-1/2		.056	
16402900	16492			.0290	1/8		1-1/2		.058	
16403000	16493			.0300	1/8		1-1/2		.060	
16403100	16572			.0310	1/8		1-1/2		.062	
16403120	16401	1/32		.0312	1/8		1-1/2		1/16	
16403150	16418		0.8	.0315		3.0		38		1.6
16403200	16573			.0320	1/8		1-1/2		.064	
16403300	16574			.0330	1/8		1-1/2		.066	
16403400	16575			.0340	1/8		1-1/2		.067	
16403500	16494			.0350	1/8		1-1/2		.070	
16403540	16420		0.9	.0354		3.0		38		1.8
16403600	16576			.0360	1/8		1-1/2		.072	
16403700	16577			.0370	1/8		1-1/2		.074	
16403800	16578			.0380	1/8		1-1/2		.076	
16403900	16579			.0390	1/8		1-1/2		.078	
16403940	16403		1.0	.0394		3.0		38		2.0
16404000	16495			.0400	1/8		1-1/2		.080	
16404100	16580			.0410	1/8		1-1/2		.082	
16404200	16581			.0420	1/8		1-1/2		.084	
16404300	16582			.0430	1/8		1-1/2		.086	
16404330	16428		1.1	.0433		3.0		38		2.2
16404400	16583			.0440	1/8		1-1/2		.088	
16404500	16496			.0450	1/8		1-1/2		.090	
16404600	16584			.0460	1/8		1-1/2		.092	
16404680	16405	3/64		.0468	1/8		1-1/2		3/32	
16404700	16585			.0470	1/8		1-1/2		.094	
16404720	16430		1.2	.0472		3.0		38		2.4
16404800	16586			.0480	1/8		1-1/2		.096	

Series 164 coated tools on page 233.



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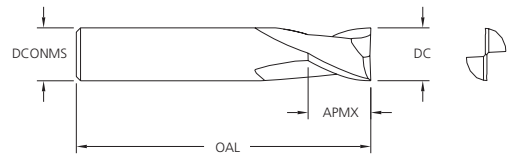
Uncoated		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16404900	16587			.0490	1/8		1-1/2		.098	
16405000	16497			.0500	1/8		1-1/2		.100	
16405100	16588			.0510	1/8		1-1/2		.102	
16405120	16434		1.3	.0512		3.0		38		2.6
16405200	16589			.0520	1/8		1-1/2		.104	
16405300	16590			.0530	1/8		1-1/2		.106	
16405400	16591			.0540	1/8		1-1/2		.108	
16405500	16498			.0550	1/8		1-1/2		.110	
16405510	16438		1.4	.0551		3.0		38		2.8
16405600	16592			.0560	1/8		1-1/2		.112	
16405700	16593			.0570	1/8		1-1/2		.114	
16405800	16594			.0580	1/8		1-1/2		.116	
16405900	16595			.0590	1/8		1-1/2		.118	
16405910	16407		1.5	.0591		3.0		38		3.0
16406000	16499			.0600	1/8		1-1/2		.120	
16406250	16409	1/16		.0625	1/8		1-1/2		1/8	
16406300	16444		1.6	.0630		3.0		38		3.2
16406690	16446		1.7	.0669		3.0		38		3.4
16407090	16448		1.8	.0709		3.0		38		3.6
16407480	16450		1.9	.0748		3.0		38		3.8
16407810	16410	5/64		.0781	1/8		1-1/2		5/32	
16407870	16411		2.0	.0787		3.0		38		4.0
16409370	16413	3/32		.0937	1/8		1-1/2		3/16	
16409840	16415		2.5	.0984		3.0		38		5.0
16410930	16416	7/64		.1093	1/8		1-1/2		7/32	
16411810	16417		3.0	.1181		3.0		38		6.0
16412500	16419	1/8		.1250	1/8		1-1/2		1/4	
16413780	16421		3.5	.1378		4.0		51		7.0
16414060	16422	9/64		.1406	3/16		2		5/16	
16415620	16423	5/32		.1562	3/16		2		5/16	
16415750	16425		4.0	.1575		4.0		51		8.0
16417180	16426	11/64		.1718	3/16		2		3/8	
16417720	16427		4.5	.1772		5.0		51		9.0
16418750	16429	3/16		.1875	3/16		2		3/8	
16419680	16431		5.0	.1968		5.0		51		11.0
16420310	16432	13/64		.2031	1/4		2		1/2	
16421650	16433		5.5	.2165		6.0		51		12.0
16421870	16435	7/32		.2187	1/4		2		1/2	
16423430	16436	15/64		.2343	1/4		2		1/2	
16423620	16437		6.0	.2362		6.0		51		13.0
16425000	16439	1/4		.2500	1/4		2		1/2	

Series 164 coated tools on page 233.



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TuffCut® GP - Series 164 *Continued*



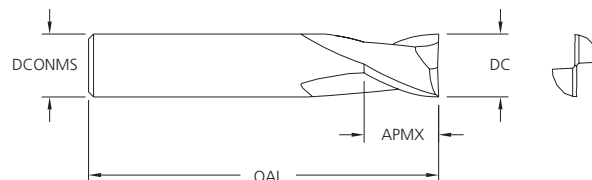
Uncoated		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16427560	16441		7.0	.2756		8.0		51		13.0
16428120	16442	9/32		.2812	5/16		2		1/2	
16431250	16443	5/16		.3125	5/16		2		1/2	
16431500	16445		8.0	.3150		8.0		51		13.0
16435430	16447		9.0	.3543		9.0		51		14.0
16437500	16449	3/8		.3750	3/8		2		5/8	
16439370	16451		10.0	.3937		10.0		51		14.0
16443310	16453		11.0	.4331		11.0		64		16.0
16443750	16455	7/16		.4375	7/16		2-1/2		5/8	
16447240	16457		12.0	.4724		12.0		64		16.0
16450000	16459	1/2		.5000	1/2		2-1/2		5/8	
16455120	16461		14.0	.5512		14.0		70		18.0
16462500	16463	5/8		.6250	5/8		3		3/4	
16462990	16465		16.0	.6299		16.0		76		20.0
16470870	16466		18.0	.7087		18.0		76		25.0
16475000	16467	3/4		.7500	3/4		3		1	
16478740	16462		20.0	.7874		20.0		76		25.0

Series 164 coated tools on page 233.



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TuffCut® GP - Series 164 Coated



TIN		ALtma®		TiCN		DC			DCONMS		OAL		APMX	
Tool No.	EDP	Tool No.	EDP	Tool No.	EDP	Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm
16411810T	56400	16411810A	56433	16411810C	56466		3.0	.1181		3.0		38		6.0
16412500T	56401	16412500A	56434	16412500C	56467	1/8		.1250	1/8		1-1/2		1/4	
16415750T	56405	16415750A	56438	16415750C	56471		4.0	.1575		4.0		51		8.0
16418750T	56408	16418750A	56441	16418750C	56474	3/16		.1875	3/16		2		3/8	
16419680T	56409	16419680A	56442	16419680C	56475		5.0	.1968		5.0		51		11.0
16423620T	56414	16423620A	56447	16423620C	56480		6.0	.2362		6.0		51		13.0
16425000T	56415	16425000A	56448	16425000C	56481	1/4		.2500	1/4		2		1/2	
16431250T	56418	16431250A	56451	16431250C	56484	5/16		.3125	5/16		2		1/2	
16431500T	56419	16431500A	56452	16431500C	56485		8.0	.3150		8.0		51		13.0
16437500T	56421	16437500A	56454	16437500C	56487	3/8		.3750	3/8		2		5/8	
16439370T	56422	16439370A	56455	16439370C	56488		10.0	.3937		10.0		51		14.0
16443750T	56424	16443750A	56457	16443750C	56490	7/16		.4375	7/16		2-1/2		5/8	
16447240T	56425	16447240A	56458	16447240C	56491		12.0	.4724		12.0		64		16.0
16450000T	56426	16450000A	56459	16450000C	56492	1/2		.5000	1/2		2-1/2		5/8	
16462500T	56428	16462500A	56461	16462500C	56494	5/8		.6250	5/8		3		3/4	
16462990T	56429	16462990A	56462	16462990C	56495		16.0	.6299		16.0		76		20.0
16475000T	56431	16475000A	56464	16475000C	56497	3/4		.7500	3/4		3		1	
16478740T	56432	16478740A	56465	16478740C	56498		20.0	.7874		20.0		76		25.0

Series 164 uncoated tools on page 229.



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TuffCut® End Mills
Series 164 Coated