

ENGINEERED TOOLS & APPLICATIONS

THUNDERBOLT

DIAMOND

BLACK WIDOW

NEW
Pricelist
Effective 10-6-2008


Crystallume

A Division of RobbJack Corporation

Extended Shank End Mills

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance	Part Number	List Price
0.0625	1/16		1/16	5/16	3	1/16	4	BN	+.001/-0.001	P820-200105-1	\$82.40
0.0625	1/16		1/16	5/16	3	1/16	4	SE	+.001/-0.001	P820-200209-1	\$82.40
0.0938	3/32		3/32	11/32	3	3/32	4	BN	+.001/-0.001	P820-200106-1	\$87.55
0.0938	3/32		3/32	11/32	3	3/32	4	SE	+.001/-0.001	P820-200582-1	\$87.55
0.1250	1/8		1/8	5/8	3	1/8	4	BN	+.001/-0.001	P820-200107-1	\$92.70
0.1250	1/8		1/8	5/8	3	1/8	4	SE	+.001/-0.001	P820-200210-1	\$92.70
0.1250	1/8		1/8	5/8	3	1/8	4	SE-.015CR	+.001/-0.001	P820-200241-1	\$92.70
0.1250	1/8		1/8	5/8	3	1/8	4	SE-.031CR	+.001/-0.001	P820-200628-1	\$92.70
0.1875	3/16		3/16	11/16	3	3/16	4	BN	+.001/-0.001	P820-200108-1	\$103.00
0.1875	3/16		3/16	11/16	3	3/16	4	SE	+.001/-0.001	P820-200237-1	\$103.00
0.1875	3/16		3/16	11/16	3	3/16	4	SE-.062CR	+.001/-0.001	P820-200627-1	\$103.00
0.2500	1/4		1/4	3/4	4	1/4	4	BN	+.001/-0.001	P820-200109-1	\$118.45
0.2500	1/4		1/4	3/4	4	1/4	4	SE	+.001/-0.001	P820-200211-1	\$118.45
0.2500	1/4		1/4	3/4	4	1/4	4	SE-.015CR	+.001/-0.001	P820-200242-1	\$118.45
0.2500	1/4		1/4	3/4	4	1/4	4	SE-.030CR	+.001/-0.001	P820-200279-1	\$118.45
0.2500	1/4		1/4	3/4	4	1/4	4	SE-.062CR	+.001/-0.001	P820-200626-1	\$118.45
0.3125	5/16		5/16	13/16	4	5/16	4	BN	+.001/-0.001	P820-200110-1	\$133.90
0.3125	5/16		5/16	13/16	4	5/16	4	SE	+.001/-0.001	P820-200581-1	\$133.90
0.3750	3/8		3/8	1-1/8	4	3/8	4	BN	+.001/-0.001	P820-200111-1	\$144.20
0.3750	3/8		3/8	1-1/8	4	3/8	4	SE	+.001/-0.001	P820-200512-1	\$144.20
0.3750	3/8		3/8	1-1/8	4	3/8	4	SE-.015CR	+.001/-0.001	P820-200309-1	\$144.20
0.5000	1/2		1/2	1-1/4	6	1/2	4	BN	+.001/-0.001	P820-200602-1	\$226.60
0.5000	1/2		1/2	1-1/4	6	1/2	4	SE	+.001/-0.001	P820-200603-1	\$226.60
0.5000	1/2		1/2	1-1/4	6	1/2	4	SE-.015CR	+.001/-0.001	P820-200310-1	\$226.60

Mold Maker End Mills US Sizes

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance	Part Number	List Price
Mold Makers With Reach											
0.0156	1/64		0.075	1/8	2-1/2	1/8	2	BN	+.000/-0.0005	P820-200404-1	\$175.10
0.0156	1/64		0.075	1/8	2-1/2	1/8	2	SE	+.000/-0.0005	P820-200403-1	\$164.80
0.0313	1/32		5/32	1/4	2-1/2	1/8	4	BN	+.000/-0.0005	P820-200406-1	\$175.10
0.0313	1/32		5/32	1/4	2-1/2	1/8	4	SE	+.000/-0.0005	P820-200405-1	\$164.80
0.0313	1/32		5/32	1/4	2-1/2	1/8	4	SE-.005CR	+.000/-0.0005	P820-200407-1	\$175.10
0.0469	3/64		15/64	1/2	2-1/2	1/8	4	BN	+.000/-0.0005	P820-200409-1	\$164.80
0.0469	3/64		15/64	1/2	2-1/2	1/8	4	SE	+.000/-0.0005	P820-200408-1	\$154.50
0.0469	3/64		15/64	1/2	2-1/2	1/8	4	SE-.010CR	+.000/-0.0005	P820-200410-1	\$164.80
0.0625	1/16		5/16	1	2-1/2	1/8	4	BN	+.000/-0.0005	P820-200412-1	\$164.80
0.0625	1/16		5/16	1	2-1/2	1/8	4	SE	+.000/-0.0005	P820-200411-1	\$154.50
0.0625	1/16		5/16	1	2-1/2	1/8	4	SE-.010CR	+.000/-0.0005	P820-200413-1	\$164.80
0.0938	3/32		15/32	1	2-1/2	1/8	4	BN	+.000/-0.0005	P820-200415-1	\$164.80
0.0938	3/32		15/32	1	2-1/2	1/8	4	SE	+.000/-0.0005	P820-200414-1	\$154.50
0.0938	3/32		15/32	1	2-1/2	1/8	4	SE-.015CR	+.000/-0.0005	P820-200416-1	\$164.80
0.0938	3/32		15/32	1	2-1/2	1/8	4	SE-.020CR	+.000/-0.0005	P820-200417-1	\$164.80
0.1250	1/8		5/8	1-1/4	3	1/8	4	BN	+.000/-0.0005	P820-200419-1	\$175.10
0.1250	1/8		5/8	1-1/4	3	1/8	4	SE	+.000/-0.0005	P820-200418-1	\$164.80
0.1250	1/8		5/8	1-1/4	3	1/8	4	SE-.015CR	+.000/-0.0005	P820-200420-1	\$175.10
0.1250	1/8		5/8	1-1/4	3	1/8	4	SE-.020CR	+.000/-0.0005	P820-200421-1	\$175.10
0.1250	1/8		5/8	1-1/4	3	1/8	4	SE-.030CR	+.000/-0.0005	P820-200422-1	\$175.10
0.1875	3/16		15/16	1-1/2	3	3/16	4	BN	+.000/-0.001	P820-200424-1	\$195.70

Mold Maker End Mills US Sizes

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance	Part Number	List Price
0.1875	3/16	15/16	1-1/2	3	3/16	4	SE	+ .000/- .001	P820-200423-1	\$185.40	
0.1875	3/16	15/16	1-1/2	3	3/16	4	SE-.030CR	+ .000/- .001	P820-200425-1	\$195.70	
0.2500	1/4	1-1/4	2-1/2	4	1/4	4	BN	+ .000/- .001	P820-200427-1	\$216.30	
0.2500	1/4	1-1/4	2-1/2	4	1/4	4	SE	+ .000/- .001	P820-200426-1	\$195.70	
0.2500	1/4	1-1/4	2-1/2	4	1/4	4	SE-.015CR	+ .000/- .001	P820-200428-1	\$216.30	
0.2500	1/4	1-1/4	2-1/2	4	1/4	4	SE-.020CR	+ .000/- .001	P820-200429-1	\$216.30	
0.2500	1/4	1-1/4	2-1/2	4	1/4	4	SE-.030CR	+ .000/- .001	P820-200430-1	\$216.30	
0.2500	1/4	1-1/4	2-1/2	4	1/4	4	SE-.060CR	+ .000/- .001	P820-200431-1	\$216.30	

Mold Makers Without Reach

0.0156	1/64	0.075		2-1/2	1/8	2	BN	+ .000/- .0005	P820-200684-1	\$175.10
0.0156	1/64	0.075		2-1/2	1/8	2	SE	+ .000/- .0005	P820-200683-1	\$164.80
0.0313	1/32	5/32		2-1/2	1/8	4	BN	+ .000/- .0005	P820-200686-1	\$175.10
0.0313	1/32	5/32		2-1/2	1/8	4	SE	+ .000/- .0005	P820-200685-1	\$164.80
0.0313	1/32	5/32		2-1/2	1/8	4	SE-.005CR	+ .000/- .0005	P820-200687-1	\$175.10
0.0469	3/64	15/64		2-1/2	1/8	4	BN	+ .000/- .0005	P820-200689-1	\$164.80
0.0469	3/64	15/64		2-1/2	1/8	4	SE	+ .000/- .0005	P820-200688-1	\$154.50
0.0469	3/64	15/64		2-1/2	1/8	4	SE-.010CR	+ .000/- .0005	P820-200690-1	\$164.80
0.0625	1/16	5/16		2-1/2	1/8	4	BN	+ .000/- .0005	P820-200692-1	\$164.80
0.0625	1/16	5/16		2-1/2	1/8	4	SE	+ .000/- .0005	P820-200691-1	\$154.50
0.0625	1/16	5/16		2-1/2	1/8	4	SE-.010CR	+ .000/- .0005	P820-200693-1	\$164.80
0.0938	3/32	15/32		2-1/2	1/8	4	BN	+ .000/- .0005	P820-200695-1	\$164.80
0.0938	3/32	15/32		2-1/2	1/8	4	SE	+ .000/- .0005	P820-200694-1	\$154.50
0.0938	3/32	15/32		2-1/2	1/8	4	SE-.015CR	+ .000/- .0005	P820-200696-1	\$164.80
0.0938	3/32	15/32		2-1/2	1/8	4	SE-.020CR	+ .000/- .0005	P820-200697-1	\$164.80
0.1250	1/8	5/8		3	1/8	4	BN	+ .000/- .0005	P820-200699-1	\$175.10
0.1250	1/8	5/8		3	1/8	4	SE	+ .000/- .0005	P820-200698-1	\$164.80
0.1250	1/8	5/8		3	1/8	4	SE-.015CR	+ .000/- .0005	P820-200700-1	\$175.10
0.1250	1/8	5/8		3	1/8	4	SE-.020CR	+ .000/- .0005	P820-200701-1	\$175.10
0.1250	1/8	5/8		3	1/8	4	SE-.030CR	+ .000/- .0005	P820-200702-1	\$175.10
0.1875	3/16	15/16		3	3/16	4	BN	+ .000/- .001	P820-200704-1	\$195.70
0.1875	3/16	15/16		3	3/16	4	SE	+ .000/- .001	P820-200703-1	\$185.40
0.1875	3/16	15/16		3	3/16	4	SE-.030CR	+ .000/- .001	P820-200705-1	\$195.70
0.2500	1/4	1-1/4		4	1/4	4	BN	+ .000/- .001	P820-200707-1	\$216.30
0.2500	1/4	1-1/4		4	1/4	4	SE	+ .000/- .001	P820-200706-1	\$195.70
0.2500	1/4	1-1/4		4	1/4	4	SE-.015CR	+ .000/- .001	P820-200708-1	\$216.30
0.2500	1/4	1-1/4		4	1/4	4	SE-.020CR	+ .000/- .001	P820-200709-1	\$216.30
0.2500	1/4	1-1/4		4	1/4	4	SE-.030CR	+ .000/- .001	P820-200710-1	\$216.30
0.2500	1/4	1-1/4		4	1/4	4	SE-.060CR	+ .000/- .001	P820-200711-1	\$216.30
0.3750	3/8	1-1/2		6	3/8	4	BN	+ .000/- .001	P820-200713-1	\$288.40
0.3750	3/8	1-1/2		6	3/8	4	SE	+ .000/- .001	P820-200712-1	\$267.80
0.3750	3/8	1-1/2		6	3/8	4	SE-.015CR	+ .000/- .001	P820-200714-1	\$288.40
0.3750	3/8	1-1/2		6	3/8	4	SE-.030CR	+ .000/- .001	P820-200715-1	\$288.40
0.3750	3/8	1-1/2		6	3/8	4	SE-.060CR	+ .000/- .001	P820-200716-1	\$288.40
0.5000	1/2	1-1/2		6	1/2	4	BN	+ .000/- .001	P820-200718-1	\$350.20
0.5000	1/2	1-1/2		6	1/2	4	SE	+ .000/- .001	P820-200717-1	\$339.90
0.5000	1/2	1-1/2		6	1/2	4	SE-.015CR	+ .000/- .001	P820-200719-1	\$350.20
0.5000	1/2	1-1/2		6	1/2	4	SE-.030CR	+ .000/- .001	P820-200720-1	\$350.20
0.5000	1/2	1-1/2		6	1/2	4	SE-.060CR	+ .000/- .001	P820-200721-1	\$350.20

Mold Maker End Mills Metric Sizes

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance +0.XXXX/-0.XXXX	Part Number	List Price
Metric Mold Makers With Reach											
0.0197		0.5mm	2.5mm	3mm	62mm	3mm	2	BN	+.000mm/-0.013mm	P820-200338-1	\$175.10
0.0197		0.5mm	2.5mm	3mm	62mm	3mm	2	SE	+.000mm/-0.013mm	P820-200337-1	\$164.80
0.0394		1mm	5mm	12mm	62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200340-1	\$175.10
0.0394		1mm	5mm	12mm	62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200339-1	\$164.80
0.0591		1.5mm	7.5mm	25mm	62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200342-1	\$164.80
0.0591		1.5mm	7.5mm	25mm	62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200341-1	\$154.50
0.0787		2mm	10mm	25mm	62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200344-1	\$164.80
0.0787		2mm	10mm	25mm	62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200343-1	\$154.50
0.1181		3mm	15mm	30mm	62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200346-1	\$164.80
0.1181		3mm	15mm	30mm	62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200345-1	\$154.50
0.1575		4mm	20mm	40mm	75mm	4mm	4	BN	+.000mm/-0.025mm	P820-200348-1	\$175.10
0.1575		4mm	20mm	40mm	75mm	4mm	4	SE	+.000mm/-0.025mm	P820-200347-1	\$164.80
0.2362		6mm	24mm	50mm	75mm	6mm	4	BN	+.000mm/-0.025mm	P820-200350-1	\$206.00
0.2362		6mm	24mm	50mm	75mm	6mm	4	SE	+.000mm/-0.025mm	P820-200349-1	\$195.70
Metric Mold Makers Without Reach											
0.0197		0.5mm	2.5mm		62mm	3mm	2	BN	+.000mm/-0.013mm	P820-200670-1	\$175.10
0.0197		0.5mm	2.5mm		62mm	3mm	2	SE	+.000mm/-0.013mm	P820-200669-1	\$164.80
0.0394		1mm	5mm		62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200672-1	\$175.10
0.0394		1mm	5mm		62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200671-1	\$164.80
0.0591		1.5mm	7.5mm		62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200674-1	\$164.80
0.0591		1.5mm	7.5mm		62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200673-1	\$154.50
0.0787		2mm	10mm		62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200676-1	\$164.80
0.0787		2mm	10mm		62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200675-1	\$154.50
0.1181		3mm	15mm		62mm	3mm	4	BN	+.000mm/-0.013mm	P820-200678-1	\$164.80
0.1181		3mm	15mm		62mm	3mm	4	SE	+.000mm/-0.013mm	P820-200677-1	\$154.50
0.1575		4mm	20mm		75mm	4mm	4	BN	+.000mm/-0.025mm	P820-200680-1	\$175.10
0.1575		4mm	20mm		75mm	4mm	4	SE	+.000mm/-0.025mm	P820-200679-1	\$164.80
0.2362		6mm	24mm		75mm	6mm	4	BN	+.000mm/-0.025mm	P820-200682-1	\$206.00
0.2362		6mm	24mm		75mm	6mm	4	SE	+.000mm/-0.025mm	P820-200681-1	\$195.70

Deep Cavity Mold Maker End Mills

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance +0.XXXX/-0.XXXX	Part Number	List Price
0.0197		0.5mm	2.5mm	15mm	2-1/2	1/8	2	SE	+.000mm/-0.013mm	P820-200921-1	\$169.95
0.0197		0.5mm	2.5mm	15mm	2-1/2	1/8	2	BN	+.000mm/-0.013mm	P820-200922-1	\$180.25
0.0394		1mm	6.3mm	19mm	2-1/2	1/8	4	SE	+.000mm/-0.013mm	P820-200927-1	\$169.95
0.0394		1mm	6.3mm	19mm	2-1/2	1/8	4	BN	+.000mm/-0.013mm	P820-200928-1	\$180.25
0.0156	1/64		0.075	0.575	2-1/2	1/8	2	SE	+.000/-0.0005	P820-200919-1	\$169.95
0.0156	1/64		0.075	0.575	2-1/2	1/8	2	BN	+.000/-0.0005	P820-200920-1	\$180.25
0.0313	1/32		0.150	0.650	2-1/2	1/8	4	SE	+.000/-0.0005	P820-200923-1	\$169.95
0.0313	1/32		0.150	0.650	2-1/2	1/8	4	BN	+.000/-0.0005	P820-200924-1	\$180.25
0.0313	1/32		0.250	0.750	2-1/2	1/8	4	SE	+.000/-0.0005	P820-200925-1	\$169.95
0.0313	1/32		0.250	0.750	2-1/2	1/8	4	BN	+.000/-0.0005	P820-200926-1	\$180.25
0.0469	3/64		0.250	0.750	2-1/2	1/8	4	SE	+.000/-0.0005	P820-200929-1	\$159.65
0.0469	3/64		0.250	0.750	2-1/2	1/8	4	BN	+.000/-0.0005	P820-200930-1	\$169.95

Big Shank Tools

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance +0.XXXX/-0.XXXX	Part Number	List Price
0.0157		0.4mm	2mm		62mm	6mm	2	BN	+ .010mm/- .000mm	P820-200745-1	\$195.70
0.0157		0.4mm	2mm		62mm	6mm	2	SE	+ .010mm/- .000mm	P820-200744-1	\$185.40
0.0197		0.5mm	2.5mm		62mm	6mm	2	BN	+ .010mm/- .000mm	P820-200733-1	\$195.70
0.0197		0.5mm	2.5mm		62mm	6mm	2	SE	+ .010mm/- .000mm	P820-200746-1	\$185.40
0.0236		0.6mm	3mm		63mm	6mm	2	BN	+ .010mm/- .000mm	P820-200784-1	\$195.70
0.0236		0.6mm	3mm		63mm	6mm	2	SE	+ .010mm/- .000mm	P820-200785-1	\$185.40
0.0315		0.8mm	5mm	7mm	50mm	6mm	4	BN	+ .010mm/- .000mm	P820-200734-1	\$195.70
0.0315		0.8mm	5mm	7mm	50mm	6mm	4	SE	+ .010mm/- .000mm	P820-200783-1	\$185.40
0.0394		1mm	5mm	7mm	50mm	6mm	4	BN	+ .010mm/- .000mm	P820-200768-1	\$195.70
0.0394		1mm	5mm	7mm	50mm	6mm	4	SE	+ .010mm/- .000mm	P820-200747-1	\$185.40
0.0787		2mm	8mm		50mm	6mm	4	BN	+ .010mm/- .000mm	P820-200749-1	\$185.40
0.0787		2mm	8mm		50mm	6mm	4	SE	+ .010mm/- .000mm	P820-200748-1	\$175.10
0.1181		3mm	12mm		50mm	6mm	4	BN	+ .010mm/- .000mm	P820-200769-1	\$185.40
0.1181		3mm	12mm		50mm	6mm	4	SE	+ .010mm/- .000mm	P820-200770-1	\$175.10
0.1575		4mm	14mm		50mm	6mm	4	BN	+ .010mm/- .000mm	P820-200737-1	\$195.70
0.1575		4mm	14mm		50mm	6mm	4	SE	+ .010mm/- .000mm	P820-200771-1	\$185.40
0.2362		6mm	14mm		57mm	6mm	4	BN	+ .010mm/- .010mm	P820-200772-1	\$226.60
0.2362		6mm	14mm		57mm	6mm	4	SE	+ .010mm/- .010mm	P820-200773-1	\$216.30
0.3150		8mm	18mm		63mm	8mm	4	BN	+ .025mm/- .050mm	P820-200574-1	\$206.00
0.3150		8mm	18mm		63mm	8mm	4	SE	+ .025mm/- .050mm	P820-200573-1	\$195.70
0.3937		10mm	10mm	25mm	63mm	10mm	4	BN	+ .025mm/- .050mm	P820-200786-1	\$226.60
0.3937		10mm	10mm	25mm	63mm	10mm	4	SE	+ .025mm/- .050mm	P820-200575-1	\$216.30

ThunderBolt Tools

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Cutting DIA Tolerance +0.XXXX/-0.XXXX	Part Number	List Price
0.0625	1/16		1/16	5/16	3	1/16	4	BN	+ .001/- .001	P47-100001-1	\$47.25
0.0625	1/16		1/16	5/16	3	1/16	4	SE	+ .001/- .001	P47-100006-1	\$47.25
0.0935	3/32		3/32	11/32	3	3/32	4	BN	+ .001/- .001	P47-100002-1	\$47.25
0.0935	3/32		3/32	11/32	3	3/32	4	SE	+ .001/- .001	P47-100007-1	\$47.25
0.1250	1/8		1/8	5/8	3	1/8	4	BN	+ .001/- .001	P47-100003-1	\$52.50
0.1250	1/8		1/8	5/8	3	1/8	4	SE	+ .001/- .001	P47-100008-1	\$52.50
0.1250	1/8		1/8	5/8	3	1/8	4	SE, .015CR	+ .001/- .001	P47-100009-1	\$52.50
0.1250	1/8		1/8	5/8	3	1/8	4	SE, .031CR	+ .001/- .001	P47-100010-1	\$52.50
0.1875	3/16		3/16	11/16	3	3/16	4	BN	+ .001/- .001	P47-100004-1	\$56.70
0.1875	3/16		3/16	11/16	3	3/16	4	SE	+ .001/- .001	P47-100011-1	\$56.70
0.1875	3/16		3/16	11/16	3	3/16	4	SE, .062CR	+ .001/- .001	P47-100012-1	\$56.70
0.2500	1/4		1/4	3/4	4	1/4	4	BN	+ .001/- .001	P47-100005-1	\$57.75
0.2500	1/4		1/4	3/4	4	1/4	4	SE	+ .001/- .001	P47-100013-1	\$57.75
0.2500	1/4		1/4	3/4	4	1/4	4	SE, .015CR	+ .001/- .001	P47-100014-1	\$57.75
0.2500	1/4		1/4	3/4	4	1/4	4	SE, .031CR	+ .001/- .001	P47-100015-1	\$57.75
0.2500	1/4		1/4	3/4	4	1/4	4	SE, .062CR	+ .001/- .001	P47-100016-1	\$57.75
0.0313	1/32		3/32		1-1/2	1/8	4	SE	+ .001/- .001	P47-100017-1	\$31.50
0.0313	1/32		3/32		1-1/2	1/8	4	BN	+ .001/- .001	P47-100018-1	\$31.50
0.0625	1/16		1/4	*	1-1/2	1/8	4	SE	+ .001/- .001	P47-100019-1	\$36.75
0.0625	1/16		1/4	*	1-1/2	1/8	4	BN	+ .001/- .001	P47-100020-1	\$36.75
0.0935	3/32		3/8	*	1-1/2	1/8	4	SE	+ .001/- .001	P47-100021-1	\$36.75
0.0935	3/32		3/8	*	1-1/2	1/8	4	BN	+ .001/- .001	P47-100022-1	\$36.75
0.1250	1/8		1/2	*	1-1/2	1/8	4	SE	+ .001/- .001	P47-100023-1	\$42.00
0.1250	1/8		1/2	*	1-1/2	1/8	4	BN	+ .001/- .001	P47-100024-1	\$42.00
0.1875	3/16		5/8	*	2	3/16	4	SE	+ .001/- .001	P47-100025-1	\$47.25
0.1875	3/16		5/8	*	2	3/16	4	BN	+ .001/- .001	P47-100026-1	\$47.25
0.2500	1/4		3/4	*	2-1/2	1/4	4	SE	+ .001/- .001	P47-100027-1	\$52.50
0.2500	1/4		3/4	*	2-1/2	1/4	4	BN	+ .001/- .001	P47-100028-1	\$52.50

*Tools coated 1X Diameter

Standard End Mills

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance +0.XXXX/-0.XXXX	Part Number	List Price
Standard Length											
0.0313	1/32		3/32		1-1/2	1/8	4	SE	+.0005/-0.0010	P820-200219-1	\$92.70
0.0313	1/32		3/32		1-1/2	1/8	4	BN	+.0005/-0.0010	P820-200202-1	\$103.00
0.0625	1/16		1/4		1-1/2	1/8	4	SE	+.0005/-0.0010	P820-200492-1	\$97.85
0.0625	1/16		1/4		1-1/2	1/8	4	BN	+.0005/-0.0010	P820-200646-1	\$108.15
0.0938	3/32		3/8		1-1/2	1/8	4	SE	+.0005/-0.0010	P820-200002-1	\$97.85
0.0938	3/32		3/8		1-1/2	1/8	4	BN	+.0005/-0.0010	P820-200004-1	\$108.15
0.1250	1/8		1/2		1-1/2	1/8	4	SE	+.0005/-0.0010	P820-200006-1	\$113.30
0.1250	1/8		1/2		1-1/2	1/8	4	BN	+.0005/-0.0010	P820-200008-1	\$128.75
0.1875	3/16		5/8		2	3/16	4	SE	+.0005/-0.0010	P820-200014-1	\$139.05
0.1875	3/16		5/8		2	3/16	4	BN	+.0005/-0.0010	P820-200016-1	\$154.50
0.2500	1/4		3/4		2-1/2	1/4	4	SE	+.0005/-0.0010	P820-200022-1	\$149.35
0.2500	1/4		3/4		2-1/2	1/4	4	BN	+.0005/-0.0010	P820-200024-1	\$164.80
0.3125	5/16		13/16		2-1/2	5/16	4	SE	+.0005/-0.0010	P820-200030-1	\$164.80
0.3125	5/16		13/16		2-1/2	5/16	4	BN	+.0005/-0.0010	P820-200032-1	\$175.10
0.3750	3/8		7/8		2-1/2	3/8	4	SE	+.0005/-0.0010	P820-200038-1	\$180.25
0.3750	3/8		7/8		2-1/2	3/8	4	BN	+.0005/-0.0010	P820-200040-1	\$195.70
0.4375	7/16		1		2-3/4	7/16	4	SE	+.0005/-0.0010	P820-200046-1	\$216.30
0.4375	7/16		1		2-3/4	7/16	4	BN	+.0005/-0.0010	P820-200048-1	\$231.75
0.5000	1/2		1		3	1/2	4	SE	+.0005/-0.0010	P820-200054-1	\$231.75
0.5000	1/2		1		3	1/2	4	BN	+.0005/-0.0010	P820-200056-1	\$247.20
Long Standard											
0.1250	1/8		1		3	1/8	4	SE	+.0005/-0.0010	P820-200010-1	\$149.35
0.1250	1/8		1		3	1/8	4	BN	+.0005/-0.0010	P820-200012-1	\$169.95
0.1875	3/16		1-1/8		3	3/16	4	SE	+.0005/-0.0010	P820-200018-1	\$159.65
0.1875	3/16		1-1/8		3	3/16	4	BN	+.0005/-0.0010	P820-200020-1	\$175.10
0.2500	1/4		1-1/4		3	1/4	4	SE	+.0005/-0.0010	P820-200026-1	\$190.55
0.2500	1/4		1-1/4		3	1/4	4	BN	+.0005/-0.0010	P820-200028-1	\$206.00
0.3125	5/16		1-3/8		3-1/8	5/16	4	SE	+.0005/-0.0010	P820-200034-1	\$195.70
0.3125	5/16		1-3/8		3-1/8	5/16	4	BN	+.0005/-0.0010	P820-200036-1	\$211.15
0.3750	3/8		1-1/2		4	3/8	4	SE	+.0005/-0.0010	P820-200722-1	\$221.45
0.3750	3/8		1-1/2		4	3/8	4	BN	+.0005/-0.0010	P820-200094-1	\$231.75
0.5000	1/2		2		4	1/2	4	SE	+.0005/-0.0010	P820-200058-1	\$288.40
0.5000	1/2		2		4	1/2	4	BN	+.0005/-0.0010	P820-200060-1	\$319.30
Extra Long Standard											
0.2500	1/4		2		4	1/4	4	BN	+.0005/-0.0010	P820-200539-1	\$221.45
0.2500	1/4		2		4	1/4	4	SE	+.0005/-0.0010	P820-200277-1	\$206.00
0.5000	1/2		3		6	1/2	4	BN	+.0005/-0.0010	P820-200205-1	\$339.90
0.5000	1/2		3		6	1/2	4	SE	+.0005/-0.0010	P820-200195-1	\$324.45

Standard End Mills Metric Sizes

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance +0.XXXX/-0.XXXX	Part Number	List Price
0.0787		2mm	8mm		38mm	3mm	2	BN	+.013mm/-0.025mm	P820-200659-1	\$113.30
0.0787		2mm	8mm		38mm	3mm	2	SE	+.013mm/-0.025mm	P820-200723-1	\$103.00
0.1181		3mm	12mm		38mm	3mm	2	BN	+.013mm/-0.025mm	P820-200661-1	\$144.20
0.1181		3mm	12mm		38mm	3mm	2	SE	+.013mm/-0.025mm	P820-200660-1	\$133.90
0.1575		4mm	12mm		50mm	4mm	2	BN	+.013mm/-0.025mm	P820-200663-1	\$149.35
0.1575		4mm	12mm		50mm	4mm	2	SE	+.013mm/-0.025mm	P820-200662-1	\$139.05
0.1968		5mm	14mm		50mm	5mm	2	BN	+.013mm/-0.025mm	P820-200665-1	\$159.65
0.1968		5mm	14mm		50mm	5mm	2	SE	+.013mm/-0.025mm	P820-200664-1	\$149.35
0.2362		6mm	14mm		57mm	6mm	2	BN	+.013mm/-0.025mm	P820-200239-1	\$169.95
0.2362		6mm	14mm		57mm	6mm	2	SE	+.013mm/-0.025mm	P820-200666-1	\$159.65
0.3150		8mm	16mm		63mm	8mm	2	BN	+.013mm/-0.025mm	P820-200667-1	\$185.40
0.3150		8mm	16mm		63mm	8mm	2	SE	+.013mm/-0.025mm	P820-200522-1	\$175.10
0.3937		10mm	20mm		72mm	10mm	2	BN	+.013mm/-0.025mm	P820-200526-1	\$200.85
0.3937		10mm	20mm		72mm	10mm	2	SE	+.013mm/-0.025mm	P820-200668-1	\$190.55
0.4724		12mm	25mm		83mm	12mm	2	BN	+.013mm/-0.025mm	P820-200525-1	\$278.10
0.4724		12mm	25mm		83mm	12mm	2	SE	+.013mm/-0.025mm	P820-200523-1	\$267.80

Center Drills (Only one end coated)

Tool Number	Drill Size	Body Size	Angle	OAL	Part Number	List Price
#00	0.025	1/8	60°	11/2	P810-100200-1	\$123.60
#0	1/32	1/8	60°	11/2	P810-100071-1	\$123.60
#1	3/64	1/8	60°	11/2	P810-100072-1	\$123.60
#2	5/64	3/16	60°	2	P810-100073-1	\$144.20
#3	7/64	1/4	60°	2	P810-100074-1	\$154.50
#4	1/8	5/16	60°	21/8	P810-100075-1	\$164.80
#5	3/16	7/16	60°	2.75	P810-100240-1	\$190.55

Drills

Decimal Equivalent	Tolerance from Nominal		Fractional	Wire & Letter	Metric	Flute Length	OAL	Type/Point	Part Number	List Price
	Minimum	Maximum								
0.0280	-0.0003	0.0005		70		5/16	1-1/4	4FCT	P810-100070-1	\$103.00
0.0292	-0.0003	0.0005		69		5/16	1-1/4	4FCT	P810-100069-1	\$103.00
0.0310	-0.0003	0.0005		68		5/16	1-1/4	4FCT	P810-100068-1	\$103.00
0.0312	-0.0003	0.0005	1/32			5/16	1-1/4	4FCT	P810-100180-1	\$103.00
0.0320	-0.0003	0.0005		67		5/16	1-1/4	4FCT	P810-100067-1	\$103.00
0.0330	-0.0003	0.0005		66		5/16	1-1/4	4FCT	P810-100066-1	\$103.00
0.0350	-0.0003	0.0005		65		5/8	1-1/2	4FCT	P810-100065-1	\$103.00
0.0360	-0.0003	0.0005		64		5/8	1-1/2	4FCT	P810-100064-1	\$103.00
0.0370	-0.0003	0.0005		63		5/8	1-1/2	4FCT	P810-100063-1	\$103.00
0.0380	-0.0003	0.0005		62		5/8	1-1/2	4FCT	P810-100062-1	\$103.00
0.0390	-0.0003	0.0005		61		5/8	1-1/2	4FCT	P810-100061-1	\$103.00
0.0394	-0.0003	0.0005			1.00	5/8	1-1/2	4FCT	P810-100037-1	\$103.00
0.0400	-0.0003	0.0005		60		3/4	1-1/2	4FCT	P810-100060-1	\$103.00
0.0410	-0.0001	0.0006		59		3/4	1-1/2	4FCT	P810-100059-1	\$103.00
0.0420	-0.0001	0.0006		58		3/4	1-1/2	4FCT	P810-100058-1	\$103.00
0.0430	-0.0001	0.0006		57		3/4	1-1/2	4FCT	P810-100057-1	\$103.00
0.0465	-0.0001	0.0006		56		3/4	1-1/2	4FCT	P810-100056-1	\$103.00
0.0469	-0.0001	0.0006	3/64			3/4	1-1/2	4FCT	P810-100181-1	\$103.00
0.0520	-0.0001	0.0006		55		3/4	1-1/2	4FCT	P810-100055-1	\$103.00
0.0550	-0.0001	0.0006		54		3/4	1-1/2	4FCT	P810-100054-1	\$103.00
0.0591	-0.0001	0.0006			1.50	3/4	1-1/2	4FCT	P810-100038-1	\$103.00
0.0595	-0.0001	0.0006		53		3/4	1-1/2	4FCT	P810-100053-1	\$103.00
0.0625	-0.0001	0.0006	1/16			3/4	1-1/2	4FCT	P810-100023-1	\$103.00
0.0635	-0.0001	0.0006		52		3/4	1-1/2	4FCT	P810-100052-1	\$103.00
0.0670	-0.0001	0.0006		51		3/4	1-1/2	4FCT	P810-100051-1	\$103.00
0.0700	-0.0001	0.0006		50		7/8	1-3/4	4FCT	P810-100050-1	\$103.00
0.0730	-0.0001	0.0006		49		7/8	1-3/4	4FCT	P810-100049-1	\$103.00
0.0760	-0.0001	0.0006		48		7/8	1-3/4	4FCT	P810-100048-1	\$103.00
0.0781	-0.0001	0.0006	5/64			7/8	1-3/4	4FCT	P810-100182-1	\$103.00
0.0785	-0.0001	0.0006		47		7/8	1-3/4	4FCT	P810-100039-1	\$103.00
0.0787	-0.0001	0.0006			2.00	7/8	1-3/4	4FCT	P810-100040-1	\$103.00
0.0810	-0.0001	0.0006		46		7/8	1-3/4	4FCT	P810-100041-1	\$103.00
0.0820	-0.0001	0.0006		45		7/8	1-3/4	4FCT	P810-100042-1	\$103.00
0.0860	-0.0001	0.0006		44		1	2	4FCT	P810-100043-1	\$103.00
0.0890	-0.0001	0.0006		43		1	2	4FCT	P810-100044-1	\$103.00
0.0935	-0.0001	0.0006		42		1	2	4FCT	P810-100045-1	\$103.00
0.0938	-0.0001	0.0006	3/32			1	2	4FCT	P810-100016-1	\$103.00
0.0960	-0.0001	0.0006		41		1	2	4FCT	P810-100046-1	\$103.00
0.0980	-0.0001	0.0006		40		1	2	4FCT	P810-100076-1	\$103.00
0.0984	-0.0001	0.0006			2.50	1	2	4FCT	P810-100077-1	\$103.00
0.0995	-0.0001	0.0006		39		1-1/4	2-1/4	4FCT	P810-100078-1	\$103.00
0.1015	0.0001	0.0010		38		1-1/4	2-1/4	4FCT	P810-100079-1	\$103.00
0.1040	0.0001	0.0010		37		1-1/4	2-1/4	4FCT	P810-100081-1	\$103.00
0.1065	0.0001	0.0010		36		1-1/4	2-1/4	4FCT	P810-100082-1	\$103.00
0.1094	0.0001	0.0010	7/64			1-1/4	2-1/4	4FCT	P810-100083-1	\$103.00
0.1100	0.0001	0.0010		35		1-1/4	2-1/4	4FCT	P810-100084-1	\$103.00
0.1110	0.0001	0.0010		34		1-1/4	2-1/4	4FCT	P810-100085-1	\$103.00
0.1130	0.0001	0.0010		33		1-1/4	2-1/4	4FCT	P810-100086-1	\$103.00
0.1160	0.0001	0.0010		32		1-1/4	2-1/4	4FCT	P810-100087-1	\$103.00
0.1181	0.0001	0.0010			3.00	1-1/4	2-1/4	4FCT	P810-100088-1	\$103.00
0.1200	0.0001	0.0010		31		1-1/4	2-1/4	4FCT	P810-100089-1	\$103.00

Drills

Decimal Equivalent	Tolerance from Nominal		Fractional	Wire & Letter	Metric	Flute Length	OAL	Type/Point	Part Number	List Price
	Minimum	Maximum								
0.1250	0.0001	0.0010	1/8			1-1/4	2-1/4	4FCT	P810-100024-1	\$103.00
0.1285	0.0001	0.0010		30		1-3/8	2-1/2	4FCT	P810-100015-1	\$113.30
0.1360	0.0001	0.0010		29		1-3/8	2-1/2	4FCT	P810-100090-1	\$113.30
0.1378	0.0001	0.0010			3.50	1-3/8	2-1/2	4FCT	P810-100091-1	\$113.30
0.1405	0.0001	0.0010		28		1-3/8	2-1/2	4FCT	P810-100092-1	\$113.30
0.1406	0.0001	0.0010	9/64			1-3/8	2-1/2	4FCT	P810-100006-1	\$113.30
0.1440	0.0001	0.0010		27		1-3/8	2-1/2	4FCT	P810-100093-1	\$113.30
0.1470	0.0001	0.0010		26		1-3/8	2-1/2	4FCT	P810-100094-1	\$113.30
0.1495	0.0001	0.0010		25		1-3/8	2-1/2	4FCT	P810-100095-1	\$113.30
0.1520	0.0001	0.0010		24		1-3/8	2-1/2	4FCT	P810-100096-1	\$113.30
0.1540	0.0001	0.0010		23		1-3/8	2-1/2	4FCT	P810-100097-1	\$113.30
0.1562	0.0001	0.0010	5/32			1-3/8	2-1/2	4FCT	P810-100018-1	\$113.30
0.1570	0.0003	0.0011		22		1-3/8	2-1/2	4FCT	P810-100098-1	\$113.30
0.1575	0.0003	0.0011			4.00	1-3/8	2-1/2	4FCT	P810-100099-1	\$113.30
0.1590	0.0003	0.0011		21		1-3/8	2-1/2	4FCT	P810-100100-1	\$113.30
0.1610	0.0003	0.0011		20		1-3/8	2-1/2	4FCT	P810-100101-1	\$113.30
0.1655	0.0003	0.0011				1	3	4FCT	P810-100020-1	\$113.30
0.1660	0.0003	0.0011		19		1-5/8	2-3/4	4FCT	P810-100102-1	\$113.30
0.1695	0.0003	0.0011		18		1-5/8	2-3/4	4FCT	P810-100103-1	\$113.30
0.1719	0.0003	0.0011	11/64			1-5/8	2-3/4	4FCT	P810-100007-1	\$113.30
0.1730	0.0003	0.0011		17		1-5/8	2-3/4	4FCT	P810-100104-1	\$113.30
0.1770	0.0003	0.0011		16		1-5/8	2-3/4	4FCT	P810-100008-1	\$113.30
0.1772	0.0003	0.0011			4.50	1-5/8	2-3/4	4FCT	P810-100105-1	\$113.30
0.1800	0.0003	0.0011		15		1-5/8	2-3/4	4FCT	P810-100106-1	\$113.30
0.1820	0.0003	0.0011		14		1-5/8	2-3/4	4FCT	P810-100107-1	\$113.30
0.1850	0.0003	0.0011		13		1-5/8	2-3/4	4FCT	P810-100108-1	\$113.30
0.1875	0.0003	0.0011	3/16			1-5/8	2-3/4	4FCT	P810-100027-1	\$113.30
0.1890	0.0003	0.0011		12		1-5/8	2-3/4	4FCT	P810-100109-1	\$123.60
0.1910	0.0003	0.0011		11		1-5/8	2-3/4	4FCT	P810-100110-1	\$123.60
0.1915	0.0003	0.0011				1	3	4FCT	P810-100021-1	\$123.60
0.1935	0.0003	0.0011		10		15/8	2-3/4	4FCT	P810-100111-1	\$123.60
0.1960	0.0003	0.0011		9		1-3/4	3	4FCT	P810-100112-1	\$123.60
0.1968	0.0003	0.0011			5.00	1-3/4	3	4FCT	P810-100113-1	\$123.60
0.1990	0.0003	0.0011		8		1-3/4	3	4FCT	P810-100114-1	\$123.60
0.2010	0.0003	0.0011		7		1-3/4	3	4FCT	P810-100009-1	\$123.60
0.2031	0.0003	0.0011	13/64			1-3/4	3	4FCT	P810-100019-1	\$123.60
0.2040	0.0003	0.0011		6		1-3/4	3	4FCT	P810-100115-1	\$123.60
0.2055	0.0003	0.0011		5		1-3/4	3	4FCT	P810-100116-1	\$123.60
0.2090	0.0003	0.0011		4		1-3/4	3	4FCT	P810-100117-1	\$123.60
0.2130	0.0003	0.0011		3		1-3/4	3	4FCT	P810-100118-1	\$123.60
0.2165	0.0003	0.0011			5.50	1-3/4	3	4FCT	P810-100119-1	\$123.60
0.2188	0.0003	0.0011	7/32			1-3/4	3	4FCT	P810-100026-1	\$123.60
0.2210	0.0006	0.0016		2		1-3/4	3	4FCT	P810-100120-1	\$123.60
0.2280	0.0006	0.0016		1		1-3/4	3	4FCT	P810-100121-1	\$123.60
0.2340	0.0006	0.0016		A		2	3-1/4	4FCT	P810-100122-1	\$123.60
0.2344	0.0006	0.0016	15/64			2	3-1/4	4FCT	P810-100010-1	\$123.60
0.2362	0.0006	0.0016			6.00	2	3-1/4	4FCT	P810-100123-1	\$123.60
0.2380	0.0006	0.0016		B		2	3-1/4	4FCT	P810-100124-1	\$123.60
0.2420	0.0006	0.0016		C		2	3-1/4	4FCT	P810-100125-1	\$123.60
0.2460	0.0006	0.0016		D		2	3-1/4	4FCT	P810-100126-1	\$123.60
0.2484	0.0006	0.0016				2-1/4	3-1/4	4FCT	P810-100030-1	\$123.60
0.2500	0.0006	0.0016	1/4	E		2	3-1/4	4FCT	P810-100002-1	\$123.60
0.3125	0.0006	0.0016	5/16			2-3/8	4	4FCT	P810-100142-1	\$139.05
0.3150	0.0006	0.0016			8.00	2-3/8	4	4FCT	P810-100143-1	\$139.05
0.3543	0.0006	0.0016			9.00	2-3/4	4-1/4	4FCT	P810-100151-1	\$159.65
0.3750	0.0006	0.0016	3/8			2-3/4	4-1/4	4FCT	P810-100047-1	\$159.65
0.3937	0.0006	0.0016			10.00	2-7/8	4-1/2	4FCT	P810-100159-1	\$206.00
0.4375	0.0006	0.0016	7/16			2-7/8	4-1/2	4FCT	P810-100017-1	\$231.75
0.4724	0.0006	0.0016			12.00	3	4-3/4	4FCT	P810-100034-1	\$257.50
0.5000	0.0006	0.0016	1/2			3	4-3/4	4FCT	P810-100004-1	\$257.50

Inserts

ANSI Code	ISO Code	Part Number	List Price
ADKT-1505 PDR	ADKT1505 PDR	P830-100551-1	\$56.65
BDR-0500-N-F1-R1-R1/32		P830-100690-1	\$103.00
BDR-1000-N-F1-R1/32		P830-100699-1	\$175.10
CCGT-32.50HP	CCGT09T302HP	P830-100547-1	\$56.65
CCGT-32.51HP	CCGT09T304HP	P830-100558-1	\$56.65
CCGX-431 AL	CCGX120404 AL	P830-100523-1	\$51.50
CCMT-21.50	CCMT060202	P830-100309-1	\$46.35
CCMT-21.51	CCMT060204	P830-100310-1	\$46.35
CCMT-32.50	CCMT09T302	P830-100163-1	\$56.65
CCMT-32.52UM	CCMT09T308	P830-100201-1	\$56.65
CDCD-500		P830-100006-1	\$46.35
CDCD-505		P830-100007-1	\$46.35
CDCD-51		P830-100500-1	\$46.35
CNGA-430	CNGA120402	P830-100009-1	\$61.80
CNMG-431	CNMG120404	P830-100491-1	\$66.95
CNMG-432	CNMG120408	P830-100012-1	\$66.95
CNMP-431	CNMP120404	P830-100013-1	\$66.95
CNMP-432	CNMP120408	P830-100014-1	\$66.95
CPG-421	CPGN120304	P830-100017-1	\$66.95
CPG-422	CPGN120308	P830-100018-1	\$66.95
CPGT-32.52	CPGT09T308	P830-100091-1	\$61.80
CPGW-21.51	CPGW060204	P830-100253-1	\$51.50
CPGW-32.51	CPGW09T304	P830-100420-1	\$61.80
DCGT-32.51HP	DCGT11T304HP	P830-100559-1	\$61.80
DCMT-32.51	DCMT11T304	P830-100170-1	\$61.80
DDGB-522	DDGB190308	P830-100722-1	\$82.40
DNMG-431	DNMG150404	P830-100211-1	\$72.10
DNMG-432	DNMG150408	P830-100374-1	\$72.10
DNMP-431	DNMP150402	P830-100027-1	\$72.10
DPG-432	DPG150408	P830-100279-1	\$72.10
DPG-532	DPG190408	P830-100495-1	\$92.70
DPGT-21.51	DPGT070204	P830-100429-1	\$51.50
FLGD 3062R		P830-100628-1	\$56.65
DPGT-32.52	DPGT11T308	P830-100347-1	\$61.80
FLGD-3125L		P830-100400-1	\$56.65
FLGD-3125R		P830-100401-1	\$56.65
FLRD-3031L		P830-100599-1	\$56.65
FLRD-3031R		P830-100600-1	\$56.65
GFN-2J (.079 wide, .006 CR)		P830-100501-1	\$51.50
GFN-3		P830-100605-1	\$46.35
N151.2-300-30-4P		P830-100597-1	\$56.65
N151.2-400-40-4P		P830-100596-1	\$56.65
N151.4-600-40-AL		P830-100595-1	\$56.65
NG-2062L		P830-100436-1	\$56.65
NG-2062R		P830-100031-1	\$56.65
NG-2062RK		P830-100254-1	\$56.65
NG-3094R		P830-100236-1	\$72.10
NPGR-51L		P830-100032-1	\$61.80
NPL-51		P830-100438-1	\$61.80
NT-3R		P830-100521-1	\$61.80
R290.90-150420M-WM		P830-100103-1	\$61.80
RCGX-10T3MO-AL	RCGX-10T3MO-AL	P830-100505-1	\$61.80
RCHT-130400KL	RCHT130400KL	P830-100588-1	\$72.10
RCHT-190600-KL	RCHT190600-KL	P830-100598-1	\$92.70
RCMT-0803MO-100	RCMT0803MO-100	P830-100607-1	\$51.50
RD-6P	RXGB090300	P830-100224-1	\$56.65
RD-8P	RXGB120300	P830-100040-1	\$66.95
RD-10P	RXGB150300	P830-100153-1	\$82.40
RD-12P	RXGB190400	P830-100396-1	\$82.40
RD-16P	RXGB250600	P830-100196-1	\$113.30
RFG-21F (1/4IC)		P830-100650-1	\$46.35
RFG-21F (5/16IC)		P830-100399-1	\$51.50
RNG-42	RNGN120300	P830-100042-1	\$66.95
RNMG-43	RNMG120400	P830-100044-1	\$66.95
SD-421P		P830-100652-1	\$66.95
SD-531P		P830-100576-1	\$77.25
SPG-1242	SPGN370608	P830-100584-1	\$206.00

ANSI Code	ISO Code	Part Number	List Price
SPG-322	SPGN090308	P830-100063-1	\$56.65
SPG-420	SPGN120302	P830-100240-1	\$66.95
SPG-422	SPGN120308	P830-100064-1	\$66.95
SPG-424	SPGN120316	P830-100065-1	\$66.95
SPG-428	SPGN120332	P830-100162-1	\$66.95
SPG-632	SPGN190408	P830-100343-1	\$92.70
SPG-633	SPGN190412	P830-100386-1	\$92.70
SPG-634	SPGN190416	P830-100175-1	\$92.70
SPG-842	SPGN250608	P830-100583-1	\$123.60
SPGB-432	SPGB120408	P830-100385-1	\$72.10
SPMR-322	SPMR090308	P830-100620-1	\$51.50
SPMT-432-WH	SPMT120408WH	P830-100244-1	\$72.10
TCGW-32.52	TCGW16T308	P830-100072-1	\$56.65
TCGX-1.8(1.5)1AL	TCGX090204-AL	P830-100564-1	\$51.50
TCGX-21.51-AL	TCGX110204-AL	P830-100327-1	\$51.50
TCGX-3(2.5)1-AL	TCGX16T304	P830-100602-1	\$61.80
TCMT-32.52	TCMT16T308	P830-100269-1	\$61.80
TCMW-21.51	TCMW110204	P830-100076-1	\$46.35
TCMW-32.51	TCMW16T304	P830-100372-1	\$56.65
TD-6P		P830-100078-1	\$61.80
TD-6P1		P830-100080-1	\$61.80
TD-8P		P830-100081-1	\$72.10
TDAB-500	TDAB070102	P830-100082-1	\$46.35
TDAB-51	TDAB070104	P830-100083-1	\$46.35
TDAB-52	TDAB070108	P830-100084-1	\$46.35
TEGA-321	TEGA160304	P830-100300-1	\$51.50
TEGA-322	TEGA160308	P830-100301-1	\$51.50
TEGA-323	TEGA160312	P830-100302-1	\$51.50
TEGA-324	TEGA160316	P830-100303-1	\$51.50
TEGA-326	TEGA160324	P830-100304-1	\$51.50
TEGA-328	TEGA160332	P830-100305-1	\$51.50
TNMA-432	TNMA220408	P830-100454-1	\$61.80
TPCB-221	TPCB110304	P830-100360-1	\$46.35
TPG-221	TPGN110304	P830-100101-1	\$46.35
TPG-222	TPGN110308	P830-100102-1	\$46.35
TPG-320	TPGN160301	P830-100252-1	\$56.65
TPG-321	TPGN160304	P830-100104-1	\$56.65
TPG-322	TPGN160308	P830-100105-1	\$56.65
TPG-324	TPGN160316	P830-100107-1	\$56.65
TPG-431	TPGN220404	P830-100109-1	\$66.95
TPG-432	TPGN220408	P830-100110-1	\$66.95
TPG-433	TPGN220412	P830-100111-1	\$66.95
TPMA-322	TPMA160308	P830-100227-1	\$56.65
TPMM-321	TPMM160304	P830-100373-1	\$56.65
TPMM-322	TPMM160308	P830-100023-1	\$56.65
TPMM-431	TPMM220404	P830-100026-1	\$72.10
TPMM-432	TPMM220408	P830-100397-1	\$72.10
VBGT-331HP	VBGT160404HP	P830-100525-1	\$61.80
VBMT-221	VBMT110304	P830-100127-1	\$51.50
VBMT-331	VBMT160404	P830-100217-1	\$61.80
VBMT-332	VBMT160408	P830-100165-1	\$61.80
VCGT-220HP	VCGT110302HP	P830-100548-1	\$51.50
VCGT-221HP	VCGT110304HP	P830-100524-1	\$51.50
VCGT-330HP	VCGT160402HP	P830-100530-1	\$72.10
VCGT-331HP	VCGT160404HP	P830-100531-1	\$72.10
VCGX-21.50-AL	VCGX110202-AL	P830-100351-1	\$51.50
VCGX-331-AL	VCGX160404-AL	P830-100395-1	\$61.80
VCGX-332-AL	VCGX160408-AL	P830-100498-1	\$61.80
VNGP-330	VNGP160402	P830-100615-1	\$61.80
VNGP-330.5	VNGP160403	P830-100575-1	\$61.80
VNMP-331	VNMP160404	P830-100483-1	\$61.80
VNMP-332	VNMP160408	P830-100131-1	\$61.80
VPGR-331	VPGR160404	P830-100485-1	\$61.80
VPGR-332	VPGR160408	P830-100136-1	\$61.80
WNMG-431	WNMG080404	P830-100314-1	\$66.95
WNMG-432	WNMG080408	P830-100209-1	\$66.95

Black Widow Tools

Diameter	Fractional	Metric	LOC	Reach	OAL	Shank Diameter	Flute Number	Style	Tolerance +0.XXXX/-0.XXXX	Part Number	List Price
High Velocity Cutters											
0.2500	1/4		3/8	1-1/8	2-1/2	1/4	3	SE-45°Helix	+0.0000/-0.0010	P61-100001-1	\$57.75
0.2500	1/4		3/8	2-1/8	4	1/4	3	SE-45°Helix	+0.0000/-0.0010	P61-100002-1	\$63.00
0.3750	3/8		1/2	1-1/8	2-1/2	3/8	3	SE-45°Helix	+0.0000/-0.0010	P61-100003-1	\$63.00
0.3750	3/8		1/2	2-1/8	4	3/8	3	SE-45°Helix	+0.0000/-0.0010	P61-100004-1	\$68.25
0.5000	1/2		5/8	1-3/8	3	1/2	3	SE-45°Helix	+0.0000/-0.0010	P61-100005-1	\$84.00
0.5000	1/2		5/8	3-3/8	6	1/2	3	SE-45°Helix	+0.0000/-0.0010	P61-100006-1	\$105.00
High Performance End Mills											
0.1250	1/8		1/2		1-1/2	1/8	2	SE-45°Helix	+0.0000/-0.0010	P61-100007-1	\$21.00
0.1875	3/16		5/8		2	3/16	2	SE-45°Helix	+0.0000/-0.0010	P61-100008-1	\$26.25
0.2500	1/4		1		2-1/2	1/4	2	SE-45°Helix	+0.0000/-0.0010	P61-100009-1	\$42.00
0.3750	3/8		1		2-1/2	3/8	2	SE-45°Helix	+0.0000/-0.0010	P61-100010-1	\$52.50
0.5000	1/2		1		3	1/2	2	SE-45°Helix	+0.0000/-0.0010	P61-100011-1	\$73.50
Automotive Contour Profilers											
0.5000	1/2		1/2		6	1/2	4	LollyPop Cutter	+0.0000/-0.0010	P61-100012-1	\$210.00

Notes: The Shank Tolerance is held to -0.0001/-0.0003 and the OAL Tolerance is held to -0.000/+0.030

Diamond-coated Aircraft Drills

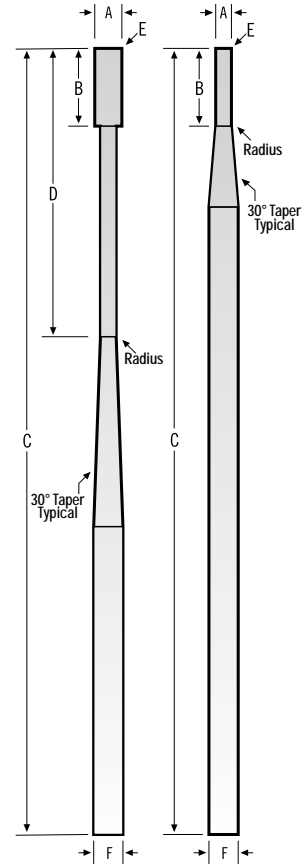
Crystallume is proud to introduce our expanded line of Diamond Coated Aircraft Drills. There are now more sizes available from stock to meet your composite drilling needs.

Decimal Equivalent	Tolerance from Nominal		Flute Length	OAL	Part Number	List Price
	Minimum	Maximum				
0.0980	+0.0000	-0.0005	1.40	2.70	P810-100345-1	\$103.00
0.1285	+0.0000	-0.0005	1.40	2.70	P810-100334-1	\$103.00
0.1421	+0.0000	-0.0005	1.40	2.70	P810-100402-1	\$113.30
0.1560	+0.0000	-0.0005	1.40	2.70	P810-100409-1	\$113.30
0.1655	+0.0000	-0.0005	1.40	2.70	P810-100335-1	\$113.30
0.1734	+0.0000	-0.0005	1.40	2.70	P810-100404-1	\$113.30
0.1900	+0.0000	-0.0005	1.40	2.70	P810-100400-1	\$123.60
0.1915	+0.0000	-0.0005	1.40	2.70	P810-100336-1	\$123.60
0.1990	+0.0000	-0.0005	1.40	2.70	P810-100411-1	\$123.60
0.2055	+0.0000	-0.0005	1.40	2.70	P810-100405-1	\$123.60
0.2210	+0.0000	-0.0005	1.40	2.70	P810-100346-1	\$123.60
0.2515	+0.0000	-0.0005	1.40	2.70	P810-100337-1	\$123.60
0.2590	+0.0000	-0.0005	1.40	2.70	P810-100406-1	\$139.05
0.2710	+0.0000	-0.0005	1.40	2.70	P810-100407-1	\$149.35
0.2770	+0.0000	-0.0005	1.40	2.70	P810-100412-1	\$149.35
0.2800	+0.0000	-0.0005	1.40	2.70	P810-100408-1	\$164.80
0.2812	+0.0000	-0.0005	1.40	2.70	P810-100410-1	\$164.80
0.3135	+0.0000	-0.0005	1.50	2.70	P810-100338-1	\$195.70
0.3765	+0.0000	-0.0005	1.50	2.70	P810-100341-1	\$216.30

Drill Diameters +0.0000/-0.0005

Lightning Series – Long Reach End Mills

Ref. Dia. A	Ref. Dia. A	LOC B	OAL C	Reach D	Style E	No. Flutes	Shank Dia. F	Part Number	List Price
1/64	0.0156	0.047	3.0	0.000	BN	2	1/8	P38-005101-1	\$73.50
1/64	0.0156	0.047	3.0	0.000	SE	2	1/8	P38-005102-1	\$73.50
1/64	0.0156	0.047	3.0	0.250	BN	2	1/8	P38-005103-1	\$78.75
1/64	0.0156	0.047	3.0	0.250	SE	2	1/8	P38-005104-1	\$78.75
1/64	0.0156	0.047	3.0	0.500	BN	2	1/8	P38-005105-1	\$78.75
1/64	0.0156	0.047	3.0	0.500	SE	2	1/8	P38-005106-1	\$78.75
1/32	0.0313	0.094	3.0	0.000	BN	4	1/8	P38-005107-1	\$68.25
1/32	0.0313	0.094	3.0	0.000	SE	4	1/8	P38-005108-1	\$68.25
1/32	0.0313	0.094	3.0	0.000	.005CR	4	1/8	P38-005109-1	\$68.25
1/32	0.0313	0.094	3.0	0.400	BN	4	1/8	P38-005110-1	\$73.50
1/32	0.0313	0.094	3.0	0.400	SE	4	1/8	P38-005111-1	\$73.50
1/32	0.0313	0.094	3.0	0.400	.005CR	4	1/8	P38-005112-1	\$73.50
1/32	0.0313	0.094	3.0	0.625	BN	4	1/8	P38-005113-1	\$73.50
1/32	0.0313	0.094	3.0	0.625	SE	4	1/8	P38-005114-1	\$73.50
1/32	0.0313	0.094	3.0	0.625	.005CR	4	1/8	P38-005115-1	\$73.50
1/32	0.0313	0.094	3.0	0.900	BN	4	1/8	P38-005116-1	\$78.75
1/32	0.0313	0.094	3.0	0.900	SE	4	1/8	P38-005117-1	\$78.75
1/32	0.0313	0.094	3.0	0.900	.005CR	4	1/8	P38-005118-1	\$78.75
3/64	0.0469	0.141	3.0	0.000	BN	4	1/8	P38-005119-1	\$68.25
3/64	0.0469	0.141	3.0	0.000	SE	4	1/8	P38-005120-1	\$68.25
3/64	0.0469	0.141	3.0	0.000	.010CR	4	1/8	P38-005121-1	\$68.25
3/64	0.0469	0.141	3.0	0.563	BN	4	1/8	P38-005122-1	\$73.50
3/64	0.0469	0.141	3.0	0.563	SE	4	1/8	P38-005123-1	\$73.50
3/64	0.0469	0.141	3.0	0.563	.010CR	4	1/8	P38-005124-1	\$73.50
3/64	0.0469	0.141	3.0	0.750	BN	4	1/8	P38-005125-1	\$78.75
3/64	0.0469	0.141	3.0	0.750	SE	4	1/8	P38-005126-1	\$78.75
3/64	0.0469	0.141	3.0	0.750	.010CR	4	1/8	P38-005127-1	\$78.75
1/16	0.0625	0.188	3.0	0.000	BN	4	1/8	P38-005128-1	\$68.25
1/16	0.0625	0.188	3.0	0.000	SE	4	1/8	P38-005129-1	\$68.25
1/16	0.0625	0.188	3.0	0.000	.010CR	4	1/8	P38-005130-1	\$68.25
1/16	0.0625	0.188	3.0	0.750	BN	4	1/8	P38-005131-1	\$73.50
1/16	0.0625	0.188	3.0	0.750	SE	4	1/8	P38-005132-1	\$73.50
1/16	0.0625	0.188	3.0	0.750	.010CR	4	1/8	P38-005133-1	\$73.50
1/16	0.0625	0.188	3.0	1.000	BN	4	1/8	P38-005134-1	\$78.75
1/16	0.0625	0.188	3.0	1.000	SE	4	1/8	P38-005135-1	\$78.75
1/16	0.0625	0.188	3.0	1.000	.010CR	4	1/8	P38-005136-1	\$78.75
3/32	0.0938	0.281	3.0	0.000	BN	4	1/8	P38-005137-1	\$68.25
3/32	0.0938	0.281	3.0	0.000	SE	4	1/8	P38-005138-1	\$68.25
3/32	0.0938	0.281	3.0	0.000	.010CR	4	1/8	P38-005139-1	\$68.25
3/32	0.0938	0.281	3.0	1.000	BN	4	1/8	P38-005140-1	\$73.50
3/32	0.0938	0.281	3.0	1.000	SE	4	1/8	P38-005141-1	\$73.50
3/32	0.0938	0.281	3.0	1.000	.010CR	4	1/8	P38-005142-1	\$73.50
3/32	0.0938	0.281	3.0	1.500	BN	4	1/8	P38-005143-1	\$78.75
3/32	0.0938	0.281	3.0	1.500	SE	4	1/8	P38-005144-1	\$78.75
3/32	0.0938	0.281	3.0	1.500	.010CR	4	1/8	P38-005145-1	\$78.75
1/8	0.1250	0.375	3.0	0.000	BN	4	1/8	P38-005146-1	\$73.50
1/8	0.1250	0.375	3.0	0.000	SE	4	1/8	P38-005147-1	\$73.50
1/8	0.1250	0.375	3.0	0.000	.010CR	4	1/8	P38-005148-1	\$73.50
1/8	0.1250	0.375	3.0	1.000	BN	4	1/8	P38-005149-1	\$78.75
1/8	0.1250	0.375	3.0	1.000	SE	4	1/8	P38-005150-1	\$78.75
1/8	0.1250	0.375	3.0	1.000	.010CR	4	1/8	P38-005151-1	\$78.75
1/8	0.1250	0.375	3.0	2.000	BN	4	1/8	P38-005152-1	\$84.00
1/8	0.1250	0.375	3.0	2.000	SE	4	1/8	P38-005153-1	\$84.00
1/8	0.1250	0.375	3.0	2.000	.010CR	4	1/8	P38-005154-1	\$84.00



Lightning Series – Extended Shank End Mills

Ref. Dia.	Ref. Dia.	LOC	OAL	Reach	Style	No. Flutes	Shank Dia.	Part Number	List Price
1/16	0.0625	0.0625	3.0	0.313	BN	4	1/16	P38-005155-1	\$63.00
1/16	0.0625	0.0625	3.0	0.313	SE	4	1/16	P38-005156-1	\$63.00
3/32	0.0938	0.0938	3.0	0.344	BN	4	3/32	P38-005157-1	\$63.00
3/32	0.0938	0.0938	3.0	0.344	SE	4	3/32	P38-005158-1	\$63.00
1/8	0.1250	0.1250	3.0	0.625	BN	4	1/8	P38-005159-1	\$68.25
1/8	0.1250	0.1250	3.0	0.625	SE	4	1/8	P38-005160-1	\$68.25
1/8	0.1250	0.1250	3.0	0.625	SE-.015CR	4	1/8	P38-005161-1	\$68.25
1/8	0.1250	0.1250	3.0	0.625	SE-.031CR	4	1/8	P38-005162-1	\$68.25
3/16	0.1875	0.1875	3.0	0.688	BN	4	3/16	P38-005163-1	\$73.50
3/16	0.1875	0.1875	3.0	0.688	SE	4	3/16	P38-005164-1	\$73.50
3/16	0.1875	0.1875	3.0	0.688	SE-.062CR	4	3/16	P38-005165-1	\$73.50
1/4	0.2500	0.2500	4.0	0.750	BN	4	1/4	P38-005166-1	\$89.25
1/4	0.2500	0.2500	4.0	0.750	SE	4	1/4	P38-005167-1	\$89.25
1/4	0.2500	0.2500	4.0	0.750	SE-.015CR	4	1/4	P38-005168-1	\$89.25
1/4	0.2500	0.2500	4.0	0.750	SE-.030CR	4	1/4	P38-005169-1	\$89.25
1/4	0.2500	0.2500	4.0	0.750	SE-.062CR	4	1/4	P38-005170-1	\$89.25

Lightning Series – General Purpose End Mills

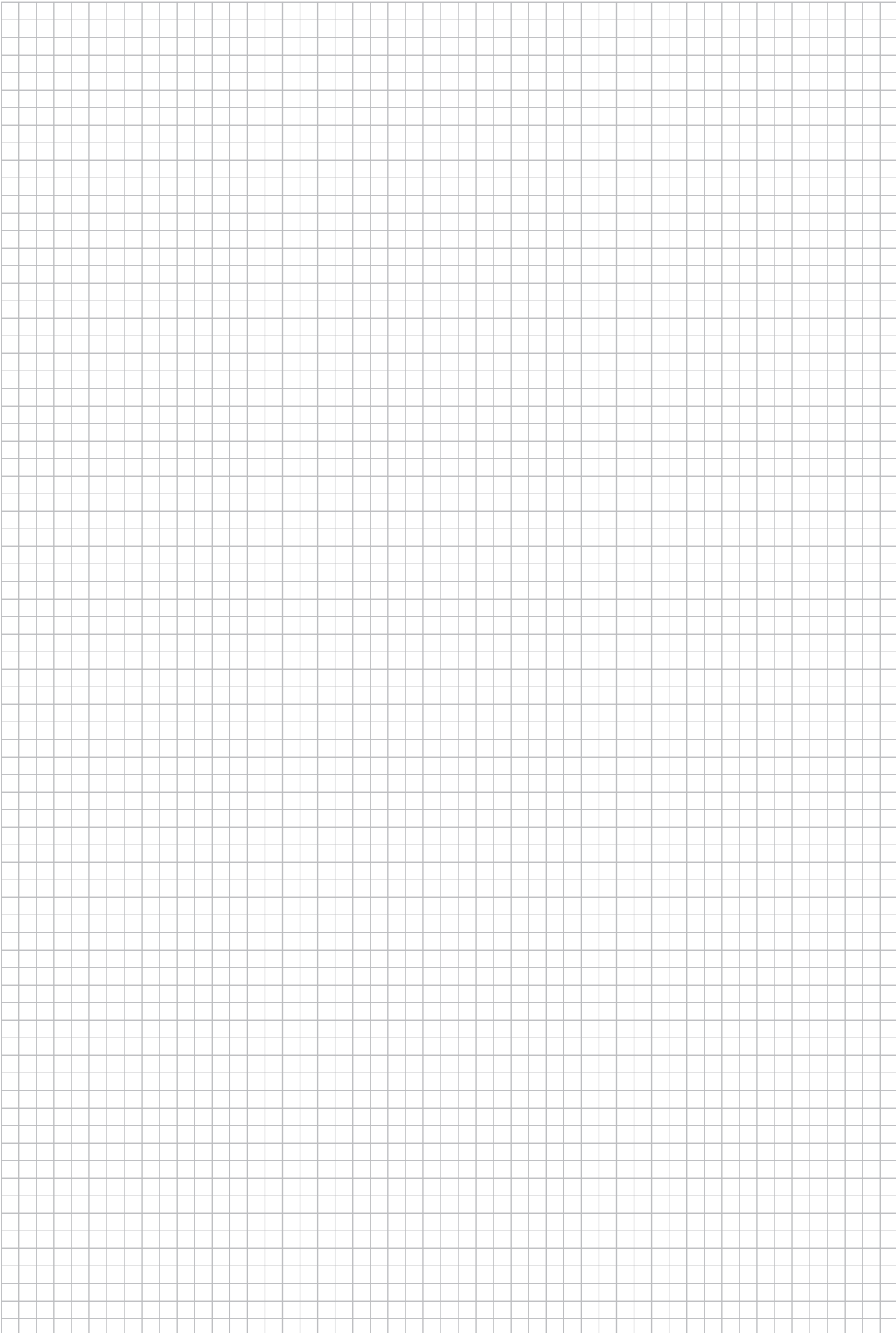
Ref. Dia.	Ref. Dia.	LOC	OAL	Style	No. Flutes	Shank Dia.	Part Number	List Price
1/32	0.0313	0.094	1.5	BN	4	1/8	P38-200202-1	\$47.25
1/32	0.0313	0.094	1.5	SE	4	1/8	P38-200219-1	\$42.00
1/16	0.0625	0.188	1.5	BN	4	1/8	P38-200175-1	\$52.50
1/16	0.0625	0.188	1.5	SE	4	1/8	P38-200477-1	\$47.25
3/32	0.0938	0.375	1.5	BN	4	1/8	P38-200004-1	\$52.50
3/32	0.0938	0.375	1.5	SE	4	1/8	P38-200002-1	\$47.25
1/8	0.1250	0.500	1.5	BN	4	1/8	P38-200008-1	\$57.75
1/8	0.1250	0.500	1.5	SE	4	1/8	P38-200006-1	\$52.50
1/8	0.1250	1.000	3.0	BN	4	1/8	P38-200012-1	\$73.50
1/8	0.1250	1.000	3.0	SE	4	1/8	P38-200010-1	\$68.25
3/16	0.1875	0.625	2.5	BN	4	3/16	P38-200016-1	\$73.50
3/16	0.1875	0.625	2.5	SE	4	3/16	P38-200014-1	\$57.75
1/4	0.2500	0.750	2.5	BN	4	1/4	P38-200024-1	\$68.25
1/4	0.2500	0.750	2.5	SE	4	1/4	P38-200022-1	\$63.00
1/4	0.2500	1.250	3.0	BN	4	1/4	P38-200028-1	\$99.75
1/4	0.2500	1.250	3.0	SE	4	1/4	P38-200026-1	\$94.50
3/8	0.3750	0.875	2.5	BN	4	3/8	P38-200040-1	\$99.75
3/8	0.3750	0.875	2.5	SE	4	3/8	P38-200038-1	\$94.50
1/2	0.5000	1.000	3.0	BN	4	1/2	P38-200056-1	\$120.75
1/2	0.5000	1.000	3.0	SE	4	1/2	P38-200054-1	\$115.50
1/2	0.5000	2.000	4.0	BN	4	1/2	P38-200058-1	\$147.00
1/2	0.5000	2.000	4.0	SE	4	1/2	P38-200060-1	\$157.50

The 0.500 Diameter Replaceable Tip End Mill

This tool is intended to be held in a heat shrink holder and give you 4 and 6 flute productivity as compared to the 2 flutes available from insert end mills this size. Depending on your application three configurations are currently available from stock

Diameter	Flute Length	OAL	Type or Point	Part Number	List Price
1/2	1/2	1-1/2	6 flute SE w/1/4 shank	P820-201143-1	\$149.35
1/2	1/2	1-1/2	4 flute SE w/1/4 shank	P820-201142-1	\$149.35
1/2	1/2	1-1/2	4 flute BN w/1/4 shank	P820-201145-1	\$149.35
1/2	1/2	1-1/2	4 flute SE-.030cr w/1/4 shank	P820-201206-1	\$149.35

NOTES



Terms & Conditions – General Information

Terms

1% 10 Day. Net 30 Days. Minimum Invoice \$75.00

Shipping:

F.O.B. Santa Clara, California. All shipments via UPS Orange unless otherwise specified. Actual shipping rates will be invoiced.

Claims:

Although goods are considered sold and our responsibility ceases when delivery is made to the transportation company, in the event of goods being lost in transit, we will make every effort on behalf of customers to have lost goods found or to have the transportation company make proper restitution for loss.

Damage claims must be made against carrier.

Specials:

Orders for special tools, non-catalog or modified tools are accepted on a no-cancellation basis and tools are not returnable. A confirming purchase order is required before any work begins on special tools.

A 10% over and under shipment on a special is acceptable based on industry practices unless no overshipment is stated on the order when placed.

Return Policy:

No merchandise may be returned without prior authorization from the factory. Credit will not be issued for merchandise returned without a return authorization number.

All merchandise returned for credit will be subject to a 15% restocking fee.

Errors:

Crystallume Corporation can not be held responsible for incorrect parts made with our products due to mislabeling or defects. We assume all tools used by our customers are inspected before use and that a first part inspection in customer's plant is the rule. We will replace or credit tools in those situations.

Prices:

Prices subject to change without notice.

For more information contact:



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Crystallume is a division of RobbJack Corporation, manufacturer of premium rotary cutting tools and experts in application technology.



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