KORLOY
TECH-NEWS

PC6510

New

Milling Inserts for Cast Iron

The specialized grade for multi-purpose milling applications of cast iron

- **Excellent Surface Finish**
  Specially prepared surface provides mirror like finish on workpieces
- **Stable Tool Life**
  Optimized PVD coating for cast iron minimizes tool life deviation
- **High Speed and Feed Capability for Higher Productivity**

KORLOY

PVD-coated Insert Specialized for Milling Applications of Cast Iron

New PC6510

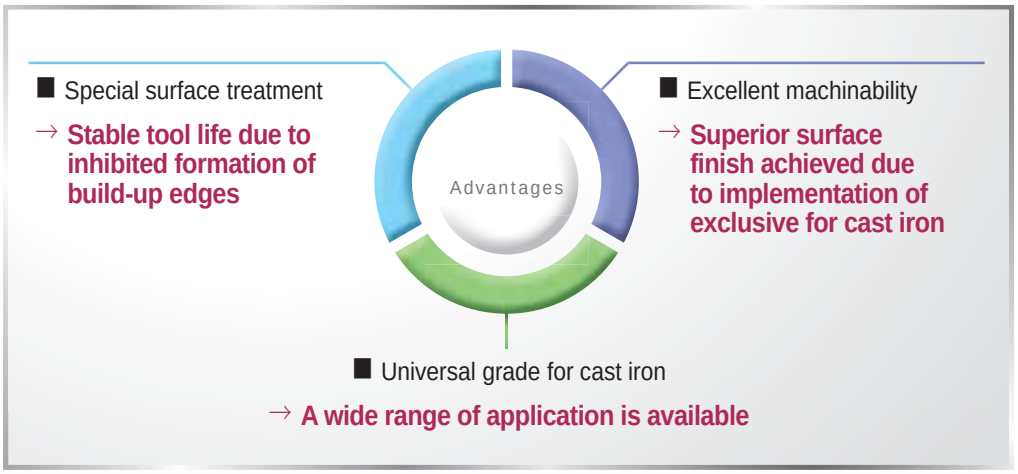
New PC6510

For multi-purpose cutting of cast iron

Cast iron is characterized by heavy chip breaking during milling. Wear is more rapid on the relief surface where the contact time with the workpiece is relatively long while the cutting load on the flank surface is low. In addition, graphite contained in cast iron causes a lot of dust during cutting. To prevent dust, the machining process is mainly done wet, however, there are still chances of thermal cracking on cutting edges due to the thermal impact of the cutting fluids to the inserts. Melted and compressed chips on the surface of inserts create uneven chipping, making the tool life unstable.

Now KORLOY offers a new milling grade to provide more stable machining for cast iron.

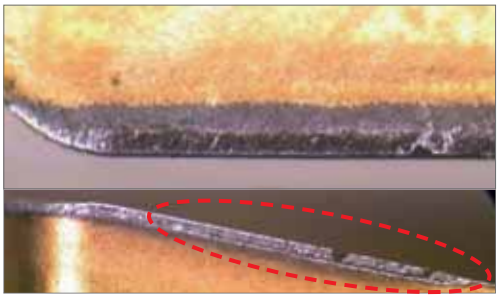
The **NEW PC6510** has PVD coating optimized for multi-purpose machining of cast iron, which also can be used to inhibit heat cracks. Special surface treatment also prevents chips from melting or compressing onto inserts, providing mirror-like surface finish and stable tool life.



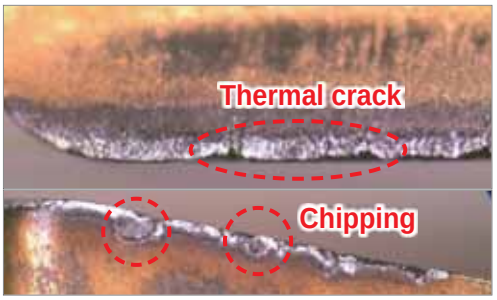
Problems When Machining Cast Iron

- Excessive wear on relief surface due to friction between graphite particles and cutting edge.

1. Wear on relief surface



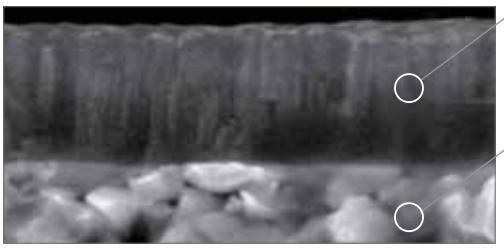
2. Thermal crack / chipping



Development of New PC6510

PVD coatings specialized for cast iron

Excellent wear resistance and stable tool life

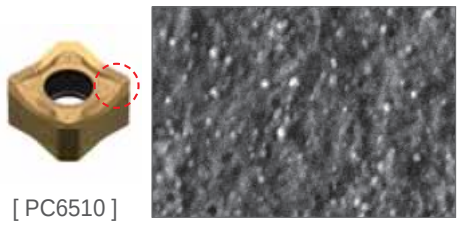


- Stable machinability due to the highly wear-resistant TiAlN coating of toughness
- Minimized life deviation due to the thermal crack-resistant material optimized for cast iron

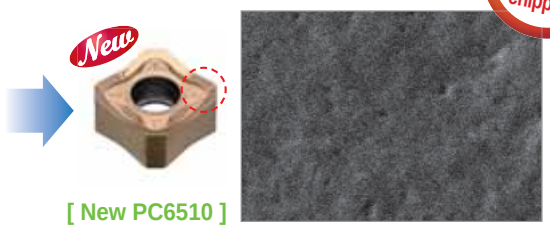
Coating surface treatment

Excellent resistance to welding and chipping

- Improved surface finish due to coating surface treatment
  → Stronger resistance to welding and chipping



[PC6510]



[New PC6510]

Development Effects

[Evaluation of wear resistance]

■**Workpiece**
80-55-06

■**Cutting conditions**
vc(sfm) = 656
fz(ipr) = 0.008
ap(inch) = 0.039
ae(inch) = 4.724, wet

■**Tools**
SNMX1206ANN-MF
RM8ACA4500HR-M

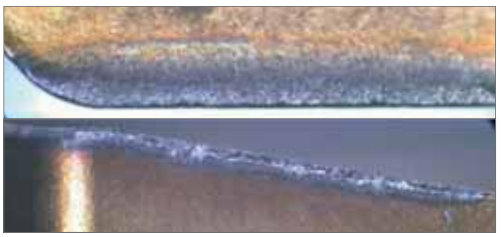
[Evaluation of thermal crack]

■**Workpiece**
A48-40-B

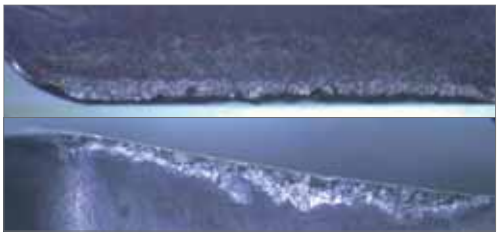
■**Cutting conditions**
vc(sfm) = 591
fz(ipr) = 0.008
ap(inch) = 0.039
ae(inch) = 0.787, wet

■**Tools**
SNMX1206ANN-MF
RM8ACA4250HR-M

1. Higher wear resistance

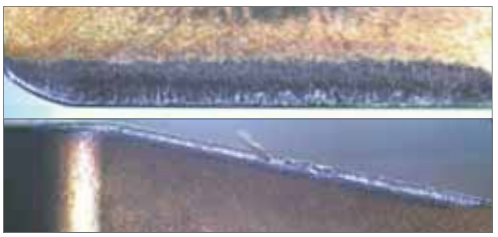


[New PC6510]

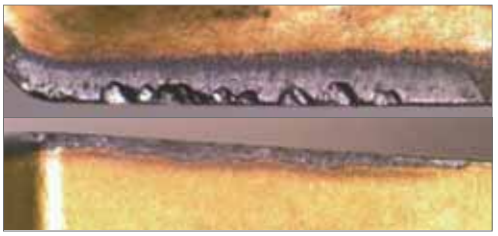


[Competitor]

2. Less thermal crack / chipping



[New PC6510]

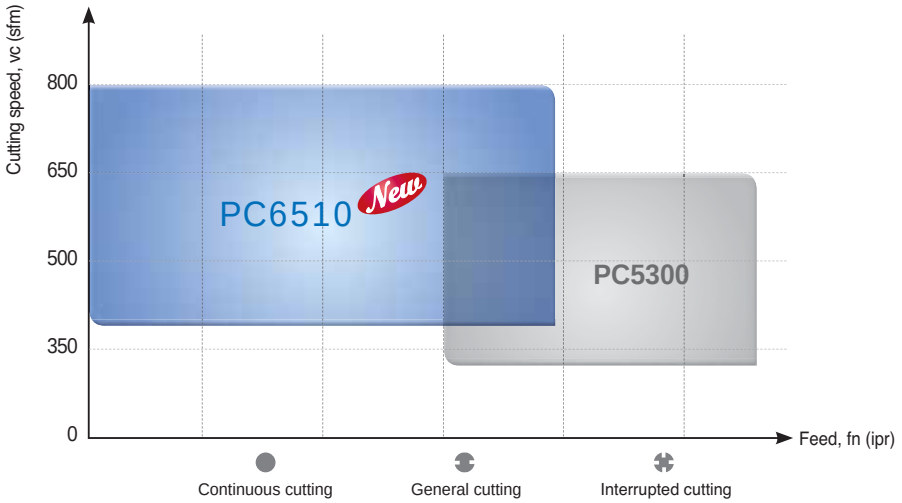


[Competitor]

Grades Application Range

- **New PC6510**
  - Surface treatment on the rake surface of insert
  - Excellent resistance to thermal cracks
  - High speeds and interrupted machining available
  - Reduced fine chipping from compression

Recommended Grades and Cutting Conditions for Cast Iron



Grade Guideline by Workpiece Type for Cylinder Blocks

- **New PC6510**
  - For multi-purpose machining of cast iron
  - For general cutting
- **PC5300**
  - For interrupted machining
  - For unstable machining

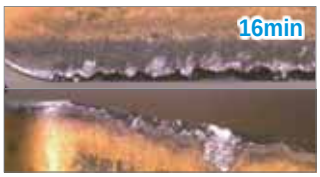
Specification	General cutting	Multi-purpose	High interruptions
Grade	New PC6510	New PC6510	**PC5300**
Workpiece material	Gray cast iron, ductile cast iron	Gray cast iron, ductile cast iron	Gray cast iron, ductile cast iron
Machining type	General cutting for wide areas	Multi-purpose cutting for various shapes	Highly interrupted and unstable cutting
Workpiece type	Top & Bottom face 	Front & Rear face 	Bosses 

Grade Guideline by Workpiece Type for Crank Shafts

Specification	Roughing (pin miller)		Finishing (pin miller)	
Grade	New PC6510	**PC5300**	New PC6510	**PC5300**
Workpiece material	Cast iron	Cast iron, steel	Cast iron, steel	Steel
Wear type	Wear on relief surface, thermal crack, chipping	Edge chipping, thermal crack, breakage	Wear on relief surface	Wear on relief surface, chipping
Workpiece type	Pin & Journal 		Pin-Grooving 	

Cutting Performance

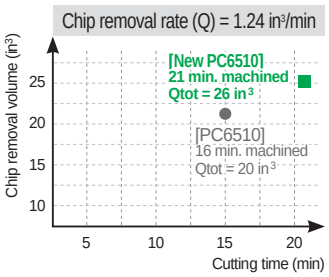
[New PC6510]



[PC6510]

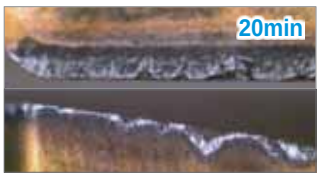
Performance Evaluation of New PC6510 (Rich Mill)

- Workpiece: A48-40-B
- Cutting conditions: vc (sfm) = 656, fz (ipr) = 0.008, ap (inch) = 0.079, ae (inch) = 3.937
- Tools: Insert : SNMX1206ANN-MF, Holder : RM8ACA4500HR-M



30% more cutting volume compared to the existing PC6510

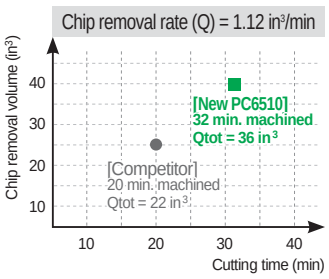
[New PC6510]



[Competitor]

Performance Evaluation of New PC6510 (Rich Mill)

- Workpiece: 100-70-03
- Cutting conditions: vc (sfm) = 591, fz (ipr) = 0.008, ap (inch) = 0.079, ae (inch) = 3.937
- Tools: Insert : SNMX1206ANN-MF, Holder : RM8ACA4500HR-M



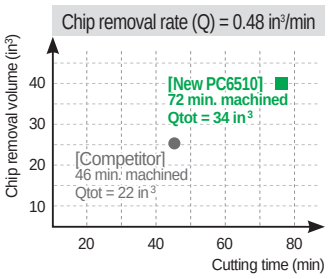
60% more cutting volume compared to the competitor

[New PC6510]

[Competitor]

Performance Evaluation of New PC6510 (Rich Mill)

- Workpiece: 100-70-03
- Cutting conditions: vc (sfm) = 656, fz (ipr) = 0.008, ap (inch) = 0.079, ae (inch) = 0.787
- Tools: Insert : SNMX1206ANN-MF, Holder : RM8ACA4250HR-H



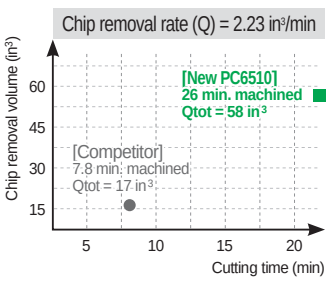
56% more cutting volume compared to the competitor

[New PC6510]

[Competitor]

Performance Evaluation of New PC6510 (ISO)

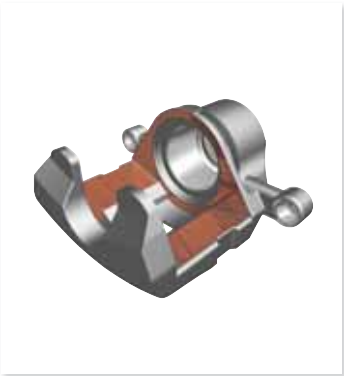
- Workpiece: No-35-B
- Cutting conditions: vc (sfm) = 656, fz (ipr) = 0.008, ap (inch) = 0.118, ae (inch) = 4.724
- Tools: Insert : SPCN42EDSR-RH, Holder : EPN4500R



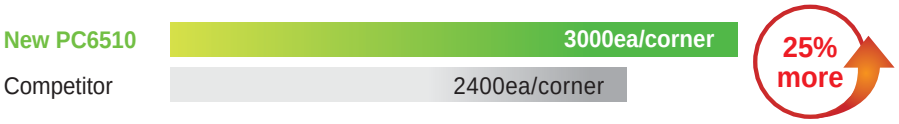
233% more cutting volume compared to the competitor

Application Examples

Automotive components (Brake Housing)



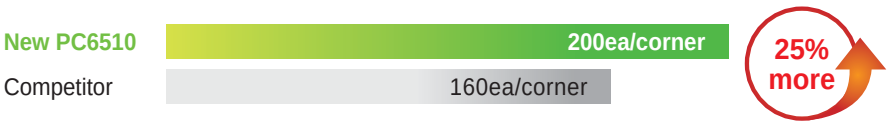
- Workpiece: Cast iron (80-55-06)
- Cutting conditions: vc (sfm) = 781, fz (ipr) = 0.004, ap (inch) = 0.079, ae (inch) = 3.937, wet
- Tool: Insert : CNHQ1305-C1.0-HG (NEW PC6510)
  Holder : HSG300R-T62.5R3.5-MDL



25% longer tool life compared to the competitor

Automotive components (knuckle)

- Workpiece: Cast iron (100-70-03)
- Cutting conditions: vc (sfm) = 689, fz (ipr) = 0.006, ap (inch) = 0.098, ae (inch) = 3.937, wet
- Tool: Insert : SNEX150712N (NEW PC6510)
  Holder : KSFCB1303R-D31.75-D46



25% longer tool life compared to the competitor

Automotive components (exhaust manifold)

- Workpiece: Cast iron (60-40-18)
- Cutting conditions: vc (sfm) = 617, fz (ipr) = 0.008, ap (inch) = 0.079, ae (inch) = 0.787 wet
- Tool: Insert : SDXT09M405R-MM (NEW PC6510)
  Holder : FMPCA3400HS

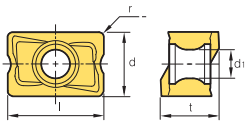
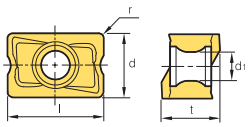
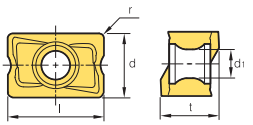
26% longer tool life compared to the competitor

Automotive components (bearing cap)

- Workpiece: Cast iron (80-55-06)
- Cutting conditions: vc (sfm) = 820, fz (ipr) = 0.006, ap (inch) = 0.039, ae (inch) = 4.724, wet
- Tool: Insert : SNCF1206QNN-MF (NEW PC6510)
  Holder : RMT8QA4400R-M

25% longer tool life compared to the competitor

Available Stock

Type	Shape	Designation		Grade PC6510 (New)	Dimensions (inch) l	d	t	r	d_1	a	Figure
Rich Mill		LNM(E)X	LNMX 100605PNR-MF	●	25/64	33/128	33/128	3/128	0.318	-	
			100608PNR-MF	●	25/64	33/128	33/128	1/32	0.318	-	
			LNEX 100605PNR-MF	●	25/64	33/128	33/128	3/128	0.318	-	
			100608PNR-MF	●	25/64	33/128	33/128	1/32	0.318	-	
		LNM(E)X	LNMX 151004PNR-MF	●	19/32	25/64	25/64	1/64	0.177	-	
			151008PNR-MF	●	19/32	25/64	25/64	1/32	0.177	-	
			151016PNR-MF	●	19/32	25/64	25/64	1/16	0.177	-	
			LNEX 151004PNR-MF	●	19/32	25/64	25/64	1/64	0.177	-	
			151008PNR-MF	●	19/32	25/64	25/64	1/32	0.177	-	
			151016PNR-MF	●	19/32	25/64	25/64	1/16	0.177	-	
		LNM(E)X	LNMX 100605PNR-MM	●	25/64	33/128	33/128	3/128	0.318	-	
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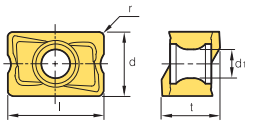
			100605PNL-MM	●	25/64	33/128	33/128	3/128	0.318	-	
			LNEX 100605PNR-MM	●	25/64	33/128	33/128	3/128	0.318	-	
			100608PNR-MM	●	25/64	33/128	33/128	1/32	0.318	-	
			100605PNL-MM	●	25/64	33/128	33/128	3/128	0.318	-	
		LNM(E)X	LNMX 151004PNR-MM	●	19/32	25/64	25/64	1/64	0.177	-	
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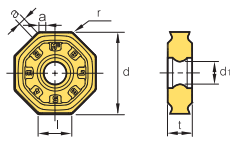
			151016PNR-MM	●	19/32	25/64	25/64	1/16	0.177	-	
			LNEX 151004PNR-MM	●	19/32	25/64	25/64	1/64	0.177	-	
			151008PNR-MM	●	19/32	25/64	25/64	1/32	0.177	-	
			151016PNR-MM	●	19/32	25/64	25/64	1/16	0.177	-	
			151008PNL-MM	●	19/32	25/64	25/64	1/32	0.177	-	
		ONHX	060608-MF	●	17/64	5/8	15/64	1/32	0.220	-	
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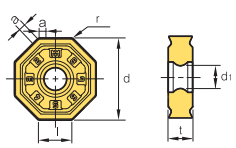
			0606ANN-MF	●	17/64	5/8	15/64	1/32	0.220	0.041	
			0806ANN-MF	●	21/64	51/64	15/64	1/32	0.220	0.060	
		ONHX	060608-MM	●	17/64	5/8	15/64	1/32	0.220	-	
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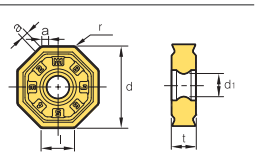
			0606ANN-MM	●	17/64	5/8	15/64	1/32	0.220	0.041	
			0806ANN-MM	●	21/64	51/64	15/64	1/32	0.220	0.060	
		ONHX	060608-MA	●	17/64	5/8	15/64	1/32	0.220	-	
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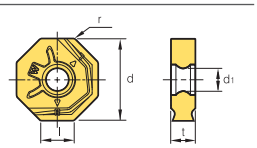
		ONHX	060608-W	●	17/64	5/8	15/64	1/32	0.220	-	
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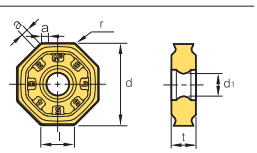
		ONMX	060608-MF	●	17/64	5/8	15/64	1/32	0.220	-	
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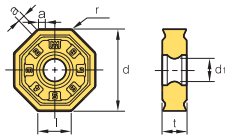
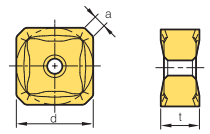
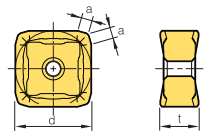
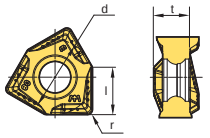
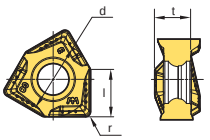
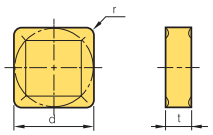
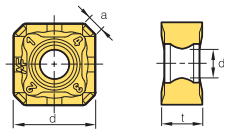
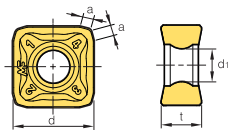
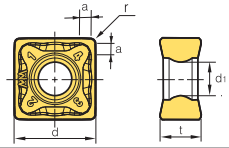
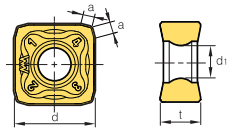
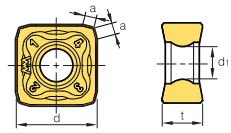
			0606ANN-MF	●	17/64	5/8	15/64	1/32	0.220	0.041	
			0806ANN-MF	●	21/64	51/64	15/64	1/32	0.220	0.060	

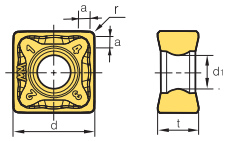
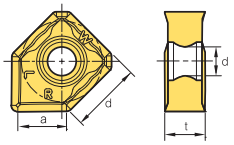
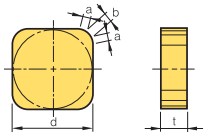
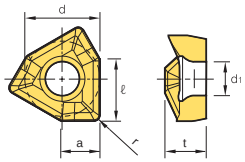
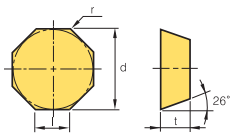
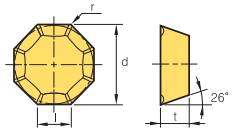
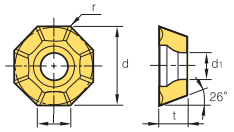
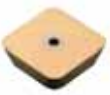
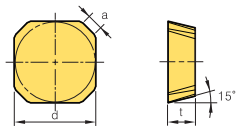
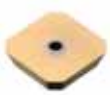
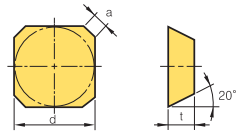
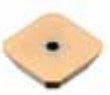
●: Stock item

Available Stock

Type	Shape	Designation		Grade PC6510 (New)	Dimensions (inch) l	d	t	r	d_1	a	Figure
Rich Mill		ONMX	060608-MM	●	17/64	5/8	15/64	1/32	0.220	-	
			080608-MM	●	21/64	51/64	15/64	1/32	0.220	-	
			0606ANN-MM	●	17/64	5/8	15/64	1/32	0.220	0.041	
			0806ANN-MM	●	21/64	51/64	15/64	1/32	0.220	0.060	
		SNCF	1507ANN-MF	●	-	5/8	0.289	-	-	0.083	
			1206ENN-MF	●	-	1/2	17/64	-	-	0.079	
			1507ENN-MF	●	-	5/8	0.289	-	-	0.083	
			1206QNN-MF	●	-	1/2	33/128	0.039	-	0.039	
		SNCF	1206QNN-MM	●	-	1/2	33/128	0.031	-	0.039	
		WNGX	040304PNER-ML		0.169	0.276	0.136	0.016	-	-	
			040308PNER-ML		0.169	0.276	0.136	0.031	-	-	
			080604PNER-ML		0.323	0.512	0.252	0.016	-	-	
			080608PNER-ML		0.323	0.512	0.252	0.031	-	-	
		WNGX	040304PNSR-MM		0.169	0.276	0.136	0.016	-	-	
			040308PNSR-MM		0.169	0.276	0.136	0.031	-	-	
			080604PNSR-MM		0.323	0.512	0.252	0.016	-	-	
			080608PNSR-MM		0.323	0.512	0.252	0.031	-	-	
		SNEF	435	●	-	1/2	0.187	0.075	-	-	
		SNM(E)X	SNMX 1206ANN-MF	●	-	1/2	1/4	-	0.177	0.093	
			1507ANN-MF	●	-	5/8	5/16	-	0.220	0.124	
			SNEX 1206ANN-MF	●	-	1/2	1/4	-	0.177	0.093	
			1507ANN-MF	●	-	5/8	5/16	-	0.220	0.124	
		SNM(E)X	SNMX 1206ENN-MF	●	-	1/2	1/4	-	0.205	0.072	
			1507ENN-MF	●	-	5/8	5/16	-	0.220	0.105	
			SNEX 1206ENN-MF	●	-	1/2	1/4	-	0.205	0.072	
			1507ENN-MF	●	-	5/8	5/16	-	0.220	0.105	
		SNM(E)X	SNMX 1206QNN-MF	●	-	1/2	1/4	1/32	0.177	0.093	
			120612-MF	●	-	1/2	1/4	0.047	0.177	-	
			SNEX 1206QNN-MF	●	-	1/2	1/4	1/32	0.177	0.093	
			120612-MF	●	-	1/2	1/4	0.047	0.177	-	
		SNM(E)X	SNMX 1206ANN-MM	●	-	1/2	1/4	-	0.177	0.093	
			1507ANN-MM	●	-	5/8	5/16	-	0.220	0.124	
			SNEX 1206ANN-MM	●	-	1/2	1/4	-	0.177	0.093	
			1507ANN-MM	●	-	5/8	5/16	-	0.220	0.124	
		SNM(E)X	SNMX 1206ENN-MM	●	-	1/2	1/4	-	0.205	0.072	
			1507ENN-MM	●	-	5/8	5/16	-	0.220	0.105	
			SNEX 1206ENN-MM	●	-	1/2	1/4	-	0.205	0.072	
			1507ENN-MM	●	-	5/8	5/16	-	0.220	0.105	

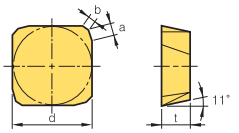
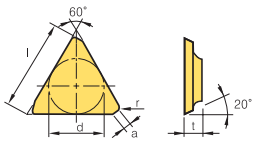
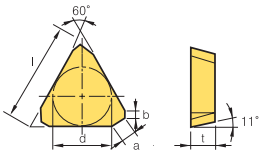
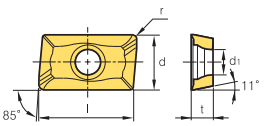
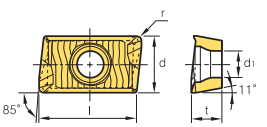
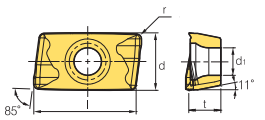
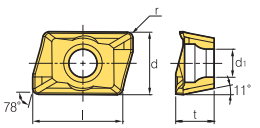
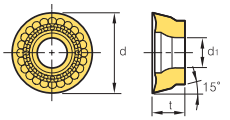
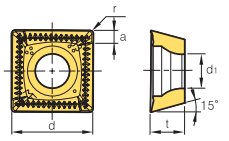
●: Stock item

Available Stock

Type	Shape	Designation		Grade PC6510 (New)	Dimensions (inch) l	d	t	r	d_1	a	b	Figure
Rich Mill		SNM(E)X	SNMX 1206QNN-MM	●	-	1/2	1/4	1/32	0.177	0.093	-	
			120612-MM	●	-	1/2	1/4	0.047	0.177	-	-	
			SNEX 1206QNN-MM	●	-	1/2	1/4	1/32	0.177	0.093	-	
			120612-MM	●	-	1/2	1/4	0.047	0.177	-	-	
		SNEX	1206ANN-W	●	0.674	1/2	1/4	-	0.177	0.299	-	
		SNKN	1204ENN	●	-	1/2	3/16	-	-	0.055	0.039	
		XNKT	060405PNER-ML	●	0.224	0.256	0.157	0.020	0.134	0.071	-	
			060408PNER-ML	●	0.224	0.256	0.157	0.031	0.134	0.071	-	
			080508PNER-ML	●	0.323	0.394	0.217	0.031	0.177	0.114	-	
			120608PNER-ML	●	0.472	0.512	0.256	0.031	0.217	0.138	-	
		XNKT	060405PNSR-MM	●	0.224	0.256	0.157	0.020	0.134	0.071	-	
			060408PNSR-MM	●	0.224	0.256	0.157	0.031	0.134	0.071	-	
			080508PNSR-MM	●	0.323	0.394	0.217	0.031	0.177	0.114	-	
			120608PNSR-MM	●	0.472	0.512	0.256	0.031	0.217	0.138	-	
ISO		OFCN	0704SN	●	19/64	45/64	0.187	3/128	-	-	-	
		OFKR	0704SN-MM	●	19/64	45/64	3/16	3/128	-	-	-	
		OFKT	05T3SN-MF	●	13/64	1/2	5/32	3/128	0.173	-	-	
		SDCN	53AEEN-RH	●	-	5/8	3/16	-	-	0.056	-	
			53AESN-RH	●	-	5/8	3/16	-	-	0.056	-	
		SECN	42AFEN-RH	●	-	1/2	0.125	-	-	0.091	-	
			53AFSN-RH	●	-	5/8	0.187	-	-	0.094	-	
		SFKN	42.5AZEN	●	-	1/2	0.156	-	-	0.087	-	-

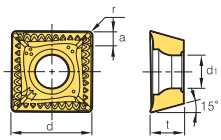
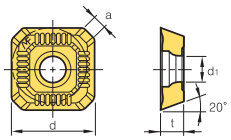
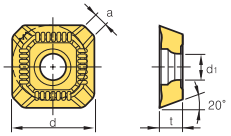
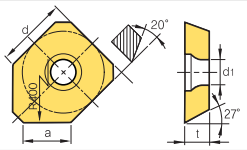
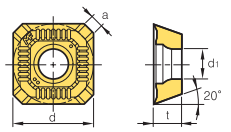
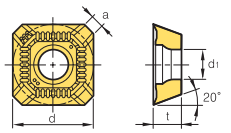
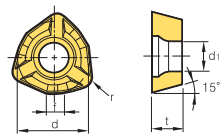
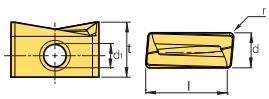
●: Stock item

Available Stock

Type	Shape	Designation		Grade	Dimensions (inch)							Figure
				PC6510 (New)	l	d	t	r	d_1	a	b	
ISO		SPCN	42EDER-RH	●	-	1/2	1/8	-	-	0.064	0.031	
			42EDSR-RH	●	-	1/2	1/8	-	-	0.064	0.031	
			53EDL	●	-	5/8	3/16	-	-	0.055	0.039	
			53EDER-RH	●	-	5/8	3/16	-	-	0.064	0.031	
			53EDSR-RH	●	-	5/8	3/16	-	-	0.064	0.031	
		SPGN	322	●	-	3/8	0.125	1/32	-	-	-	-
		TEEN	43TR	●	55/64	1/2	0.187	1/32	-	0.059	-	
		TPCN	32PPN	●	0.650	3/8	1/8	-	-	0.047	0.047	
			32PDER-RH	●	0.650	3/8	1/8	1/32	-	0.059	-	
			32PDSR-RH	●	0.650	3/8	1/8	1/32	-	0.059	-	
			43PDER-RH	●	0.866	1/2	3/16	1/32	-	0.071	-	
			43PDSR-RH	●	0.866	1/2	3/16	1/32	-	0.071	-	
Alpha Mill		APKT	1604PDSR	●	0.646	0.375	0.187	0.031	0.173	-	-	
		APKT	1604PDSR-MM	●	0.646	0.375	0.205	0.031	0.173	-	-	
		APMT	11T3PDSR-MF	●	0.441	0.255	0.142	0.020	0.112	-	-	
			1604PDSR-MF	●	0.646	0.370	0.227	0.031	0.177	-	-	
			1806PDSR-MF	●	0.685	0.432	0.250	0.031	0.177	-	-	
		APMT	0602PDSR-MM	●	0.236	0.167	0.102	0.016	0.079	-	-	
			0903PDSR-MM	●	0.370	0.244	0.142	0.016	0.110	-	-	
			11T3PDSR-MM	●	0.441	0.255	0.142	0.020	0.112	-	-	
			1604PDSR-MM	●	0.646	0.370	0.227	0.031	0.177	-	-	
			1806PDSR-MM	●	0.685	0.432	0.250	0.031	0.177	-	-	
Future Mill		RDKT	10T3M0-MM	●	-	25/64	0.156	-	0.152	-	-	
			1204M0-MM	●	-	15/32	0.187	-	0.177	-	-	
		SDXT	09M405R-MF	●	-	3/8	0.157	3/128	0.157	0.047	-	
			130508R-MF	●	-	0.531	7/32	1/32	0.219	0.087	-	

●: Stock item

Available Stock

Type	Shape	Designation		Grade PC6510 (New)	Dimensions (inch) l	d	t	r	d_1	a	f	Figure
Future Mill		SDXT	09M405R-MM	●	-	3/8	0.157	3/128	0.157	0.047	-	
			09M405L-MM	●	-	3/8	0.157	3/128	0.157	0.047	-	
			130508R-MM	●	-	0.531	7/32	1/32	0.219	0.087	-	
		SEET	32AGSN-MF	●	-	3/8	0.125	-	0.134	0.083	-	
			14M4AGSN-MF	●	-	0.551	0.157	-	0.173	0.096	-	
		SEET	32AGSN-MM	●	-	3/8	0.125	-	0.134	0.083	-	
			14M4AGSN-MM	●	-	0.551	0.157	-	0.173	0.096	-	
		SEEW	14M4AGTN-W	●	-	0.551	0.717	-	0.157	0.173	-	
		SEXT	32AGSN-MF	●	-	3/8	1/8	-	0.134	0.083	-	
			14M4AGSN-MF	●	-	0.551	0.157	-	0.173	0.104	-	
		SEXT	32AGSN-MM	●	-	3/8	1/8	-	0.134	0.083	-	
			14M4AGSN-MM	●	-	0.551	0.157	-	0.173	0.104	-	
HRMD		WDKT	080316ZDSR-MH	●	-	5/16	0.125	1/16	0.13	-	0.071	
			10T320ZDSR-MH	●	-	25/64	0.156	5/64	0.169	-	0.091	
			130520ZDSR-MH	●	-	17/32	0.219	5/64	0.219	-	0.122	
			150625ZDSR-MH	●	-	19/32	0.25	13/128	0.219	-	0.138	
TP2P		LNKT	170708PNR-ML	●	0.650	0.276	0.433	0.031	0.177	-	-	

●: Stock item

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