

# SECTIONING

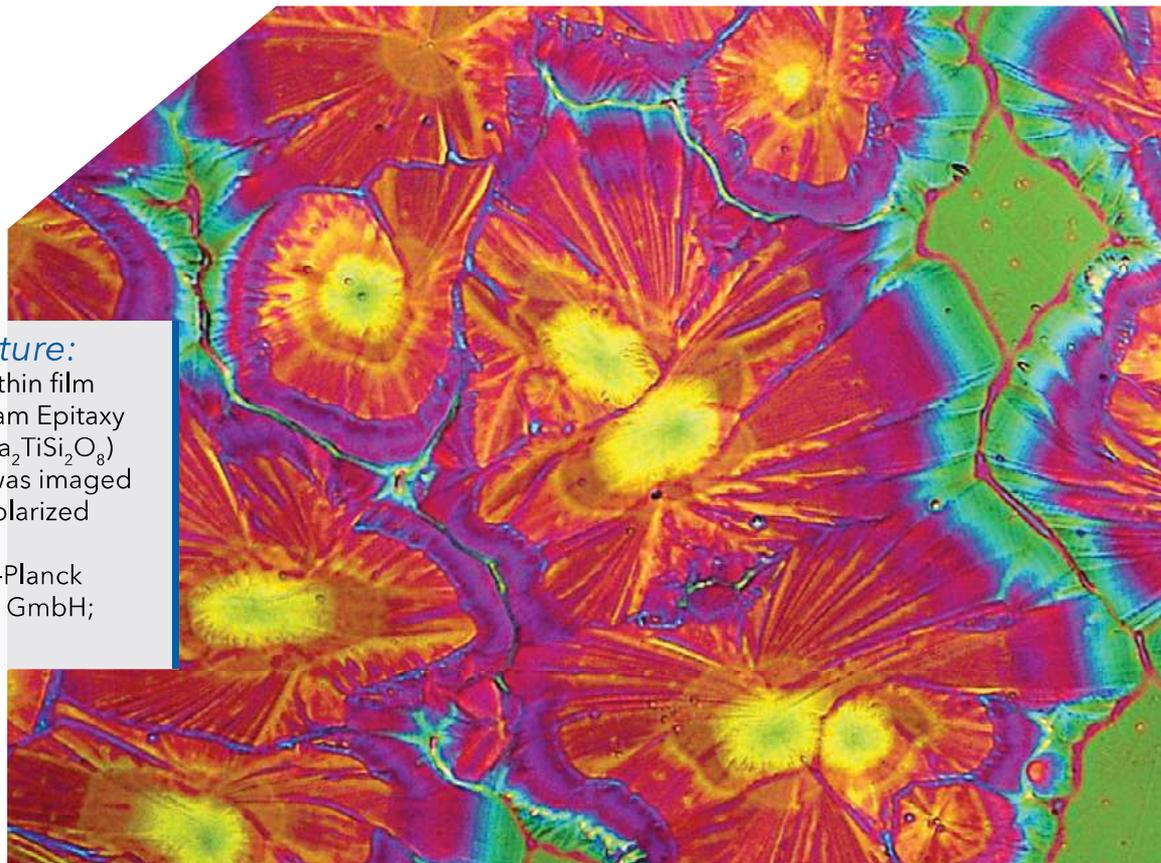
A full range of abrasive and precision saws, blades, and vises for cutting any material

Specimen preparation for microstructural examination starts with a quality cut. The proper equipment with firm and stable vising minimizes the depth of deformation on the sample surface. The abrasive and precision saws save time by limiting the number of steps needed to analyze samples after sectioning.

## *Featured Microstructure:*

Surface of a 300nm BaTiO<sub>3</sub> thin film deposited by Molecular Beam Epitaxy on Silicon. The Fresnoite (Ba<sub>2</sub>TiSi<sub>2</sub>O<sub>8</sub>) formed during deposition was imaged at 200x mag. under cross polarized light.

~ Angelika Bobrowski; Max-Planck Institut für Eisenforschung GmbH; Düsseldorf, Germany





# Product Comparison

## Abrasive Cutters

	AbrasiMet™ M	AbrasiMatic™ 300	Delta Manual	AbrasiMet™ XL Pro
Wheel Diameter	10in [254mm] 12in [305mm]	12in [305mm]	14in [350mm]	14in [356mm] 16in [406mm] 18in [457mm]
Cut Types	Chop	Chop Y-Feed with Pulsing	Chop	Chop, Y-feed, Planar Pulsing
Manual Movement	Z-axis	X-axis*, Y-axis, Z-axis	Z-axis	Y-axis, Z-axis
Automated Movement		Y-axis		X-axis, Y-axis, Z-axis
Maximum Part Size in Chamber	25 x 13 x 4.3in [636 x 330 x 109mm]	16 x 6 x 3.75in [406 x 152 x 95mm]	26 x 24 x 5in [660 x 610 x 127mm]	49 x 24 x 7in [1245 x 610 x 178mm]
Cutting Capacity	4.3in** [109mm]	3.75in [95mm]	5.00in** [127mm]	7in [178mm]

*\*Optional Items*  
*\*\*Maximum cutting capacity assumes largest size blade with smallest flange.*

## Precision Cutters

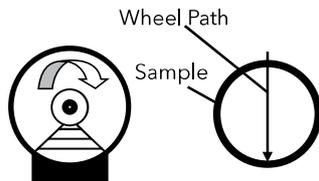
	IsoMet™ Low Speed	IsoMet™ 1000	IsoMet™ High Speed	IsoMet™ High Speed Pro	PetroThin™ Thin Sectioning System
Maximum Wheel Diameter	5in [127mm]	7in [178mm]	8in [203mm]	8in [203mm]	8in [203mm]
Cut Style	Gravity Fed	Gravity Fed	Y-Feed	Y-Feed	Manual
Sample Movement	X-axis, Z-axis	X-axis, Z-axis			X-axis, Z-axis
Wheel Movement			X-axis, Y-axis	X-axis, Y-axis and Z-axis	
Maximum Cutting Capacity**	1.77in [45mm]	2.5in [64mm]	2.8in [76mm]; 2 x 6.5 x 1in [51 x 165 x 25mm]	2.8in [76mm]; 2 x 6.5 x 1in [51 x 165 x 25mm]	Petrographic Glass Slides: 1.06 x 1.81in [27x46mm] or 3 x 1in [76.2 x 25.4mm]

*\*\*Maximum cutting capacity assumes largest size blade with smallest flange.*

## Cutting Style and Wheel Path

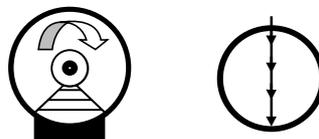
### Chop Cutting

The traditional form of machine operation. Wheel contact arc is governed by sample size. Generally a struggle with large/difficult parts.



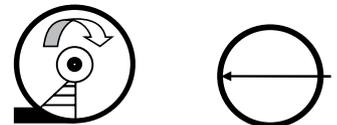
### Chop Cutting with Pulsing

Wheel contact still governed by sample size. The pulsing action pauses the feed rate in short intervals enabling coolant to wash away swarf and dissipate heat.



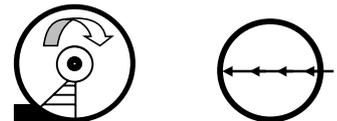
### Y-Feed Cut

The abrasive wheel is stationary and the cutting table moves forward completing a one time cut into the sample. Wheel contact arc is governed by sample size.



### Y-Feed Cut with Pulsing

Wheel Contact arc is still governed by sample size. The pulsing action pauses the feed rate in short intervals enabling coolant to wash away swarf and dissipate heat.



### Planar Cut

Like Y-feed, the abrasive wheel is stationary and the cutting table moves into the blade to complete a cut into the sample. In Planar mode, the Y-feed cut is completed in successive vertical steps.

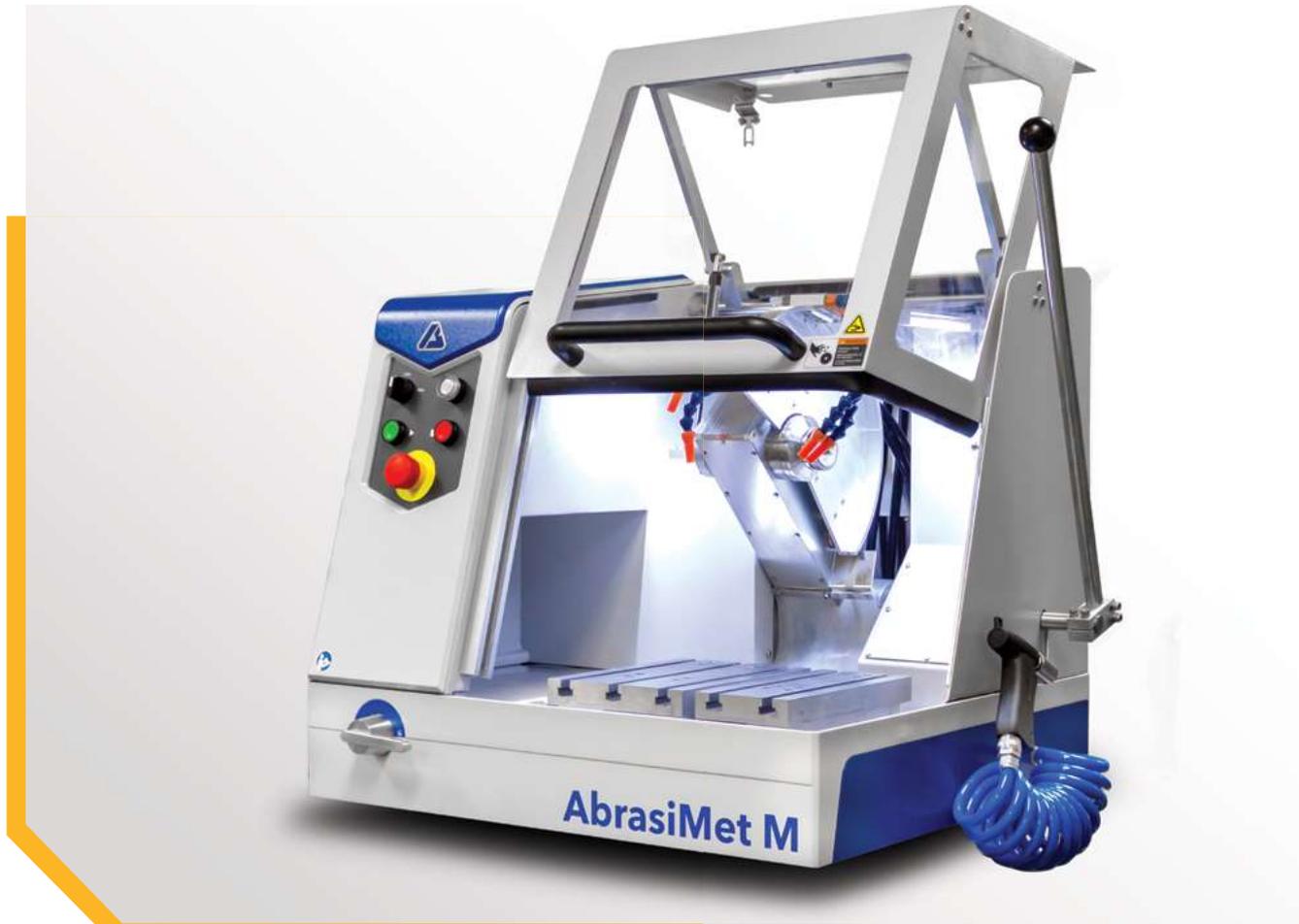




# Abrasive Cutters

## Simple Setup for Efficient Cuts

The AbrasiMet M is an easy to use, manual, tabletop cutter that provides excellent cutting results.



## AbrasiMet™ M

The AbrasiMet M is a benchtop manual cutting machine for 10in [254mm] and 12in [305mm] blades that provides consistent sectioning results.

### Easy to Cut and Maintain

- No tools required to change blades
- Adjustable cutting arm to maximize ergonomics
- Recirculation tank with filter minimizes the frequency and time required to clean the recirculation tank

### Durable Machine with Versatile Performance

- Powerful motor cuts through challenging materials with ease
- Dual blade feature performs two cuts in a single cycle

Part Number	Voltage/Frequency
10-10107-200	200 - 240VAC, 50-60Hz
10-10107-400	380 - 460VAC, 50-60Hz
10-10107-200C	CSA 200-240VAC, 50-60Hz

**Dimensions:** 31.1in [791mm] W x 27.3in [694mm] Dx 36.2in [979mm] H open  
25.7in [653mm] H closed

**Weight:** 309 lb [140 kg]

### Recirculation Tank (Required)

The advanced Recirculation tank features a nested tank design with a filter screen that makes regular debris removal fast and simple, extending the time in between cleaning the system. The standard recirculation tank does not feature the filtering option, but comes at a more economical price. All tanks are 30 gal[113L]

10-2166-200	Advanced Recirculation Tank 200-240VAC, 50/60Hz	10-2166-400	Advanced Recirculation Tank 380-460VAC, 50/60Hz
10-2166-205	Standard Recirculation Tank 200-240VAC, 50/60Hz	10-2166-405	Standard Recirculation Tank 380-460VAC, 50/60Hz

Visit [www.buehler.com](http://www.buehler.com) for ordering information.



# Abrasive Cutters

## Highly Reproducible Results

Our line of abrasive cutters are built for high volume environments. Our cutters combine speed with advanced features without compromising cut quality.

### AbrasiMatic™ 300

The AbrasiMatic 300 is a benchtop cutting machine for 12in [305mm] blades that provides both manual and automatic cutting capabilities. These capabilities provide versatility in sectioning to suit a wide variety of needs.



#### Two Axis Cutting

	Part Number	Voltage
Y & Z-axis	10-2190-260	200-240VAC, 60Hz
	10-2190-460	440-480VAC, 60Hz
	10-2190-250	200-240VAC, 50Hz
	10-2190-400	380-400VAC, 50Hz

**Dimensions:** 34in [864mm] x 27in [686mm] x 41in [1041mm] open  
24in [610mm] closed  
**Weight:** 350lb [165kg]

#### Three Axis Cutting

	Part Number	Voltage
X, Y & Z-axis	10-2193-260	200-240VAC, 60Hz
	10-2193-460	440-480VAC, 60Hz
	10-2193-250	200-240VAC, 50Hz
	10-2193-400	380-400VAC, 50Hz

**Dimensions:** 34in [864mm] x 27in [686mm] x 41in [1041mm] open  
24in [610mm] closed  
**Weight:** 350lb [165kg]

### Delta Manual

The Delta Manual is a floor standing manual abrasive cutter for 14in [350mm] blades. This cutter's high powered motor, large chamber and versatile viewing options enable simple, quick and easy positioning of samples for sectioning.



Part Number	Voltage
10-2213EB-260	200-240VAC, 60Hz
10-2213EB-460	440-480VAC, 60Hz
10-2213EB-400	380-415VAC, 50Hz

\*Recirculation tank is included

**Dimensions:** 33in [838mm]W x 48in [1212mm]D x 81.5in [2070mm]H open  
64in [1626mm]H closed

**Weight:** 800lb [365kg]

#### Accessories

10-2327 T-Slot Bed, 12mm, Y-axis Slots



# Abrasive Cutters

## Robust Machine with Intuitive Features

The durable design and intuitive features of the AbrasiMet XL Pro make it the ideal machine for high volume environments that require the highest levels of cut quality, flexibility and consistency.



SECTIONING

### AbrasiMet™ XL Pro

The AbrasiMet™ XL Pro is a floor standing automatic abrasive cutting machine for 14in [356mm] to 18in [457mm] blades that provides consistent and repeatable cut quality for larger diameter samples.

#### Intuitive and Quick to Operate

- Quickly set up for a cut by positioning the blade and table with the joystick and laser alignment
- Save cutting methods to ensure repeatability and consistency.
- Filtration recirculation tank with vibration motor continuously filters the coolant to minimize cleaning frequency and time.

#### Powerful Machine for Demanding Environments

- Ideal for heavy duty, repetitive use in the toughest environments
- Efficiently cut through hard and difficult materials with the powerful 13.4hp [10kW] motor and optimized cutting arm.

Part Number	Voltage/Frequency
10-2320-400	380-480VAC, 50/60Hz

Dimensions: 54in [1372mm] W x 50.7in [1288mm] D x 75in [1905mm] H

Weight: 1750 lb [800 kg]

#### Accessories

##### Mist Extractor

Recommended to use the mist extractor listed below or connect the machine to a facility exhaust system

10-2343-400 Mist Extractor

See page 8 for vise with 12mm T-nuts

Visit [www.buehler.com](http://www.buehler.com) for ordering information.



# Abrasive Cutter Vises Accessories

## Single Piece Sliding Vises

### Speed Clamping Vise



**Size:** Medium  
**Part Numbers:** Left: 10-3544  
 Right: 10-3545  
**Max Opening:** 2.75" [70mm]  
**Clamping Plate:** 3.2" x 1.4"  
 [80 x 35mm]  
**T-Nuts:** 12mm or 14mm



**Size:** Large  
**Part Numbers:** Left: 10-3546  
 Right: 10-3547  
**Max Opening:** 7.3" [185mm]  
**Clamping Plate:** 3.1" x 3.5"  
 [78 x 89mm]  
**T-Nuts:** 12mm or 14mm

### MetKlamp VIII



**Part Numbers:** Left: 95-C1821  
 Right: 95-C1822  
**Max Opening:** 3.125" [80mm]  
**Clamping Plate:** 1.75" x 2.25"  
 [45 x 58mm]  
**T-Nuts:** 12mm

## Two Piece Sliding Vises

### Sliding Vise Kit



**Size:** Medium  
**Part Numbers:** Left: 10-3540  
 Right: 10-3541  
**Clamping Plate:** 2.36" x 3"  
 [60x76 mm]  
**T-Nuts:** 12mm\*

**Size:** Large  
**Part Numbers:** Left: 10-3542  
 Right: 10-3543  
**Clamping Plate:** 2.95" x 4.23"  
 [74 x 107mm]  
**T-Nuts:** 12mm\*  
 \*14mm conversion kits are available  
 Medium: 10-3548  
 Large: 10-3549

## Specialty Vises

### Chain Clamping Kit



**Application:** For clamping very large or irregularly shaped samples  
**Part Number:** 46-0030

### Fastener Vise



**Application:** For longitudinal sectioning of fasteners. Must be held by left hand sliding vise.  
**Max Opening:** 1.6" [40.6mm]  
**Part Number:** 95-C1702

## Vertical Clamping Vises

### Vertical Clamping Kit



**Size:** Small  
**Part Numbers:** 10-3531  
**Clamping Height:** 2.3" [58mm]  
**Reach:** 2.1" [54mm]  
**T-Nuts:** 12mm

**Size:** Large  
**Part Numbers:** 10-3523  
**Clamping Height:** 4" [102mm]  
**Reach:** 2.4" [61mm] + 3.5" [90mm]  
 with extension (included)  
**T-Nuts:** 12mm and 14mm

### Riser Blocks

Small: 10-3532; 2.4" [60mm]  
 Large: 10-3528; 2.9" [74mm]



### Horizontal Clamp

**T-Nuts:** 12mm and 14mm  
**Part Number:** 10-3526



### Vee Block Clamp Kit

**T-Nuts:** 12mm and 14mm  
**Part Number:** 10-3527



### Adjustable Vee Blocks

**T-Nuts:** 12mm and 14mm  
**Part Number:** 10-3525



See Visiting Guide for More Information

## Recirculating Systems



### Recirculating System 30 gal [113L]

For AbrasiMet™ M  
27 W x 26 D x 24in H  
686 W x 660 D x 610mm H

10-2166-200 [Adv 200-240VAC, 50/60Hz]  
10-2166-205 [Std 200-240VAC, 50/60Hz]  
10-2166-400 [Adv 380-460VAC, 50/60Hz]  
10-2166-405 [Std 380-460VAC, 50/60Hz]



### Recirculating System 22 gal [90L]

For AbrasiMatic 300  
26.5 W x 18.25 D x 26.5in H  
674 W x 464 D x 674mm H  
(22.5in [572mm]H w/o wheels)

10-2332-260 [200-240VAC, 60Hz]  
10-2332-460 [440-480VAC, 60Hz]  
10-2332-250 [200-240VAC, 50Hz]  
10-2332-400 [380-400VAC, 50Hz]



### Cool 3 Fluid

Water miscible fluid  
concentrate. Dilute coolant to  
1:25 to 2:25, with water.

10-6001 33.8oz [1L]  
10-6004 1gal [4L]  
10-6010 2.6gal [10L]



### Base Cabinet

For AbrasiMet M and AbrasiMatic 300  
36 W x 30 D x 36in H  
[910 W x 760 D x 910mm H]

80-10001

### Recirculating System

Part Numbers	Description
10-2431-400	42 gal [160L] with sloped filter for AbrasiMatic 300 and Delta 30 W x 25.5 D x 24in H 762 W x 648 D x 610mm H



## Diamond & CBN Blades for Abrasive Cutters

[Blade Thickness is listed under Part Number] 1.25in [32mm] Arbor (Qty 1)

Recommended Use	Blade Type	8in [200mm]	10in [250mm]	12in [300mm]	14in [350mm]
General Use	Diamond	114608E 0.047in [1.2mm]	114610E 0.051in [1.3mm]		
Hard Materials	Diamond	114808E 0.047in [1.2mm]	114810E 0.047in [1.2mm]	103056 0.055in [1.4mm]	114814E 0.059in [1.5mm]
Ceramic and Petrographic samples	Diamond		114710E 0.047in [1.2mm]	103053 0.087in [2.2mm]	114714E 0.059in [1.5mm]
Plastics and Polymers	Diamond		102557 0.049in [1.25mm]		
General use, hardened steel, HRC55 and Up	CBN				103551 0.079in [2mm]

\* 230mm Ø

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# Abrasive Cutter Consumables



## Abrasive Blades

Buehler's Abrasive Blades are designed to provide high quality sectioning results with no burning and minimal surface deformation. This can reduce the amount of grinding & polishing required later in the preparation process.

### Efficient Cutting with Extended Life

An abrasive blade wears down during cutting to expose new abrasive particles and maintain efficient cutting. However, too fast of a wear rate leads to shortened blade life. Buehler's blades have been designed to balance this wear rate to maintain efficient cutting while extending blade life.

### Resin Bond vs Rubber Bond

Buehler's line of abrasive blades includes both rubber bonded and resin bonded blades. While both provide high quality cutting, there are some differences between them. Rubber bonded blades may be thinner for some applications, but emit a burnt rubber odor while cutting. Resin bonded blades offer similar performance with a reduced odor.

## Abrasive Blades Selection, 1.25in [32mm] Arbor (Qty 10)

[Blade Thickness is listed under Part Number] *Rubber Bond* = • *Resin Bond* = \*

Recommended Use	10in [254mm] Chop/Linear	12in [305mm] Chop/Linear	14in [356mm] Chop/Linear	16in [406mm] Chop/Linear
Superalloys, General Steel, Non-Ferrous	12-4205-010• 0.051in [1.3mm]	12-4405-010• 0.055in [1.4mm] 10-31205-010 0.08in [2mm]	12-4305-010• 0.063in [1.6mm]	10-31605-010* 0.125in [3mm]
Ferrous materials >HRC60	10-4210-010• 0.083in [2.1mm] 102509P* 0.06in [1.5mm]	12-4110-010• 0.09in [2.3mm] 10-31218-010* 0.08in [2mm]	10-4310-010• 0.075in [1.9mm] 103509P* 0.098in [2.5mm]	10-31610-010 0.125in [3mm]
Ferrous materials HRC50-60	10-4212-010• 0.083in [2.1mm] 10-31014-010 0.06in [1.5mm]	10-4412-010• 0.105in [2.7mm] 10-31212-010* 0.08in [2mm]	10-4312-010• 0.09in [2.3mm] 103509P* 0.098in [2.5mm]	10-31612-010 0.125in [3mm]
Ferrous materials HRC35-50	10-4216-010• 0.083in [2.1mm] 10-31014-010* 0.06in [1.5mm]	12-4116-010• 0.105in [2.7mm] 10-31218-010* 0.08in [2mm]	12-4305-010• 0.063in [1.6mm] 103510P* 0.098in [2.5mm]	10-31616-010 0.125in [3mm]
Ferrous materials HRC15-35	10-4220-010• 0.067in [1.7mm] 102511P* 0.06in [1.5mm]	12-4120-010• 0.105in [2.7mm] 103011P* 0.079in [2mm]	12-4305-010• 0.063in [1.6mm] 103511P* 0.098in [2.5mm]	
High Speed Steel, Stainless Steel, Carburized Steel	102508P* 0.063in [1.6mm]	103008P* 0.079in [2mm]	103508P* 0.102in [2.6mm]	
Delicate Cutting	10-4227-010• 0.032in [0.8mm]			
Titanium Alloys, Zirconium Alloys, Ductile Materials	10-4245-010• 0.063in [1.6mm] 102507P* 0.06in [1.5mm]	12-4145-010• 0.087in [2.2mm] 103007P* 0.079in [2mm]	10-4345-010• 0.063in [1.6mm] 103507P* 0.098in [2.5mm]	
Non-Ferrous Materials (Aluminum, Copper, Brass), Very Soft Ferrous Materials	10-4250-010• 0.063in [1.6mm] 102512P* 0.06in [1.5mm]	103012P* 0.079in [2mm]	10-4350-010• 0.087in [2.2mm] 103512P* 0.098in [2.5mm]	10-31650-010 0.125in [3mm]

## AcuThin™ Blades (Qty 10)



For certain applications, it is important to minimize the amount of damage done to the sample during sectioning. The AcuThin series offers thin blades that have been developed to minimize the area of cutting thus reducing the amount of damage to the sample. These blades utilize a rubber bond and allow for precise, delicate abrasive sectioning with minimal surface damage. [Blade Thickness is listed under Part Number]

Recommended Use	9in [230mm]	10in [254mm]	12in [305mm] Chop	14in [356mm] Chop
General Use <HRC45	102301 0.032in [0.8mm]	102501 0.04in [1mm]	10-4360-010 0.032in [0.8mm]	10-3501 0.063in [1.6mm]
Ferrous Materials >HRC45	10-4161-010 0.025in [0.635mm]	10-4261-010 0.025in [0.635mm]	10-4361-010 0.025in [0.635mm]	103502 0.105in [2.7mm]

## Abrasive Blades Selection, 1.25in [32mm] Arbor (Qty 10)

[Blade Thickness is listed under Part Number] Rubber Bond = • Resin Bond = \*

Recommended Use	12in [305mm] Orbital	14in [356mm] Orbital	16in [406mm] Orbital	18in [455mm] Orbital
Superalloys, General Steel, Non-Ferrous	12-4405-010• 0.055in [1.4mm]	12-4305-010• 0.063in [1.6mm]	12-5605-010• 0.075in [1.9mm]	12-5805-010• 0.1in [2.5mm]
Ferrous materials >HRC60	12-4410-010• 0.105in [2.7mm]	12-4310-010• 0.105in [2.7mm]	12-5610-010• 0.125in [3mm]	12-5810-010• 0.153in [3.8mm]
Ferrous materials HRC50-60	12-4410-010• 0.105in [2.7mm]	12-4310-010• 0.105in [2.7mm]	12-5612-010• 0.125in [3mm]	12-5816-010• 0.153in [3.8mm]
Ferrous materials HRC35-50	12-4416-010• 0.105in [2.7mm]	12-4316-010• 0.105in [2.7mm]	12-5616-010• 0.125in [3mm]	12-5816-010• 0.153in [3.8mm]
Ferrous materials HRC15-35	12-4420-010• 0.105in [2.7mm]	12-4320-010• 0.087in [2.2mm]	12-5616-010• 0.125in [3mm]	12-5816-010• 0.153in [3.8mm]
Titanium Alloys, Zirconium Alloys, Ductile Materials			12-5645-010• 0.075in [1.9mm]	12-5845-010• 0.1in [2.5mm]



See Blade Guide for More Information