

NEW LINE!

**HI-ROC FINISHER
HIGH PERFORMANCE
END MILLS**

Pricing current as of January 1, 2006

**No. 0601H
SUPPLEMENT TO
CATALOG 2003-04**

ARR TOOL
CO.



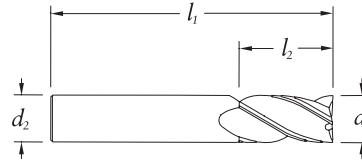
Series 545MA Square End - X.CEED Coated

TOLERANCES

Flute Diameter: $+0.000 - 0.002"$ ($+0.000 - 0.050\text{mm}$)
Shank Diameter: $-0.0001 - 0.0004"$ ($-0.0025 - 0.0100\text{mm}$)

High performance solid carbide end mill for use in high Rockwell materials

Recommended to run in hardened die mold, inconel, and tool steels (A2, D2) above 45Rc



EDP#	Decimal Equiv.	d_1 Flute Diameter †	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	Number Flutes	1-11	12-25	26-49	50-100
21200	.1181	3mm	3mm	38mm	12mm	4	11.97	11.45	10.93	10.41
21230	.1250	1/8 (3.17mm)	1/8	1-1/2	1/2	4	11.37	10.88	10.38	9.89
21260	.1575	4mm	6mm	50mm	12mm	4	19.34	18.50	17.66	16.82
21290	.1875	3/16 (4.76mm)	3/16	2	9/16	4	14.29	13.67	13.05	12.43
21320	.1969	5mm	6mm	65mm	15mm	4	21.28	20.26	19.34	18.42
21350	.2362	6mm	6mm	65mm	19mm	4	20.54	19.65	18.75	17.86
21380	.2500	1/4 (6.35mm)	1/4	2-1/2	3/4	4	19.79	18.93	18.07	17.21
21410	.2756	7mm	8mm	65mm	22mm	5	31.02	29.67	28.32	26.97
21440	.3125	5/16 (7.94mm)	5/16	2-1/2	13/16	5	26.88	25.71	24.54	23.37
21470	.3150	8mm	8mm	65mm	22mm	5	28.26	27.03	25.80	24.57
21500	.3543	9mm	10mm	65mm	22mm	5	41.50	39.70	37.89	36.09
21530	.3750	3/8 (9.52mm)	3/8	2-1/2	7/8	5	31.15	29.80	28.44	27.09
21560	.3937	10mm	10mm	70mm	22mm	5	37.59	35.96	34.32	32.69
21620	.4724	12mm	12mm	75mm	32mm	5	55.12	52.72	50.33	47.93
21660	.5000	1/2 (12.70mm)	1/2	3	1-1/4	5	52.42	50.14	47.86	45.58
21710	.6250	5/8 (15.87mm)	5/8	3-1/2	1-1/4	5	83.23	79.61	75.99	72.37
21740	.6299	16mm	16mm	88mm	32mm	5	87.54	83.73	79.93	76.12

Pricing current as of January 1, 2006

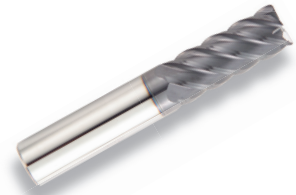
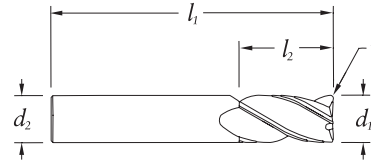
Series 545RA Corner Radius - X.CEED Coated

TOLERANCES

Flute Diameter: +.000 - .002" (+0.000 - 0.050mm)
Shank Diameter: -.0001 - .0004" (-0.0025 - 0.0100mm)
Corner Radius: +.001 - .001" (+0.025 - 0.025mm)

High performance solid carbide end mill for use in high Rockwell materials

Recommended to run in hardened die mold, inconel, and tool steels (A2, D2) above 45Rc



EDP#	Decimal Equivalent	d1 Flute Diameter +	d2 Shank Diameter	l1 Overall Length	l2 Flute Length	r Corner Radius	Number Flutes	1-11	12-25	26-49	50-100
21202	.1181	3mm	3mm	38mm	12mm	0.2mm	4	13.08	12.51	11.94	11.37
21232	.1250	1/8 (3.17mm)	1/8	1-1/2	1/2	.010	4	12.42	11.88	11.34	10.80
21262	.1575	4mm	6mm	50mm	12mm	0.3mm	4	21.07	20.15	19.24	18.32
21292	.1875	3/16 (4.76mm)	3/16	2	9/16	.010	4	15.61	14.93	14.25	13.57
21322	.1969	5mm	6mm	65mm	15mm	0.3mm	4	22.98	21.98	20.98	19.98
21352	.2362	6mm	6mm	65mm	19mm	0.5mm	4	22.26	21.29	20.32	19.36
21382	.2500	1/4 (6.35mm)	1/4	2-1/2	3/4	.015	4	21.44	20.51	19.58	18.64
21412	.2756	7mm	8mm	65mm	22mm	0.5mm	5	33.64	32.18	30.71	29.25
21442	.3125	5/16 (7.94mm)	5/16	2-1/2	13/16	.015	5	29.04	27.78	26.51	25.25
21472	.3150	8mm	8mm	65mm	22mm	0.5mm	5	30.57	29.24	27.91	26.58
21502	.3543	9mm	10mm	65mm	22mm	0.5mm	5	45.17	43.21	41.24	39.28
21532	.3750	3/8 (9.52mm)	3/8	2-1/2	7/8	.015	5	33.79	32.32	30.85	29.38
21562	.3937	10mm	10mm	70mm	22mm	0.5mm	5	40.83	39.05	37.28	35.50
21622	.4724	12mm	12mm	75mm	32mm	1.0mm	5	60.31	57.69	55.07	52.44
21662	.5000	1/2 (12.70mm)	1/2	3	1-1/4	.030	5	57.29	54.80	52.31	49.82
21712	.6250	5/8 (15.87mm)	5/8	3-1/2	1-1/4	.030	5	91.11	87.15	83.19	79.23
21742	.6299	16mm	16mm	88mm	32mm	1.0mm	5	95.91	91.74	87.57	83.40

Pricing current as of January 1, 2006

989-463-6171

800-248-9003

fax 989-463-3609

Series 545BA

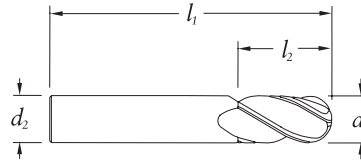
Ball End - X.CEED Coated

TOLERANCES

Flute Diameter: +.000 - .002" (+0.000 - 0.050mm)
 Shank Diameter: -.0001 - .0004" (-0.0025 - 0.0100mm)
 Ball Radius: +.000 - .001" (+0.000 - 0.025mm)

High performance solid carbide end mill for use in high Rockwell materials

Recommended to run in hardened die mold, inconel, and tool steels (A2, D2) above 45Rc



EDP#	Decimal Equivalent	d_1 Flute Diameter †	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	Number Flutes	1-11	12-25	26-49	50-100
21204	.1181	3mm	3mm	38mm	12mm	4	13.08	12.51	11.94	11.37
21234	.1250	1/8 (3.17mm)	1/8	1-1/2	1/2	4	12.42	11.88	11.34	10.80
21264	.1575	4mm	6mm	50mm	12mm	4	21.07	20.15	19.24	18.32
21294	.1875	3/16 (4.76mm)	3/16	2	9/16	4	15.61	14.93	14.25	13.57
21324	.1969	5mm	6mm	65mm	15mm	4	22.98	21.98	20.98	19.98
21354	.2362	6mm	6mm	65mm	19mm	4	22.26	21.29	20.32	19.36
21384	.2500	1/4 (6.35mm)	1/4	2-1/2	3/4	4	21.44	20.51	19.58	18.64
21414	.2756	7mm	8mm	65mm	22mm	5	33.64	32.18	30.71	29.25
21444	.3125	5/16 (7.94mm)	5/16	2-1/2	13/16	5	29.04	27.78	26.51	25.25
21474	.3150	8mm	8mm	65mm	22mm	5	30.57	29.24	27.91	26.58
21504	.3543	9mm	10mm	65mm	22mm	5	45.17	43.21	41.24	39.28
21534	.3750	3/8 (9.52mm)	3/8	2-1/2	7/8	5	33.79	32.32	30.85	29.38
21564	.3937	10mm	10mm	70mm	22mm	5	40.83	39.05	37.28	35.50
21624	.4724	12mm	12mm	75mm	32mm	5	60.31	57.69	55.07	52.44
21664	.5000	1/2 (12.70mm)	1/2	3	1-1/4	5	57.29	54.80	52.31	49.82
21714	.6250	5/8 (15.87mm)	5/8	3-1/2	1-1/4	5	91.11	87.15	83.19	79.23
21744	.6299	16mm	16mm	88mm	32mm	5	95.91	91.74	87.57	83.40

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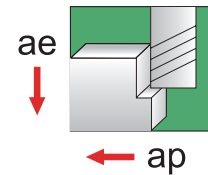
GARR TOOL Hi-Roc Finisher Milling Guide for Hardened Steel

Metric - Chipload per Tooth (Fz)

DIAMETER	35 - 45 HRC	45 - 55 HRC	55 - 63 HRC
3	0.013	0.008	0.008
4	0.020	0.013	0.013
6	0.032	0.020	0.020
8	0.038	0.024	0.024
10	0.045	0.032	0.032
12	0.065	0.038	0.038
16	0.075	0.045	0.045
20	0.089	0.050	0.050

HRC	SMM	
	SLOTING (Vc)	PROFILING (Vc)
35 - 45	70	90
45 - 55	40	45
55 - 63	20	24

	SLOTING	PROFILING
Axial (ae)	.5xD	1xD
Radial (ap)	1xD	.3xD

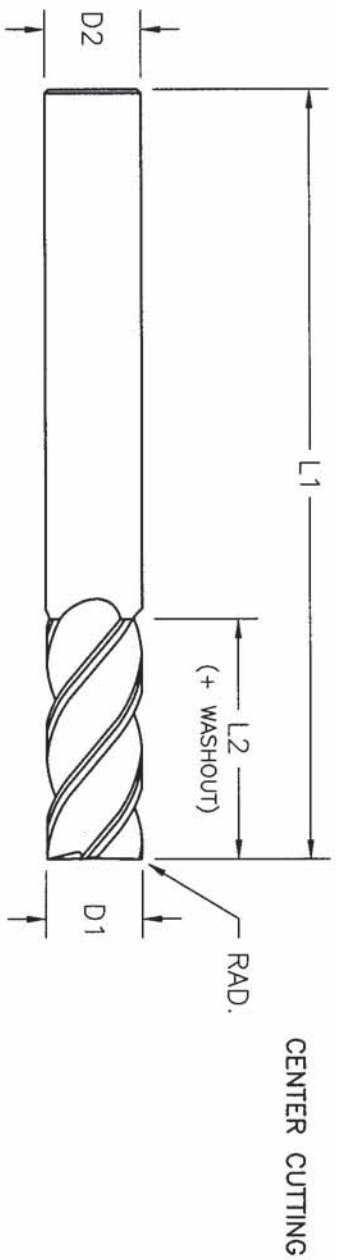


Imperial - Chipload per Tooth (Fz)

DIAMETER	35 - 45 HRC	45 - 55 HRC	56 - 63 HRC
1/8"	.0005"	.0003"	.0003"
3/16"	.0008"	.0005"	.0005"
1/4"	.0013"	.0008"	.0008"
3/8"	.0018"	.0013"	.0013"
1/2"	.0025"	.0015"	.0015"
5/8"	.0030"	.0018"	.0018"
3/4"	.0035"	.0020"	.0020"

HRC	SFM	
	SLOTING (Vc)	PROFILING (Vc)
35 - 45	225	300
45 - 55	125	150
55 - 63	65	75

NOTE - ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.



D1: _____ TOL: $\frac{+0}{-0.002}$ [$\frac{+0.000}{-0.050}$]

D2: _____ TOL: $\frac{-0.0001}{-0.0004}$ [$\frac{-0.0025}{-0.0100}$]

L1: _____

L2: _____

RAD: _____ TOL: _____

* NO. FLUTES: _____

SPIRAL (RH/LH/STR): _____ RH _____

HELIX ANGLE: _____ 45° _____

CUT (RH/LH): _____ RH _____

SINGLE END/DOUBLE END: _____ S/E _____

COATING: _____ X.CEED _____

MAT'L BEING CUT: _____ HARDENED DIE MOLD _____

* NUMBER OF FLUTES:
 .125"-.250" [3.175-6.350mm]: 4 FLUTES
 LARGER THAN .250" [6.350mm]: CAN BE 5 FLUTES

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

REVISIONS

GARR TOOL

ALMA, MICHIGAN

SCALE: _____ DRAWN BY: _____

APPR. BY: _____

DATE: _____

DATE: _____

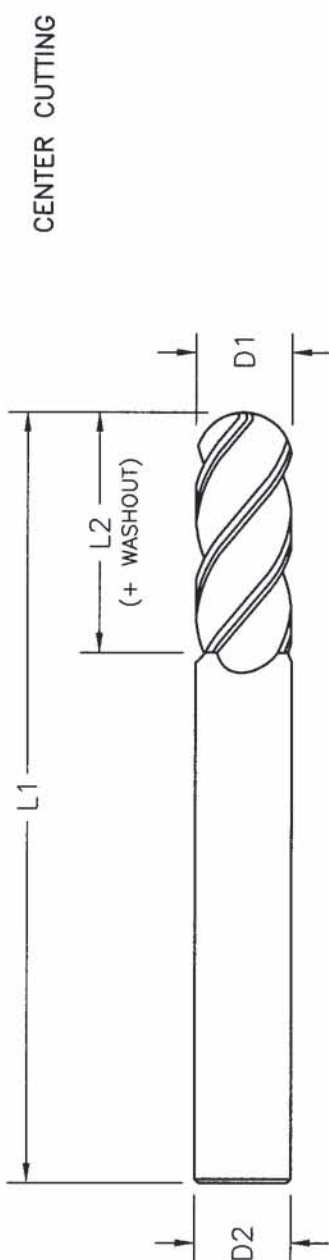
TITLE: _____

HIGH Rc FINISHER

CUSTOMER: _____

DWG NO.: _____

SERIES 545



D1: _____ TOL: $\begin{matrix} +0 \\ -0.002 \end{matrix}$ [$\begin{matrix} +0.000 \\ -0.050 \end{matrix}$]
 D2: _____ TOL: $\begin{matrix} -0.0001 \\ -0.0004 \end{matrix}$ [$\begin{matrix} -0.0025 \\ -0.0100 \end{matrix}$]
 L1: _____
 L2: _____

* NUMBER OF FLUTES: _____
 .125" - .250" [3.175 - 6.350mm]: 4 FLUTES
 LARGER THAN .250" [6.350mm]: CAN BE 5 FLUTES

* NO. FLUTES: _____
 SPIRAL (RH/LH/STR): _____ RH _____
 HELIX ANGLE: _____ 45° _____
 CUT (RH/LH): _____ RH _____
 SINGLE END/DOUBLE END: _____ S/E _____
 COATING: _____ X.CEED _____
 MAT'L BEING CUT: _____ HARDENED DIE MOLD _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL
 ALMA, MICHIGAN

SCALE: _____	DRAWN BY: _____	APPR. BY: _____
DATE: _____	DATE: _____	
TITLE: BALL END HIGH Rc FINISHER		
CUSTOMER: _____	DWG NO.: _____	SERIES 545

REVISIONS

The background is a complex, abstract composition of overlapping geometric shapes and glowing elements. A large, bright yellow and orange circular glow is the central focus, surrounded by smaller, semi-transparent circles and lines. The overall color palette is dominated by deep reds, oranges, and purples, with a dark, almost black, background. The shapes are sharp and angular, creating a sense of depth and movement.

GARR TOOL®

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