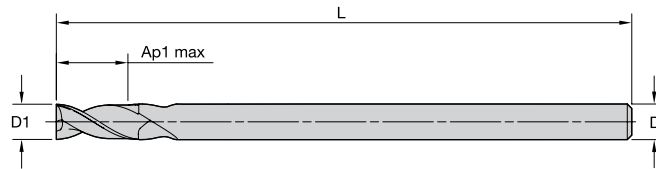
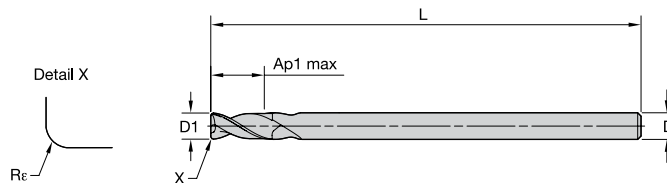


**ALUFLASH SERIES 2A09 • SQUARE END • 2 FLUTE •
REGULAR LENGTH • CYLINDRICAL SHANK • INCH**



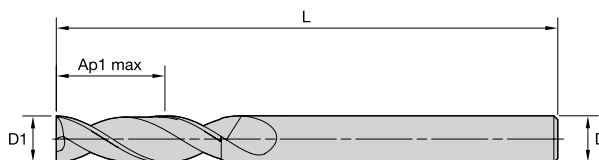
grade	UNCOATED			length of cut	length		
order #	catalog #	D1	D	Ap1 max	L	Z	U
6853394	2A09E03000SZT	1/8	1/8	1/4	2	2	
6853396	2A09E05001SZT	3/16	3/16	5/16	2	2	
6853398	2A09E07003SZT	1/4	1/4	3/8	2	2	
6853421	2A09E08004SZT	5/16	5/16	5/8	2 1/2	2	
6853423	2A09E10005SZT	3/8	3/8	1	3	2	
6853426	2A09E13006SZT	1/2	1/2	1 1/4	3 1/2	2	
6853431	2A09E19009SZT	3/4	3/4	1 5/8	4 1/4	2	
6853435	2A09E2500ASZT	1	1	2 1/2	5 1/2	2	

**ALUFLASH SERIES 2A09 • RADIUS • 2 FLUTE •
REGULAR LENGTH • CYLINDRICAL SHANK • INCH**



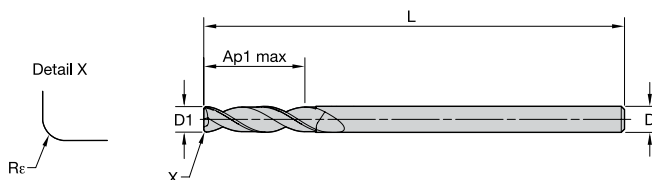
grade	UNCOATED			length of cut	length		
order #	catalog #	D1	D	Ap1 max	L	Re	Z U
6853395	2A09E03000RAT	1/8	1/8	1/4	2	.015	2
6853397	2A09E05001RAT	3/16	3/16	5/16	2	.015	2
6853399	2A09E07003RAT	1/4	1/4	3/8	2	.015	2
6853400	2A09E07003RET	1/4	1/4	3/8	2	.030	2
6853422	2A09E08004RAT	5/16	5/16	5/8	2 1/2	.015	2
6853424	2A09E10005RAT	3/8	3/8	1	3	.015	2
6853425	2A09E10005RET	3/8	3/8	1	3	.030	2
6853427	2A09E13006RAT	1/2	1/2	1 1/4	3 1/2	.015	2
6853428	2A09E13006RET	1/2	1/2	1 1/4	3 1/2	.030	2
6853429	2A09E13006RGT	1/2	1/2	1 1/4	3 1/2	.060	2
6853430	2A09E13006RKT	1/2	1/2	1 1/4	3 1/2	.120	2
6853432	2A09E19009RET	3/4	3/4	1 5/8	4 1/4	.030	2
6853433	2A09E19009RGT	3/4	3/4	1 5/8	4 1/4	.060	2
6853434	2A09E19009RKT	3/4	3/4	1 5/8	4 1/4	.120	2
6853436	2A09E2500ARET	1	1	2 1/2	5 1/2	.030	2
6853437	2A09E2500ARGT	1	1	2 1/2	5 1/2	.060	2
6853438	2A09E2500ARKT	1	1	2 1/2	5 1/2	.120	2

ALUFLASH SERIES 2A19 • SQUARE END • 2 FLUTE • LONG LENGTH • CYLINDRICAL SHANK • INCH



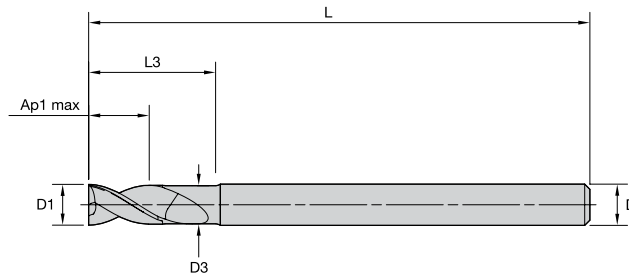
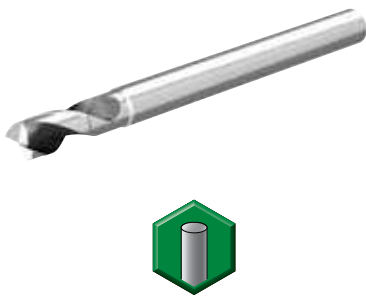
grade	UNCOATED					
order #	catalog #	D1	D	length of cut Ap1 max	length L	Z U
6853379	2A19E03010SZT	1/8	1/8	1/2	2	2
6853381	2A19E05011SZT	3/16	3/16	5/8	2	2
6853383	2A19E07013SZT	1/4	1/4	3/4	2 1/2	2
6853386	2A19E08014SZT	5/16	5/16	1 1/4	3	2
6853388	2A19E10015SZT	3/8	3/8	1 1/2	4	2
6853391	2A19E13016SZT	1/2	1/2	2	4	2

ALUFLASH SERIES 2A19 • RADIUS • 2 FLUTE • LONG LENGTH • CYLINDRICAL SHANK • INCH



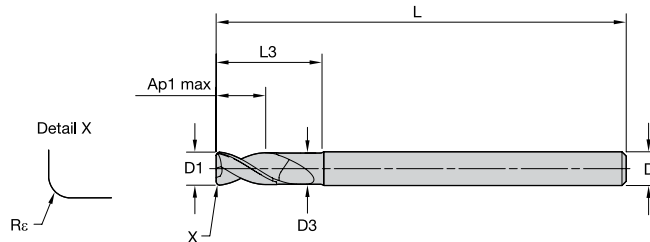
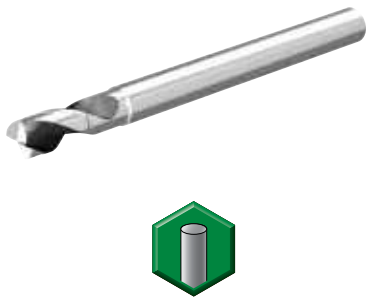
grade	UNCOATED					
order #	catalog #	D1	D	length of cut Ap1 max	length L	Re Z U
6853380	2A19E03010RAT	1/8	1/8	1/2	2	.015 2
6853382	2A19E05011RAT	3/16	3/16	5/8	2	.015 2
6853384	2A19E07013RAT	1/4	1/4	3/4	2 1/2	.015 2
6853385	2A19E07013RET	1/4	1/4	3/4	2 1/2	.030 2
6853387	2A19E08014RAT	5/16	5/16	1 1/4	3	.015 2
6853389	2A19E10015RAT	3/8	3/8	1 1/2	4	.015 2
6853390	2A19E10015RET	3/8	3/8	1 1/2	4	.030 2
6853392	2A19E13016RAT	1/2	1/2	2	4	.015 2
6853393	2A19E13016RET	1/2	1/2	2	4	.030 2

**ALUFLASH SERIES 2AN9 • SQUARE END • 2 FLUTE •
REGULAR LENGTH • REGULAR NECK • CYLINDRICAL SHANK • INCH**



order #	grade UNCOATED catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6859874	2AN9E03000SZT	1/8	1/8	.118	3/16	1 1/2	3/8	2
6859876	2AN9E05001SZT	3/16	3/16	.176	1/4	2 1/4	9/16	2
6859878	2AN9E07003SZT	1/4	1/4	.235	5/16	2 1/2	3/4	2
6859883	2AN9E08004SZT	5/16	5/16	.294	3/8	2 1/2	1	2
6859886	2AN9E10005SZT	3/8	3/8	.353	1/2	3	1 1/4	2
6859889	2AN9E13006SZT	1/2	1/2	.470	5/8	3 1/2	1 1/2	2
6859892	2AN9E16008SZT	5/8	5/8	.588	3/4	4	2	2
6859895	2AN9E19009SZT	3/4	3/4	.705	1	5	2 1/4	2
6859898	2AN9E2500ASZT	1	1	.940	1 1/4	5 1/2	2 1/2	2

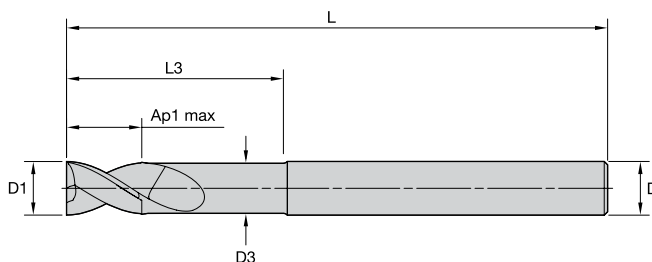
**ALUFLASH SERIES 2AN9 • RADIUS • 2 FLUTE •
REGULAR LENGTH • REGULAR NECK • CYLINDRICAL SHANK • INCH**



order #	grade UNCOATED catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Rc	Z U
6859875	2AN9E03000RAT	1/8	1/8	.118	3/16	1 1/2	3/8	.015	2
6859877	2AN9E05001RAT	3/16	3/16	.176	1/4	2 1/4	9/16	.015	2
6859881	2AN9E07003RET	1/4	1/4	.235	5/16	2 1/2	3/4	.030	2
6859882	2AN9E07003RGT	1/4	1/4	.235	5/16	2 1/2	3/4	.060	2
6859884	2AN9E08004RET	5/16	5/16	.294	3/8	2 1/2	1	.030	2
6859885	2AN9E08004RGT	5/16	5/16	.294	3/8	2 1/2	1	.060	2
6859887	2AN9E10005RET	3/8	3/8	.353	1/2	3	1 1/4	.030	2
6859888	2AN9E10005RGT	3/8	3/8	.353	1/2	3	1 1/4	.060	2
6859890	2AN9E13006RET	1/2	1/2	.470	5/8	3 1/2	1 1/2	.030	2
6859891	2AN9E13006RGT	1/2	1/2	.470	5/8	3 1/2	1 1/2	.060	2
6859893	2AN9E16008RET	5/8	5/8	.588	3/4	4	2	.030	2
6859894	2AN9E16008RGT	5/8	5/8	.588	3/4	4	2	.060	2
6859896	2AN9E19009RET	3/4	3/4	.705	1	5	2 1/4	.030	2
6859897	2AN9E19009RGT	3/4	3/4	.705	1	5	2 1/4	.060	2
6859899	2AN9E2500ARET	1	1	.940	1 1/4	5 1/2	2 1/2	.030	2
6859900	2AN9E2500ARGT	1	1	.940	1 1/4	5 1/2	2 1/2	.060	2

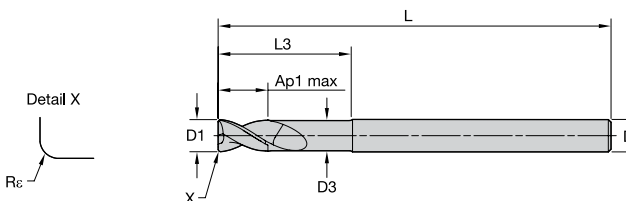


ALUFLASH SERIES 2AL9 • SQUARE END • 2 FLUTE • REGULAR LENGTH • MEDIUM NECK • CYLINDRICAL SHANK • INCH



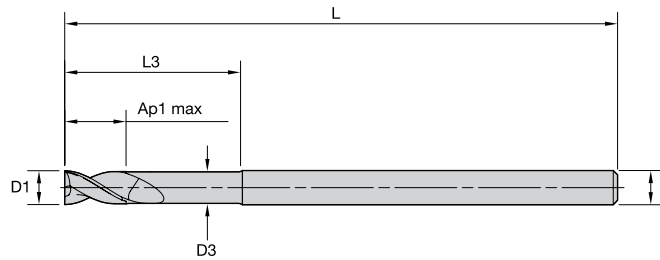
grade	UNCOATED				length of cut	length		
order #	catalog #	D1	D	D3	Ap1 max	L	L3	Z U
6859607	2AL9E07013SZT	1/4	1/4	.235	5/16	2 1/2	1	2
6859651	2AL9E08014SZT	5/16	5/16	.294	3/8	3	1 1/4	2
6859654	2AL9E10015SZT	3/8	3/8	.353	1/2	3	1 1/2	2
6859657	2AL9E13016SZT	1/2	1/2	.470	5/8	4	2	2
6859660	2AL9E16018SZT	5/8	5/8	.588	3/4	5	2 1/2	2
6859673	2AL9E19019SZT	3/4	3/4	.705	1	5	3	2
6859676	2AL9E2501ASZT	1	1	.940	1 1/4	5 1/2	3	2

ALUFLASH SERIES 2AL9 • RADIUS • 2 FLUTE • REGULAR LENGTH • MEDIUM NECK • CYLINDRICAL SHANK • INCH



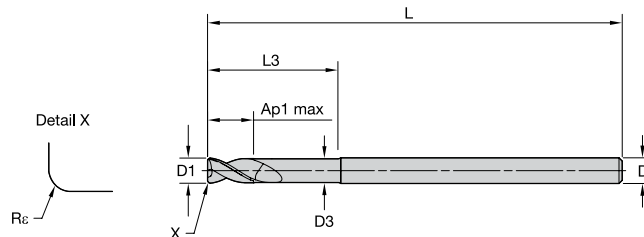
grade	UNCOATED				length of cut	length		
order #	catalog #	D1	D	D3	Ap1 max	L	L3	Re Z U
6859606	2AL9E05011RAT	3/16	3/16	.176	1/4	2 1/4	3/4	.015 2
6859608	2AL9E07013RET	1/4	1/4	.235	5/16	2 1/2	1	.030 2
6859610	2AL9E07013RGT	1/4	1/4	.235	5/16	2 1/2	1	.060 2
6859652	2AL9E08014RET	5/16	5/16	.294	3/8	3	1 1/4	.030 2
6859653	2AL9E08014RGT	5/16	5/16	.294	3/8	3	1 1/4	.060 2
6859655	2AL9E10015RET	3/8	3/8	.353	1/2	3	1 1/2	.030 2
6859656	2AL9E10015RGT	3/8	3/8	.353	1/2	3	1 1/2	.060 2
6859658	2AL9E13016RET	1/2	1/2	.470	5/8	4	2	.030 2
6859659	2AL9E13016RGT	1/2	1/2	.470	5/8	4	2	.060 2
6859671	2AL9E16018RET	5/8	5/8	.588	3/4	5	2 1/2	.030 2
6859672	2AL9E16018RGT	5/8	5/8	.588	3/4	5	2 1/2	.060 2
6859674	2AL9E19019RET	3/4	3/4	.705	1	5	3	.030 2
6859675	2AL9E19019RGT	3/4	3/4	.705	1	5	3	.060 2
6859677	2AL9E2501ARET	1	1	.940	1 1/4	5 1/2	3	.030 2
6859678	2AL9E2501ARGT	1	1	.940	1 1/4	5 1/2	3	.060 2

**ALUFLASH SERIES 2AF9 • SQUARE END • 2 FLUTE •
REGULAR LENGTH • LONG NECK • CYLINDRICAL SHANK • INCH**



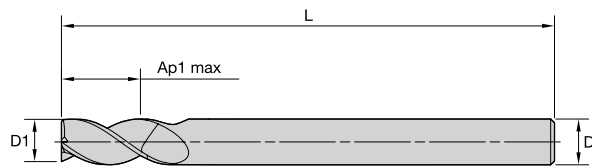
grade UNCOATED	order #	catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6859680	2AF9E03020SZT		1/8	1/8	.118	3/16	2	5/8	2
6859682	2AF9E05021SZT		3/16	3/16	.176	1/4	2 1/4	1	2
6859684	2AF9E07023SZT		1/4	1/4	.235	5/16	3	1 1/4	2
6859687	2AF9E08024SZT		5/16	5/16	.294	3/8	3	1 1/2	2
6859690	2AF9E10025SZT		3/8	3/8	.353	1/2	3 1/2	2	2
6859693	2AF9E13026SZT		1/2	1/2	.470	5/8	4 1/2	2 1/2	2
6859696	2AF9E16028SZT		5/8	5/8	.588	3/4	5	3 1/4	2
6859699	2AF9E19029SZT		3/4	3/4	.705	1	5 1/2	3 1/2	2
6859702	2AF9E2502ASZT		1	1	.940	1 1/4	6 1/2	3 3/4	2

**ALUFLASH SERIES 2AF9 • RADIUS • 2 FLUTE •
REGULAR LENGTH • LONG NECK • CYLINDRICAL SHANK • INCH**



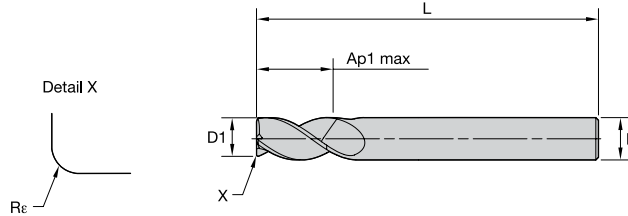
grade UNCOATED	order #	catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Rc	Z U
6859681	2AF9E03020RAT		1/8	1/8	.118	3/16	2	5/8	.015	2
6859683	2AF9E05021RAT		3/16	3/16	.176	1/4	2 1/4	1	.015	2
6859685	2AF9E07023RET		1/4	1/4	.235	5/16	3	1 1/4	.030	2
6859686	2AF9E07023RGT		1/4	1/4	.235	5/16	3	1 1/4	.060	2
6859688	2AF9E08024RET		5/16	5/16	.176	3/8	3	1 1/2	.030	2
6859689	2AF9E08024RGT		5/16	5/16	.294	3/8	3	1 1/2	.060	2
6859691	2AF9E10025RET		3/8	3/8	.353	1/2	3 1/2	2	.030	2
6859692	2AF9E10025RGT		3/8	3/8	.353	1/2	3 1/2	2	.060	2
6859694	2AF9E13026RET		1/2	1/2	.470	5/8	4 1/2	2 1/2	.030	2
6859695	2AF9E13026RGT		1/2	1/2	.470	5/8	4 1/2	2 1/2	.060	2
6859697	2AF9E16028RET		5/8	5/8	.588	3/4	5	3 1/4	.030	2
6859698	2AF9E16028RGT		5/8	5/8	.588	3/4	5	3 1/4	.060	2
6859700	2AF9E19029RET		3/4	3/4	.705	1	5 1/2	3 1/2	.030	2
6859701	2AF9E19029RGT		3/4	3/4	.705	1	5 1/2	3 1/2	.060	2
6859703	2AF9E2502ARET		1	1	.940	1 1/4	6 1/2	3 3/4	.030	2
6859704	2AF9E2502ARGT		1	1	.940	1 1/4	6 1/2	3 3/4	.060	2

**ALUFLASH SERIES 3A09 • SQUARE END • 3 FLUTE •
REGULAR LENGTH • CYLINDRICAL SHANK • INCH**



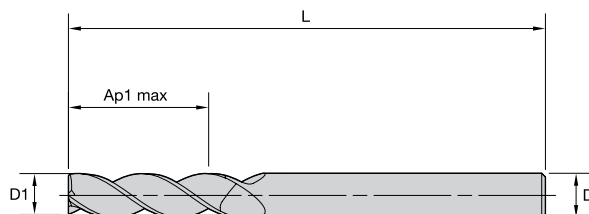
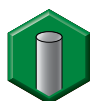
order #	UNCOATED catalog #	D1	D	length of cut Ap1 max	length L	Z U
6853347	3A09E05001SZT	3/16	3/16	5/16	2	3
6853349	3A09E07003SZT	1/4	1/4	3/8	2	3
6853352	3A09E08004SZT	5/16	5/16	5/8	2 1/2	3
6853354	3A09E10005SZT	3/8	3/8	1	3	3
6853358	3A09E13006SZT	1/2	1/2	1 1/4	3 1/2	3
6853363	3A09E16008SZT	5/8	5/8	1 1/2	3 1/2	3
6853366	3A09E19009SZT	3/4	3/4	1 5/8	4	3
6853371	3A09E2500ASZT	1	1	2 1/2	5 1/2	3

**ALUFLASH SERIES 3A09 • RADIUS • 3 FLUTE •
REGULAR LENGTH • CYLINDRICAL SHANK • INCH**



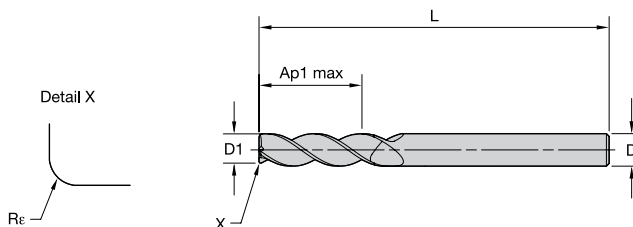
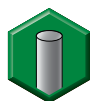
order #	grade UNCOATED catalog #	D1	D	length of cut Ap1 max	length L	Re	Z U
6853348	3A09E05001RAT	3/16	3/16	5/16	2	.015	3
6853350	3A09E07003RAT	1/4	1/4	3/8	2	.015	3
6853351	3A09E07003RET	1/4	1/4	3/8	2	.030	3
6853353	3A09E08004RAT	5/16	5/16	5/8	2 1/2	.015	3
6853355	3A09E10005RAT	3/8	3/8	1	3	.015	3
6853356	3A09E10005RET	3/8	3/8	1	3	.030	3
6853357	3A09E10005RGT	3/8	3/8	1	3	.060	3
6853359	3A09E13006RAT	1/2	1/2	1 1/4	3 1/2	.015	3
6853360	3A09E13006RET	1/2	1/2	1 1/4	3 1/2	.030	3
6853361	3A09E13006RGT	1/2	1/2	1 1/4	3 1/2	.060	3
6853362	3A09E13006RKT	1/2	1/2	1 1/4	3 1/2	.120	3
6853364	3A09E16008RGT	5/8	5/8	1 1/2	3 1/2	.060	3
6853365	3A09E16008RKT	5/8	5/8	1 1/2	3 1/2	.120	3
6853367	3A09E19009RET	3/4	3/4	1 5/8	4	.030	3
6853368	3A09E19009RGT	3/4	3/4	1 5/8	4	.060	3
6853369	3A09E19009RKT	3/4	3/4	1 5/8	4	.120	3
6853370	3A09E19009RPT	3/4	3/4	1 5/8	4	.190	3
6853372	3A09E2500ARET	1	1	2 1/2	5 1/2	.030	3
6853373	3A09E2500ARGT	1	1	2 1/2	5 1/2	.060	3
6853374	3A09E2500ARJT	1	1	2 1/2	5 1/2	.090	3
6853375	3A09E2500ARKT	1	1	2 1/2	5 1/2	.120	3
6853376	3A09E2500ARPT	1	1	2 1/2	5 1/2	.190	3
6853377	3A09E2500ARQT	1	1	2 1/2	5 1/2	.250	3

ALUFLASH SERIES 3A19 • SQUARE END • 3 FLUTE • MEDIUM LENGTH • CYLINDRICAL SHANK • INCH



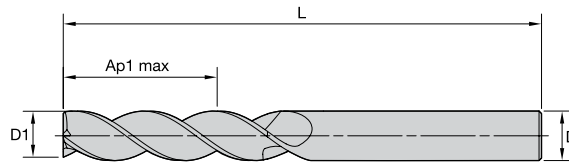
grade	UNCOATED					
order #	catalog #	D1	D	length of cut Ap1 max	length L	Z U
6853307	3A19E05011SZT	3/16	3/16	5/8	2	3
6853309	3A19E07013SZT	1/4	1/4	3/4	2 1/2	3
6853323	3A19E10015SZT	3/8	3/8	1 1/2	4	3
6853327	3A19E13016SZT	1/2	1/2	2	4	3
6853331	3A19E16018SZT	5/8	5/8	2	5	3
6853335	3A19E19019SZT	3/4	3/4	2 1/2	5	3
6853339	3A19E2501ASZT	1	1	3 1/4	6 1/2	3

ALUFLASH SERIES 3A19 • RADIUS • 3 FLUTE • MEDIUM LENGTH • CYLINDRICAL SHANK • INCH



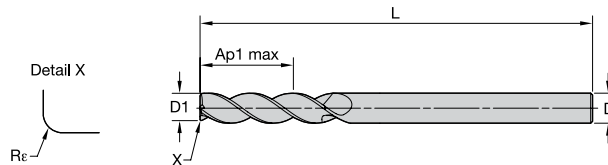
grade	UNCOATED					
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rr
6853308	3A19E05011RAT	3/16	3/16	5/8	2	.015
6853310	3A19E07013RAT	1/4	1/4	3/4	2 1/2	.015
6853321	3A19E07013RET	1/4	1/4	3/4	2 1/2	.030
6853322	3A19E07013RGT	1/4	1/4	3/4	2 1/2	.060
6853324	3A19E10015RAT	3/8	3/8	1 1/2	4	.015
6853325	3A19E10015RET	3/8	3/8	1 1/2	4	.030
6853326	3A19E10015RGT	3/8	3/8	1 1/2	4	.060
6853328	3A19E13016RET	1/2	1/2	2	4	.030
6853329	3A19E13016RGT	1/2	1/2	2	4	.060
6853330	3A19E13016RKT	1/2	1/2	2	4	.120
6853332	3A19E16018RET	5/8	5/8	2	5	.030
6853333	3A19E16018RGT	5/8	5/8	2	5	.060
6853334	3A19E16018RKT	5/8	5/8	2	5	.120
6853336	3A19E19019RET	3/4	3/4	2 1/2	5	.030
6853337	3A19E19019RGT	3/4	3/4	2 1/2	5	.060
6853338	3A19E19019RKT	3/4	3/4	2 1/2	5	.120
6853340	3A19E2501ARET	1	1	3 1/4	6 1/2	.030
6853341	3A19E2501ARGT	1	1	3 1/4	6 1/2	.060
6853342	3A19E2501ARJT	1	1	3 1/4	6 1/2	.090
6853343	3A19E2501ARKT	1	1	3 1/4	6 1/2	.120
6853344	3A19E2501ARPT	1	1	3 1/4	6 1/2	.190
6853345	3A19E2501ARQT	1	1	3 1/4	6 1/2	.250

**ALUFLASH SERIES 3A29 • SQUARE END • 3 FLUTE •
LONG LENGTH • CYLINDRICAL SHANK • INCH**



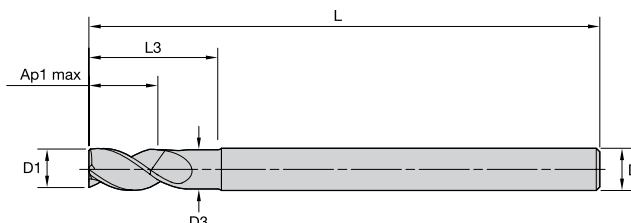
order #	catalog #	grade UNCOATED	D1	D	length of cut Ap1 max	length L	Z U
6853216	3A29E07023SZT		1/4	1/4	1	3 1/4	3
6853220	3A29E08024SZT		5/16	5/16	1 1/4	3	3
6853282	3A29E10025SZT		3/8	3/8	1 3/4	4	3
6853285	3A29E13026SZT		1/2	1/2	2 1/4	4 1/2	3
6853289	3A29E19029SZT		3/4	3/4	3	5 1/2	3
6853303	3A29E2502ASZT		1	1	4	7	3

**ALUFLASH SERIES 3A29 • RADIUS • 3 FLUTE •
LONG LENGTH • CYLINDRICAL SHANK • INCH**



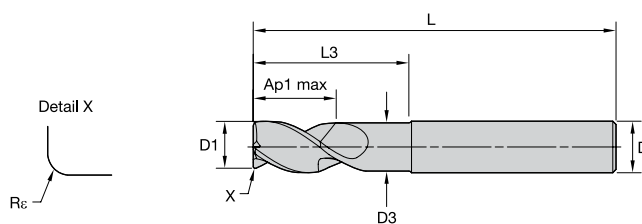
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6853217	3A29E07023RAT		1/4	1/4	1	3 1/4	.015	3
6853218	3A29E07023RET		1/4	1/4	1	3 1/4	.030	3
6853219	3A29E07023RGT		1/4	1/4	1	3 1/4	.060	3
6853281	3A29E08024RAT		5/16	5/16	1 1/4	3	.015	3
6853283	3A29E10025RET		3/8	3/8	1 3/4	4	.030	3
6853284	3A29E10025RGT		3/8	3/8	1 3/4	4	.060	3
6853286	3A29E13026RET		1/2	1/2	2 1/4	4 1/2	.030	3
6853287	3A29E13026RGT		1/2	1/2	2 1/4	4 1/2	.060	3
6853288	3A29E13026RKT		1/2	1/2	2 1/4	4 1/2	.120	3
6853290	3A29E19029RET		3/4	3/4	3	5 1/2	.030	3
6853301	3A29E19029RGT		3/4	3/4	3	5 1/2	.060	3
6853302	3A29E19029RKT		3/4	3/4	3	5 1/2	.120	3
6853304	3A29E2502ARET		1	1	4	7	.030	3
6853305	3A29E2502ARGT		1	1	4	7	.060	3
6853306	3A29E2502ARKT		1	1	4	7	.120	3

ALUFLASH SERIES 3AN9 • SQUARE END • 3 FLUTE • REGULAR LENGTH • REGULAR NECK • CYLINDRICAL SHANK • INCH



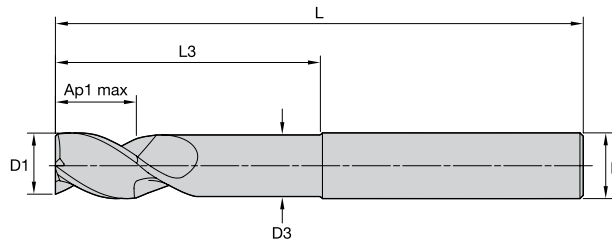
grade	UNCOATED				length of cut	length		
order #	catalog #	D1	D	D3	Ap1 max	L	L3	Z U
6859706	3AN9E05001SZT	3/16	3/16	.176	1/4	2 1/4	9/16	3
6859708	3AN9E07003SZT	1/4	1/4	.235	5/16	2 1/2	3/4	3
6859711	3AN9E08004SZT	5/16	5/16	.294	3/8	2 1/2	1	3
6859715	3AN9E10005SZT	3/8	3/8	.353	1/2	3	1 1/4	3
6859718	3AN9E13006SZT	1/2	1/2	.470	5/8	3 1/2	1 1/2	3
6859721	3AN9E16008SZT	5/8	5/8	.588	3/4	4	2	3
6859724	3AN9E19009SZT	3/4	3/4	.705	1	5	2 1/4	3
6859727	3AN9E2500ASZT	1	1	.940	1 1/4	5 1/2	2 1/2	3

ALUFLASH SERIES 3AN9 • RADIUS • 3 FLUTE • REGULAR LENGTH • REGULAR NECK • CYLINDRICAL SHANK • INCH



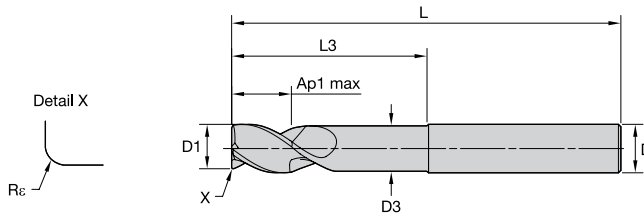
grade	UNCOATED				length of cut	length		
order #	catalog #	D1	D	D3	Ap1 max	L	L3	Rε Z U
6859707	3AN9E05001RAT	3/16	3/16	.176	1/4	2 1/4	9/16	.015 3
6859709	3AN9E07003RET	1/4	1/4	.235	5/16	2 1/2	3/4	.030 3
6859710	3AN9E07003RGT	1/4	1/4	.235	5/16	2 1/2	3/4	.060 3
6859712	3AN9E08004RET	5/16	5/16	.294	3/8	2 1/2	1	.030 3
6859714	3AN9E08004RGT	5/16	5/16	.294	3/8	2 1/2	1	.060 3
6859716	3AN9E10005RET	3/8	3/8	.353	1/2	3	1 1/4	.030 3
6859717	3AN9E10005RGT	3/8	3/8	.353	1/2	3	1 1/4	.060 3
6859719	3AN9E13006RET	1/2	1/2	.470	5/8	3 1/2	1 1/2	.030 3
6859720	3AN9E13006RGT	1/2	1/2	.470	5/8	3 1/2	1 1/2	.060 3
6859722	3AN9E16008RET	5/8	5/8	.588	3/4	4	2	.030 3
6859723	3AN9E16008RGT	5/8	5/8	.588	3/4	4	2	.060 3
6859725	3AN9E19009RET	3/4	3/4	.705	1	5	2 1/4	.030 3
6859726	3AN9E19009RGT	3/4	3/4	.705	1	5	2 1/4	.060 3
6859728	3AN9E2500ARET	1	1	.940	1 1/4	5 1/2	2 1/2	.030 3
6859729	3AN9E2500ARGT	1	1	.940	1 1/4	5 1/2	2 1/2	.060 3

**ALUFLASH SERIES 3AL9 • SQUARE END • 3 FLUTE •
REGULAR LENGTH • MEDIUM NECK • CYLINDRICAL SHANK • INCH**



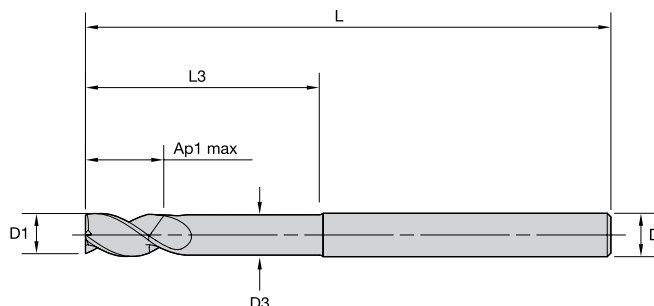
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order #	catalog #	D1	D	D3	Ap1 max	L	L3	Z U
6859740	3AL9E05011SZT	3/16	3/16	.176	1/4	2 1/4	3/4	3
6859783	3AL9E07013SZT	1/4	1/4	.235	5/16	2 1/2	1	3
6859786	3AL9E08014SZT	5/16	5/16	.294	3/8	3	1 1/4	3
6859789	3AL9E10015SZT	3/8	3/8	.353	1/2	3	1 1/2	3
6859802	3AL9E13016SZT	1/2	1/2	.470	5/8	4	2	3
6859805	3AL9E16018SZT	5/8	5/8	.588	3/4	5	2 1/2	3
6859808	3AL9E19019SZT	3/4	3/4	.705	1	5	3	3
6859811	3AL9E2501ASZT	1	1	.940	1 1/4	5 1/2	3	3

**ALUFLASH SERIES 3AL9 • RADIUSUED • 3 FLUTE •
REGULAR LENGTH • MEDIUM NECK • CYLINDRICAL SHANK • INCH**



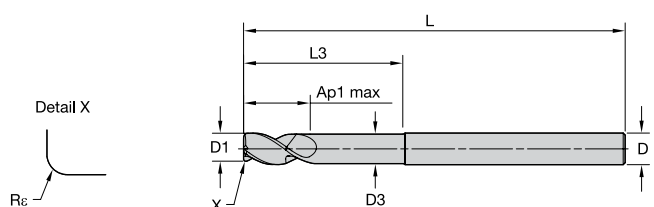
grade	UNCOATED				length of cut	length		
order #	catalog #	D1	D	D3	Ap1 max	L	L3	Re
6859781	3AL9E05011RAT	3/16	3/16	.176	1/4	2 1/4	3/4	.015
6859784	3AL9E07013RET	1/4	1/4	.235	5/16	2 1/2	1	.030
6859785	3AL9E07013RGT	1/4	1/4	.235	5/16	2 1/2	1	.060
6859787	3AL9E08014RET	5/16	5/16	.294	3/8	3	1 1/4	.030
6859788	3AL9E08014RGT	5/16	5/16	.294	3/8	3	1 1/4	.060
6859790	3AL9E10015RET	3/8	3/8	.353	1/2	3	1 1/2	.030
6859801	3AL9E10015RGT	3/8	3/8	.353	1/2	3	1 1/2	.060
6859803	3AL9E13016RET	1/2	1/2	.470	5/8	4	2	.030
6859804	3AL9E13016RGT	1/2	1/2	.470	5/8	4	2	.060
6859806	3AL9E16018RET	5/8	5/8	.588	3/4	5	2 1/2	.030
6859807	3AL9E16018RGT	5/8	5/8	.588	3/4	5	2 1/2	.060
6859809	3AL9E19019RET	3/4	3/4	.705	1	5	3	.030
6859810	3AL9E19019RGT	3/4	3/4	.705	1	5	3	.060
6859812	3AL9E2501ARET	1	1	.940	1 1/4	5 1/2	3	.030
6859813	3AL9E2501ARGT	1	1	.940	1 1/4	5 1/2	3	.060

ALUFLASH SERIES 3AF9 • SQUARE END • 3 FLUTE • REGULAR LENGTH • LONG NECK • CYLINDRICAL SHANK • INCH



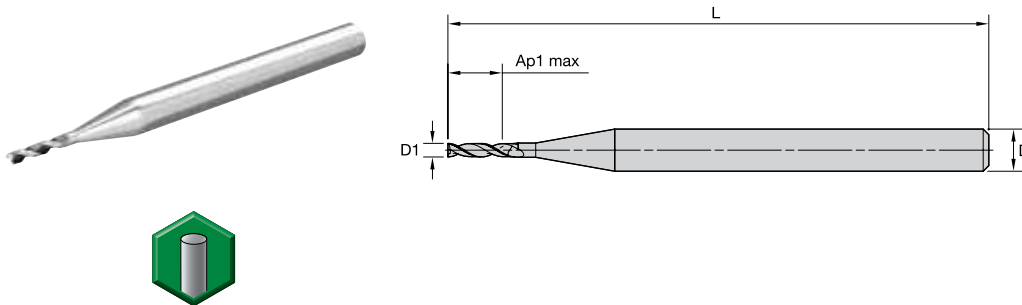
order #	grade UNCOATED catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6859818	3AF9E05021SZT	3/16	3/16	.176	1/4	2 1/4	1	3
6859820	3AF9E07023SZT	1/4	1/4	.235	5/16	3	1 1/4	3
6859843	3AF9E08024SZT	5/16	5/16	.294	3/8	3	1 1/2	3
6859846	3AF9E10025SZT	3/8	3/8	.353	1/2	3 1/2	2	3
6859849	3AF9E13026SZT	1/2	1/2	.470	5/8	4 1/2	2 1/2	3
6859862	3AF9E16028SZT	5/8	5/8	.588	3/4	5	3 1/4	3
6859866	3AF9E19029SZT	3/4	3/4	.705	1	5 1/2	3 1/2	3
6859869	3AF9E2502ASZT	1	1	.940	1 1/4	6 1/2	3 3/4	3

ALUFLASH SERIES 3AF9 • RADIUS • 3 FLUTE • REGULAR LENGTH • LONG NECK • CYLINDRICAL SHANK • INCH



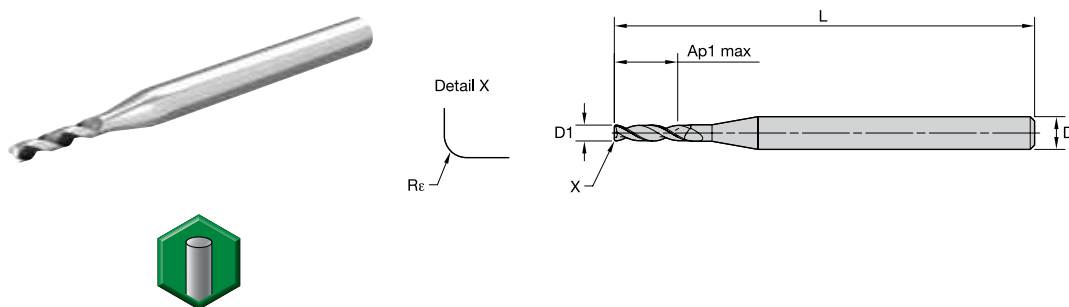
order #	grade UNCOATED catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Rc	Z U
6859819	3AF9E05021RAT	3/16	3/16	.176	1/4	2 1/4	1	.015	3
6859841	3AF9E07023RET	1/4	1/4	.235	5/16	3	1 1/4	.030	3
6859842	3AF9E07023RGT	1/4	1/4	.235	5/16	3	1 1/4	.060	3
6859844	3AF9E08024RET	5/16	5/16	.294	3/8	3	1 1/2	.030	3
6859845	3AF9E08024RGT	5/16	5/16	.294	3/8	3	1 1/2	.060	3
6859847	3AF9E10025RET	3/8	3/8	.353	1/2	3 1/2	2	.030	3
6859848	3AF9E10025RGT	3/8	3/8	.353	1/2	3 1/2	2	.060	3
6859850	3AF9E13026RET	1/2	1/2	.470	5/8	4 1/2	2 1/2	.030	3
6859861	3AF9E13026RGT	1/2	1/2	.470	5/8	4 1/2	2 1/2	.060	3
6859864	3AF9E16028RET	5/8	5/8	.588	3/4	5	3 1/4	.030	3
6859865	3AF9E16028RGT	5/8	5/8	.588	3/4	5	3 1/4	.060	3
6859867	3AF9E19029RET	3/4	3/4	.705	1	5 1/2	3 1/2	.030	3
6859868	3AF9E19029RGT	3/4	3/4	.705	1	5 1/2	3 1/2	.060	3
6859870	3AF9E2502ARET	1	1	.940	1 1/4	6 1/2	3 3/4	.030	3
6859871	3AF9E2502ARGT	1	1	.940	1 1/4	6 1/2	3 3/4	.060	3

**ALUFLASH SERIES 2A09 • SQUARE END • 2 FLUTE •
REGULAR LENGTH • CYLINDRICAL SHANK • METRIC**



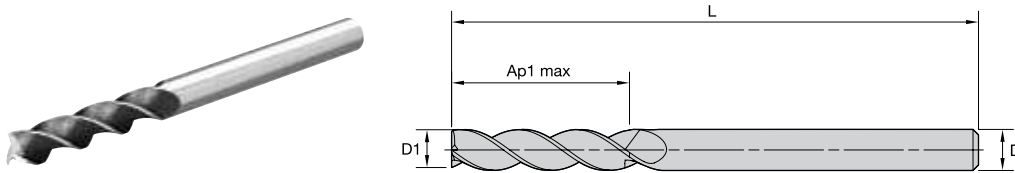
grade UNCOATED order # catalog #	D1	D	length of cut Ap1 max	length L	Z U
6853514 2A09M01000SZT	1,0	3	4,00	38	2
6853515 2A09M01500SZT	1,5	3	6,00	38	2
6853517 2A09M02000SZT	2,0	3	8,00	38	2
6853519 2A09M02500SZT	2,5	3	9,00	38	2
6853542 2A09M04001SZT	4,0	4	12,00	50	2
6853544 2A09M05002SZT	5,0	5	14,00	50	2
6853547 2A09M06003SZT	6,0	6	16,00	50	2
6853549 2A09M08004SZT	8,0	8	20,00	63	2
6853552 2A09M12006SZT	12,0	12	25,00	76	2
6853554 2A09M16008SZT	16,0	16	32,00	89	2
6853556 2A09M20009SZT	20,0	20	40,00	104	2

**ALUFLASH SERIES 2A09 • RADIUS • 2 FLUTE •
REGULAR LENGTH • CYLINDRICAL SHANK • METRIC**



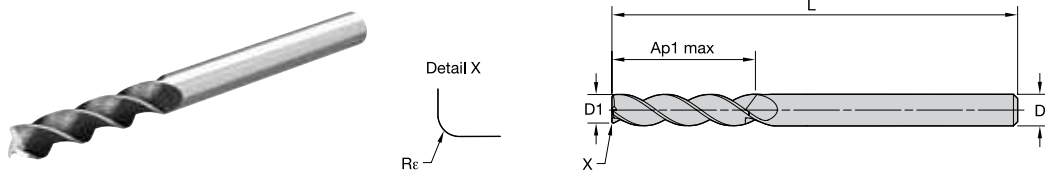
grade UNCOATED order # catalog #	D1	D	length of cut Ap1 max	length L	Re	Z U
6853516 2A09M01500RAT	1,5	3	6,00	38	0,20	2
6853518 2A09M02000RAT	2,0	3	8,00	38	0,20	2
6853520 2A09M02500RAT	2,5	3	9,00	38	0,20	2
6853541 2A09M03000RAT	3,0	3	12,00	38	0,20	2
6853543 2A09M04001RAT	4,0	4	12,00	50	0,20	2
6853546 2A09M05002RAT	5,0	5	14,00	50	0,20	2
6853548 2A09M06003RET	6,0	6	16,00	50	0,50	2
6853550 2A09M08004RET	8,0	8	20,00	63	0,50	2
6853551 2A09M10005RJT	10,0	10	22,00	76	1,00	2
6853553 2A09M12006RJT	12,0	12	25,00	76	1,00	2
6853555 2A09M16008RJT	16,0	16	32,00	89	1,00	2
6853557 2A09M20009RJT	20,0	20	40,00	104	1,00	2

ALUFLASH SERIES 3A09 • SQUARE END • 3 FLUTE • REGULAR LENGTH • CYLINDRICAL SHANK • METRIC



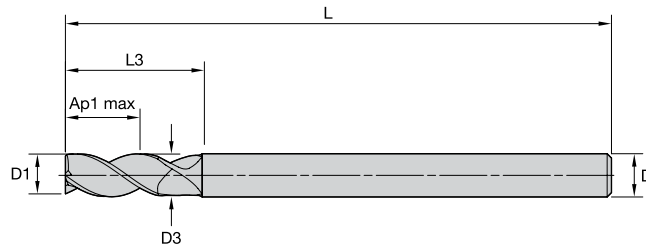
grade UNCOATED	order #	catalog #	D1	D	length of cut Ap1 max	length L	Z U
6853511	3A09M03000SZT		3,0	3	12,00	38	3

ALUFLASH SERIES 3A09 • RADIUS • 3 FLUTE • REGULAR LENGTH • CYLINDRICAL SHANK • METRIC



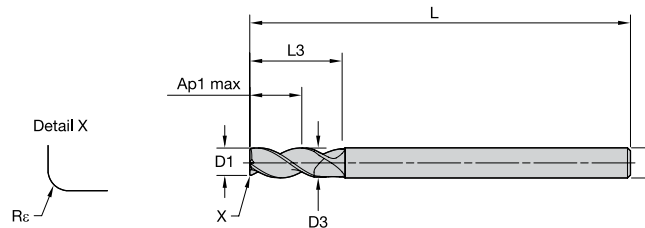
grade UNCOATED	order #	catalog #	D1	D	length of cut Ap1 max	length L	Re	Z U
6853512	3A09M03000RAT		3,0	3	12,00	38	0,20	3
6853513	3A09M04001RET		4,0	4	12,00	63	0,50	3

**ALUFLASH SERIES 3AN9 • SQUARE END • 3 FLUTE •
REGULAR LENGTH • REGULAR NECK • CYLINDRICAL SHANK • METRIC**



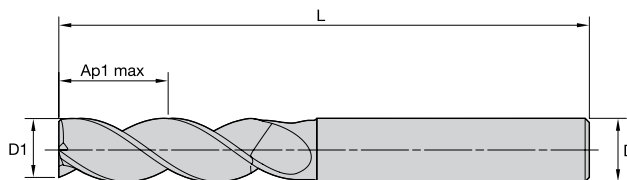
grade UNCOATED								
order #	catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6853460	3AN9M04001SZT	4,0	4	3,76	8,00	50	12,00	3
6853462	3AN9M05002SZT	5,0	5	4,70	10,00	63	15,00	3
6853465	3AN9M06003SZT	6,0	6	5,64	13,00	63	18,00	3
6853469	3AN9M08004SZT	8,0	8	7,52	18,00	76	24,00	3
6853474	3AN9M10005SZT	10,0	10	9,40	22,00	76	30,00	3
6853479	3AN9M12006SZT	12,0	12	11,28	25,00	76	36,00	3
6853486	3AN9M16008SZT	16,0	16	15,04	32,00	89	48,00	3
6853494	3AN9M20009SZT	20,0	20	18,80	40,00	115	60,00	3

ALUFLASH SERIES 3AN9 • RADIUS • 3 FLUTE • REGULAR LENGTH • REGULAR NECK • CYLINDRICAL SHANK • METRIC



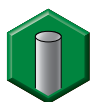
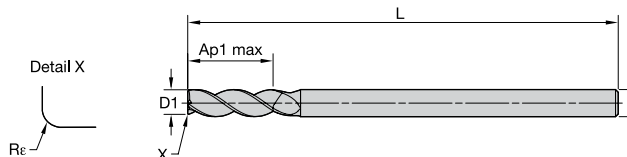
order #	grade UNCOATED catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Rε	Z U
6853461	3AN9M04001RAT	4,0	4	3,76	8,00	50	12,00	0,20	3
6853463	3AN9M05002RAT	5,0	5	4,70	10,00	63	15,00	0,20	3
6853464	3AN9M05002RET	5,0	5	4,70	10,00	63	15,00	0,50	3
6853466	3AN9M06003RAT	6,0	6	5,64	13,00	63	18,00	0,20	3
6853467	3AN9M06003RET	6,0	6	5,64	13,00	63	18,00	0,50	3
6853468	3AN9M06003RJT	6,0	6	5,64	13,00	63	18,00	1,00	3
6853470	3AN9M08004RAT	8,0	8	7,52	18,00	76	24,00	0,20	3
6853471	3AN9M08004RET	8,0	8	7,52	18,00	76	24,00	0,50	3
6853473	3AN9M08004RHT	8,0	8	7,52	18,00	76	24,00	1,50	3
6853472	3AN9M08004RJT	8,0	8	7,52	18,00	76	24,00	1,00	3
6853475	3AN9M10005RAT	10,0	10	9,40	22,00	76	30,00	0,20	3
6853476	3AN9M10005RET	10,0	10	9,40	22,00	76	30,00	0,50	3
6853478	3AN9M10005RHT	10,0	10	9,40	22,00	76	30,00	1,50	3
6853477	3AN9M10005RJT	10,0	10	9,40	22,00	76	30,00	1,00	3
6853480	3AN9M12006RAT	12,0	12	11,28	25,00	76	36,00	0,20	3
6853481	3AN9M12006RET	12,0	12	11,28	25,00	76	36,00	0,50	3
6853483	3AN9M12006RHT	12,0	12	11,28	25,00	76	36,00	1,50	3
6853482	3AN9M12006RJT	12,0	12	11,28	25,00	76	36,00	1,00	3
6853484	3AN9M12006RKT	12,0	12	11,28	25,00	76	36,00	2,00	3
6853485	3AN9M12006RPT	12,0	12	11,28	25,00	76	36,00	3,00	3
6853487	3AN9M16008RAT	16,0	16	15,04	32,00	89	48,00	0,20	3
6853488	3AN9M16008RET	16,0	16	15,04	32,00	89	48,00	0,50	3
6853490	3AN9M16008RHT	16,0	16	15,04	32,00	89	48,00	1,50	3
6853489	3AN9M16008RJT	16,0	16	15,04	32,00	89	48,00	1,00	3
6853491	3AN9M16008RMT	16,0	16	15,04	32,00	89	48,00	2,50	3
6853492	3AN9M16008RPT	16,0	16	15,04	32,00	89	48,00	3,00	3
6853493	3AN9M16008RQT	16,0	16	15,04	32,00	89	48,00	4,00	3
6853495	3AN9M20009RAT	20,0	20	18,80	40,00	115	60,00	0,20	3
6853496	3AN9M20009RHT	20,0	20	18,80	40,00	115	60,00	1,50	3
6853497	3AN9M20009RKT	20,0	20	18,80	40,00	115	60,00	2,00	3
6853498	3AN9M20009RPT	20,0	20	18,80	40,00	115	60,00	3,00	3
6853499	3AN9M20009RQT	20,0	20	18,80	40,00	115	60,00	4,00	3
6853500	3AN9M20009RRT	20,0	20	18,80	40,00	115	60,00	5,00	3

**ALUFLASH SERIES 3AP9 • SQUARE END • 3 FLUTE •
LONG LENGTH • REGULAR NECK • CYLINDRICAL SHANK • METRIC**



grade UNCOATED	order #	catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
	6853448	3AP9M12016SZT	12,0	12	11,28	36,00	100	48,00	3

**ALUFLASH SERIES 3AP9 • RADIUS • 3 FLUTE •
LONG LENGTH • REGULAR NECK • CYLINDRICAL SHANK • METRIC**



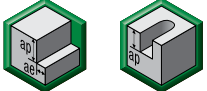

grade UNCOATED	order #	catalog #	D1	D	D3	length of cut Ap1 max	length L	L3	Rε	Z U
6853439	3AP9M04011RAT		4,0	4	3,76	12,00	63	16,00	0,20	3
6853440	3AP9M05002RAT		5,0	5	4,70	15,00	63	20,00	0,20	3
6853441	3AP9M06013RET		6,0	6	5,64	18,00	76	24,00	0,50	3
6853442	3AP9M06013RJT		6,0	6	5,64	18,00	76	24,00	1,00	3
6853443	3AP9M08014RET		8,0	8	7,52	24,00	76	32,00	0,50	3
6853444	3AP9M08014RJT		8,0	8	7,52	24,00	76	32,00	1,00	3
6853445	3AP9M10015RET		10,0	10	9,40	30,00	89	40,00	0,50	3
6853446	3AP9M10015RHT		10,0	10	9,40	30,00	89	40,00	1,50	3
6853447	3AP9M10015RKT		10,0	10	9,40	30,00	89	40,00	2,00	3
6853449	3AP9M12016RET		12,0	12	11,28	36,00	100	48,00	0,50	3
6853450	3AP9M12016RHT		12,0	12	11,28	36,00	100	48,00	1,50	3
6853451	3AP9M12016RPT		12,0	12	11,28	36,00	100	48,00	3,00	3
6853452	3AP9M16018RET		16,0	16	15,04	48,00	110	64,00	0,50	3
6853453	3AP9M16018RHT		16,0	16	15,04	48,00	110	64,00	1,50	3
6853454	3AP9M16018RPT		16,0	16	15,04	48,00	110	64,00	3,00	3
6853455	3AP9M20019RET		20,0	20	18,80	60,00	150	80,00	0,50	3
6853456	3AP9M20019RHT		20,0	20	18,80	60,00	150	80,00	1,50	3
6853457	3AP9M20019RKT		20,0	20	18,80	60,00	150	80,00	2,00	3
6853458	3AP9M20019RPT		20,0	20	18,80	60,00	150	80,00	3,00	3
6853459	3AP9M20019RQT		20,0	20	18,80	60,00	150	80,00	4,00	3

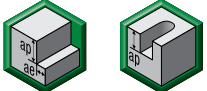

ALUFLASH • SIDE MILLING AND SLOTTING • APPLICATION DATA • INCH

Material Group	Side Milling (A) and Slotting (B)			UNCOATED			Recommended feed per tooth (Fz = IPT) for side milling (A). For slotting (B), reduce Fz by 20%.													
	A		B	Cutting Speed – Vc SFM			D1 – Diameter													
	ap	ae	ap	min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1	
	N	1	Ap1 max	0,5 x D1	1 x D1	1500	1800	6000	IPT	.0009	.0017	.0022	.0026	.0035	.0043	.0052	.0060	.0069	.0078	.0087
2		Ap1 max	0,5 x D1	1 x D1	1500	1800	4500	IPT	.0008	.0016	.0019	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097
3		Ap1 max	0,5 x D1	1 x D1	1500	1800	4500	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076
4		Ap1 max	0,5 x D1	1 x D1	1200	1350	2250	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076
5		Ap1 max	0,5 x D1	1 x D1	750	1200	3000	IPT	.0008	.0016	.0020	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097

Material Group	Side Milling (A) and Slotting (B)			UNCOATED			Recommended feed per tooth (Fz = IPT) for side milling (A). For slotting (B), reduce Fz by 20%.													
	A		B	Cutting Speed – Vc SFM			D1 – Diameter													
	ap	ae	ap	min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1	
	N	1	Ap1 max	0,5 x D1	1 x D	1500	1800	4500	IPT	.0009	.0017	.0022	.0026	.0035	.0043	.0052	.0060	.0069	.0078	.0087
2		Ap1 max	0,5 x D1	1 x D	1500	1800	4500	IPT	.0008	.0016	.0019	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097
3		Ap1 max	0,5 x D1	1 x D	1500	1800	4500	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076
4		Ap1 max	0,5 x D1	1 x D	1200	1350	2250	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076
5		Ap1 max	0,5 x D1	1 x D	750	1200	3000	IPT	.0008	.0016	.0020	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097

ALUFLASH • SIDE MILLING AND SLOTTING • APPLICATION DATA • METRIC

																					
		Side Milling (A) and Slotting (B)			UNCOATED			Recommended feed per tooth (fz = mm/z) for side milling (A). For slotting (B), reduce fz by 20%.													
		A		B	Cutting Speed – Vc m/min			D1 – Diameter													
Material Group		ap	ae	ap	min	Start	max	mm	2.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
N	1	Ap1 max	0,5 x D1	1 x D	500	600	2000	fz	0.022	0.044	0.055	0.066	0.088	0.110	0.132	0.153	0.176	0.198	0.220	0.275	
	2	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0.020	0.040	0.048	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247	
	3	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192	
	4	Ap1 max	0,5 x D1	1 x D	400	450	750	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192	
	5	Ap1 max	0,5 x D1	1 x D	250	400	1000	fz	0.020	0.040	0.050	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247	

																					
		Side Milling (A) and Slotting (B)			UNCOATED			Recommended feed per tooth (fz = mm/z) for side milling (A). For slotting (B), reduce fz by 20%.													
		A		B	Cutting Speed – Vc m/min			D1 – Diameter													
Material Group		ap	ae	ap	min	Start	max	mm	2.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
N	1	Ap1 max	0,5 x D1	1 x D	500	600	2000	fz	0.022	0.044	0.055	0.066	0.088	0.110	0.132	0.153	0.176	0.198	0.220	0.275	
	2	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0.020	0.040	0.048	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247	
	3	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192	
	4	Ap1 max	0,5 x D1	1 x D	400	450	750	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192	
	5	Ap1 max	0,5 x D1	1 x D	250	400	1000	fz	0.020	0.040	0.050	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247	

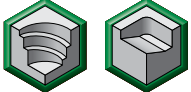

ALUFLASH • RAMPING 2FL • APPLICATION DATA • INCH



Material Group		Max Depth			Helical Interpolation / Ramping			Diameter - D1 [Ømin-Ømax]												
					0° - 15°			Recommended feed per tooth (fz = IPT) for Helical Interpolation and Ramping												
					UNCOATED			Cutting Speed - Vc SFM												
		min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1			
					Decimals	.180	.180	.216	.288	.359	.431	.575	.633	.719	.814	.863	1.150			
N	1	1.25 x D1	1500	1800	6000	IPT	.0009	.0017	.0022	.0026	.0035	.0043	.0052	.0060	.0069	.0078	.0087	.0108		
	2	1.25 x D1	1500	1800	4500	IPT	.0008	.0016	.0019	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097		
	3	1.25 x D1	1500	1800	4500	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076		
	4	1.25 x D1	1200	1350	2250	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076		
	5	1.25 x D1	750	1200	3000	IPT	.0008	.0016	.0020	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097		



Material Group		Max Depth			Helical Interpolation / Ramping			Diameter - D1 [Ømin-Ømax]												
					15° - 30°			Recommended feed per tooth (fz = IPT) for Helical Interpolation and Ramping												
					UNCOATED			Cutting Speed - Vc SFM												
		min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1			
					Decimals	.180	.180	.216	.288	.359	.431	.575	.633	.719	.814	.863	1.150			
N	1	1.25 x D1	1500	1800	4800	IPT	.0006	.0013	.0016	.0019	.0026	.0032	.0039	.0045	.0052	.0058	.0065	.0081		
	2	1.25 x D1	1500	1800	3600	IPT	.0006	.0012	.0014	.0018	.0023	.0029	.0035	.0041	.0047	.0053	.0058	.0073		
	3	1.25 x D1	1500	1800	3600	IPT	.0005	.0009	.0011	.0014	.0018	.0023	.0027	.0032	.0036	.0041	.0045	.0057		
	4	1.25 x D1	1200	1350	1800	IPT	.0005	.0009	.0011	.0014	.0018	.0023	.0027	.0032	.0036	.0041	.0045	.0057		
	5	1.25 x D1	750	1200	2400	IPT	.0006	.0012	.0015	.0018	.0023	.0029	.0035	.0041	.0047	.0053	.0058	.0073		

Material Group		Max Depth			Helical Interpolation / Ramping			Diameter - D1 [Ømin-Ømax]												
					30° - 45°			Recommended feed per tooth (fz = IPT) for Helical Interpolation and Ramping												
					UNCOATED			Cutting Speed - Vc SFM												
		min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1			
					Decimals	.180	.180	.216	.288	.359	.431	.575	.633	.719	.814	.863	1.150			
N	1	1.25 x D1	1260	1500	2400	IPT	.0005	.0010	.0013	.0016	.0021	.0026	.0031	.0036	.0042	.0047	.0052	.0065		
	2	1.25 x D1	1260	1500	2400	IPT	.0005	.0009	.0011	.0014	.0019	.0023	.0028	.0033	.0037	.0042	.0047	.0058		
	3	1.25 x D1	1260	1500	2400	IPT	.0004	.0007	.0009	.0011	.0015	.0018	.0022	.0025	.0029	.0033	.0036	.0045		
	4	1.25 x D1	1020	1140	1350	IPT	.0004	.0007	.0009	.0011	.0015	.0018	.0022	.0025	.0029	.0033	.0036	.0045		
	5	1.25 x D1	630	1020	1800	IPT	.0005	.0009	.0012	.0014	.0019	.0023	.0028	.0033	.0037	.0042	.0047	.0058		

ALUFLASH • RAMPING 2FL • APPLICATION DATA • METRIC

Material Group	Max Depth	Helical Interpolation / Ramping 0° - 15°			 													
		UNCOATED			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping													
		Cutting Speed – Vc m/min			Diameter – D1 [Ømin–Ømax]													
		min	Start	max	mm	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
			mm	2.5-4.8	4.6-7.6	5.8-9.5	6.9-11.4	9.2-15.2	11.5-19.0	13.8-22.8	16.1-26.6	18.4-30.4	20.7-34.2	23.0-38.0	28.8-47.5			
N	1	1,25 x D1	500	600	2000	fz	0.022	0.044	0.055	0.066	0.088	0.110	0.132	0.153	0.176	0.198	0.220	0.275
	2	1,25 x D1	500	600	1500	fz	0.020	0.040	0.048	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247
	3	1,25 x D1	500	600	1500	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192
	4	1,25 x D1	400	450	750	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192
	5	1,25 x D1	250	400	1000	fz	0.020	0.040	0.050	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247

Material Group	Max Depth	Helical Interpolation / Ramping 15° - 30°			 													
		UNCOATED			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping													
		Cutting Speed – Vc m/min			Diameter – D1 [Ømin–Ømax]													
		min	Start	max	mm	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
			mm	2.5-4.8	4.6-7.6	5.8-9.5	6.9-11.4	9.2-15.2	11.5-19.0	13.8-22.8	16.1-26.6	18.4-30.4	20.7-34.2	23.0-38.0	28.8-47.5			
N	1	1,25 x D1	500	600	1600	fz	0.017	0.033	0.041	0.050	0.066	0.082	0.099	0.115	0.132	0.148	0.165	0.206
	2	1,25 x D1	500	600	1200	fz	0.015	0.030	0.036	0.045	0.059	0.074	0.089	0.104	0.119	0.134	0.148	0.185
	3	1,25 x D1	500	600	1200	fz	0.012	0.023	0.029	0.035	0.046	0.058	0.069	0.080	0.092	0.104	0.115	0.144
	4	1,25 x D1	400	450	600	fz	0.012	0.023	0.029	0.035	0.046	0.058	0.069	0.080	0.092	0.104	0.115	0.144
	5	1,25 x D1	250	400	800	fz	0.015	0.030	0.038	0.045	0.059	0.074	0.089	0.104	0.119	0.134	0.148	0.185

Material Group	Max Depth	Helical Interpolation / Ramping 30° - 45°			 													
		UNCOATED			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping													
		Cutting Speed – Vc m/min			Diameter – D1 [Ømin–Ømax]													
		min	Start	max	mm	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
			mm	2.5-4.8	4.6-7.6	5.8-9.5	6.9-11.4	9.2-15.2	11.5-19.0	13.8-22.8	16.1-26.6	18.4-30.4	20.7-34.2	23.0-38.0	28.8-47.5			
N	1	1,25 x D1	420	500	800	fz	0.013	0.026	0.033	0.040	0.053	0.066	0.079	0.092	0.106	0.119	0.132	0.165
	2	1,25 x D1	420	500	800	fz	0.012	0.024	0.029	0.036	0.048	0.059	0.071	0.083	0.095	0.107	0.119	0.148
	3	1,25 x D1	420	500	800	fz	0.009	0.018	0.023	0.028	0.037	0.046	0.055	0.064	0.074	0.083	0.092	0.115
	4	1,25 x D1	340	380	450	fz	0.009	0.018	0.023	0.028	0.037	0.046	0.055	0.064	0.074	0.083	0.092	0.115
	5	1,25 x D1	210	340	600	fz	0.012	0.024	0.030	0.036	0.048	0.059	0.071	0.083	0.095	0.107	0.119	0.148



ALUFLASH • RAMPING 3FL • APPLICATION DATA • INCH



		Helical Interpolation / Ramping 0° - 15°			UNCOATED													
		Cutting Speed – Vc m/min			Recommended feed per tooth (fz = IPT) for Helical Interpolation and Ramping – fz x 1													
					Diameter – D1 [Ømin-Ømax]													
Material Group	Max Depth	min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1	
					Decimals	.180-.180	.216-.297	.288-.356	.475-.475	.594-.594	.713-.713	.950-.950	1.047-1.047	1.188-1.188	1.346-1.346	1.425-1.425	1.900-1.900	
N	1	1.25 x D1	1500	1800	6000	IPT	.0009	.0017	.0022	.0026	.0035	.0043	.0052	.0060	.0069	.0078	.0087	.0108
	2	1.25 x D1	1500	1800	4500	IPT	.0008	.0016	.0019	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097
	3	1.25 x D1	1500	1800	4500	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076
	4	1.25 x D1	1200	1350	2250	IPT	.0006	.0012	.0015	.0018	.0024	.0030	.0036	.0042	.0048	.0054	.0061	.0076
	5	1.25 x D1	750	1200	3000	IPT	.0008	.0016	.0020	.0023	.0031	.0039	.0047	.0054	.0062	.0070	.0078	.0097



		Helical Interpolation / Ramping 15° - 30°			UNCOATED													
		Cutting Speed – Vc m/min			Recommended feed per tooth (fz = IPT) for Helical Interpolation and Ramping – fz x 1													
					Diameter – D1 [Ømin-Ømax]													
Material Group	Max Depth	min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1	
					Decimals	.180-.180	.216-.297	.288-.356	.475-.475	.594-.594	.713-.713	.950-.950	1.047-1.047	1.188-1.188	1.346-1.346	1.425-1.425	1.900-1.900	
N	1	1.25 x D1	1500	1800	4800	IPT	.0006	.0013	.0016	.0019	.0026	.0032	.0039	.0045	.0052	.0058	.0065	.0081
	2	1.25 x D1	1500	1800	3600	IPT	.0006	.0012	.0014	.0018	.0023	.0029	.0035	.0041	.0047	.0053	.0058	.0073
	3	1.25 x D1	1500	1800	3600	IPT	.0005	.0009	.0011	.0014	.0018	.0023	.0027	.0032	.0036	.0041	.0045	.0057
	4	1.25 x D1	1200	1350	1800	IPT	.0005	.0009	.0011	.0014	.0018	.0023	.0027	.0032	.0036	.0041	.0045	.0057
	5	1.25 x D1	750	1200	2400	IPT	.0006	.0012	.0015	.0018	.0023	.0029	.0035	.0041	.0047	.0053	.0058	.0073

		Helical Interpolation / Ramping 30° - 45°			UNCOATED													
		Cutting Speed – Vc m/min			Recommended feed per tooth (fz = IPT) for Helical Interpolation and Ramping – fz x 1													
					Diameter – D1 [Ømin-Ømax]													
Material Group	Max Depth	min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1	
					Decimals	.180-.180	.216-.297	.288-.356	.475-.475	.594-.594	.713-.713	.950-.950	1.047-1.047	1.188-1.188	1.346-1.346	1.425-1.425	1.900-1.900	
N	1	1.25 x D1	1260	1500	2400	IPT	.0005	.0010	.0013	.0016	.0021	.0026	.0031	.0036	.0042	.0047	.0052	.0065
	2	1.25 x D1	1260	1500	2400	IPT	.0005	.0009	.0011	.0014	.0019	.0023	.0028	.0033	.0037	.0042	.0047	.0058
	3	1.25 x D1	1260	1500	2400	IPT	.0004	.0007	.0009	.0011	.0015	.0018	.0022	.0025	.0029	.0033	.0036	.0045
	4	1.25 x D1	1020	1140	1350	IPT	.0004	.0007	.0009	.0011	.0015	.0018	.0022	.0025	.0029	.0033	.0036	.0045
	5	1.25 x D1	630	1020	1800	IPT	.0005	.0009	.0012	.0014	.0019	.0023	.0028	.0033	.0037	.0042	.0047	.0058

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		Helical Interpolation / Ramping 0° - 15°			UNCOATED													
					Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping – fz x 1													
		Cutting Speed – Vc m/min			Diameter – D1 [Ømin-Ømax]													
Material Group	Max Depth	min	Start	max	mm	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
					mm	2.5-4.8	4.6-7.6	5.8-9.5	6.9-11.4	9.2-15.2	11.5-19.0	13.8-22.8	16.1-26.6	18.4-30.4	20.7-34.2	23.0-38.0	28.8-47.5	
N	1	1,25 x D1	500	600	2000	fz	0.022	0.044	0.055	0.066	0.088	0.110	0.132	0.153	0.176	0.198	0.220	0.275
	2	1,25 x D1	500	600	1500	fz	0.020	0.040	0.048	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247
	3	1,25 x D1	500	600	1500	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192
	4	1,25 x D1	400	450	750	fz	0.015	0.031	0.038	0.046	0.062	0.077	0.092	0.107	0.123	0.138	0.154	0.192
	5	1,25 x D1	250	400	1000	fz	0.020	0.040	0.050	0.059	0.079	0.099	0.119	0.138	0.158	0.178	0.198	0.247

																		
		Helical Interpolation / Ramping 15° - 30°			UNCOATED													
					Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping – fz x 1													
		Cutting Speed – Vc m/min			Diameter – D1 [Ømin-Ømax]													
Material Group	Max Depth	min	Start	max	mm	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
					mm	2.5-4.8	4.6-7.6	5.8-9.5	6.9-11.4	9.2-15.2	11.5-19.0	13.8-22.8	16.1-26.6	18.4-30.4	20.7-34.2	23.0-38.0	28.8-47.5	
N	1	1,25 x D1	500	600	1600	fz	0.017	0.033	0.041	0.050	0.066	0.082	0.099	0.115	0.132	0.148	0.165	0.206
	2	1,25 x D1	500	600	1200	fz	0.015	0.030	0.036	0.045	0.059	0.074	0.089	0.104	0.119	0.134	0.148	0.185
	3	1,25 x D1	500	600	1200	fz	0.012	0.023	0.029	0.035	0.046	0.058	0.069	0.080	0.092	0.104	0.115	0.144
	4	1,25 x D1	400	450	600	fz	0.012	0.023	0.029	0.035	0.046	0.058	0.069	0.080	0.092	0.104	0.115	0.144
	5	1,25 x D1	250	400	800	fz	0.015	0.030	0.038	0.045	0.059	0.074	0.089	0.104	0.119	0.134	0.148	0.185

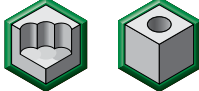

																		
		Helical Interpolation / Ramping 30° - 45°			UNCOATED													
					Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping – fz x 1													
		Cutting Speed – Vc m/min			Diameter – D1 [Ømin-Ømax]													
Material Group	Max Depth	min	Start	max	mm	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
					mm	2.5-4.8	4.6-7.6	5.8-9.5	6.9-11.4	9.2-15.2	11.5-19.0	13.8-22.8	16.1-26.6	18.4-30.4	20.7-34.2	23.0-38.0	28.8-47.5	
N	1	1,25 x D1	420	500	800	fz	0.013	0.026	0.033	0.040	0.053	0.066	0.079	0.092	0.106	0.119	0.132	0.165
	2	1,25 x D1	420	500	800	fz	0.012	0.024	0.029	0.036	0.048	0.059	0.071	0.083	0.095	0.107	0.119	0.148
	3	1,25 x D1	420	500	800	fz	0.009	0.018	0.023	0.028	0.037	0.046	0.055	0.064	0.074	0.083	0.092	0.115
	4	1,25 x D1	340	380	450	fz	0.009	0.018	0.023	0.028	0.037	0.046	0.055	0.064	0.074	0.083	0.092	0.115
	5	1,25 x D1	210	340	600	fz	0.012	0.024	0.030	0.036	0.048	0.059	0.071	0.083	0.095	0.107	0.119	0.148

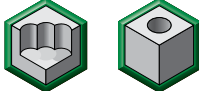

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Plunging/Drilling				UNCOATED			Recommended feed per revolution (fn =IPR) for Plunging 2 flute end mills													
				Cutting Speed – Vc SFM			D1 – Diameter													
Material Group	Max Depth	Applicable	Coolant	min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1	
N	1	1.5 x D	●	Required	360	780	1200	IPR	.0031	.0047	.0053	.0059	.0063	.0079	.0087	.0093	.0098	.0104	.0110	.0118
	2	1.5 x D	●	Required	360	750	840	IPR	.0031	.0047	.0053	.0059	.0063	.0079	.0087	.0093	.0098	.0104	.0110	.0118
	3	1.5 x D	●	Required	300	600	780	IPR	.0031	.0047	.0053	.0059	.0063	.0079	.0087	.0093	.0098	.0104	.0110	.0118
	4	1 x D	●	Required	180	450	780	IPR	.0024	.0031	.0039	.0047	.0055	.0063	.0079	.0083	.0087	.0093	.0098	.0110
	5	1.5 x D	●	Required	180	600	1200	IPR	.0031	.0047	.0053	.0059	.0063	.0079	.0087	.0093	.0098	.0104	.0110	.0118

																				
Plunging/Drilling				UNCOATED			Recommended feed per revolution (fn =IPR) for Plunging 3 flute end mills													
				Cutting Speed – Vc SFM			D1 – Diameter													
Material Group	Max Depth	Applicable	Coolant	min	Start	max	Fraction	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	23/32	3/4	1	
N	1	1.5 x D	●	Required	360	780	1200	IPR	.0022	.0033	.0037	.0041	.0044	.0055	.0061	.0065	.0069	.0073	.0077	.0083
	2	1.5 x D	●	Required	360	750	840	IPR	.0022	.0033	.0037	.0041	.0044	.0055	.0061	.0065	.0069	.0073	.0077	.0083
	3	1.5 x D	●	Required	300	600	780	IPR	.0022	.0033	.0037	.0041	.0044	.0055	.0061	.0065	.0069	.0073	.0077	.0083
	4	1 x D	●	Required	180	450	780	IPR	.0017	.0022	.0028	.0033	.0039	.0044	.0055	.0058	.0061	.0065	.0069	.0077
	5	1.5 x D	●	Required	180	600	1200	IPR	.0022	.0033	.0037	.0041	.0044	.0055	.0061	.0065	.0069	.0073	.0077	.0083

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																				Plunging/Drilling
Material Group				Cutting Speed – Vc m/min				D1 – Diameter												
				Max Depth	Applicable	Coolant	min	Start	max	mm	2.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0
N	1	1,5 x D	●	Required	120	260	400	fn	0.080	0.120	0.135	0.150	0.160	0.200	0.220	0.235	0.250	0.265	0.280	0.300
	2	1,5 x D	●	Required	120	250	280	fn	0.080	0.120	0.135	0.150	0.160	0.200	0.220	0.235	0.250	0.265	0.280	0.300
	3	1,5 x D	●	Required	100	200	260	fn	0.080	0.120	0.135	0.150	0.160	0.200	0.220	0.235	0.250	0.265	0.280	0.300
	4	1 x D	●	Required	60	150	260	fn	0.060	0.080	0.100	0.120	0.140	0.160	0.200	0.210	0.220	0.235	0.250	0.280
	5	1,5 x D	●	Required	60	200	400	fn	0.080	0.120	0.135	0.150	0.160	0.200	0.220	0.235	0.250	0.265	0.280	0.300

																				
																				Plunging/Drilling
Material Group				Cutting Speed – Vc m/min				D1 – Diameter												
				Max Depth	Applicable	Coolant	min	Start	max	mm	2.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0
N	1	1,5 x D	●	Required	120	260	400	fn	0.056	0.084	0.095	0.105	0.112	0.140	0.154	0.165	0.175	0.186	0.196	0.210
	2	1,5 x D	●	Required	120	250	280	fn	0.056	0.084	0.095	0.105	0.112	0.140	0.154	0.165	0.175	0.186	0.196	0.210
	3	1,5 x D	●	Required	100	200	260	fn	0.056	0.084	0.095	0.105	0.112	0.140	0.154	0.165	0.175	0.186	0.196	0.210
	4	1 x D	●	Required	60	150	260	fn	0.042	0.056	0.070	0.084	0.098	0.112	0.140	0.147	0.154	0.165	0.175	0.196
	5	1,5 x D	●	Required	60	200	400	fn	0.056	0.084	0.095	0.105	0.112	0.140	0.154	0.165	0.175	0.186	0.196	0.210