



MFK

High Efficiency

Multi-Edge Cutter for Cast Iron

■ **Excellent Surface Finish**

High axial rake leads to chatter resistance

■ **Tough & Reliable Inserts**

Dual angle edge design reduces fracturing

■ **Maximum Cost Savings**

10 usable cutting edges per insert for stable and economical machining

NEW **NEW DEVELOPMENT IN CVD COATING TECHNOLOGY**

Unique Crystal Control & Advanced Film Adhesion will revolutionize your productivity!



MFK

Multi-edge cutter for cast iron with unique innovations in CVD coating technology brings your cast iron machining to new levels of *perfection* and *efficiency*.

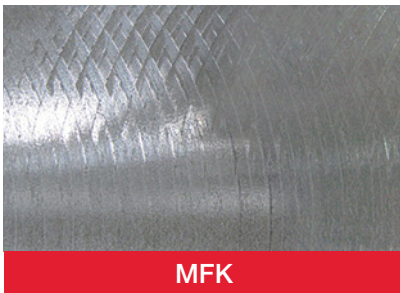


BALANCED DESIGN

MAXIMUM TOOL LIFE

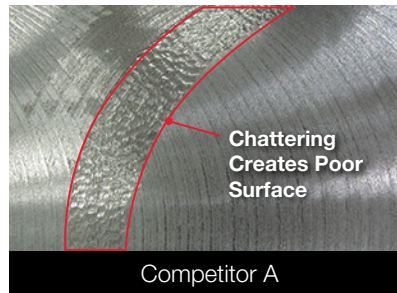
EXCEPTIONAL SURFACE FINISH QUALITY

Surface Finish Comparison

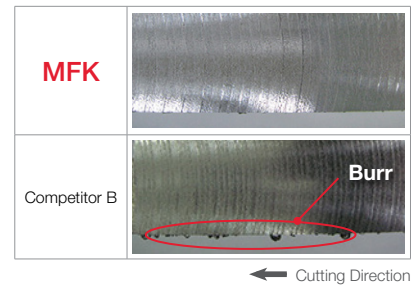


Cutting Conditions

Workpiece : Nodular Cast Iron (80-60-03), Dry, Vc=591sfm, f=0.012ipt, D.O.C.=0.118"x3.071"



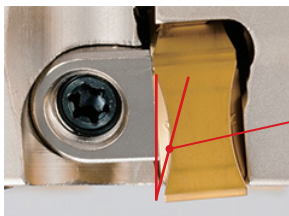
Burr Comparison



Sharp Cutting Prevents Burr Formation

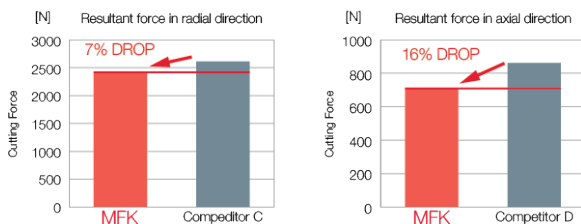
TOUGH & RELIABLE INSERT CONSTRUCTION

Low Cutting Forces with Helical Cutting Edge Design



A.R. Max. +15°

Cutting Force Comparison

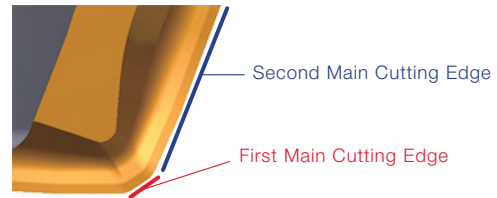


Cutting Conditions

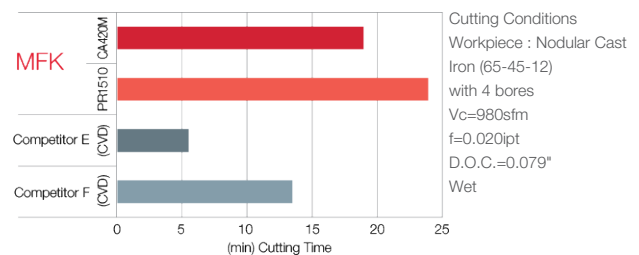
Workpiece : Nodular Cast Iron (80-60-03), Dry, Ø4.921"

Vc=590sfm, f=0.012ipt, D.O.C.=0.118"x2.441"

Tough & Reliable Dual Angle Edge Design



Fracture Resistance Comparison



Reduced Impact Load During Initial Contact

Recommended for
UNSTABLE SETUPS



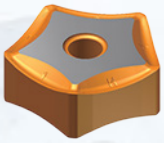
Fine Pitch
(Example : 5000R-11-12T = 12 Inserts)
• General purpose for wider application ranges

Recommended for
RIGID SETUPS

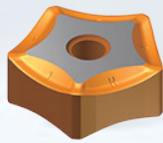


Extra Fine Pitch
(Example : 5000R-11-18T = 18 Inserts)
• Finer pitch for higher efficiency

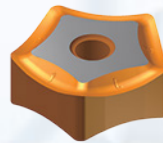
By Application
CHIPBREAKER LINEUP



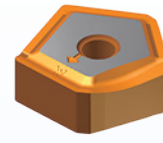
General Purpose:
GM Chipbreaker



Heavy Duty:
GH Chipbreaker



Finishing:
GL Ground
Chipbreaker



Wiper Edge:
W Ground
Wiper Edge

NEW Newly Developed CVD Coating Technology

Kyocera's unique crystal control technology and advanced film adhesion will revolutionize your productivity!

Longer Tool Life

Controlled α -Al₂O₃ crystal growth for wear and fracture resistance



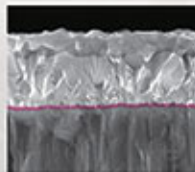
CA420M



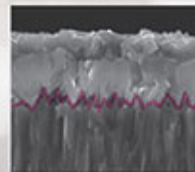
Conventional

Prevents Film Peeling

40% improved film adhesion by optimized interface



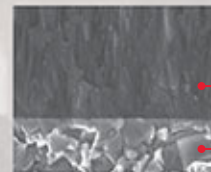
CA420M



Conventional

Increased Edge Strength

Higher film strength and fracture resistance with high aspect ratio TiCN

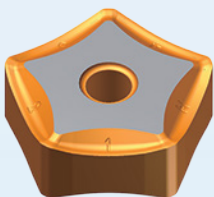


CA420M

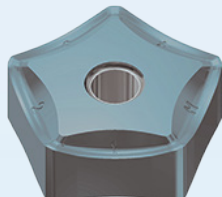
TiCN Layer
Carbide Substrate

Insert
GRADE LINEUP

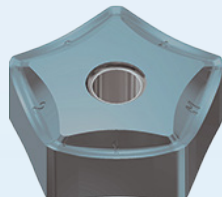
1st Recommendation



Long Tool Life
CA420M

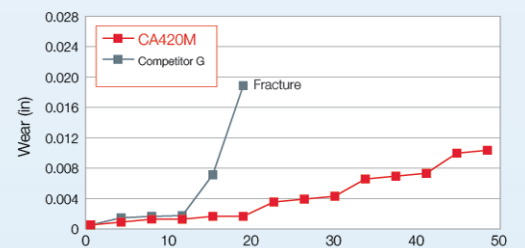


Stable Machining
PR1510



Fracture Resistance
PR1525

Wear Resistance Comparison

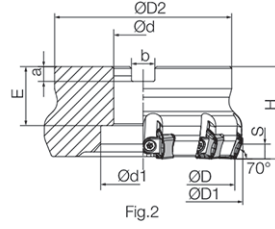
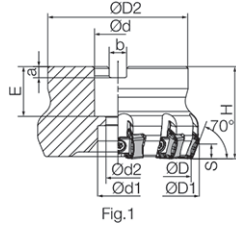


Cutting Conditions
Workpiece : Nodular Cast Iron (65-45-12), Dry
Vc=656sfm, f=0.012ipt, D.O.C.=0.079"×3.150"

MFK FACE MILL



(Fine Pitch Type Shown)



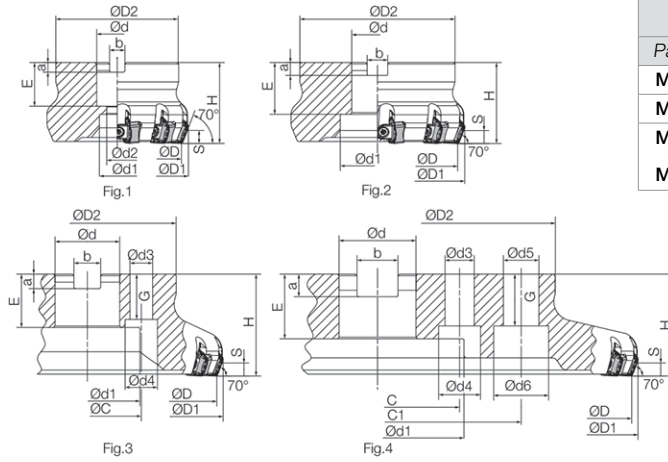
Rake Angle (°)		
Part Number	A.R.	R.R.
MFK3000R...		-7°
MFK4000R...	(MAX.)	-6°
MFK5000R...	+15°	
MFK6000R...		-5°

MFK Face Mill (Inch Sizes)																	
Bore Dia.	Part Number	Stock	No. of Inserts	Dimensions (in)											Drawing	Weight (kg)	
				ØD	ØD1	ØD2	Ød	Ød1	Ød2	H	E	a	b	S			
Inch Spec	Fine pitch	MFK 3000R-11-8T	●	8	3.000	3.340	2.750	1.000	0.866	0.551	2.480	1.063	0.240	0.382	0.236	Fig.1	1.610
		4000R-11-10T	●	10	4.000	4.340	3.750	1.500	1.299	0.866	2.480	1.181	0.390	0.626	0.236	Fig.1	2.860
		5000R-11-12T	●	12	5.000	5.340	3.750	1.500	2.047	-	2.480	1.496	0.390	0.626	0.236	Fig.2	3.670
		6000R-11-16T	●	16	6.000	6.340	4.880	2.000	2.835	-	2.480	1.496	0.430	0.752	0.236	Fig.2	4.940
	Extra Fine pitch	MFK 3000R-11-10T	●	10	3.000	3.340	2.750	1.000	0.866	0.551	2.480	1.063	0.240	0.382	0.236	Fig.1	1.550
		4000R-11-14T	●	14	4.000	4.340	3.750	1.500	1.299	0.866	2.480	1.181	0.390	0.626	0.236	Fig.1	2.740
		5000R-11-18T	●	18	5.000	5.340	3.750	1.500	2.047	-	2.480	1.496	0.390	0.626	0.236	Fig.2	3.480
		6000R-11-22T	●	22	6.000	6.340	4.880	2.000	2.835	-	2.480	1.496	0.430	0.752	0.236	Fig.2	4.760

MFK Face Mill (Inch)					
Part Number	Wedge	Wedge Screw	Wrench	Mounting Bolt	Applicable Inserts
MFK 3000R-11-8T				HH1/2-1.25	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W
4000R-11-10T				HH3/4-2.3	
5000R-11-12T				-	
6000R-11-16T				-	
MFK 3000R-11-10T				HH1/2-1.25	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W
4000R-11-14T				HH3/4-2.3	
5000R-11-18T				-	
6000R-11-22T				-	



(Fine Pitch Type Shown)



Rake Angle (°)		
Part Number	A.R.	R.R.
MFK080R...	(MAX.) +15°	-7°
MFK100R...		-6°
MFK125R...		
MFK315R...		-5°

MFK Face Mill (Metric Sizes)

Bore Dia.	Part Number	Stock	No. of Inserts	Dimensions (mm)																	Drawing	Weight (kg)	
				ØD	ØD1	ØD2	Ød	Ød1	Ø	H	E	a	b	S	Ød3	Ød4	Ød5	Ød6	ØC	ØC1			G
Inch Spec	Fine Pitch	MFK 080R-11-8T	8	80	89	76	31.750*	26	17	63	32	8	12.7	6	-	-	-	-	-	-	-	Fig.1	1.76
		100R-11-10T	10	100	109	96	31.750*	26	17	63	32	8	12.7	6	-	-	-	-	-	-	-	Fig.1	2.98
		125R-11-12T	12	125	134	100	38.100*	55	-	63	38	10	15.9	6	-	-	-	-	-	-	-	Fig.2	3.65
		160R-11-16T	16	160	169	100	50.800*	70	-	63	38	11	19.1	6	-	-	-	-	-	-	-	Fig.2	4.62
		200R-11-20T	20	200	209	142	47.625*	110	-	63	40	14	25.4	6	18	26	-	-	101.6	-	32	Fig.3	7.65
		250R-11-24T	24	250	259	142	47.625*	110	-	63	40	14	25.4	6	18	26	-	-	101.6	-	32	Fig.3	10.73
	315R-11-28T	28	315	324	220	47.625*	110	-	63	40	14	25.4	6	18	26	22	32	101.6	177.8	32	Fig.4	19.71	
	Extra Fine Pitch	MFK 080R-11-10T	10	80	89	76	31.750*	26	17	63	32	8	12.7	6	-	-	-	-	-	-	-	Fig.1	1.70
		100R-11-14T	14	100	109	96	31.750*	26	17	63	32	8	12.7	6	-	-	-	-	-	-	-	Fig.1	2.85
		125R-11-18T	18	125	134	100	38.100*	55	-	63	38	10	15.9	6	-	-	-	-	-	-	-	Fig.2	3.44
		160R-11-22T	22	160	169	100	50.800*	70	-	63	38	11	19.1	6	-	-	-	-	-	-	-	Fig.2	4.44
		200R-11-28T	28	200	209	142	47.625*	110	-	63	40	14	25.4	6	18	26	-	-	101.6	-	32	Fig.3	7.40
250R-11-36T		36	250	259	142	47.625*	110	-	63	40	14	25.4	6	18	26	-	-	101.6	-	32	Fig.3	10.36	
Metric Spec	Fine Pitch	MFK 080R-11-8T-M	8	80	89	76	27	20	13	63	24	7	12.4	6	-	-	-	-	-	-	-	Fig.1	1.87
		100R-11-10T-M	10	100	109	96	32	26	17	63	28	8	14.4	6	-	-	-	-	-	-	-	Fig.1	2.99
		125R-11-12T-M	12	125	134	100	40	55	-	63	33	9	16.4	6	-	-	-	-	-	-	-	Fig.2	3.56
		160R-11-16T-M	16	160	169	100	40	70	-	63	33	9	16.4	6	14	20	-	-	66.7	-	28	Fig.3	4.51
		200R-11-20T-M	20	200	209	142	60	110	-	63	40	14	25.7	6	18	26	-	-	101.6	-	32	Fig.3	7.35
		250R-11-24T-M	24	250	259	142	60	110	-	63	40	14	25.7	6	18	26	-	-	101.6	-	32	Fig.3	10.43
	315R-11-28T-M	28	315	324	220	60	110	-	63	40	14	25.7	6	18	26	22	32	101.6	177.8	32	Fig.4	19.41	
	Extra Fine Pitch	MFK 080R-11-10T-M	10	80	89	76	27	20	13	63	24	7	12.4	6	-	-	-	-	-	-	-	Fig.1	1.81
		100R-11-14T-M	14	100	109	96	32	26	17	63	28	8	14.4	6	-	-	-	-	-	-	-	Fig.1	2.86
		125R-11-18T-M	18	125	134	100	40	55	-	63	33	9	16.4	6	-	-	-	-	-	-	-	Fig.2	3.38
		160R-11-22T-M	22	160	169	100	40	70	-	63	33	9	16.4	6	14	20	-	-	66.7	-	28	Fig.3	4.32
		200R-11-28T-M	28	200	209	142	60	110	-	63	40	14	25.7	6	18	26	-	-	101.6	-	32	Fig.3	7.10
250R-11-36T-M		36	250	259	142	60	110	-	63	40	14	25.7	6	18	26	-	-	101.6	-	32	Fig.3	10.07	
315R-11-44T-M	44	315	324	220	60	110	-	63	40	14	25.7	6	18	26	22	32	101.6	177.8	32	Fig.4	18.92		

MFK Face Mill (Metric) Spare Parts & Applicable Inserts


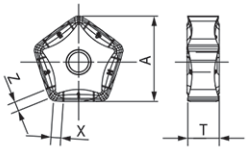

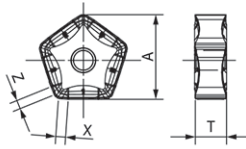

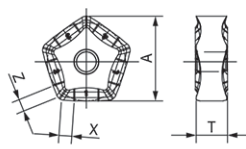

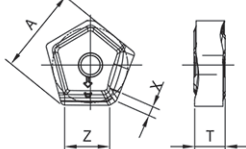
Part Number	Wedge	Wedge Screw	Wrench	Mounting Bolt	Applicable Inserts
MFK 080R-11-8T	C09N	W6X18N	TT-15	HH16X40	PNMG1106XNEN-GM
100R-11-10T					PNMG1106XNEN-GH
125R-11-12T					PNMG1106XNEN-GL
160R-11-16T					PNMG1106XNER-W
200R-11-20T					
250R-11-24T					
315R-11-28T					
MFK 080R-11-10T	C09N	W6X18N	TT-15	HH16X40	PNMG1106XNEN-GM
100R-11-14T					PNMG1106XNEN-GH
125R-11-18T					PNMG1106XNEN-GL
160R-11-22T					PNMG1106XNER-W
200R-11-28T					
250R-11-36T					
315R-11-44T					

MFK Face Mill (Metric) Spare Parts & Applicable Inserts

Part Number	Wedge	Wedge Screw	Wrench	Mounting Bolt	Applicable Inserts
MFK 080R-11-8T-M	C09N	W6X18N	TT-15	HH12X35	PNMG1106XNEN-GM
100R-11-10T-M					PNMG1106XNEN-GH
125R-11-12T-M					PNMG1106XNEN-GL
160R-11-16T-M					PNMG1106XNER-W
200R-11-20T-M					
250R-11-24T-M					
315R-11-28T-M					
MFK 080R-11-10T-M	C09N	W6X18N	TT-15	HH16X40	PNMG1106XNEN-GM
100R-11-14T-M					PNMG1106XNEN-GH
125R-11-18T-M					PNMG1106XNEN-GL
160R-11-22T-M					PNMG1106XNER-W
200R-11-28T-M					
250R-11-36T-M					
315R-11-44T-M					

Recommended Cutting Conditions **P6**

○ : World Express (Shipping : 10 Business Days) □ : Made to Order (Call for Delivery)

Applicable Inserts									
Insert	Drawing	Part Number	Dimensions (in)				CVD Coated Carbide	MEGACOAT NANO	
			A	T	X	Z	CA420M	PR1510	PR1525
 General		PNMG1106XNEN-GM	0.678	0.250	0.079	0.079	●	●	●
 Tough Edge		PNMG1106XNEN-GH	0.678	0.250	0.079	0.079	●	●	●
 Surface Finish Oriented		PNEG1106XNEN-GL	0.676	0.250	0.102	0.102	●	●	●
 Wiper Insert (2-Edges)		PNEG1106XNER-W	0.709	0.250	0.079	0.394	●	●	●

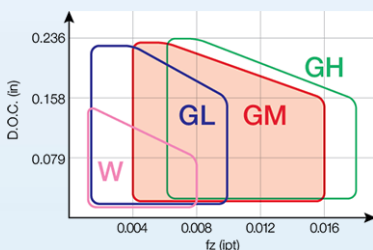
● : U.S. Stock

Recommended Conditions											
Workpiece Material	Insert Grade	Cutting Speed (sfm)	Chipbreakers	fz (ipt) Feed Per Tooth							
				0.002	0.004	0.008	0.012	0.016	0.020	0.024	0.028
Gray Cast Iron (FC)	CA420M	560~750~980	GM★			● 0.010					
	PR1510	390~590~820	GH☆			● 0.012					
	PR1525	390~590~820	GL		● 0.005						
Nodular Cast Iron (FCD)	CA420M	490~660~820	GM★			● 0.008					
	PR1510	330~490~660	GH☆			● 0.010					
	PR1525	330~490~660	GL		● 0.004						

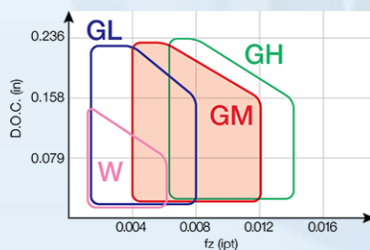
★ : 1st Recommendation ☆ : 2nd Recommendation

Recommended Application Range

Workpiece : Gray Cast Iron (FC)



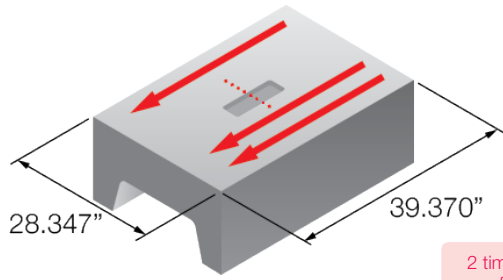
Workpiece : Nodular Cast Iron (FCD)



Note:
 When using **W** (wiper), please use together with **GM** or **GH**. (Not recommended for use with **GL**)
 When using wiper, do not exceed fz=0.008ipt or insert corner may be damaged.

Case Studies

Gray Cast Iron NO.45



2 times more efficient

- Machine base • Vc=525sfm • f=0.006ipt (Vf=30.787"/min)
- D.O.C.xae=0.118"x3.937" • Dry
- MFK125R-11-12T (12 inserts) • PNMG1106XNEN-GM (PR1510)

PR1510

Chip Removal Rate = 235cc/min

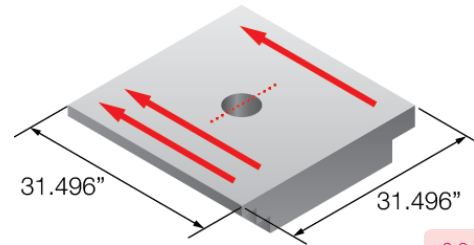
Competitor A
(12 inserts)

Chip Removal Rate = 125cc/min

Little noise and vibration with increased cutting speed and feed rate.

(User Evaluation)

Gray Cast Iron NO.45



2.3 times more efficient

- Base • Vc=525sfm • f=0.0071ipt (Vf=36.102"/min)
- D.O.C.xae=0.118"x5.512" • Dry
- MFK200R-11-20T (20 inserts) • PNMG1106XNEN-GM (CA420M)

CA420M

Chip Removal Rate = 385cc/min

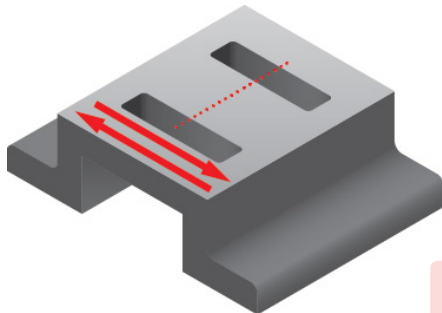
Competitor B
(12 inserts)

Chip Removal Rate = 167cc/min

CA420M performed at 2.3 times the efficiency of Competitor B. Little noise and stable machining.

(User Evaluation)

Nodular Cast Iron (80-60-03)



3 times longer tool life

- Mold Part • Vc=300sfm • f=0.013ipt (Vf=38.346"/min)
- D.O.C.xae=0.079"x~2.362" • Dry
- MFK080R-11-8T (8 inserts) • PNMG1106XNEN-GM (PR1525)

PR1525

Machining efficiency: 3 pcs/edge

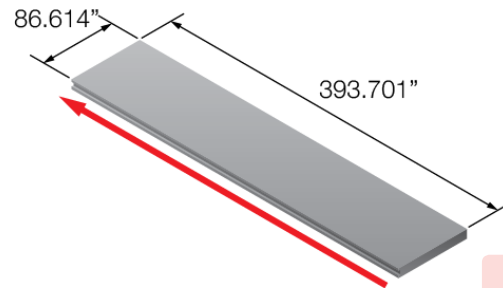
Competitor C
(8 inserts)

Machining efficiency: 1 pcs/edge

Competitor C caused chipping after machining 1pc. PR1525 maintained better edge condition and stable machining after 3 pcs.

(User Evaluation)

Gray Cast Iron (NO.50)



4 times more efficient

- Bed • Vc=492sfm • f=0.010 (Vf=48.898"/min)
- D.O.C.xae=0.118"x3.937" • Dry
- MFK160R-11-16T (16 inserts) • PNMG1106XNEN-GM (CA420M)

CA420M

Chip Removal Rate = 372cc/min

Competitor D
(8 inserts)

Chip Removal Rate = 93cc/min

CA420M improved the efficiency by 4 times compared with Competitor D.

(User Evaluation)



KYOCERA Precision Tools, Inc.

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