

POW•R•FEED[®]

When Is a Rougher Not a Rougher?

The POW•R•FEED is designed to achieve a high metal removal rate – the job for a rougher. The unique combination of design, substrate and coating also allows the POW•R•FEED to yield excellent finishes, potentially saving polishing time on parts with critical surface finish requirements.

POW·R·FEED[®] M90

Results: Smooth, silent machining at high feed rates, excellent surface finishes and significant savings achieved by extended tool life.



With 20% greater hot hardness than conventional TiAlN coating, POW·R·FEED end mills last longer in high heat environments.

Ideal for heavy interrupted cuts and when machining stainless steel, titanium and other metals that generate high temperatures.

Durability

Unique design reduces chatter and enhances tool life. Its advanced multi-layer coating provides maximum heat protection for the carbide core at higher feed rates. With multiple coating layers, thermal cracks travel only down the affected layer, preserving the integrity of the carbide substrate.

Productivity

POW·R·FEED runs at higher feed rates, even on deeper cuts, reducing cycle time and boosting productivity.

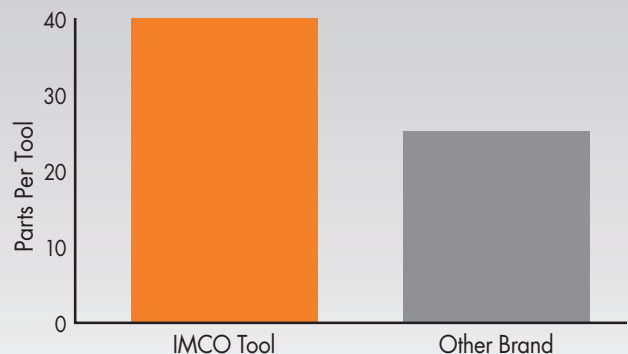
Versatility

One tool for slotting, pocketing, roughing and finishing in a wide range of materials:

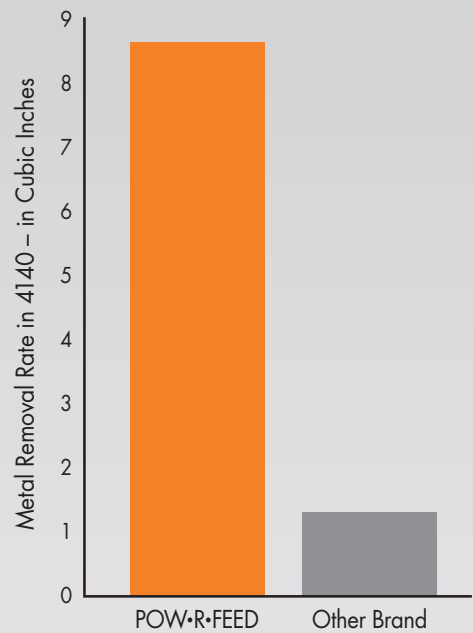
- Stainless steels
- Cast iron
- High-temp alloys
- Inconel[®]
- Titanium
- Carbon steels

More Parts per Tool

Never underestimate the power of the coating. Tested in 6AL-4V titanium against a tool with a different coating, the POW·R·FEED M90 tool lasted 60% longer, simply due to the advanced AlTiNX coating. That translates into a 60% parts per tool increase and takes a big bite out of the customer's ongoing tool costs.



Higher Metal Removal Rates



Another customer achieved a feed rate more than five times higher with the 4-flute POW-R-FEED M90 than with a similar competitor's tool, as tested in the customer's operation in 1020 hot roll steel. POW-R-FEED M90 not only ran smoothly at a higher speed, it also devoured 450% more material, effectively eating the former tool for lunch.

POW•R•FEED M90 END MILLS

For high performance milling in a broad range of materials

4 Variable Flutes For maximum feed rates

M904



M904 • Radius



M904 • Square

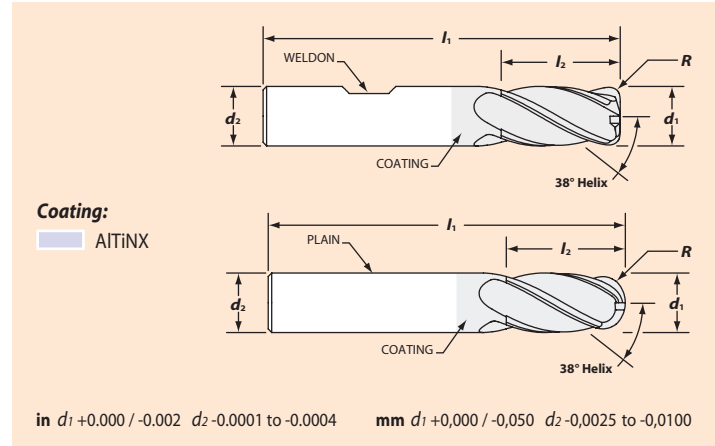


M904B • Ball

- Chatter free machining with excellent surface finishes
- High strength edge
- Easy to sharpen
- Advanced **AlTiNX** coating

	Carbon & tool steels ≤ 48 HRC	✓✓✓
	Carbon & tool steels > 48 HRC	✓
	Stainless steels	✓✓✓
	Super alloys, Inconel® & titanium	✓✓✓
	Cast irons	✓✓✓

✓ Good ✓✓ Very Good ✓✓✓ Excellent



Inch

d_1 Cutter Dia	d_2 Shank Dia	I_2 Length of Cut	I_1 Overall Length	R Corner Radius	Shank Style	Style Code	AlTiNX EDP Number	List Price
1/8	1/8	1/4	1-1/2	.015	Plain	SR	63248	15.02
		1/4	2-1/4	.015	Plain	SL	63259	20.63
		1/2	1-1/2	Square	Plain	RR	63010	15.59
		1/2	1-1/2	.015	Plain	RR	63064	16.22
		1/2	1-1/2	Ball	Plain	RR	63139	18.53
5/32	3/16	9/16	2	Square	Plain	RR	63011	23.57
		9/16	2	.015	Plain	RR	63118	24.31
		9/16	2	Ball	Plain	RR	63140	28.19
3/16	3/16	5/16	2	.015	Plain	SR	63249	22.73
		5/16	2-1/2	.015	Plain	SL	63260	29.98
		5/8	2	Square	Plain	RR	63012	22.00
		5/8	2	.015	Plain	RR	63065	22.73
		5/8	2	Ball	Plain	RR	63142	25.52
7/32	1/4	5/8	2-1/2	Square	Plain	RR	63013	28.77
		5/8	2-1/2	.020	Plain	RR	63119	30.24
		5/8	2-1/2	Ball	Plain	RR	63143	32.60
1/4	1/4	3/8	2	Square	Plain	SS	63003	24.41
		3/8	2	.020	Plain	SS	63058	25.52
		3/8	2-1/2	.020	Plain	SR	63250	26.78
		3/8	3	.020	Plain	SL	63261	30.92
		3/8	4	.020	Plain	SX	63272	36.70
		3/4	2-1/2	Square	Plain	RR	63014	26.41
		3/4	2-1/2	.020	Plain	RR	63066	27.88
		3/4	2-1/2	.030	Plain	RR	63466	27.88
		3/4	2-1/2	Ball	Plain	RR	63144	30.03
		1-1/8	3	.020	Plain	LL	63420	33.02
		1-1/2	4	.020	Plain	XX	63425	39.16
5/16	5/16	13/16	2-1/2	Square	Plain	RR	63016	36.64
		13/16	2-1/2	.020	Plain	RR	63067	38.48
		13/16	2-1/2	Ball	Plain	RR	63146	41.37
3/8	3/8	1/2	2	Square	Plain	SS	63004	40.22
		1/2	2	.020	Plain	SS	63059	42.26
		1/2	2-1/2	.020	Plain	SR	63252	44.15
		1/2	3	.020	Plain	SL	63263	48.82
		1/2	4	.020	Plain	SX	63274	58.64
		1/2	6	.020	Plain	SE	63281	75.18

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POW•FEED M90 END MILLS

For high performance milling in a broad range of materials

Inch • Continued

d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AITINX EDP Number	List Price		
3/8	3/8	7/8	2-1/2	Square	Plain	RR	63018	42.79		
		7/8	2-1/2	Square	Weldon	RR	63043	44.68		
		7/8	2-1/2	.020	Plain	RR	63068	45.83		
		7/8	2-1/2	.020	Weldon	RR	63083	47.72		
		7/8	2-1/2	.030	Plain	RR	63390	45.83		
		7/8	2-1/2	.030	Weldon	RR	63400	47.72		
		7/8	2-1/2	Ball	Plain	RR	63148	48.56		
		7/8	2-1/2	Ball	Weldon	RR	63176	50.45		
		1-1/8	3	.020	Plain	LL	63421	54.81		
		1-3/4	4	.020	Plain	XX	63426	66.99		
7/16	7/16	1	2-3/4	Square	Plain	RR	63020	57.22		
		1	2-3/4	Square	Weldon	RR	63044	59.17		
		1	2-3/4	.020	Plain	RR	63069	59.96		
		1	2-3/4	.020	Weldon	RR	63084	61.90		
		1	2-3/4	Ball	Plain	RR	63150	61.69		
		1	2-3/4	Ball	Weldon	RR	63178	63.63		
		5/8	2-1/2	Square	Plain	SS	63005	65.73		
5/8	2-1/2	.030	Plain	SS	63060	67.88				
5/8	3	.030	Plain	SR	63254	68.41				
5/8	4	.030	Plain	SL	63265	87.26				
5/8	5	.030	Plain	SX	63276	104.90				
5/8	6	.030	Plain	SX	63283	116.18				
1/2	1/2	1	3	Square	Plain	RR	63022	69.04		
		1	3	Square	Weldon	RR	63045	71.03		
		1	3	.030	Plain	RR	63070	72.24		
		1	3	.030	Weldon	RR	63085	74.24		
		1	3	Ball	Plain	RR	63152	83.58		
		1	3	Ball	Weldon	RR	63180	85.58		
		1-1/4	3	Square	Plain	RR	63100	69.51		
		1-1/4	3	Square	Weldon	RR	63101	71.50		
		1-1/4	3	.015	Plain	RR	63467	72.71		
		1-1/4	3	.015	Weldon	RR	63473	74.71		
		1-1/4	3	.030	Plain	RR	63098	72.71		
		1-1/4	3	.030	Weldon	RR	63099	74.71		
		1-1/4	3	.060	Plain	RR	63391	72.71		
		1-1/4	3	.060	Weldon	RR	63401	74.71		
		1-1/4	3	.090	Plain	RR	63392	72.71		
		1-1/4	3	.090	Weldon	RR	63402	74.71		
		1-1/4	3	.125	Plain	RR	63393	72.71		
		1-1/4	3	.125	Weldon	RR	63403	74.71		
		1-1/4	3	Ball	Plain	RR	63153	84.05		
		1-1/4	3	Ball	Weldon	RR	63181	86.05		
		2	4	.030	Plain	LL	63422	92.98		
		2-1/2	5	.030	Plain	LX	63427	112.88		
		3	6	.030	Plain	XX	63430	125.32		
		5/8	5/8	3/4	3	Square	Plain	SS	63006	124.27
				3/4	3	.030	Plain	SS	63061	130.94
				3/4	3-1/2	.030	Plain	SR	63255	134.45
				3/4	5	.030	Plain	SL	63266	161.65
				3/4	6	.030	Plain	SX	63277	176.40

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Inch • Continued

d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AITINX EDP Number	List Price		
5/8	5/8	1-1/4	3-1/2	Square	Plain	RR	63024	133.51		
		1-1/4	3-1/2	Square	Weldon	RR	63046	135.87		
		1-1/4	3-1/2	.015	Plain	RR	63468	140.60		
		1-1/4	3-1/2	.015	Weldon	RR	63474	142.96		
		1-1/4	3-1/2	.030	Plain	RR	63071	140.60		
		1-1/4	3-1/2	.030	Weldon	RR	63086	142.96		
		1-1/4	3-1/2	.060	Plain	RR	63394	140.60		
		1-1/4	3-1/2	.060	Weldon	RR	63404	142.96		
		1-1/4	3-1/2	Ball	Plain	RR	63155	148.63		
		1-1/4	3-1/2	Ball	Weldon	RR	63183	150.99		
		7/8	3	Square	Plain	SS	63007	181.81		
		7/8	3	.030	Plain	SS	63062	191.10		
3/4	3/4	1	4	.030	Plain	SR	63256	207.58		
		1	5	.030	Plain	SL	63267	233.42		
		1	6	.030	Plain	SX	63278	255.26		
		1	7	.030	Plain	SE	63285	290.32		
		1-1/2	4	Square	Plain	RR	63025	194.25		
		1-1/2	4	Square	Weldon	RR	63047	197.35		
		1-1/2	4	.015	Plain	RR	63469	203.70		
		1-1/2	4	.015	Weldon	RR	63475	206.80		
		1-1/2	4	.030	Plain	RR	63072	203.70		
		1-1/2	4	.030	Weldon	RR	63087	206.80		
		1-1/2	4	.060	Plain	RR	63395	203.70		
		1-1/2	4	.060	Weldon	RR	63405	206.80		
		1-1/2	4	.090	Plain	RR	63396	203.70		
		1-1/2	4	.090	Weldon	RR	63406	206.80		
		1-1/2	4	.125	Plain	RR	63397	203.70		
		1-1/2	4	.125	Weldon	RR	63407	206.80		
		1-1/2	4	Ball	Plain	RR	63156	212.31		
		1-1/2	4	Ball	Weldon	RR	63184	215.41		
		2-1/4	5	.030	Plain	LL	63423	244.65		
		3	6	.030	Plain	XX	63428	274.00		
		4	7	.030	Plain	EE	63431	324.08		
		1	1	1-1/8	4	.030	Plain	SR	63257	310.38
				1-1/4	5	.030	Plain	SL	63268	347.02
				1-1/4	6	.030	Plain	SX	63279	374.80
1-1/4	7			.030	Plain	SE	63286	425.93		
1-1/2	4			Square	Plain	RR	63026	304.50		
1-1/2	4			Square	Weldon	RR	63048	308.12		
1-1/2	4			.030	Plain	RR	63073	309.44		
1-1/2	4			.030	Weldon	RR	63088	313.06		
1-1/2	4			.060	Plain	RR	63398	309.44		
1-1/2	4			.060	Weldon	RR	63408	313.06		
1-1/2	4			Ball	Plain	RR	63158	347.08		
1-1/2	4			Ball	Weldon	RR	63186	350.70		
3	6			.030	Plain	XX	63429	401.89		
4-1/8	7			.030	Plain	EE	63432	460.90		

Style Code Reference

EE—Extreme LOC, Extreme OAL
RR—Regular LOC, Regular OAL
SR—Short LOC, Regular OAL
XX—X-Long LOC, X-Long OAL

LL—Long LOC, Long OAL
SE—Short LOC, Extreme OAL
SS—Short LOC, Short OAL

LX—Long LOC, X-Long OAL
SL—Short LOC, Long OAL
SX—Short LOC, X-Long OAL

POW•FEED M90 END MILLS

For high performance milling in a broad range of materials

Metric

d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AITINX EDP Number	List Price
3	3	8	38	Square	Plain	RR	63027	15.59
		8	38	0,3	Plain	RR	63102	16.22
		8	38	Ball	Plain	RR	63160	18.53
4	4	11	50	Square	Plain	RR	63028	17.38
		11	50	0,3	Plain	RR	63103	17.96
		11	50	Ball	Plain	RR	63161	22.36
5	5	13	50	Square	Plain	RR	63029	24.41
		13	50	0,3	Plain	RR	63104	25.20
		13	50	Ball	Plain	RR	63162	30.19
6	6	10	54	Square	Plain	SS	63123	24.41
		10	54	0,3	Plain	SS	63108	25.52
		13	57	Square	Plain	RR	63030	26.41
		13	57	0,3	Plain	RR	63074	27.88
		13	57	0,5	Plain	RR	63434	27.88
		13	57	Ball	Plain	RR	63163	30.66
		28	75	0,5	Plain	LL	63455	32.39
		28	75	Ball	Plain	RR	63165	44.89
8	8	12	58	Square	Plain	SS	63124	34.70
		12	58	0,5	Plain	SS	63109	36.54
		19	63	Square	Plain	RR	63032	36.64
		19	63	0,3	Plain	RR	63435	38.48
		19	63	0,5	Plain	RR	63075	38.48
		19	63	Ball	Plain	RR	63165	44.89
		29	75	0,5	Plain	LL	63456	45.00
		29	75	Ball	Plain	RR	63167	45.00
10	10	14	66	Square	Plain	SS	63125	48.91
		14	66	0,5	Plain	SS	63110	51.96
		22	72	Square	Plain	RR	63034	53.27
		22	72	0,3	Plain	RR	63436	56.32
		22	72	0,5	Plain	RR	63076	56.32
		22	72	Ball	Plain	RR	63167	63.10
		36	88	0,5	Plain	LL	63457	66.04

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Metric • Continued

d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AITINX EDP Number	List Price
12	12	16	73	Square	Plain	SS	63126	63.10
		16	73	1,0	Plain	SS	63111	65.15
		26	83	Square	Plain	RR	63036	74.39
		26	83	0,5	Plain	RR	63437	78.44
		26	83	0,75	Plain	RR	63438	78.44
		26	83	1,0	Plain	RR	63077	78.44
		26	83	Ball	Plain	RR	63169	90.04
		45	100	0,75	Plain	LL	63458	89.98
		45	100	Ball	Plain	RR	63170	90.04
16	16	22	82	Square	Plain	SS	63128	133.25
		22	82	1,0	Plain	SS	63113	140.75
		32	92	Square	Plain	RR	63038	146.96
		32	92	0,75	Plain	RR	63439	154.46
		32	92	1,0	Plain	RR	63079	154.46
		32	92	Ball	Plain	RR	63171	180.76
		56	125	1,0	Plain	LL	63459	191.77
		56	125	Ball	Plain	RR	63172	191.77
20	20	26	92	Square	Plain	SS	63130	234.04
		26	92	1,0	Plain	SS	63115	241.54
		38	104	Square	Plain	RR	63040	238.81
		38	104	0,75	Plain	RR	63440	246.31
		38	104	1,0	Plain	RR	63081	246.31
		38	104	Ball	Plain	RR	63173	279.62
		56	125	1,0	Plain	LL	63460	276.62
		56	125	Ball	Plain	RR	63174	279.62

Style Code Reference

LL—Long LOC, Long OAL

RR—Regular LOC, Regular OAL

SS—Short LOC, Short OAL