

ENGINEERED DIAMOND PRODUCTS

Crystallume

2011 Catalog

GRAPHITE ELECTRODE MACHINING

GENERAL PURPOSE TOOLS

AIRCRAFT TOOLS

COATING SERVICES

See the 2011 Pricelist ▶

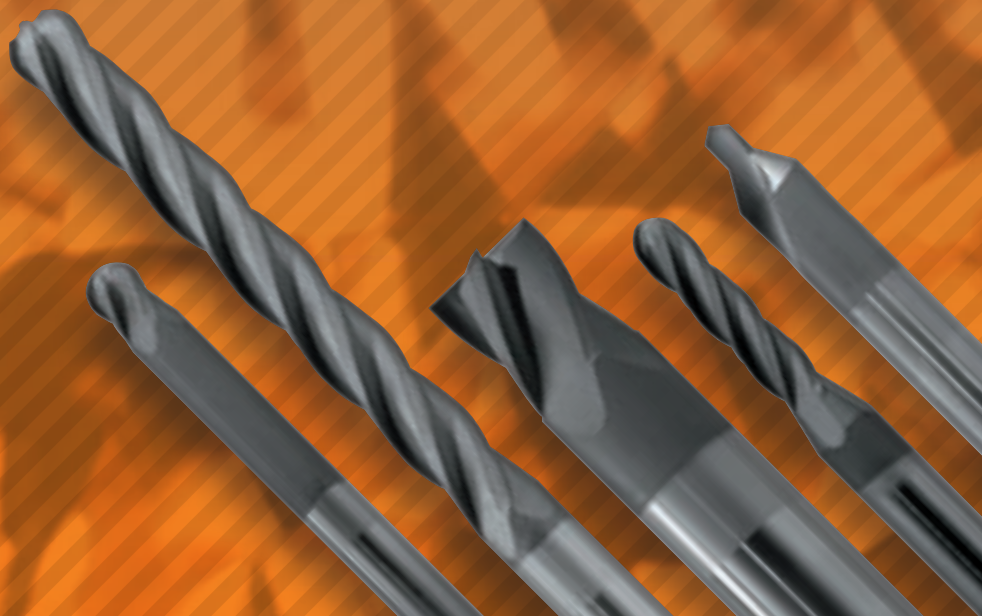


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Founded in 1984, Crystallume pioneered the development and application of Chemical Vapor Deposition (CVD) diamond technology. Crystallume has been shipping diamond products since 1988 and diamond has always been the technology that is Crystallume's specialty. The company's strength is its ability to apply its technology, coating and application experience to solve customer problems.

COATINGS AVAILABLE

ThunderBolt P47 SERIES

Our thinnest diamond coating is only 2 to 4 microns thick and gives up tool life for extreme edge sharpness. This coating is only available on end mills smaller than 1/4" in diameter.

Lightning P38 SERIES

Lightning is coating that is between ThunderBolt and Standard Premium in thickness. This coating gives up tool life due to the reduced thickness for lower cost. As a reference it is usually 8 to 12 microns on 1/4" diameter end mill.

Standard Premium

Standard Premium is our original and the most versatile coating thickness. As a reference it is usually 18 to 20 microns on 1/4" diameter and larger tools. This coating is available on all products end mills, drills, inserts and as a toll coating. This is our best general purpose coating.

Standard Premium Plus

Standard Premium Plus (also known as "Milkshake Coating") is available as a special order. It can be as thick as 30 microns for use in severe and extremely abrasive applications. This coating is available on end mills, drills, inserts and as a toll coating.



ThunderBolt Series

Real Crystallume DIAMOND COATING —THE THICKNESS OF PVD—

The new ThunderBolt Ultra Thin Nano Diamond Tools have a real diamond coating that is the thickness of most PVD coatings. The performance of real diamond, along with the edge sharpness of a thin coating, gives unheard of performance in the finishing of graphite. It is also the perfect tool for rib machining on graphite electrodes.

Standard Tolerance

Cutting Diameter = $\pm 0.001/-0.001$ "
Shank Tolerance = $-0.0001/-0.0003$ "
Flute Length = ± 0.060 "
Overall Length = ± 0.060 "

Graphite Electrode

4 Flute ThunderBolt Series End Mills

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/16"	1/16"	3"	5/16"	BN	1/16"	P47-100001-1
1/16"	1/16"	3"	5/16"	SE	1/16"	P47-100006-1
3/32"	3/32"	3"	11/32"	BN	3/32"	P47-100002-1
3/32"	3/32"	3"	11/32"	SE	3/32"	P47-100007-1
1/8"	1/8"	3"	5/8"	BN	1/8"	P47-100003-1
1/8"	1/8"	3"	5/8"	SE	1/8"	P47-100008-1
1/8"	1/8"	3"	5/8"	SE, .015"CR	1/8"	P47-100009-1
1/8"	1/8"	3"	5/8"	SE, .031"CR	1/8"	P47-100010-1
3/16"	3/16"	3"	11/16"	BN	3/16"	P47-100004-1
3/16"	3/16"	3"	11/16"	SE	3/16"	P47-100011-1
3/16"	3/16"	3"	11/16"	SE, .062"CR	3/16"	P47-100012-1
1/4"	1/4"	4"	3/4"	BN	1/4"	P47-100005-1
1/4"	1/4"	4"	3/4"	SE	1/4"	P47-100013-1
1/4"	1/4"	4"	3/4"	SE, .015"CR	1/4"	P47-100014-1
1/4"	1/4"	4"	3/4"	SE, .031"CR	1/4"	P47-100015-1
1/4"	1/4"	4"	3/4"	SE, .062"CR	1/4"	P47-100016-1
1/32"	3/32"	1-1/2"	—	SE	1/8"	P47-100017-1
1/32"	3/32"	1-1/2"	—	BN	1/8"	P47-100018-1
1/16"	1/4"	1-1/2"	—	SE	1/8"	P47-100019-1*
1/16"	1/4"	1-1/2"	—	BN	1/8"	P47-100020-1*
3/32"	3/8"	1-1/2"	—	SE	1/8"	P47-100021-1*
3/32"	3/8"	1-1/2"	—	BN	1/8"	P47-100022-1*
1/8"	1/2"	1-1/2"	—	SE	1/8"	P47-100023-1*
1/8"	1/2"	1-1/2"	—	BN	1/8"	P47-100024-1*
3/16"	5/8"	2"	—	SE	3/16"	P47-100025-1*
3/16"	5/8"	2"	—	BN	3/16"	P47-100026-1*
1/4"	3/4"	2-1/2"	—	SE	1/4"	P47-100027-1*
1/4"	3/4"	2-1/2"	—	BN	1/4"	P47-100028-1*



Standard uncoated carbide tool



Standard diamond coated carbide tool



ThunderBolt coated carbide tool

*Tools coated 1x Diameter

Lightning Series

The Lightning series of tools offer a cost-effective solution for the machining of graphite electrodes. By reducing the coating thickness the edge

sharpness is increased and cost is reduced. These tools offer a cost-effective solution for most medium lot size jobs.

Standard Tolerance

Cutting Diameter = $+0.001/-0.001$ "
 Shank Tolerance = $-0.0001/-0.0003$ "
 Flute Length = ± 0.060 "
 Overall Length = ± 0.060 "

4 Flute Lightning Series Extended Shank End Mills

Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/16"	0.0625"	3.0"	0.313"	BN	1/16"	P38-005155-1
1/16"	0.0625"	3.0"	0.313"	SE	1/16"	P38-005156-1
3/32"	0.0938"	3.0"	0.344"	BN	3/32"	P38-005157-1
3/32"	0.0938"	3.0"	0.344"	SE	3/32"	P38-005158-1
1/8"	0.1250"	3.0"	0.625"	BN	1/8"	P38-005159-1
1/8"	0.1250"	3.0"	0.625"	SE	1/8"	P38-005160-1
1/8"	0.1250"	3.0"	0.625"	SE, .015"CR	1/8"	P38-005161-1
1/8"	0.1250"	3.0"	0.625"	SE, .031"CR	1/8"	P38-005162-1
3/16"	0.1875"	3.0"	0.688"	BN	3/16"	P38-005163-1
3/16"	0.1875"	3.0"	0.688"	SE	3/16"	P38-005164-1
3/16"	0.1875"	3.0"	0.688"	SE, .062"CR	3/16"	P38-005165-1
1/4"	0.2500"	4.0"	0.750"	BN	1/4"	P38-005166-1
1/4"	0.2500"	4.0"	0.750"	SE	1/4"	P38-005167-1
1/4"	0.2500"	4.0"	0.750"	SE, .015"CR	1/4"	P38-005168-1
1/4"	0.2500"	4.0"	0.750"	SE, .030"CR	1/4"	P38-005169-1
1/4"	0.2500"	4.0"	0.750"	SE, .062"CR	1/4"	P38-005170-1

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4 Flute Lightning Series General Purpose End Mills

Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
1/32"	0.094"	1.5"	BN	1/8"	P38-200202-1
1/32"	0.094"	1.5"	SE	1/8"	P38-200219-1
1/16"	0.188"	1.5"	BN	1/8"	P38-200175-1
1/16"	0.188"	1.5"	SE	1/8"	P38-200477-1
3/32"	0.375"	1.5"	BN	1/8"	P38-200004-1
3/32"	0.375"	1.5"	SE	1/8"	P38-200002-1
1/8"	0.500"	1.5"	BN	1/8"	P38-200008-1
1/8"	0.500"	1.5"	SE	1/8"	P38-200006-1
1/8"	1.000"	3.0"	BN	1/8"	P38-200012-1
1/8"	1.000"	3.0"	SE	1/8"	P38-200010-1
3/16"	0.625"	2.5"	BN	3/16"	P38-200016-1
3/16"	0.625"	2.5"	SE	3/16"	P38-200014-1
1/4"	0.750"	2.5"	BN	1/4"	P38-200024-1
1/4"	0.750"	2.5"	SE	1/4"	P38-200022-1
1/4"	1.250"	3.0"	BN	1/4"	P38-200028-1
1/4"	1.250"	3.0"	SE	1/4"	P38-200026-1
3/8"	0.875"	2.5"	BN	3/8"	P38-200040-1
3/8"	0.875"	2.5"	SE	3/8"	P38-200038-1
1/2"	1.000"	3.0"	BN	1/2"	P38-200056-1
1/2"	1.000"	3.0"	SE	1/2"	P38-200054-1
1/2"	2.000"	4.0"	BN	1/2"	P38-200060-1
1/2"	2.000"	4.0"	SE	1/2"	P38-200058-1

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Don't See What You Need?

Call, it might be a stocked special.

Lightning Series – Long Reach

2 Flute Lightning Series Long Reach End Mills

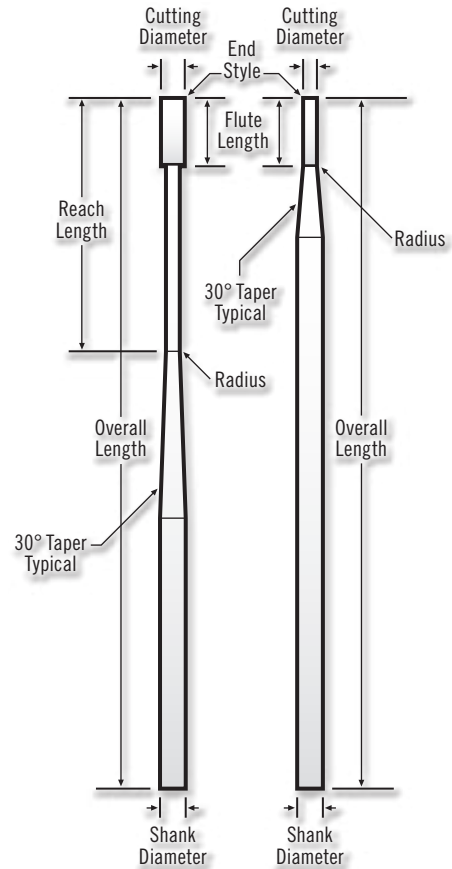
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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/64"	0.047"	3.0"	0.000"	BN	1/8"	P38-005101-1
1/64"	0.047"	3.0"	0.000"	SE	1/8"	P38-005102-1
1/64"	0.047"	3.0"	0.250"	BN	1/8"	P38-005103-1
1/64"	0.047"	3.0"	0.250"	SE	1/8"	P38-005104-1
1/64"	0.047"	3.0"	0.500"	BN	1/8"	P38-005105-1
1/64"	0.047"	3.0"	0.500"	SE	1/8"	P38-005106-1

4 Flute Lightning Series Long Reach End Mills

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/32"	0.094"	3.0"	0.000"	BN	1/8"	P38-005107-1
1/32"	0.094"	3.0"	0.000"	SE	1/8"	P38-005108-1
1/32"	0.094"	3.0"	0.000"	SE, .005"CR	1/8"	P38-005109-1
1/32"	0.094"	3.0"	0.400"	BN	1/8"	P38-005110-1
1/32"	0.094"	3.0"	0.400"	SE	1/8"	P38-005111-1
1/32"	0.094"	3.0"	0.400"	SE, .005"CR	1/8"	P38-005112-1
1/32"	0.094"	3.0"	0.625"	BN	1/8"	P38-005113-1
1/32"	0.094"	3.0"	0.625"	SE	1/8"	P38-005114-1
1/32"	0.094"	3.0"	0.625"	SE, .005"CR	1/8"	P38-005115-1
1/32"	0.094"	3.0"	0.900"	BN	1/8"	P38-005116-1
1/32"	0.094"	3.0"	0.900"	SE	1/8"	P38-005117-1
1/32"	0.094"	3.0"	0.900"	SE, .005"CR	1/8"	P38-005118-1
3/64"	0.141"	3.0"	0.000"	BN	1/8"	P38-005119-1
3/64"	0.141"	3.0"	0.000"	SE	1/8"	P38-005120-1
3/64"	0.141"	3.0"	0.000"	SE, .010"CR	1/8"	P38-005121-1
3/64"	0.141"	3.0"	0.563"	BN	1/8"	P38-005122-1
3/64"	0.141"	3.0"	0.563"	SE	1/8"	P38-005123-1
3/64"	0.141"	3.0"	0.563"	SE, .010"CR	1/8"	P38-005124-1
3/64"	0.141"	3.0"	0.750"	BN	1/8"	P38-005125-1
3/64"	0.141"	3.0"	0.750"	SE	1/8"	P38-005126-1
3/64"	0.141"	3.0"	0.750"	SE, .010"CR	1/8"	P38-005127-1
1/16"	0.188"	3.0"	0.000"	BN	1/8"	P38-005128-1
1/16"	0.188"	3.0"	0.000"	SE	1/8"	P38-005129-1
1/16"	0.188"	3.0"	0.000"	SE, .010"CR	1/8"	P38-005130-1
1/16"	0.188"	3.0"	0.750"	BN	1/8"	P38-005131-1
1/16"	0.188"	3.0"	0.750"	SE	1/8"	P38-005132-1
1/16"	0.188"	3.0"	0.750"	SE, .010"CR	1/8"	P38-005133-1
1/16"	0.188"	3.0"	1.000"	BN	1/8"	P38-005134-1
1/16"	0.188"	3.0"	1.000"	SE	1/8"	P38-005135-1
1/16"	0.188"	3.0"	1.000"	SE, .010"CR	1/8"	P38-005136-1
3/32"	0.281"	3.0"	0.000"	BN	1/8"	P38-005137-1
3/32"	0.281"	3.0"	0.000"	SE	1/8"	P38-005138-1
3/32"	0.281"	3.0"	0.000"	SE, .010"CR	1/8"	P38-005139-1
3/32"	0.281"	3.0"	1.000"	BN	1/8"	P38-005140-1
3/32"	0.281"	3.0"	1.000"	SE	1/8"	P38-005141-1
3/32"	0.281"	3.0"	1.000"	SE, .010"CR	1/8"	P38-005142-1
3/32"	0.281"	3.0"	1.500"	BN	1/8"	P38-005143-1
3/32"	0.281"	3.0"	1.500"	SE	1/8"	P38-005144-1
3/32"	0.281"	3.0"	1.500"	SE, .010"CR	1/8"	P38-005145-1
1/8"	0.375"	3.0"	0.000"	BN	1/8"	P38-005146-1
1/8"	0.375"	3.0"	0.000"	SE	1/8"	P38-005147-1
1/8"	0.375"	3.0"	0.000"	SE, .010"CR	1/8"	P38-005148-1
1/8"	0.375"	3.0"	1.000"	BN	1/8"	P38-005149-1
1/8"	0.375"	3.0"	1.000"	SE	1/8"	P38-005150-1
1/8"	0.375"	3.0"	1.000"	SE, .010"CR	1/8"	P38-005151-1
1/8"	0.375"	3.0"	2.000"	BN	1/8"	P38-005152-1
1/8"	0.375"	3.0"	2.000"	SE	1/8"	P38-005153-1
1/8"	0.375"	3.0"	2.000"	SE, .010"CR	1/8"	P38-005154-1



Mold Maker End Mills (with Reach)

Crystallume's Mold Maker tools offer features specifically for electrode and mold manufacturing. The Mold Maker tools have a 5× diameter flute length with an extended shank. The big difference is the tolerance of the tools. With a cutting diameter up to 1/8" and 3 mm the tolerance is +0.0000/−0.0005" and for tools larger than this the tolerance is +0.0000/−0.0010".

All shanks are held to a tolerance of −0.0001/−0.0002" to assure consistent and concentric gripping in shrink-fit holders. Mold Maker tools are available in sizes from 1/64 to 1/2" and from .5 to 6 mm in diameter with tools below 1/4" and 6 mm available with and without extended reach. Crystallume Mold Maker tools are the most precise diamond coated tools available off the shelf.



2 Flute Mold Maker End Mills (WITH REACH)

Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/64"	0.075"	2-1/2"	1/8"	BN	1/8"	P820-200404-1
1/64"	0.075"	2-1/2"	1/8"	SE	1/8"	P820-200403-1

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4 Flute Mold Maker End Mills (WITH REACH)

Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/32"	5/32"	2-1/2"	1/4"	BN	1/8"	P820-200406-1
1/32"	5/32"	2-1/2"	1/4"	SE	1/8"	P820-200405-1
1/32"	5/32"	2-1/2"	1/4"	SE, .005"CR	1/8"	P820-200407-1
3/64"	15/64"	2-1/2"	1/2"	BN	1/8"	P820-200409-1
3/64"	15/64"	2-1/2"	1/2"	SE	1/8"	P820-200408-1
3/64"	15/64"	2-1/2"	1/2"	SE, .010"CR	1/8"	P820-200410-1
1/16"	5/16"	2-1/2"	1"	BN	1/8"	P820-200412-1
1/16"	5/16"	2-1/2"	1"	SE	1/8"	P820-200411-1
1/16"	5/16"	2-1/2"	1"	SE, .010"CR	1/8"	P820-200413-1
3/32"	15/32"	2-1/2"	1"	BN	1/8"	P820-200415-1
3/32"	15/32"	2-1/2"	1"	SE	1/8"	P820-200414-1
3/32"	15/32"	2-1/2"	1"	SE, .015"CR	1/8"	P820-200416-1
3/32"	15/32"	2-1/2"	1"	SE, .020"CR	1/8"	P820-200417-1
1/8"	5/8"	3"	1-1/4"	BN	1/8"	P820-200419-1
1/8"	5/8"	3"	1-1/4"	SE	1/8"	P820-200418-1
1/8"	5/8"	3"	1-1/4"	SE, .015"CR	1/8"	P820-200420-1
1/8"	5/8"	3"	1-1/4"	SE, .020"CR	1/8"	P820-200421-1
1/8"	5/8"	3"	1-1/4"	SE, .030"CR	1/8"	P820-200422-1
3/16"	15/16"	3"	1-1/2"	BN	3/16"	P820-200424-1
3/16"	15/16"	3"	1-1/2"	SE	3/16"	P820-200423-1
3/16"	15/16"	3"	1-1/2"	SE, .030"CR	3/16"	P820-200425-1
1/4"	1-1/4"	4"	2-1/2"	BN	1/4"	P820-200427-1
1/4"	1-1/4"	4"	2-1/2"	SE	1/4"	P820-200426-1
1/4"	1-1/4"	4"	2-1/2"	SE, .015"CR	1/4"	P820-200428-1
1/4"	1-1/4"	4"	2-1/2"	SE, .020"CR	1/4"	P820-200429-1
1/4"	1-1/4"	4"	2-1/2"	SE, .030"CR	1/4"	P820-200430-1
1/4"	1-1/4"	4"	2-1/2"	SE, .060"CR	1/4"	P820-200431-1

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2 Flute Mold Maker End Mills (WITH REACH) METRIC

Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
0.5mm	2.5mm	62mm	3mm	BN	3mm	P820-200338-1
0.5mm	2.5mm	62mm	3mm	SE	3mm	P820-200337-1

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4 Flute Mold Maker End Mills (WITH REACH) METRIC

Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1mm	5mm	62mm	12mm	BN	3mm	P820-200340-1
1mm	5mm	62mm	12mm	SE	3mm	P820-200339-1
1.5mm	7.5mm	62mm	25mm	BN	3mm	P820-200342-1
1.5mm	7.5mm	62mm	25mm	SE	3mm	P820-200341-1
2mm	10mm	62mm	25mm	BN	3mm	P820-200344-1
2mm	10mm	62mm	25mm	SE	3mm	P820-200343-1
3mm	15mm	62mm	30mm	BN	3mm	P820-200346-1
3mm	15mm	62mm	30mm	SE	3mm	P820-200345-1
4mm	20mm	75mm	40mm	BN	4mm	P820-200348-1
4mm	20mm	75mm	40mm	SE	4mm	P820-200347-1
6mm	24mm	75mm	50mm	BN	6mm	P820-200350-1
6mm	24mm	75mm	50mm	SE	6mm	P820-200349-1

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Mold Maker End Mills (without Reach)

Standard Tolerance

Cutting Diameter (up to 0.1250") = +0.0000/-0.0005"
(0.1875 to 0.5000") = +0.0000/-0.0010"

Shank Diameter = -0.0001/-0.0002"

Flute Length = ±0.060"

Overall Length = ±0.060"

Metric Tolerances

Cutting Diameter (up to 3.000 mm) = +0.000/-0.013mm
(3 mm to 6mm) = +0.000/-0.025mm

Shank Diameter = -0.002/-0.005mm

Flute Length = ±1.000mm

Overall Length = +0.500/-1.500mm

2 Flute Mold Maker End Mills (w/o REACH)

Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
1/64"	0.075"	2-1/2"	BN	1/8"	P820-200684-1
1/64"	0.075"	2-1/2"	SE	1/8"	P820-200683-1

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4 Flute Mold Maker End Mills (w/o REACH)

Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
1/32"	5/32"	2-1/2"	BN	1/8"	P820-200686-1
1/32"	5/32"	2-1/2"	SE	1/8"	P820-200685-1
1/32"	5/32"	2-1/2"	SE, .005"CR	1/8"	P820-200687-1
3/64"	15/64"	2-1/2"	BN	1/8"	P820-200689-1
3/64"	15/64"	2-1/2"	SE	1/8"	P820-200688-1
3/64"	15/64"	2-1/2"	SE, .010"CR	1/8"	P820-200690-1
1/16"	5/16"	2-1/2"	BN	1/8"	P820-200692-1
1/16"	5/16"	2-1/2"	SE	1/8"	P820-200691-1
1/16"	5/16"	2-1/2"	SE, .010"CR	1/8"	P820-200693-1
3/32"	15/32"	2-1/2"	BN	1/8"	P820-200695-1
3/32"	15/32"	2-1/2"	SE	1/8"	P820-200694-1
3/32"	15/32"	2-1/2"	SE, .015"CR	1/8"	P820-200696-1
3/32"	15/32"	2-1/2"	SE, .020"CR	1/8"	P820-200697-1
1/8"	5/8"	3"	BN	1/8"	P820-200699-1
1/8"	5/8"	3"	SE	1/8"	P820-200698-1
1/8"	5/8"	3"	SE, .015"CR	1/8"	P820-200700-1
1/8"	5/8"	3"	SE, .020"CR	1/8"	P820-200701-1
1/8"	5/8"	3"	SE, .030"CR	1/8"	P820-200702-1
3/16"	15/16"	3"	BN	3/16"	P820-200704-1
3/16"	15/16"	3"	SE	3/16"	P820-200703-1
3/16"	15/16"	3"	SE, .030"CR	3/16"	P820-200705-1
1/4"	1-1/4"	4"	BN	1/4"	P820-200707-1
1/4"	1-1/4"	4"	SE	1/4"	P820-200706-1
1/4"	1-1/4"	4"	SE, .015"CR	1/4"	P820-200708-1
1/4"	1-1/4"	4"	SE, .020"CR	1/4"	P820-200709-1
1/4"	1-1/4"	4"	SE, .030"CR	1/4"	P820-200710-1
1/4"	1-1/4"	4"	SE, .060"CR	1/4"	P820-200711-1
3/8"	1-1/2"	6"	BN	3/8"	P820-200713-1
3/8"	1-1/2"	6"	SE	3/8"	P820-200712-1
3/8"	1-1/2"	6"	SE, .015"CR	3/8"	P820-200714-1
3/8"	1-1/2"	6"	SE, .030"CR	3/8"	P820-200715-1
3/8"	1-1/2"	6"	SE, .060"CR	3/8"	P820-200716-1
1/2"	1-1/2"	6"	BN	1/2"	P820-200718-1
1/2"	1-1/2"	6"	SE	1/2"	P820-200717-1
1/2"	1-1/2"	6"	SE, .015"CR	1/2"	P820-200719-1
1/2"	1-1/2"	6"	SE, .030"CR	1/2"	P820-200720-1
1/2"	1-1/2"	6"	SE, .060"CR	1/2"	P820-200721-1

2 Flute Mold Maker End Mills (w/o REACH) METRIC

Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
0.5mm	2.5mm	62mm	BN	3mm	P820-200670-1
0.5mm	2.5mm	62mm	SE	3mm	P820-200669-1

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4 Flute Mold Maker End Mills (w/o REACH) METRIC

Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
1mm	5mm	62mm	BN	3mm	P820-200672-1
1mm	5mm	62mm	SE	3mm	P820-200671-1
1.5mm	7.5mm	62mm	BN	3mm	P820-200674-1
1.5mm	7.5mm	62mm	SE	3mm	P820-200673-1
2mm	10mm	62mm	BN	3mm	P820-200676-1
2mm	10mm	62mm	SE	3mm	P820-200675-1
3mm	15mm	62mm	BN	3mm	P820-200678-1
3mm	15mm	62mm	SE	3mm	P820-200677-1
4mm	20mm	75mm	BN	4mm	P820-200680-1
4mm	20mm	75mm	SE	4mm	P820-200679-1
6mm	24mm	75mm	BN	6mm	P820-200682-1
6mm	24mm	75mm	SE	6mm	P820-200681-1

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Extended Shank End Mills

The Extended Shank tools combine a short flute length for maximum rigidity with a long shank for reaching into deep cavities. When the extended shank is not required, you can choke up on the tool to make it extremely rigid as a stub tool. This is a great all-around tool that will become the workhorse for your shop.

Standard Tolerance

Cutting Diameter = $\pm 0.001/-0.001$ "
 Shank Tolerance = $-0.0001/-0.0003$ "
 Flute Length = ± 0.060 "
 Overall Length = ± 0.060 "



4 Flute Extended Shank End Mills

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/16"	1/16"	3"	5/16"	BN	1/16"	P820-200105-1
1/16"	1/16"	3"	5/16"	SE	1/16"	P820-200209-1
3/32"	3/32"	3"	11/32"	BN	3/32"	P820-200106-1
3/32"	3/32"	3"	11/32"	SE	3/32"	P820-200582-1
1/8"	1/8"	3"	5/8"	BN	1/8"	P820-200107-1
1/8"	1/8"	3"	5/8"	SE	1/8"	P820-200210-1
1/8"	1/8"	3"	5/8"	SE, .015"CR	1/8"	P820-200241-1
1/8"	1/8"	3"	5/8"	SE, .031"CR	1/8"	P820-200628-1
3/16"	3/16"	3"	11/16"	BN	3/16"	P820-200108-1
3/16"	3/16"	3"	11/16"	SE	3/16"	P820-200237-1
3/16"	3/16"	3"	11/16"	SE, .062"CR	3/16"	P820-200627-1
1/4"	1/4"	4"	3/4"	BN	1/4"	P820-200109-1
1/4"	1/4"	4"	3/4"	SE	1/4"	P820-200211-1
1/4"	1/4"	4"	3/4"	SE, .015"CR	1/4"	P820-200242-1
1/4"	1/4"	4"	3/4"	SE, .030"CR	1/4"	P820-200279-1
1/4"	1/4"	4"	3/4"	SE, .062"CR	1/4"	P820-200626-1
5/16"	5/16"	4"	13/16"	BN	5/16"	P820-200110-1
5/16"	5/16"	4"	13/16"	SE	5/16"	P820-200581-1
3/8"	3/8"	4"	1-1/8"	BN	3/8"	P820-200111-1
3/8"	3/8"	4"	1-1/8"	SE	3/8"	P820-200512-1
3/8"	3/8"	4"	1-1/8"	SE, .015"CR	3/8"	P820-200309-1
1/2"	1/2"	6"	1-1/4"	BN	1/2"	P820-200602-1
1/2"	1/2"	6"	1-1/4"	SE	1/2"	P820-200603-1
1/2"	1/2"	6"	1-1/4"	SE, .015"CR	1/2"	P820-200310-1

**Don't
See
What
You
Need?**

**Call, it might
be a stocked
special.**

Metric Big Shank Tools

These tools have been designed for customers using automated machining cells where graphite electrodes are machined. These cells use heat-shrink tooling and have multiple high-speed, ultra-accurate machining centers from Röders or Mikron doing unmanned graphite machining. The large shank size helps to stabilize the smaller diameter cutting tools.

Big Shank Tolerances

Cutting Diameter (0.400 to 4mm) = +0.010/−0.000mm
 (6mm) = ±0.010mm
 (8 to 10mm) = +0.025/−0.050mm
 Shank Diameter = −0.002/−0.005mm
 Flute Length = ±1.000mm
 Overall Length = +0.500/+1.500mm

2 Flute Big Shank Tools METRIC

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
0.4mm	2mm	62mm	—	BN	6mm	P820-200745-1
0.4mm	2mm	62mm	—	SE	6mm	P820-200744-1
0.5mm	2.5mm	62mm	—	BN	6mm	P820-200733-1
0.5mm	2.5mm	62mm	—	SE	6mm	P820-200746-1
0.6mm	3mm	63mm	—	BN	6mm	P820-200784-1
0.6mm	3mm	63mm	—	SE	6mm	P820-200785-1

4 Flute Big Shank Tools METRIC

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
0.8mm	5mm	50mm	7mm	BN	6mm	P820-200734-1
0.8mm	5mm	50mm	7mm	SE	6mm	P820-200783-1
1mm	5mm	50mm	7mm	BN	6mm	P820-200768-1
1mm	5mm	50mm	7mm	SE	6mm	P820-200747-1
2mm	8mm	50mm	—	BN	6mm	P820-200749-1
2mm	8mm	50mm	—	SE	6mm	P820-200748-1
3mm	12mm	50mm	—	BN	6mm	P820-200769-1
3mm	12mm	50mm	—	SE	6mm	P820-200770-1
4mm	14mm	50mm	—	BN	6mm	P820-200737-1
4mm	14mm	50mm	—	SE	6mm	P820-200771-1
6mm	14mm	57mm	—	BN	6mm	P820-200772-1
6mm	14mm	57mm	—	SE	6mm	P820-200773-1
8mm	18mm	63mm	—	BN	8mm	P820-200574-1
8mm	18mm	63mm	—	SE	8mm	P820-200573-1
10mm	10mm	63mm	25mm	BN	10mm	P820-200786-1
10mm	10mm	63mm	25mm	SE	10mm	P820-200575-1

Replaceable Tip End Mills

Crystallume is proud to introduce our latest diamond coated product to enhance your productivity: **The 0.500" 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 several configurations are currently available from stock.



4 & 6 Flute 1/2" Replaceable Tip End Mill (WITH 1/4" SHANK)

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Cutting Diameter	Flute Length	Overall Length	Flute Number	End Style	Shank Diameter	Tool Number Coated
1/2"	1/2"	1-1/2"	6	SE	1/4"	P820-201143-1
1/2"	1/2"	1-1/2"	4	SE	1/4"	P820-201142-1
1/2"	1/2"	1-1/2"	4	SE, .030"CR	1/4"	P820-201206-1
1/2"	1/2"	1-1/2"	4	BN	1/4"	P820-201145-1

Threaded Tip End Mills

4 Flute Threaded Tip End Mill

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Cutting Diameter	Flute Length	Thread	End Style	Tool Number Coated
3/8"	3/8"	T06	SE	P820-201324-1
3/8"	3/8"	T06	BN	P820-201325-1
1/2"	1/2"	T08	SE	P820-201326-1
1/2"	1/2"	T08	BN	P820-201327-1
3/4"	3/4"	T12	SE	P820-201328-1
3/4"	3/4"	T12	BN	P820-201329-1
1"	1"	T15	SE	P820-201330-1
1"	1"	T15	BN	P820-201331-1

Compatible with Ingersoll Tool Holders.



Deep Cavity End Mills

2 Flute Deep Cavity Mold Maker End Mills

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/64"	0.075"	2-1/2"	0.575	SE	1/8"	P820-200919-1
1/64"	0.075"	2-1/2"	0.575	BN	1/8"	P820-200920-1

Standard Tolerance

Cutting Diameter
(up to 0.1250") = +0.0000/-0.0005"
(0.1875 to 0.5000") = +0.0000/-0.0010"
Shank Diameter = -0.0001/-0.0002"
Flute Length = ±0.060"
Overall Length = ±0.060"

2 Flute Deep Cavity Mold Maker End Mills **METRIC**

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
0.5mm	2.5mm	2-1/2mm	15mm	SE	1/8mm	P820-200921-1
0.5mm	2.5mm	2-1/2mm	15mm	BN	1/8mm	P820-200922-1

Metric Tolerances

Cutting Diameter
(up to 3.000 mm) = +0.000/-0.013mm
(3 mm to 6mm) = +0.000/-0.025mm
Shank Diameter = -0.002/-0.005mm
Flute Length = ±1.000mm
Overall Length = +0.500/-1.500mm

4 Flute Deep Cavity Mold Maker End Mills

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1/32"	0.150"	2-1/2"	0.650"	SE	1/8"	P820-200923-1
1/32"	0.150"	2-1/2"	0.650"	BN	1/8"	P820-200924-1
1/32"	0.250"	2-1/2"	0.750"	SE	1/8"	P820-200925-1
1/32"	0.250"	2-1/2"	0.750"	BN	1/8"	P820-200926-1
3/64"	0.250"	2-1/2"	0.750"	SE	1/8"	P820-200929-1
3/64"	0.250"	2-1/2"	0.750"	BN	1/8"	P820-200930-1

4 Flute Deep Cavity Mold Maker End Mills **METRIC**

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Cutting Diameter	Flute Length	Overall Length	Reach Length	End Style	Shank Diameter	Tool Number Coated
1mm	6.3mm	2-1/2mm	19mm	SE	1/8mm	P820-200927-1
1mm	6.3mm	2-1/2mm	19mm	BN	1/8mm	P820-200928-1

Crystallume can
DESIGN & BUILD
A TOOL TO YOUR
SPECIFICATIONS.

Specials

Customs and specials are a large part of Crystallume's business, so contact one of our engineers with your requirements.

TYPICAL REQUESTS

TIGHTER TOLERANCES
SPECIAL CORNER RADIUS
SPECIAL ANGLE
REDUCED SHANK
MULTISTEP TOOLS

Standard End Mills

2 Flute Metric Tolerance

Cutting Diameter = $+0.013/-0.025$ mm
 Shank Diameter = $-0.005/-0.002$ mm
 Flute Length = ± 1.000 mm
 Overall Length = $+0.500/+1.500$ mm

4 Flute Standard Tolerance

Cutting Diameter = $+0.0005/-0.0010$ "
 Shank Tolerance = $-0.0001/-0.0003$ "
 Flute Length = ± 0.060 "
 Overall Length = ± 0.060 "



2 Flute Standard End Mills

METRIC

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Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
2mm	8mm	38mm	BN	3mm	P820-200659-1
2mm	8mm	38mm	SE	3mm	P820-200723-1
3mm	12mm	38mm	BN	3mm	P820-200661-1
3mm	12mm	38mm	SE	3mm	P820-200660-1
4mm	12mm	50mm	BN	4mm	P820-200663-1
4mm	12mm	50mm	SE	4mm	P820-200662-1
5mm	14mm	50mm	BN	5mm	P820-200665-1
5mm	14mm	50mm	SE	5mm	P820-200664-1
6mm	14mm	57mm	BN	6mm	P820-200239-1
6mm	14mm	57mm	SE	6mm	P820-200666-1
8mm	16mm	63mm	BN	8mm	P820-200667-1
8mm	16mm	63mm	SE	8mm	P820-200522-1
10mm	20mm	72mm	BN	10mm	P820-200526-1
10mm	20mm	72mm	SE	10mm	P820-200668-1
12mm	25mm	83mm	BN	12mm	P820-200525-1
12mm	25mm	83mm	SE	12mm	P820-200523-1

4 Flute Standard End Mills

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Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
1/32"	3/32"	1-1/2"	SE	1/8"	P820-200219-1
1/32"	3/32"	1-1/2"	BN	1/8"	P820-200202-1
1/16"	1/4"	1-1/2"	SE	1/8"	P820-200492-1
1/16"	1/4"	1-1/2"	BN	1/8"	P820-200646-1
3/32"	3/8"	1-1/2"	SE	1/8"	P820-200002-1
3/32"	3/8"	1-1/2"	BN	1/8"	P820-200004-1
1/8"	1/2"	1-1/2"	SE	1/8"	P820-200006-1
1/8"	1/2"	1-1/2"	BN	1/8"	P820-200008-1
3/16"	5/8"	2"	SE	3/16"	P820-200014-1
3/16"	5/8"	2"	BN	3/16"	P820-200016-1
1/4"	3/4"	2-1/2"	SE	1/4"	P820-200022-1
1/4"	3/4"	2-1/2"	BN	1/4"	P820-200024-1
5/16"	13/16"	2-1/2"	SE	5/16"	P820-200030-1
5/16"	13/16"	2-1/2"	BN	5/16"	P820-200032-1
3/8"	7/8"	2-1/2"	SE	3/8"	P820-200038-1
3/8"	7/8"	2-1/2"	BN	3/8"	P820-200040-1
7/16"	1"	2-3/4"	SE	7/16"	P820-200046-1
7/16"	1"	2-3/4"	BN	7/16"	P820-200048-1
1/2"	1"	3"	SE	1/2"	P820-200054-1
1/2"	1"	3"	BN	1/2"	P820-200056-1

Long & Extra Long Standard End Mills

Standard Tolerance

Cutting Diameter = $+0.0005/-0.0010$ "

Shank Diameter = $-0.0001/-0.0003$ "

Flute Length = ± 0.060 "

Overall Length = ± 0.060 "

General Purpose

4 Flute Long Standard End Mills

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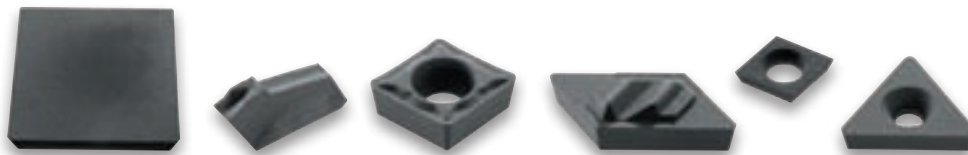
Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
1/8"	1"	3"	SE	1/8"	P820-200010-1
1/8"	1"	3"	BN	1/8"	P820-200012-1
3/16"	1-1/8"	3"	SE	3/16"	P820-200018-1
3/16"	1-1/8"	3"	BN	3/16"	P820-200020-1
1/4"	1-1/4"	3"	SE	1/4"	P820-200026-1
1/4"	1-1/4"	3"	BN	1/4"	P820-200028-1
5/16"	1-3/8"	3-1/8"	SE	5/16"	P820-200034-1
5/16"	1-3/8"	3-1/8"	BN	5/16"	P820-200036-1
3/8"	1-1/2"	4"	SE	3/8"	P820-200722-1
3/8"	1-1/2"	4"	BN	3/8"	P820-200094-1
1/2"	2"	4"	SE	1/2"	P820-200058-1
1/2"	2"	4"	BN	1/2"	P820-200060-1

4 Flute Extra Long Standard End Mills

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Cutting Diameter	Flute Length	Overall Length	End Style	Shank Diameter	Tool Number Coated
1/4"	2"	4"	BN	1/4"	P820-200539-1
1/4"	2"	4"	SE	1/4"	P820-200277-1
1/2"	3"	6"	BN	1/2"	P820-200205-1
1/2"	3"	6"	SE	1/2"	P820-200195-1

Inserts



Insert ANSI Code	Insert ISO Code	Part Number Coated
ADKT-1505 PDR	ADKT1505 PDR	P830-100551-1
BDR-0500-N-F1-R1-32	—	P830-100690-1
BDR-1000-N-F1-R1-32	—	P830-100699-1
CCGT-32.50HP	CCGT09T302HP	P830-100547-1
CCGX-431 AL	CCGX120404 AL	P830-100523-1
CCMT-21.50	CCMT060202	P830-100309-1
CCMT-21.51	CCMT060204	P830-100310-1
CDCD-500	—	P830-100006-1
CDCD-505	—	P830-100007-1
CNGA-430	CNGA120402	P830-100009-1
CNMG-431	CNMG120404	P830-100491-1
CNMG-432	CNMG120408	P830-100012-1
CNMP-431	CNMP120404	P830-100013-1
CPG-421	CPGN120304	P830-100017-1
CPG-422	CPGN120308	P830-100018-1
CPGT-32.52	CPGT09T308	P830-100091-1
DCMT-32.51	DCMT11T304	P830-100170-1
DDGB-522	DDGB190308	P830-100722-1
DNMG-431	DNMG150404	P830-100211-1
DPG-432	DPG150408	P830-100279-1
DPGT-32.52	DPGT11T308	P830-100347-1
FLGD 3062R	—	P830-100628-1
GFN-3	—	P830-100605-1
N151.2-300-30-4P	—	P830-100597-1
N151.2-400-40-4P	—	P830-100596-1
N151.4-600-40-AL	—	P830-100595-1
NG-2062L	—	P830-100436-1
NG-2062R	—	P830-100031-1
NPL-51	—	P830-100438-1
RCGX-10T3MO-AL	RCGX-10T3MO-AL	P830-100505-1
RCHT-130400KL	RCHT130400KL	P830-100588-1
RCHT-190600-KL	RCHT190600-KL	P830-100598-1
RCMT-0803MO-100	RCMT0803MO-100	P830-100607-1
RD-6P	RXGB090300	P830-100224-1
RD-8P	RXGB120300	P830-100040-1
RD-10P	RXGB150300	P830-100153-1
RD-16P	RXGB250600	P830-100196-1
RFG-21F (5/16IC)	—	P830-100399-1
SPG-322	SPGN090308	P830-100063-1
SPG-422	SPGN120308	P830-100064-1
SPG-424	SPGN120316	P830-100065-1
SPG-428	SPGN120332	P830-100162-1

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Insert ANSI Code	Insert ISO Code	Part Number Coated
SPG-632	SPGN190408	P830-100343-1
SPG-634	SPGN190416	P830-100175-1
SPG-842	SPGN250608	P830-100583-1
SPGB-432	SPGB120408	P830-100385-1
SPMT-432-WH	SPMT120408WH	P830-100244-1
TCGW-32.52	TCGW16T308	P830-100072-1
TCGX-21.51-AL	TCGX110204-AL	P830-100327-1
TCGX-3(2.5)1-AL	TCGX16T304	P830-100602-1
TCMT-32.52	TCMT16T308	P830-100269-1
TCMW-21.51	TCMW110204	P830-100076-1
TD-6P	—	P830-100078-1
TD-6P1	—	P830-100080-1
TD-8P	—	P830-100081-1
TDAB-51	TDAB070104	P830-100083-1
TDAB-52	TDAB070108	P830-100084-1
TNMA-432	TNMA220408	P830-100454-1
TPCB-221	TPCB110304	P830-100360-1
TPG-221	TPGN110304	P830-100101-1
TPG-222	TPGN110308	P830-100102-1
TPG-320	TPGN160301	P830-100252-1
TPG-321	TPGN160304	P830-100104-1
TPG-322	TPGN160308	P830-100105-1
TPG-324	TPGN160316	P830-100107-1
TPG-431	TPGN220404	P830-100109-1
TPG-432	TPGN220408	P830-100110-1
TPG-433	TPGN220412	P830-100111-1
TPMA-322	TPMA160308	P830-100227-1
TPMM-321	TPMM160304	P830-100373-1
TPMM-322	TPMM160308	P830-100023-1
VBMT-221	VBMT110304	P830-100127-1
VBMT-331	VBMT160404	P830-100217-1
VBMT-332	VBMT160408	P830-100165-1
VCGT-221HP	VCGT110304HP	P830-100524-1
VCGT-331HP	VCGT160404HP	P830-100531-1
VCGX-331-AL	VCGX160404-AL	P830-100395-1
VCGX-332-AL	VCGX160408-AL	P830-100498-1
VNGP-330	VNGP160402	P830-100615-1
VNGP-330.5	VNGP160403	P830-100575-1
VPGR-331	VPGR160404	P830-100485-1
VPGR-332	VPGR160408	P830-100136-1
WNMG-431	WNMG080404	P830-100314-1
WNMG-432	WNMG080408	P830-100209-1

[Go to Pricelist](#) ▶

Standard Drills

Standard DCC Drills are 2 flute with a 118°, 4 facet drill point and come in jobber lengths. The diamond coating extends a minimum of one diameter from the drill tip on the jobber drills and past the countersink on center drills. DCC Drills are available as specials in sizes from 0.028" to 0.750". Metric sizes are available.

Center Drills (ONLY ONE END COATED)

[Go to Pricelist](#) ▶

Tool Number	Drill Size	Body Size	Countersink Angle	Overall Length	Tool Number Coated
#00	0.025"	1/8"	60°	1-1/2"	P810-100200-1
#0	1/32"	1/8"	60°	1-1/2"	P810-100071-1
#1	3/64"	1/8"	60°	1-1/2"	P810-100072-1
#2	5/64"	3/16"	60°	2"	P810-100073-1
#3	7/64"	1/4"	60°	2"	P810-100074-1
#4	1/8"	5/16"	60°	2-1/8"	P810-100075-1
#5	3/16"	7/16"	60°	2-3/4"	P810-100240-1

General Purpose Jobber Drills (118°, 4 FACET POINT)

[Go to Pricelist](#) ▶

Cutting Diameter	Tolerance Minimum	Tolerance Maximum	Flute Length	Overall Length	Tool Number Coated
1/32"	-0.0003"	+0.0005"	5/16"	1-1/4"	P810-100180-1
1/16"	-0.0001"	+0.0006"	3/4"	1-1/2"	P810-100023-1
3/32"	-0.0001"	+0.0006"	1"	2"	P810-100016-1
1/8"	+0.0001"	+0.0010"	1-1/4"	2-1/4"	P810-100024-1
3/16"	+0.0003"	+0.0011"	1-5/8"	2-3/4"	P810-100027-1
1/4"	+0.0006"	+0.0016"	2"	3-1/4"	P810-100002-1
5/16"	+0.0006"	+0.0016"	2-3/8"	4"	P810-100142-1
1/2"	+0.0006"	+0.0016"	3"	4-3/4"	P810-100004-1

Don't See What You Need?
Call, it might be a stocked special.

Aircraft Tools

Crystallume DCC rotating tools were developed in a NIST (National Institute of Science and Technology) program that involved a research partnership with Boeing Aircraft and three other large manufacturing companies. Some of the information gained in that program is presented here.

The material was 8-276 carbon fiber laminate 0.30" thick. Test tools were 0.251" diameter drill countersinks.

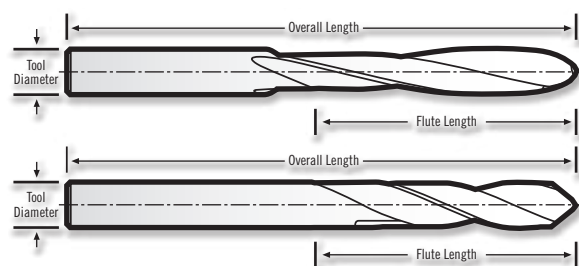
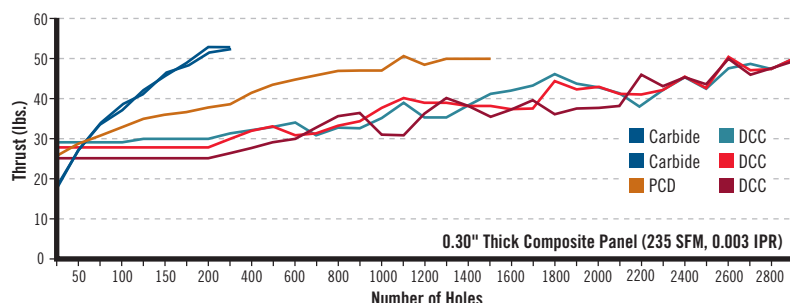
The graph compares the number of holes drilled versus the thrust required. The test was concluded at 50 lbs. of thrust when breakout and haloing became unacceptable. Carbide lasted about 200 holes, PCD lasted 1,500 holes and Crystallume DCC lasted 2,700 holes. Also, note that the sharper carbide tool started with the lowest thrust while the PCD and Crystallume DCC started with about the same thrust (even though the PCD

is a ground edge and the Crystallume DCC is a coated, faceted edge). These test lab results were repeated on the production floor.

Crystallume has continued to be a leader in developing diamond coated tools for aircraft applications.

Aircraft Drills Tolerances

Tool Diameter = $+0.0000/-0.0005$ "
Shank Diameter = $-0.0001/-0.0002$ "
Flute Length = $+0.030$ "
Overall Length = $+0.060$ "



118° Tip Standard Length Drills (4 FACET)

Tool Diameter	Flute Length	Overall Length	Tool Number Coated
0.0980"	1.4"	2.7"	P810-100345-1
0.1285"	1.4"	2.7"	P810-100334-1
0.1421"	1.4"	2.7"	P810-100402-1
0.1560"	1.4"	2.7"	P810-100409-1
0.1655"	1.4"	2.7"	P810-100335-1
0.1734"	1.4"	2.7"	P810-100404-1
0.1900"	1.4"	2.7"	P810-100400-1
0.1915"	1.4"	2.7"	P810-100336-1
0.1990"	1.4"	2.7"	P810-100411-1
0.2055"	1.4"	2.7"	P810-100405-1
0.2210"	1.4"	2.7"	P810-100346-1
0.2515"	1.4"	2.7"	P810-100337-1
0.2590"	1.4"	2.7"	P810-100406-1
0.2710"	1.4"	2.7"	P810-100407-1
0.2770"	1.4"	2.7"	P810-100412-1
0.2800"	1.4"	2.7"	P810-100408-1
0.2812"	1.4"	2.7"	P810-100410-1
0.3135"	1.5"	2.7"	P810-100338-1
0.3765"	1.5"	2.7"	P810-100341-1

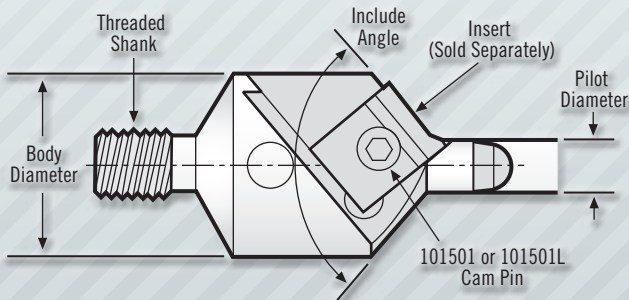
[Go to Pricelist](#) ►

Elliptical Tip Standard Length Drills

Tool Diameter	Flute Length	Overall Length	Tool Number Coated
0.0980"	1.4"	2.7"	F104-100001-1
0.1285"	1.4"	2.7"	F104-100003-1
0.1421"	1.4"	2.7"	F104-100005-1
0.1560"	1.4"	2.7"	F104-100006-1
0.1655"	1.4"	2.7"	F104-100007-1
0.1734"	1.4"	2.7"	F104-100008-1
0.1900"	1.4"	2.7"	F104-100009-1
0.1915"	1.4"	2.7"	F104-100010-1
0.1990"	1.4"	2.7"	F104-100011-1
0.2055"	1.4"	2.7"	F104-100012-1
0.2210"	1.4"	2.7"	F104-100004-1
0.2515"	1.4"	2.7"	F104-100002-1
0.2590"	1.4"	2.7"	F104-100013-1
0.2710"	1.4"	2.7"	F104-100014-1
0.2770"	1.4"	2.7"	F104-100015-1
0.2800"	1.4"	2.7"	F104-100016-1
0.2812"	1.4"	2.7"	F104-100017-1
0.3135"	1.5"	2.7"	F104-100018-1
0.3765"	1.5"	2.7"	F104-100019-1

[Go to Pricelist](#) ►

100° COUNTERSINK with Threaded Shank & DIAMOND COATED INSERT



Crystallume is proud to introduce our latest diamond coated product to enhance your productivity.

The aircraft style countersink is designed to be used in a micro-stop cage for producing 100° countersinks with a root radius or angle for aircraft rivets.

Countersink Bodies

[Go to Pricelist](#) ▶

Body Diameter	Thread Size	Pilot Diameter Range	Part Number Coated*
5/8"	1/4" - 28	0.097–0.257"	CSKB1T-6 XXXX 1-1
3/4"	3/8" - 24	0.257–0.319"	CSKB1T-7 XXXX 1-1
7/8"	3/8" - 24	0.319–0.394"	CSKB1T-8 XXXX 1-1
1"	7/16" - 20	0.394–0.559"	CSKB1T-9 XXXX 1-1

*For the tool holder body specify the pilot diameter **XXXX** (e.g. 0.2515" is **2515**).

Countersink Inserts

[Go to Pricelist](#) ▶

Insert Style	Body Diameter	Part Number Coated
25° Double-Angle	5/8"	CSKIC-6IC025-1
25° Double-Angle	3/4" 7/8" 1"	CSKIC-7IC025-1
0.020" Radius	5/8"	CSKIC-6IR020-1
0.035" Radius	3/4" 7/8" 1"	CSKIC-7IR035-1

**Don't See What
You Need?**
Call, it might be a stocked special.

Coating Services

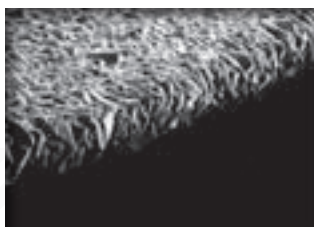
Crystallume DCC coatings can be applied to customer supplied cutting tools and wear parts.

Some of the common carbide grades that are approved for coating are listed in the chart below. The specific

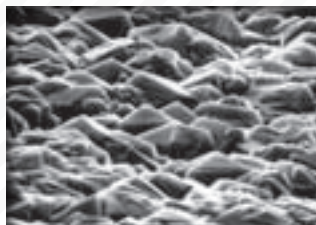
requirements are 6% Cobalt and 94% Tungsten Carbide with a 1 to 3 micron grain size. For more information contact one of our engineers regarding your application needs.



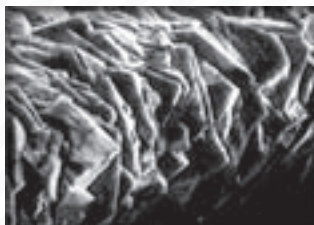
2000X smooth diamond



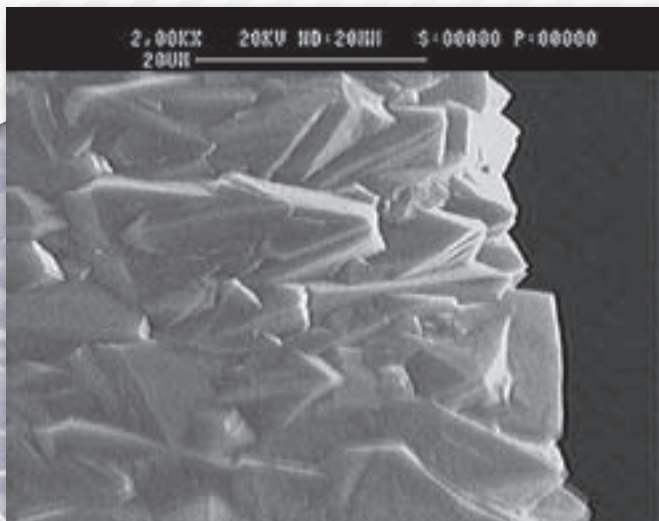
1000X continuous uniform coatings over the entire surface



2000X faceted diamond



2000X faceted edge lowers cutting forces



2000X faceted diamond cutting edge



3000X cubic diamond texture [color added]

Insert Carbide Grades

Company Name	Carbide Grade
ag&I Cutting Tools	AG22
Allied CarbiTech	E6
ANC	AN-6
Carbex	CH01, CH1
Carbide	CD-30
Carboloy	HX, 883
Carmet	CA4
Cerametal	HC05
Cera Tizit	H216T, H10T
Circle	C2, C3, C25
Cubic Diamond	2000X
Dapra	F1
Dijet	KT9
Duramet	DU2, DU22
Emuge Franken	K10
Fansteel/Hydro Carbide	HC290
Firth Stirling	H21
Guhring	DK120
Hertel	KMF
Ingersoll	ICT111
Iscar	IC20
Kaisar	D5
Kennametal	K68, K10, K313
Komet	K10
Lovejoy	LTC-21
Mitsubishi	HTi10
Pro-Cut	PC2
Rouse Arno	AK10
RTW	CQ2, CQ23
Sandvik	H13A
Stellram (Teledyne)	H21
Sumitomo	G10E
Superbee	NT33
Teledyne	HA, H21
Tool-Flo	C25
Toshiba	TH10
Toshiba Tungaloy	TH10
Tungaloy	H10T
Ultramet	Z20, Z22, Z86
Valenite-Widia	THM
Valenite-Widia	VC-2, VC-21, VC-28
Vardex	VK2
VNE-Versa-Turn	V12K
Walter	WKM
Waukesha	WK10
Widia	THM

Round Stock Carbide Grades

Company Name	Carbide Grade
Carmet	CA4
Extramet	EMT806, EMT100
Fansteel	HC290
Kennametal	K96
Newcommer	H21P
RTW	CQ2
Sandvik	H6N
Tungaloy	G1F
Valenite	WA2

General Machining Guidelines

MILLING

Working Material	Application	Cutting Speed		Chip Load	
		fpm	m/min	ipt	m/t
ALUMINUM					
Aluminum (5–8% Si) (356, 308, 242, 208)	Rough Milling	2000–5000	610–1525	0.010–0.020	0.254–0.508
Aluminum (5–8% Si) (356, 308, 242, 208)	Finish Milling	2000–6000	610–1830	0.005–0.010	0.127–0.254
Aluminum Cast (8–12% Si) (354, 357, 380)	Rough Milling	1500–4000	460–1220	0.007–0.015	0.178–0.381
Aluminum Cast (8–12% Si) (354, 357, 380)	Finish Milling	1500–5000	460–1525	0.004–0.008	0.102–0.204
Aluminum Cast (12–18% Si) (390)	Rough Milling	1000–2000	305–610	0.005–0.010	0.127–0.254
Aluminum Cast (12–18% Si) (390)	Finish Milling	1000–3000	305–915	0.002–0.006	0.050–0.150
OTHER MATERIALS					
Babbitt	Milling	700–1100	210–335	0.003–0.010	0.076–0.254
Brass	Milling	2000–4000	610–1220	0.001–0.008	0.025–0.200
Bronze	Milling	900–1350	275–410	0.003–0.008	0.076–0.200
Carbon	Milling	500–2000	150–610	0.0003–0.012	0.008–0.305
Carbon Fiber Materials	Milling	500–2000	150–610	0.003–0.015	0.076–0.381
Copper	Milling	750–1500	230–460	0.001–0.008	0.025–0.200
Glass Fiber Material	Milling	750–1500	230–460	0.001–0.010	0.025–0.254
Green Ceramic Materials	Milling	500–1500	150–460	0.002–0.010	0.050–0.254
Unfilled Plastic	Milling	1000–4000	305–1220	0.003–0.020	0.076–0.508
Wood	Milling	3300–9800	1000–3000	0.004–0.030	0.102–0.762

TURNING

Working Material	Application	Cutting Speed		Chip Load	
		fpm	m/min	ipr	m/r
ALUMINUM					
Aluminum (5–8% Si) (356, 308, 242, 208)	Rough Turning	2000–5000	610–1525	0.010–0.025	0.254–0.635
Aluminum (5–8% Si) (356, 308, 242, 208)	Finish Turning	2000–6000	610–1830	0.005–0.010	0.127–0.254
Aluminum Cast (8–12% Si) (354, 357, 380)	Rough Turning	1500–4000	460–1220	0.007–0.020	0.178–0.508
Aluminum Cast (8–12% Si) (354, 357, 380)	Finish Turning	1500–5000	460–1525	0.004–0.008	0.102–0.204
Aluminum Cast (12–18% Si) (390)	Rough Turning	1000–2000	305–610	0.005–0.010	0.127–0.254
Aluminum Cast (12–18% Si) (390)	Finish Turning	1000–3000	305–915	0.002–0.006	0.050–0.150
OTHER MATERIALS					
Babbitt	Turning	700–1100	210–335	0.003–0.010	0.076–0.254
Brass	Turning	2000–4000	610–1220	0.003–0.015	0.076–0.381
Bronze	Turning	900–1350	275–410	0.003–0.010	0.076–0.254
Carbon	Turning	500–2000	150–610	0.005–0.015	0.127–0.381
Carbon Fiber Materials	Turning	500–2000	150–610	0.003–0.020	0.076–0.508
Copper	Turning	750–1500	230–460	0.003–0.010	0.076–0.254
Glass Fiber Material	Turning	750–1500	230–460	0.001–0.015	0.025–0.381
Green Ceramic Materials	Turning	500–1500	150–460	0.002–0.020	0.050–0.508
Unfilled Plastic	Turning	1000–4000	305–1220	0.003–0.020	0.076–0.508
Wood	Turning	3300–9800	1000–3000	0.004–0.030	0.102–0.762

DRILLING

Working Material	Application	Cutting Speed		Chip Load	
		fpm	m/min	ipr	m/r
ALUMINUM					
Aluminum (5–8% Si) (356, 308, 242, 208)	Drilling	2000–6000	610–1830	0.001–0.010	0.025–0.254
Aluminum Cast (8–12% Si) (354, 357, 380)	Drilling	1500–5000	460–1525	0.001–0.010	0.025–0.254
Aluminum Cast (12–18% Si) (390)	Drilling	1000–3000	305–915	0.001–0.010	0.025–0.254
OTHER MATERIALS					
Babbitt	Drilling	700–1100	210–335	0.001–0.010	0.025–0.254
Brass	Drilling	2000–4000	610–1220	0.001–0.010	0.025–0.254
Bronze	Drilling	900–1350	275–410	0.001–0.010	0.025–0.254
Carbon	Drilling	500–2000	150–610	0.001–0.010	0.025–0.254
Carbon Fiber Materials	Drilling	500–2000	150–610	0.001–0.010	0.025–0.254
Copper	Drilling	750–1500	230–460	0.001–0.010	0.025–0.254
Glass Fiber Material	Drilling	750–1500	230–460	0.001–0.010	0.025–0.254
Green Ceramic Materials	Drilling	500–1500	150–460	0.001–0.010	0.025–0.254
Unfilled Plastic	Drilling	1000–4000	305–1220	0.001–0.010	0.025–0.254
Wood	Drilling	3300–9800	1000–3000	0.003–0.025	0.076–0.635

Speeds and Feeds are only general starting points and may vary depending on specific applications.

[Go to Catalog Table of Contents](#)

Speed & Feeds

SPEED & FEED FOR GRAPHITE

Tool Diameter	Soft Graphite Chipload		Medium Graphite Chipload		Hard Graphite Chipload	
	Roughing (ipt)	Finishing (ipt)	Roughing (ipt)	Finishing (ipt)	Roughing (ipt)	Finishing (ipt)
1/32"	0.0006–0.0008	0.0005–0.0006	0.0005–0.0006	0.0004–0.0005	0.0004–0.0005	0.0003–0.0004
1/16"	0.0013–0.0015	0.0010–0.0013	0.0010–0.0013	0.0008–0.0010	0.0008–0.0010	0.0005–0.0008
3/32"	0.0019–0.0023	0.0015–0.0019	0.0015–0.0019	0.0011–0.0015	0.0011–0.0015	0.0008–0.0011
1/8"	0.0025–0.0030	0.0020–0.0025	0.0020–0.0025	0.0015–0.0020	0.0015–0.0020	0.0010–0.0015
3/16"	0.0038–0.0045	0.0030–0.0038	0.0030–0.0038	0.0023–0.0030	0.0023–0.0030	0.0015–0.0023
1/4"	0.0050–0.0060	0.0040–0.0050	0.0040–0.0050	0.0030–0.0040	0.0030–0.0040	0.0020–0.0030
5/16"	0.0063–0.0075	0.0050–0.0063	0.0050–0.0063	0.0038–0.0050	0.0038–0.0050	0.0025–0.0038
3/8"	0.0075–0.0090	0.0060–0.0075	0.0060–0.0075	0.0045–0.0060	0.0045–0.0060	0.0030–0.0045
7/16"	0.0088–0.0105	0.0070–0.0088	0.0070–0.0088	0.0053–0.0070	0.0053–0.0070	0.0035–0.0053
1/2"	0.0100–0.0120	0.0080–0.0100	0.0080–0.0100	0.0060–0.0080	0.0060–0.0080	0.0040–0.0060

Speeds and Feeds are only general starting points and may vary depending on specific applications.

CUTTING SPEEDS

Graphite Hardness	Cutting Speed
	square ft./min
Soft Graphite	1000–2000 sfm
Medium Graphite	750–1500 sfm
Hard Graphite	500–1250 sfm

Use maximum RPM if suggested RPM is higher than the machine's capabilities.

Terms & Conditions, General Information

TERMS

1% 10 Days. 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.



A Division of RobbJack Corporation

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Fax: 408 653-1710
www.crystallume.com

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



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www.crystallumepvd.com