

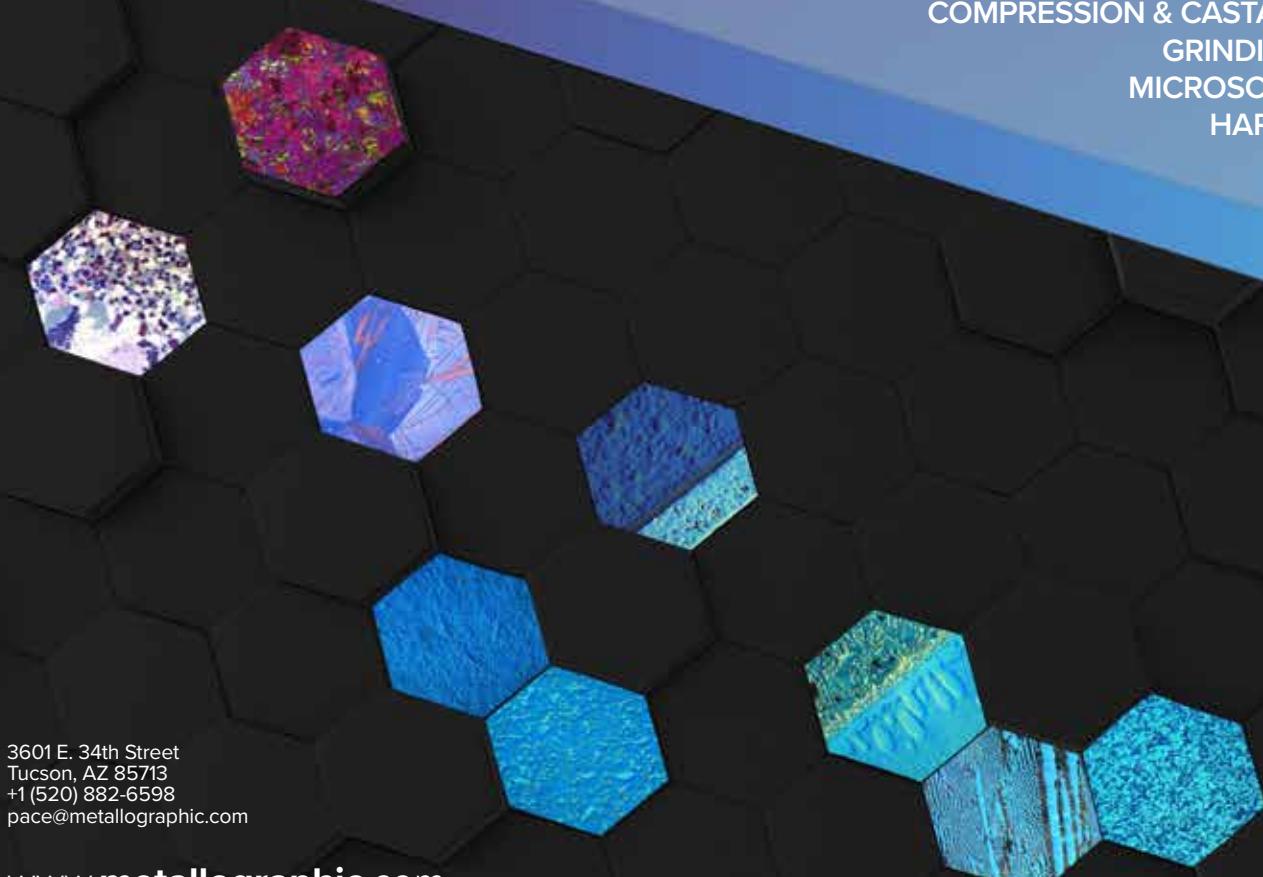


2024-2025

2024-2025 PRODUCT CATALOG

METALLOGRAPHIC EQUIPMENT AND CONSUMABLES

ABRASIVE & PRECISION CUTTING
COMPRESSION & CASTABLE MOUNTING
GRINDING & POLISHING
MICROSCOPY & ANALYSIS
HARDNESS TESTING
LAB FURNITURE



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INTRODUCTION



MESSAGE FROM THE CEO: DONALD ZIPPERIAN, PhD

I am proud to introduce the next generation of excellence here at Pace Technologies!

As a dynamic industry leader, Pace Technologies has ceaselessly pushed the boundaries of quality and customer-centricity for over a quarter century. Our relentless pursuit of perfection has led to cutting-edge equipment that welds state-of-the-art performance with affordability.

This generation of equipment offers our customers enhanced flexibility and control of their sample preparation procedures. These technical upgrades are tempered by our expanding services team who stand ready to provide you with expert guidance for optimal results.

Embracing vertical integration, we've streamlined our supply chain, ensuring unmatched product quality, timeliness, and cost efficiency. Our grinding papers, diamond suspensions, and cutting-edge lubricants are produced in-house to ensure our products meet the highest standards.

It's my hope that our combination of precision, innovation, and customer centricity converges to demonstrate that **quality matters** at Pace Technologies, in every sense of the phrase.

A handwritten signature in black ink, appearing to read "Donald Zipperian".

Customer Assistance

For order placement, prices, delivery & order status, contact us:

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Fax: +1 (520) 882-6599

Email: pace@metallographic.com

For product information, metallographic procedures, etchants & troubleshooting guidelines online, visit:

<https://www.metallographic.com>

Safety Data Sheets (SDS):

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ABRASIVE CUTTING

Manual MEGA Abrasive Cutter Options

MODEL	Blade Diameter	Wheel Feed	Manual Y-Table	Voltage (options)	Max Motor Power
MEGA-M250S	10-inch (250 mm)	Yes	n.a.	220V single phase 208Y/380V/480V, 3φ	3 hp (2.2KW)
MEGA-T250S	10-inch (250 mm)	Yes	Yes	208Y/380V,480V 3φ	5.8 hp (4.5 KW)
MEGA-T300S	12-inch (305 mm)	Yes	Yes	208Y/380V/480V, 3φ 480V, 3φ	5.8 hp (4.5 KW) OR 20 hp (15 KW)
MEGA-T350S	14-inch (350 mm)	Yes	Yes	208Y/380V/480V, 3φ 480V, 3φ	5.8 hp (4.5 KW) OR 20 hp (15 KW)
MEGA-T400S	16-inch (405 mm)	Yes	Yes	480V, 3φ	5.8 hp (4.5 KW) OR 20 hp (15 KW)

MEGA M250S

10-inch MANUAL Wheel Feed
Metallographic Abrasive Cutter



NEW

MEGA T400S

16-inch MANUAL
Metallographic Abrasive Cutter



MEGA T300S

12-inch MANUAL
Metallographic Abrasive Cutter



MEGA T250S

10-inch MANUAL Table/Wheel Feed
Metallographic Abrasive Cutter



METALLOGRAPHIC ABRASIVE CUTTERS

Automated MEGA Abrasive Cutter Options

2

year warranty
Limited Warranty

MODEL	Blade Diameter	Auto/ Manual Y-Table	Auto X-Table	Voltage Options	Max Motor Power
MEGA-T300A	12-inch (305 mm)	Yes	Optional	208Y/380V/480V 480V, 3φ	5.8 hp (4.5 KW) OR 20 hp (15 KW)
MEGA-T350A	14-inch (350 mm)	Yes	Optional	208Y/380V/480V 480V, 3φ	5.8 hp (4.5 KW) OR 20 hp (15 KW)
MEGA-T400A	16-inch (405 mm)	Yes	Optional	208Y/380V/ 480V, 3φ	5.8 hp (4.5 KW) OR 20 hp (15 KW)

Options:

- ◆ Choose the machine that accommodates your preferred blade diameter
- ◆ Add an automated X-axis Table for maximum flexibility on cuts
- ◆ Choose between voltage options to provide the exact amount of power you need

Benefits:

- ◆ Constant torque variable speed Servo Motor (3-phase)
- ◆ Manual or automated Y-Axis table feed
- ◆ X-axis tables have automated X-axis control
- ◆ Programming options for constant feed rate or constant motor load for better control
- ◆ Twin t-slotted stainless steel table
- ◆ Electronic braking system

MEGA T400A

16-inch AUTOMATED/MANUAL
Metallographic Abrasive Cutter



MEGA T350A

14-inch AUTOMATED/MANUAL
Metallographic Abrasive Cutter



MEGA T300A

12-inch AUTOMATED/MANUAL
Metallographic Abrasive Cutter



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ABRASIVE CUTTING

MEGA-M250S ABRASIVE CUTTER



MEGA-M250S

NEW

MEGA M250S

10-inch MANUAL Wheel Feed
Metallographic Abrasive Cutter

- Manual Cutting
- Economical
- 3-phase Asynchronous motor (220V single phase or 208Y/380V/480V, 3-phase)
- Variable speed cutting
- Wheel feed cutting
- T-slot table fixturing

MEGA-T250S ABRASIVE CUTTER

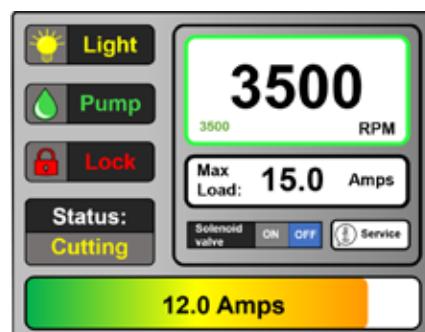


MEGA-T250S

MEGA T250S

10-inch MANUAL Wheel / Table Feed
Metallographic Abrasive Cutter

- Manual Cutting
- High torque servo motor
- Variable speed cutting
- Table and Wheel feed cutting
- T-slot table fixturing
- Non-Touch screen control (selector switch)



METALLOGRAPHIC ABRASIVE CUTTERS

10-inch Metallographic Abrasive Cutter

2

year warranty
Limited Warranty

FEATURE	MEGA-M250S DESCRIPTION	MEGA-T250S DESCRIPTION
Cut-off blade size	10-inch (~250 mm)	10-inch (~250 mm)
Arbor size	32 mm	32 mm
Cutting capacity (H X D)	Maximum 2 x 4-inch (50 x 100 mm)	Maximum 2 x 8-inch (50 x 200 mm)
Cutting capacity	Maximum diameter 2.5-inch (65 mm)	Maximum diameter 3-inch (75 mm)
Wheel feed	Manual	Manual
Table feed	n.a.	Manual
Y pulse feed	n.a.	Manual
Y constant feed	n.a.	Manual
Vertical movement (z-axis)	3.25-inch (82 mm)	3.9-inch (100 mm)
Table feed movement (y-axis)	n.a.	3.3-inch (84 mm)
Table movement (x-axis) for parallel cuts	n.a.	n.a.
T-slotted table dimensions	9.75 x 9-inch (250 x 230 mm)	11 x 18.25-inch (280 x 470 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Operation	Manual	Manual
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Asynchronous 3 phase motor speed - 2.2 KW/(3 hp)	Constant torque variable speed servo motor - 4.5 KW/(5.8 hp)
Motor speed	Variable (1000-3000 rpm)	Variable (1500-3500 rpm)
Electrical specification	220V single phase 380V or 480V, 3φ (50/60 Hz)	208Y / 380V or 480V, 3φ (50/60 Hz)
Cutting force (current settings)	15 amps (max)	3-15 amps (Adjustable)
Dimensions (WxDxH)	Hood closed: 29.5 x 27 x 28-inch (750 x 685 x 720 mm) Hood open: 29.5 x 27 x 39-inch (750 x 685 x 990 mm)	Hood closed: 35.5 x 32 x 28-inch (900 x 815 x 710 mm) Hood open: 35.5 x 32 x 39-inch (900 x 815 x 990 mm)
Weight	240 lbs (110 kg)	375 lbs (170 kg)
Cutter Support Bench (optional)	MEGA-T2-BENCH	MEGA-T2-BENCH
Catalog Number	MEGA-M250S	MEGA-T250S

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ABRASIVE CUTTING

MEGA-T300S ABRASIVE CUTTER



MEGA-T300S

MEGA T300S

12-inch MANUAL Metallographic Abrasive Cutter

- Manual Cutting
- High torque servo motor
- Variable speed cutting
- Wheel and table feed cutting
- T-slot table fixturing
- Non-Touch screen control (selector switch)



MEGA-T300A ABRASIVE CUTTER



MEGA-T300A

MEGA T300A

12-inch AUTOMATED Metallographic Abrasive Cutter

- Automated / Manual Cutting
- Auto / Manual y-axis feed (optional Auto X-axis feed)
- High torque servo motor
- Variable speed cutting
- Wheel and table feed cutting
- Constant feed or constant cutting force control
- T-slot table fixturing
- Non-Touch screen control (selector switch)



METALLOGRAPHIC ABRASIVE CUTTERS

12-inch Metallographic Abrasive Cutter

2

year warranty
Limited Warranty

FEATURE	MEGA-T300S DESCRIPTION	MEGA-T300A DESCRIPTION
Cut-off blade size	12-inch (305 mm)	12-inch (305 mm)
Operation	Manual	Auto / Manual
Screen	Non-touch	Non-touch
Arbor size	32 mm	32 mm
Cutting capacity (H X D)	Maximum 3 x 8-inch (70 x 200 mm)	Maximum 3 x 8-inch (70 x 200 mm)
Cutting capacity	Maximum diameter 4-inch (100 mm)	Maximum diameter 4-inch (100 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y-axis Table feed -Range -Speed (feed rate)	7-inch (180 mm) n.a.	7-inch (180 mm) 0.04 to 0.20-inch/second (1-10 mm/second)
X-axis Table feed -Range -Speed (feed rate)	n.a. n.a.	OPTIONAL: 1.8-inch (45 mm) 0.04 to 0.07-inch/second (1-2 mm/second)
Vertical movement (z-axis)	7-inch (175 mm)	7-inch (175 mm)
T-slotted table dimensions	11 x 18.25-inch (280 x 470 mm)	11 x 18.25-inch (280 x 470 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor, 3φ (50/60 Hz): - 4.5 KW/(5.8 hp) 208Y, 380Y, 480V -15 KW (20 hp) 480V	Constant torque variable speed Servo Motor, 3φ - 4.5 KW/(5.8 hp) 208Y, 380Y, 480V -15 KW (20 hp) 480V
Motor speed	Variable (1500-3500 rpm)	Variable (1500-3500 rpm)
Cutting force (current settings)	3-15 amps (208Y/380V) 5-25 amps (480V)	3-15 amps (208Y/380V) 5-25 amps (480V)
Electrical specification	208Y / 380V or 480V 3-phase (50/60 Hz)	208Y / 380V or 480V 3-phase (50/60 Hz)
Dimensions (WxDxH)	Hood closed: 42 x 42 x 30-inch (1070 x 1070 x 760 mm) Hood open: 42 x 42 x 36-inch (1070 x 1070 x 930 mm)	Hood closed: 42 x 42 x 30-inch (1070 x 1070 x 760 mm) Hood open: 42 x 42 x 36-inch (1070 x 1070 x 930 mm)
Weight	500-550 lbs (230-250 kg)	500-550 lbs (230-250 kg)
Cutter Support Bench (optional)	MEGA-T3-BENCH	MEGA-T3-BENCH
Catalog Number	MEGA-T300S	MEGA-T300A

Benefits:

- ◆ Non-touch screen control
- ◆ Wheel and table feed controlled cutting
- ◆ Cutting capacity up to 4-inches (110 mm) solid stock sample using 12-inch (300 mm) blade
- ◆ Variable speed control
- ◆ High leverage handle for better control
- ◆ Constant torque variable speed Servo Motor
- ◆ 5.8 hp (4.5 kW) (208V, 380V, 480V 3-phase)
- ◆ 20 hp (15 KW) (480V 3-phase)
- ◆ Twin t-slotted stainless steel table
- ◆ Electronic braking system

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ABRASIVE CUTTING

MEGA-T350S ABRASIVE CUTTER

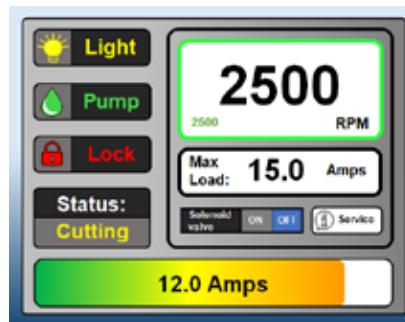


MEGA-T350S

MEGA T350S

14-inch MANUAL
Metallographic Abrasive Cutter

- Manual Cutting
- High torque servo motor
- Variable speed cutting
- Wheel and table feed cutting
- T-slot table fixturing
- Non-Touch screen control
(selector switch)



MEGA-T350A ABRASIVE CUTTER



MEGA-T350A

MEGA T350A

14-inch AUTOMATED
Metallographic Abrasive Cutter

- Automated / Manual Cutting
- Auto / Manual y-axis feed (optional Auto X-axis feed)
- High torque servo motor
- Variable speed cutting
- Wheel and table feed cutting
- Constant feed or constant cutting force control
- T-slot table fixturing
- Non-Touch screen control
(selector switch)



METALLOGRAPHIC ABRASIVE CUTTERS

14-inch Metallographic Abrasive Cutter

2

year warranty
Limited Warranty

FEATURE	MEGA-T350S DESCRIPTION	MEGA-T350A DESCRIPTION
Cut-off blade size	14-inch (350 mm)	14-inch (350 mm)
Operation	Manual	Auto / Manual
Screen	Non-touch	Non-touch
Arbor size	32 mm	32 mm
Cutting capacity (H X D)	Maximum 3 x 6-inch (70 x 150 mm)	Maximum 3 x 6-inch (70 x 150 mm)
Cutting capacity	Maximum diameter 4.5-inch (115 mm)	Maximum diameter 4.5-inch (115 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y-axis Table feed -Range -Speed (feed rate)	7-inch (180 mm) n.a.	7-inch (180 mm) 0.04 to 0.20-inch/second (1-10 mm/second)
X-axis Table feed -Range -Speed (feed rate)	n.a. n.a.	OPTIONAL: 1.8-inch (45 mm) 0.04 to 0.07-inch/second (1-2 mm/second)
Vertical movement (z-axis)	3-inch (75 mm)	5.5inch (140 mm)
T-slotted table dimensions (WxD)	28 x 16-inch (710 x 400 mm)	28 x 16-inch (710 x 400 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor, 3φ - 4.5 KW(5.8 hp) 208Y, 380Y, 480V -15 KW (20 hp) 480V	Constant torque variable speed Servo Motor, 3φ - 4.5 KW(5.8 hp) 208Y, 380Y, 480V -15 KW (20 hp) 480V
Motor speed	Variable (1000-3000 rpm)	Variable (1000-3000 rpm)
Cutting force (current settings)	3-15 amps (208Y/380V) 5-25 amps (480V)	3-15 amps (208Y/380V) 5-25 amps (480V)
Electrical specification	208Y / 380V or 480V 3-phase (50/60 Hz)	208Y / 380V or 480V 3-phase (50/60 Hz)
Dimensions (WxDxH)	Hood closed: 42 x 42 x 64-inch (1070 x 1070 x 1625 mm) Hood open: 42 x 42 x 70-inch (1070 x 1070 x 1780 mm)	Hood closed: 42 x 42 x 64-inch (1070 x 1070 x 1625 mm) Hood open: 42 x 42 x 70-inch (1070 x 1070 x 1780 mm)
Weight	650-700 lbs (300-320 kg)	650-700 lbs (300-320 kg)
Catalog Number	MEGA-T350S	MEGA-T350A

Benefits:

- ◆ Non-touch screen control
- ◆ Wheel and table feed controlled cutting
- ◆ Cutting capacity up to 4.5 inches (115 mm) solid stock sample using 14-inch (350 mm) blade
- ◆ Variable speed control
- ◆ High leverage handle for better control
- ◆ Constant torque variable speed Servo Motor
- ◆ 5.8 hp (4.5 kW) (208V, 380V, 480V 3-phase)
- ◆ 20 hp (15 KW) (480V 3-phase)
- ◆ Twin t-slotted stainless steel table
- ◆ Electronic braking system

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ABRASIVE CUTTING

MEGA-T400S ABRASIVE CUTTER

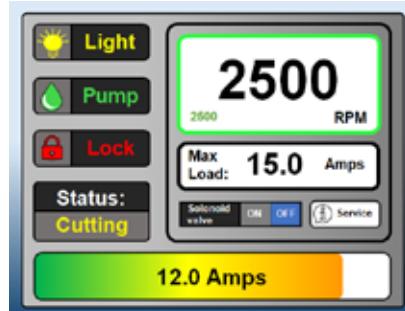


MEGA-T400S

MEGA T400S

**16-inch MANUAL
Metallographic Abrasive Cutter**

- Manual Cutting
- High torque servo motor
- Variable speed cutting
- Chop and table feed cutting
- T-slot table fixturing
- Touch screen control



MEGA-T400A

MEGA T400A

**16-inch AUTOMATED
Metallographic Abrasive Cutter**

- Automated / Manual Cutting
- Auto / Manual y-axis feed (optional Auto X-axis feed)
- High torque servo motor
- Variable speed cutting
- Wheel and table feed cutting
- Constant feed or constant cutting force control
- T-slot table fixturing
- Touch screen control



METALLOGRAPHIC ABRASIVE CUTTERS

16-inch Metallographic Abrasive Cutter

2

year warranty
Limited Warranty

FEATURE	MEGA-T400S DESCRIPTION	MEGA-T400A DESCRIPTION
Cut-off blade size	16-inch (400 mm)	16-inch (400 mm)
Operation	Manual	Auto / Manual
Screen	Touch	Touch
Arbor size	32 mm	32 mm
Cutting capacity (H X D)	Maximum 3 x 6-inch (70 x 150 mm)	Maximum 3 x 6-inch (70 x 150 mm)
Cutting capacity	Maximum diameter 6-inch (150 mm)	Maximum diameter 6-inch (150 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y-axis Table feed -Range -Speed (feed rate)	7-inch (180 mm) n.a.	7-inch (180 mm) 0.04 to 0.20-inch/second (1-10 mm/second)
X-axis Table feed -Range -Speed (feed rate)	n.a. n.a.	OPTIONAL: 1.8-inch (45 mm) 0.04 to 0.07-inch/second (1-2 mm/second)
Vertical movement (z-axis)	5-inch (125 mm)	5-inch (125 mm)
T-slotted table dimensions	11 x 18.25-inch (280 x 470 mm)	11 x 18.25-inch (280 x 470 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor, 3φ - 4.5 KW/(5.8 hp) 208Y, 380Y, 480V -15 KW (20 hp) 480V	Constant torque variable speed Servo Motor, 3φ - 4.5 KW/(5.8 hp) 208Y, 380Y, 480V -15 KW (20 hp) 480V
Motor speed	Variable (1000-3000 rpm)	Variable (1000-3000 rpm)
Cutting force (current settings)	5-25 amps (480V)	5-25 amps (480V)
Electrical specification	208Y / 380V or 480V 3-phase (50/60 Hz)	208Y / 380V or 480V 3-phase (50/60 Hz)
Dimensions (WxDxH)	Hood closed: 48 x 51 x 64-inch (1220 x 1300 x 1610 mm) Hood open: 48 x 51 x 66-inch (1220 x 1300 x 1700 mm)	Hood closed: 48 x 51 x 645-inch (1200 x 1300 x 16010 mm) Hood open: 48 x 51 x 66-inch (1200 x 1300 x 1700 mm)
Weight	880-930 lbs (400-425 kg)	880 lbs (400 kg)
Catalog Number	MEGA-T400S	MEGA-T400A

Benefits:

- ◆ Touch screen control
- ◆ Wheel and table feed controlled cutting
- ◆ Cutting capacity up to 6 inches (150 mm) solid stock sample using 16-inch (400 mm) blade
- ◆ Variable speed control
- ◆ High leverage handle for better control
- ◆ 5.8 hp (4.5 kW) (208V, 380V, 480V 3-phase)
- ◆ 20 hp (15 KW) (480V 3-phase)
- ◆ Twin t-slotted stainless steel table
- ◆ Electronic braking system

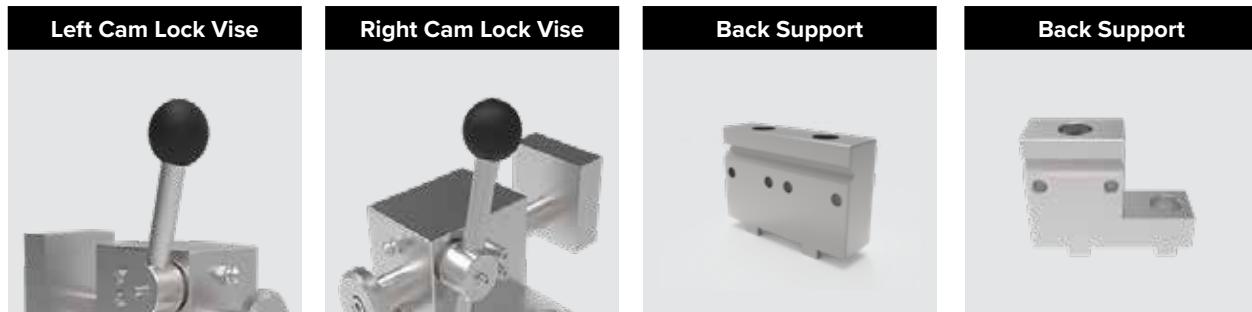
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ABRASIVE CUTTING FIXTURES

MEGA Vises



Quick release clamping vise (left hand)

Catalog no. QCL-1000-250 & QCL-1000

Quick release clamping vise (right hand)

Catalog no. QCR-1000-250 & QCL-1000

Back support plate for Quick Release clamping vises

Catalog no. QCB-1000-250 & QCB-1000

Back support plate for Quick Release clamping vises

Catalog no. QCB-1000-300R

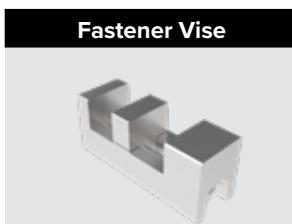
MEGA Cam Locking Vise Recommendations	MEGA-M250S	MEGA-T250S	MEGA-T300	MEGA-T350	MEGA-T400
Left cam vise	QCL-1000	QCL-1000-250	QCL-1000	QCL-1000	QCL-1000
Right cam vise	QCR-1000	QCR-1000-250	QCR-1000	QCR-1000	QCR-1000
Left backstop	QCB-1000	QCB-1000-250	QCB-1000	QCB-1000	QCB-1000
Right backstop	QCB-1000-300R	QCB-1000-250	QCB-1000-300R	QCB-1000-300R	QCB-1000



1.8-inch (45 mm) Vertical clamping vise with shoe for MEGA-T250/300/350
Catalog no. MG-01



3-inch (75 mm) Vertical clamping vise with shoe for MEGA-T400S
Catalog no. MG-15



MEGA fastener vise
Catalog no. MEGA-711



MEGA saddle vise
Catalog no. MEGA-702



Universal Vertical clamping vise with 65 and extended 95 mm arm (2.5/3.75-inch) and shoe
Catalog no. MG-E



57 mm (2.25-inch) height adapter for vertical clamping vise
Catalog no. MG-EH

Recommended Cutting Procedures:

- Select the appropriate abrasive blade (abrasive type , bond, hardness, material properties, cutter speed)
- Secure specimen. Improper clamping may result in blade and/or specimen damage
- Check coolant level and replace when low or excessively dirty
- Adjust the abrasive cutter speed to optimize the cutting process. Typically softer metals are cut at slower speeds to reduce the cutting burr or smearing of the metal. Harder samples are cut at medium to high speeds in order to break down the wheel bond in order to expose new / sharp abrasives.
- Allow the abrasive blade to reach its operating speed before beginning the cut
- A steady force or light pulsing action will produce the best cuts and minimize blade wear characteristics, as well as maintain sample integrity (no burning)
- When sectioning materials with coatings, orient the specimen so that the blade is cutting into the coating and exiting out of the base material, thereby keeping the coating in compression

ABRASIVE CUTTING CONSUMABLES

Abrasive Cutting Fluid Recommendations

CUTTING FLUID	APPLICATION	RECOMMENDED DILUTION	CHANGING FREQUENCY
MAXCUT cutting fluid	As a replacement for competitors cutting fluids	25:1 (water)	50 cuts or weekly
MAXCUT2 cutting fluid	Recommended for reducing corrosion in cutting chamber	25:1 (water)	50 cuts or weekly



Tips: Abrasive Cutter Care:

- ◆ Use clean/fresh MAXCUT2 cutting fluid; fluid should be changed weekly
- ◆ Rinse and dry table and vises after use
- ◆ When cutter is not in use open hood to prevent humidity build-up
- ◆ If cutter will not be used for an extended period of time, spray table and vises with a water displacement oil such as WD40®

Abrasive Cutting Fluids

PACE Product Name	Catalog Number	Qty	Price (\$)
MAXCUT Abrasive Cutting Fluid (32 oz)	MAXCUT-1000-32	32 oz	39.50
MAXCUT Abrasive Cutting Fluid (1/2 gallon)	MAXCUT-1000-64	1/2 gallon	58.00
MAXCUT Abrasive Cutting Fluid (1 gallon)	MAXCUT-1000-128	1 gallon	98.00
MAXCUT Abrasive Cutting Fluid (5 gallons)	MAXCUT-1000-5G	5 gallons	260.00
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (32 oz)	MAXCUT2-1000-32	32 oz	41.50
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (1/2 gallon)	MAXCUT2-1000-64	1/2 gallon	60.00
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (1 gallon)	MAXCUT2-1000-128	1 gallon	105.00
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (5 gallons)	MAXCUT2-1000-5G	5 gallons	275.00
Propylene Glycol Based Corrosion Inhibitor Additive (32 oz)	PCC-5000-32	32 oz	28.00

ABRASIVE CUTTING CONSUMABLES

Abrasive Cutting Blades

10-inch (250 mm) MAXCUT Abrasive Blades (32 mm arbor)

Blade Usage	M.O.S.	Catalog Number	Qty	Price (\$)
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	3440	MAX-C250	10/box	265.00
Hard non-ferrous materials (titanium)	3440	MAX-C250	10/box	265.00
Soft steel	4500	MAX-E250	10/box	215.00
General purpose resin bonded blade	4580	MAX-D250	10/box	215.00
Nickel, Superalloys	4580	MAX-A250	10/box	265.00
Very hard heat treated and case hardened ferrous materials (>50 Rc)	3055	MAX-VHS250	10/box	355.00
Universal Thin Blade	4580	MAX-A250	10/box	265.00
General Industrial Blade	4500	MAX-I250	10/box	182.00
180 grit high concentration Diamond Abrasive Blade cutting wheel	6100	DMAX-250	each	790.00



10-inch MAX-A250 Abrasive Blade

12-inch (300 mm) MAXCUT Abrasive Blades (32 mm arbor)

Blade Usage	M.O.S.	Catalog Number	Qty	Price (\$)
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	3800	MAX-C300	10/box	310.00
Hard non-ferrous materials (titanium)	3440	MAX-C300	10/box	310.00
Soft steel	3800	MAX-E300	10/box	250.00
General purpose resin bonded blade	3820	MAX-D300	10/box	250.00
Nickel, Superalloys	3945	MAX-A300	10/box	310.00
Very hard ferrous materials (>50 Rc)	2550	MAX-VHS300	10/box	380.00
Universal Thin Blade	3945	MAX-A300	10/box	310.00
General Industrial Blade	3800	MAX-I300	10/box	225.00
180 grit high concentration Diamond Abrasive Blade cutting wheel	5000	DMAX-305	each	975.00



12-inch MAX-D300 Abrasive Blade

14-inch (350 mm) MAXCUT Abrasive Blades (32 mm arbor)



14-inch MAX-E350
Abrasive Blade

Blade Usage	M.O.S.	Catalog Number	Qty	Price (\$)
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	2460	MAX-C350	10/box	405.00
Hard non-ferrous materials (titanium)	2460	MAX-C350	10/box	405.00
Soft steel	3200	MAX-E350	10/box	340.00
General purpose resin bonded blade	3275	MAX-D350	10/box	340.00
Nickel, Superalloys	2730	MAX-A350	10/box	405.00
Very hard heat treated and case hardened ferrous materials (>50 Rc)	2200	MAX-VHS350	10/box	450.00
Universal Thin Blade	2730	MAX-A350	10/box	405.00
General Industrial Blade	3200	MAX-I350	10/box	310.00
180 grit high concentration Diamond Abrasive Blade cutting wheel	4350	DMAX-350	each	1050.00

16-inch (400 mm) MAXCUT Abrasive Blades (32 mm arbor)



16-inch DMAX-400
Diamond Blade

Blade Usage	M.O.S.	Catalog Number	Qty	Price (\$)
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	2390	MAX-C400	10/box	465.00
Hard non-ferrous materials (titanium)	2390	MAX-C400	10/box	465.00
Soft steel	3800	MAX-E400	10/box	445.00
General purpose resin bonded blade	3800	MAX-D400	10/box	445.00
Nickel, Superalloys	2860	MAX-A400	10/box	465.00
Very hard heat treated and case hardened ferrous materials (>50 Rc)	1925	MAX-VHS400	10/box	515.00
Universal Thin Blade	2860	MAX-A400	10/box	465.00
General Industrial Blade	3800	MAX-I400	10/box	415.00
180 grit high concentration Diamond Abrasive Blade cutting wheel	3800	DMAX-400	each	1495.00

ABRASIVE CUTTING RECOMMENDATIONS

APPLICATION	ADVANTAGE	DISADVANTAGE	BLADE COMPOSITION	RECOMMENDED BLADE
General cutting with universal thin resin / rubber bonded blades	Thin durable longer lasting blade for cutting most materials.	Rubber bonded blades can produce a burning rubber smell	Alumina resin-rubber bonded	MAX-A 
Hard non-ferrous metals (titanium, zirconium, etc.)	SiC abrasives are much more effective in cutting non-ferrous metals	Rubber bonded blades can produce a burning rubber smell	SiC / resin-rubber bonded	MAX-C 
General purpose blade for steels and ferrous metals	Resin bonded blades break down easily to expose fresh abrasives for cleaner cuts	Generally thicker blades with shorter working life	Alumina / resin bonded	MAX-D 
Soft non-ferrous metals (aluminum, brass, zinc, etc.)	Resin bonded blades break down easily to expose fresh abrasives for cleaner cuts	Generally thicker blades with shorter working life	Alumina / resin bonded	MAX-E 
Industrial general purpose reinforced blade	Lower cost, longer life resin bonded blades	Harder resin bond which may result in damaging or burning of the sample during aggressive cutting	Alumina / resin-bonded	MAX-I 
Heat treated and hardened steels	Specifically designed metallographic abrasive blades to reduce heat damage during sectioning	Resin bonded blades break down faster and therefore have shorter cutting life	Alumina / resin bonded	MAX-VHS 
Non-metallic materials such as glass, minerals, ceramics and composites	Diamond Blades do not wear down like ceramic abrasives blades	Relatively more expensive	Diamond	DMAX 

Abrasive Blade Maximum Operating Speed (M.O.S.) (rpm)

BLADE (M.O.S.)	10-INCH	12-INCH	14-INCH	16-INCH
MAX-A	4580	3945	2730	2860
MAX-C	3440	3440	2460	2390
MAX-D	4580	3820	3275	3800
MAX-E	4500	3800	3200	3800
MAX-I	4500	3800	3200	3800
MAX-VHS	3055	2550	2200	1925
DMAX	6100	5000	4350	3800

TIP: Abrasive Cutting

- ◆ Properly fixture or clamp the sample/specimen
- ◆ Select the proper abrasive blade
- ◆ Set the correct cutting speed
- ◆ Use appropriate cutting fluid and direct the flow to the cutting zone
- ◆ Cut specimen while monitoring motor amperage. The correct blade will minimize the current draw on the motor
- ◆ After completion of the cutting operation, clean and dry the cutter fixtures, table and cutting chamber
- ◆ When not in use clean/dry and leave the hood in the open position to prevent corrosion. The use of a water displacement oil cutting fluids will also help prevent corrosion

Abrasive Blade Thickness

BLADE THICKNESS	10-INCH	12-INCH	14-INCH	16-INCH
MAX-A	0.039 in	0.055 in	0.063 in	0.090 in
MAX-C	0.059 in	0.078 in	0.078 in	0.100 in
MAX-D	0.059 in	0.078 in	0.078 in	0.100 in
MAX-E	0.059 in	0.078 in	0.078 in	0.100 in
MAX-I	0.059 in	0.078 in	0.078 in	0.100 in
MAX-VHS	0.075 in	0.078 in	0.098 in	0.100 in
DMAX	0.059 in	0.060 in	0.060 in	0.075 in



MEGA-A Abrasive Cutter Control Screen



MEGA-T400 t-slot table

PRECISION SECTIONING

PICO-155S LOW TO MEDIUM SPEED SAW



PICO-155P LOW TO MEDIUM SPEED SAW



PICO-200 VARIABLE SPEED TABLE SAW



PICO-155S

Precision Cutter with Digital Control

- Precise cutting
- 0.17 hp (125 W) Dynamic torque motor
- Microprocessor controlled with touch screen control
- Internal coolant pump
- Digital feedback speed control
- LED interface display
- Highly reproducible, dependable and robust
- Easy to use

PICO-155P

Precision Cutter with Analog Control

- Precise cutting
- Internal coolant pump
- Digital feedback speed control
- LED speed display with analog control
- Highly reproducible, dependable and robust
- Flexible
- Ideal for all materials
- User friendly

PICO-200

Variable Speed Table Saw

- Digital feedback speed control
- LED speed display
- Highly reproducible, dependable and robust
- Easy to use
- Flexible
- Ideal for all materials
- User friendly
- Easy service access

METALLOGRAPHIC WAFERING SAWS

Low to Medium Speed Metallographic Precision Cutter

2

year warranty
Limited Warranty

FEATURE	PICO-155S DESCRIPTION	PICO-155P DESCRIPTION
Control	5-inch touchscreen with Digital LED display	Analog Buttons and Speed Control
Cutting capacity	Max. diameter 2-inch (50 mm)	Max. diameter 2-inch (50 mm)
Coolant	Dual nozzle with pump	Dual nozzle with pump
Table feed	3-inch (75 mm) - 7-inch (175 mm)	3-inch (75 mm) - 7-inch (175 mm)
Arbor size	0.5-inch (12.7 mm)	0.5-inch (12.7 mm)
Variable Speed (rpm)	200-1500 rpm continuously adjustable with digital speed display	200-1500 rpm continuously adjustable with LED speed display
Cutting Load	0-1500 gram load	0-1500 gram load
Micrometer feed distance	0 to 1-inch (0-25 mm)	0 to 1-inch (0-25 mm)
Micrometer accuracy	2 microns	2 microns
Electrical Specification	110V/220V (50/60 Hz) (single phase)	110V/220V (50/60 Hz) (single phase)
Motor power	125W (24V)	125W (24V)
Dimensions (WxDxH)	19 x 23 x 14-inch (48 x 58 x 37 cm) (hood closed) 19 x 29 x 19-inch (48 x 74 x 37 cm) (hood open)	19 x 23 x 14-inch (48 x 58 x 37 cm) (hood closed) 19 x 29 x 19-inch (48 x 74 x 37 cm) (hood open)
Weight	66 lbs (30 kg)	66 lbs (30 kg)
Catalog Number	PICO-155S	PICO-155P



Machinery Directive 2006/42/EC
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

Variable Speed Metallographic Table Saw

2

year warranty
Limited Warranty

FEATURE	PICO-200 DESCRIPTION
Cut-off blade size	Max. diameter 8-inch (200 mm)
Cutting capacity	1.5-inches (38 mm)
Specimen feed	Table feed
Coolant tank	3 Liters
Arbor size	0.5-inch
Variable Speed (rpm)	300-3000 rpm continuously adjustable with LED speed display
Motor power	0.5 hp (400 W)
Electrical Specification	110V/220V (50/60 Hz) (single phase)
Dimensions (WxDxH)	18 x 20 x 14-inch (46 cm x 50 cm x 35 cm)
Weight	85 lbs (38 kg)
Catalog Number	PICO-200

2

year warranty
Limited Warranty

Benefits:

- ◆ Variable cutting wheel speeds from 300-3000 rpm
- ◆ Hard anodized working table
- ◆ Dry or wet cutting
- ◆ T-slot clamping vises for mounting versatility

PRECISION SECTIONING

PICO-155P/155S Accessories



Sample holder for small round and mounted specimens (1.25-inch / 32 mm)

Catalog no. P150-707



Sample holder for large round and mounted specimens (1.5-inch / 40 mm)

Catalog no. P150-708



Specimen teardrop holder for 0.6-1.6-inch (18-40 mm)

Catalog no. P150-710



Sample vise for irregular shaped samples

Catalog no. P150-706



Universal specimen vise (single saddle)

Catalog no. P150-702



Sample holder with double parallel vise for long specimens (double saddle)

Catalog no. P150-703



Large single saddle vise with support lip

Catalog no. P150-702b



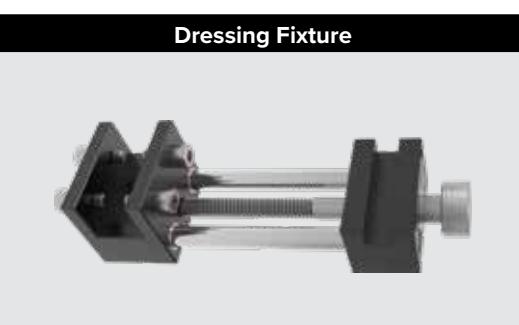
Specimen vise for adhering or gluing samples

Catalog no. P150-709



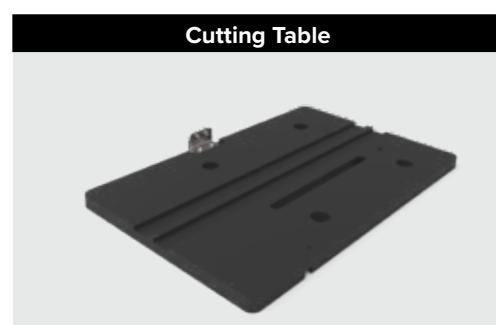
Fastener vise for longitudinal sectioning of fasteners, tubes, etc.

Catalog no. P150-711



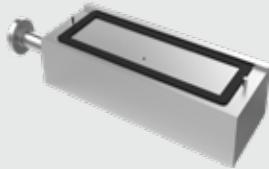
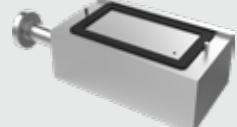
Dressing stone attachment

Catalog no. P150-701



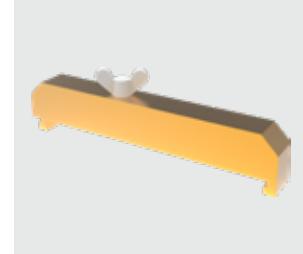
Cutting table attachment for manual cutting of flat specimens and PCB's

Catalog no. P150-601

50 mm Flanges	75 mm Flanges	100 mm Flanges	1x3-inch Glass Slide	27x46 mm Glass Slide
				
50 mm diameter arbor flanges Catalog no. P155-M-002	75 mm diameter arbor flanges Catalog no. P155-M-003	100 mm diameter arbor flanges Catalog no. P155-M-100	Vacuum glass slide holder for 1x3-inch petrographic slides Catalog no. P155-GHL	Vacuum glass slide holder for 27x46 mm petrographic slides Catalog no. P155-GHS

Sample Support Arm	Swivel Support Arm	Weight Stack
		
Sample support arm with multiple specimen vise positioning locations Catalog no. P150-407	Sample support arm with swivel for angular cutting Catalog no. P150-713	Stainless steel weight stack components: Counter balance rod Catalog no. P150-411 Counter balance weight Catalog no. P150-410 250 gram weight Catalog no. P155-M-012 300 gram weight Catalog no. P155-M-013

PICO-200 Accessories

Vertical Clamping Vise	Cutting Guide
	

PICO 200 vertical clamping vise
Catalog no. P200V

PICO 200 cutting guide
Catalog no. P200-ANGLE

PRECISION SECTIONING CONSUMABLES



Metallographic Copper Plated Diamond Blades



Metallographic Stainless Steel Diamond Blades



Electroplated Diamond Blades

3-inch (75 mm) Diamond Blades (1/2-inch arbor, 0.006-inch thick)



PACE Product Name	Catalog Number	Qty	Price (\$)
3-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0030LC	each	310.00
3-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0035LC	each	310.00
3-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0035HC	each	310.00
3-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0035	each	310.00

4-inch (102 mm) Diamond Blades (1/2-inch arbor, 0.012-inch thick)



PACE Product Name	Catalog Number	Qty	Price (\$)
4-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0040LC	each	325.00
4-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0045LC	each	325.00
4-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0045HC	each	325.00
4-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0045	each	325.00
4 x 0.024 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-040EPD	each	190.00

5-inch (127 mm) Diamond Blades (1/2-inch arbor, 0.015-inch thick)



PACE Product Name	Catalog Number	Qty	Price (\$)
5-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0050LC	each	375.00
5-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0055LC	each	375.00
5-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0055HC	each	375.00
5-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0055	each	375.00
5 x 0.024 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-050EPD	each	205.00

6-inch (153 mm) Diamond Blades (1/2-inch arbor, 0.020-inch thick)

PACE Product Name	Catalog Number	Qty	Price (\$)
6-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0060LC	each	465.00
6-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0065LC	each	465.00
6-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0065HC	each	465.00
6-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0065	each	465.00
6 x 0.032 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-060EPD	each	225.00



7-inch (175 mm) Diamond Blades (1/2-inch arbor, 0.020-inch thick)

PACE Product Name	Catalog Number	Qty	Price (\$)
7-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0070LC	each	605.00
7-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0075LC	each	605.00
7-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0075HC	each	605.00
7-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0075	each	605.00
7 x 0.039 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-070EPD	each	250.00



8-inch (204 mm) Diamond Blades (1/2-inch arbor, 0.024-inch thick)

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0080LC	each	620.00
8-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0085LC	each	620.00
8-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0085HC	each	620.00
8-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0085	each	620.00
8 x 0.039 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-080EPD	each	310.00



Precision Abrasive Blades (1/2-inch arbor)

PACE Product Name	Catalog Number	Qty	Price (\$)
5 x 0.040-inch SiC Abrasive Blade (non-ferrous metals)	MAX-C125	10	155.00
6 x 0.038-inch SiC Abrasive Blade (non-ferrous metals)	MAX-C150	10	155.00
6 x 0.062-inch Alumina Abrasive Blade (ferrous metals)	MAX-D150	10	155.00
7 x 0.028-inch Abrasive Blade (general purpose)	MAX-7000S	10	205.00



PRECISION SECTIONING CONSUMABLES

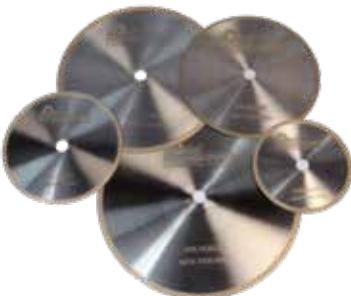
Wafer Cutting Accessories



PACE Product Name	Catalog Number	Qty	Price (\$)
DIACUT™ Dressing Stick (1/2 x 1/2 x 4-1/2-inch)	DRES-0010	each	14.50
DIACUT™ Oil-based Cutting Fluid (16 oz)	OL-3000-16	16 oz	12.50
DIACUT™ Oil-based Cutting Fluid (32 oz)	OL-3000-32	32 oz	22.50
DIACUT™ Water-based Cutting Fluid (16 oz)	WL-3000-16	16 oz	12.50
DIACUT™ Water-based Cutting Fluid (32 oz)	WL-3000-32	32 oz	22.50
DIACUT™ 2 Water-based Anti-corrosion Cutting Fluid (16 oz)	WL2-3000-16	16 oz	12.50
DIACUT™ 2 Water-based Anti-corrosion Cutting Fluid (32 oz)	WL2-3000-32	32 oz	22.50
Propylene Glycol-based Anti-Corrosion Additive (32 oz)	PCC-5000-32	32 oz	28.00

Economical Stainless Steel Diamond Wafering Blades (Best Value)

Diamond / CBN Wafering Blades with Corrosion Resistant Stainless Steel Core (1/2-inch arbor) - General Purpose Blade



PACE Product Name	Catalog Number	Qty	Price (\$)
4-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-004GP	each	205.00
5-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-005GP	each	235.00
6-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-006GP	each	310.00
7-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-007GP	each	375.00
8-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-008GP	each	435.00

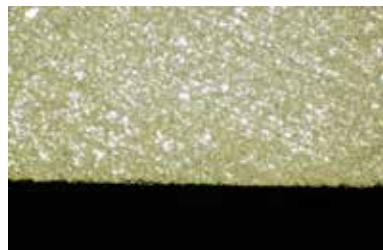
Diamond Wafering Blades (low concentration) with Corrosion Resistant Stainless Steel Core (1/2-inch arbor)

PACE Product Name	Catalog Number	Qty	Price (\$)
4-inch stainless steel low concentration diamond Wafering Blade	WB-004LCS	each	205.00
5-inch stainless steel low concentration diamond Wafering Blade	WB-005LCS	each	235.00
6-inch stainless steel low concentration diamond Wafering Blade	WB-006LCS	each	310.00
7-inch stainless steel low concentration diamond Wafering Blade	WB-007LCS	each	375.00
8-inch stainless steel low concentration diamond Wafering Blade	WB-008LCS	each	435.00

MATERIAL	CHARACTERISTIC	SPEED (RPM)	LOAD	BLADE (grit/conc)
Silicon substrates	Soft/Brittle	<300	Low	Fine/Low
Gallium arsenide	Soft/Brittle	<200	Low	Fine/Low
Boron composites	Hard/Brittle	500	Medium	Fine/Low
Ceramic fiber composites	Hard/Brittle	1000	Medium	Fine/Low
Glass	Brittle	1000	Medium	Fine/Low
Minerals	Friable/Brittle	Maximum	High	Fine/Low
Alumina ceramic	Hard/Tough	Maximum	High	Medium/Low
Zirconia (PSZ)	Hard/Tough	Maximum	High	Medium/Low
Silicon nitride	Hard/Tough	Maximum	High	Medium/Low
Metal matrix composites	Hard/Tough	Maximum	High	Medium/High
General Purpose		Variable	Variable	Medium/High



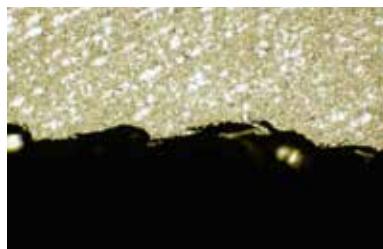
Boron-graphite composite sectioned with fine grit diamond wafering blade. Boron fibers damage minimal



Silicon edge intact after sectioning with fine grit diamond wafering blade



Boron-graphite composite sectioned with medium grit diamond wafering blade. Boron fibers damaged



Silicon edge damaged after sectioning with medium grit diamond wafering blade

TIP: Precision Wafering

1. Properly fixture or clamp the sample/specimen
2. Select the proper wafering blade and cutting fluid
3. Set the blade speed and load
4. For samples with coatings orient the sample so the coating is cut in compression
5. Dress or condition the blade periodically when the cutting rate diminishes

Diamond Wafering Blades (high concentration) with Corrosion Resistant Stainless Steel Core (1/2-inch arbor)

PACE Product Name	Catalog Number	Qty	Price (\$)
4-inch stainless steel high concentration diamond Wafering Blade	WB-004HCS	each	205.00
5-inch stainless steel high concentration diamond Wafering Blade	WB-005HCS	each	235.00
6-inch stainless steel high concentration diamond Wafering Blade	WB-006HCS	each	310.00
7-inch stainless steel high concentration diamond Wafering Blade	WB-007HCS	each	375.00
8-inch stainless steel high concentration diamond Wafering Blade	WB-008HCS	each	435.00

Improved Precision Wafering Blades:

- ◆ Stainless steel core for improved corrosion resistance
- ◆ Economical Option
- ◆ High Quality Blade
- ◆ Available with a general purpose diamond / CBN hybrid abrasive and with the traditional low and high medium grit diamond concentration

COMPRESSION MOUNTING



TERAPRESS TP-7100S



TERAPRESS TP-7500S



TP-TANK

TERAPRESS TP-7100S

Pneumatic Compression Mounting Press

- Pneumatic (air pressure) press
- Automatic
- Programmable
- 1000 & 2000 Watt heaters
- Water cooling (temperature, time and manual)
- Non-Interchangeable molds or Interchangeable mold cylinder (optional)
- Mold sizes (1, 1.25, 1.5 and 2-inch / 25, 30 and 40 mm)
- High resolution display
- Highly reproducible mounts
- Robust and durable design
- Economical

TERAPRESS TP-7500S

Hydraulic Compression Mounting Press

- Hydraulic force
- Automatic
- Programmable
- 1000 & 2000 Watt heaters
- Water cooling (temperature, time and manual)
- Non-Interchangeable molds or Interchangeable mold cylinder (optional)
- Mold sizes (1, 1.25, 1.5 and 2-inch / 25, 30 and 40 mm)
- High resolution display
- Highly reproducible mounts
- Robust and durable design
- Economical

TERAPRESS TP-TANK

Variable Speed Table Saw

- Eco-friendly recirculating tank
- Cooling heat exchanger with programmable thermostat
- 24V pump (connected to 110V power supply)
- 1.3 GPM maximum flow
- Easy to operate
- Economical

COMPRESSION MOUNTING PRESSES

Pneumatic Metallographic Compression Mounting Press

2

year warranty
Limited Warranty

FEATURE	TERAPRESS TP-7100S DESCRIPTION
Control	Touch screen
Mount sizes	1, 1.25, 1.5 and 2-inch (25, 30 and 40 mm)
Mold Cylinders	Single
Force	Pneumatic force
Incoming Pressure	Max. 95 psi
Heater Specification	1000 Watts (110V 15 amp), 2000 Watts (220V 10 amp)
Maximum Temperature	392°F (200°C)
Cooling System	Water with manual, temperature or time control
Dimensions (WxDxH)	21 x 19 x 19-inches (530 x 48 x 48 mm)
Weight	69 lbs (32 kg)
TP-TANK	Recirculating / Cooling Tank (14 gallon) with pump (optional)
Catalog Number	TP-7100S-110V & TP-7100S-220V

Benefits:

- ◆ Fast cycle times
- ◆ Interchangeable or fixed size molds
- ◆ 7-inch touchscreen
- ◆ Soft Start capabilities
- ◆ Custom procedures list
- ◆ Heating graph for monitoring temperature and cycle progress

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Hydraulic Metallographic Compression Mounting Press

FEATURE	TERAPRESS TP-7500S DESCRIPTION
Control	Touch screen
Mount sizes	1, 1.25, 1.5 and 2-inch (25, 30 and 40 mm)
Mold Cylinders	Single
Force	Hydraulic force
Maximum Force	32 MPa (4500 psi)
Heater Specification	1000 Watts (110V 15 amp), 2000 Watts (220V 10 amp)
Maximum Temperature	392°F (200°C)
Cooling System	Water with manual, temperature or time control
Dimensions (WxDxH)	21 x 19 x 19-inches (530 x 480 x 480 mm)
Weight	108 lbs (50 kg)
TP-TANK	Recirculating / Cooling Tank (14 gallon) with pump (optional)
Catalog Number	TP-7500S-110V & TP-7500S-220V

Benefits:

- ◆ Fast cycle times
- ◆ Hydraulic
- ◆ Interchangeable or fixed size molds
- ◆ Up to 32 MPa pressure at the mount
- ◆ Soft start capabilities
- ◆ Quiet operation
- ◆ 7-inch touchscreen
- ◆ Custom procedures list
- ◆ Heating graph for monitoring temperature and cycle progress

Recirculating / Coolant System

FEATURE	TP-TANK DESCRIPTION
Cooling	Programmable
Pump	24VDC, 75W Diaphragm Pump, 0.86 GPM (3.25L/ minute)
Dimensions (W x D x H)	16 x 28 x 26-inch (410 x 710 x 660 mm)
Electrical specification	110 / 240V (50/60 Hz)
Tank Volume	14 gallons (53 L)
Weight	28 lbs (13 kg)



Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

COMPRESSION MOUNTING

TERAPRESS Mold Assemblies

1-inch Mold Assembly



1.0-inch interchangeable mold assembly contains mold sleeve, lower/upper ram (spacer optional)

Catalog no. TP75-0100

1.25-inch Mold Assembly



1.25-inch interchangeable mold assembly contains mold sleeve, lower/upper ram (spacer optional)

Catalog no. TP75-0125

1.5-inch Mold Assembly



1.5-inch interchangeable mold assembly contains mold sleeve, lower/upper ram (spacer optional)

Catalog no. TP75-0150

Interchangeable Molds:

- ◆ Allows for easy changing of mold size. Simply replace mold, sleeve and rams
- ◆ Available in 1, 1.25 and 1.5-inch as well as 25, 30 and 40 mm molds

25 mm Mold Assembly



25 mm interchangeable mold assembly contains sleeve, lower/upper ram (spacer optional)

Catalog no. TP75-25

30 mm Mold Assembly



30 mm interchangeable mold assembly contains sleeve, lower/upper ram (spacer optional)

Catalog no. TP75-30

40 mm Mold Assembly



40 mm interchangeable mold assembly contains sleeve, lower/upper ram (spacer optional)

Catalog no. TP75-40

Fixed Block Molds:

- ◆ The heater/cooler is manufactured to match the size of the mold (does not require a mold sleeve)
- ◆ Reduces cooling times for producing faster mounts
- ◆ Available in 1, 1.25, 1.5 and 2-inch as well as 25, 30, 40 and 50 mm sizes

Mold Assemblies for Interchangeable Mold Heater

TERAPRESS Molds	Flat Ram Catalog no.	Chamfered Ram Catalog no.
1-inch diameter mold assembly	TP75-0100	TP75-0100C
1.25-inch diameter mold assembly	TP75-0125	TP75-0125C
1.5-inch diameter mold assembly	TP75-0150	TP75-0150C
25 mm diameter mold assembly	TP75-25	TP75-25C
30 mm diameter mold assembly	TP75-30	TP75-30C
40 mm diameter mold assembly	TP75-40	TP75-40C

Mold Spacers

TERAPRESS Spacers	Flat Ram Catalog no.	Chamfered Ram Catalog no.
1-inch diameter spacer	TPS-0100	TPS-0100C
1.25-inch diameter spacer	TPS-0125	TPS-0125C
1.5-inch diameter spacer	TPS-0150	TPS-0150C
2-inch diameter spacer	TPS-0200	TPS-0200C
25 mm diameter spacer	TPS-25	TPS-25C
30 mm diameter spacer	TPS-30	TPS-30C
40 mm diameter spacer	TPS-40	TPS-40C
50 mm diameter spacer	TPS-50	TPS-50C

TERAPRESS Heating/Cooling Blocks



1.0-inch Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-0100H



1.25-inch Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-0125H



1.5-inch Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-0150H



2.0-inch Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-0200H



25 mm Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-25H



30 mm Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-30H



40 mm Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-40H



50 mm Heating / Cooling block with lower & upper rams (spacer optional)

Catalog no. TP75-50H

Mold Assemblies for Interchangeable Mold Heater

TERAPRESS Fixed sized Heater / Molds	Flat Ram Catalog no.	Chamfered Ram Catalog no.
1-inch diameter fixed heater / cooler assembly	TP75-0100H	TP75-0100HC
1.25-inch diameter fixed heater / cooler assembly	TP75-0125H	TP75-0125HC
1.5-inch diameter fixed heater / cooler assembly	TP75-0150H	TP75-0150HC
2-inch diameter fixed heater / cooler assembly	TP75-0200H	TP75-0200HC
25 mm diameter fixed heater / cooler assembly	TP75-25H	TP75-25HC
30 mm diameter fixed heater / cooler assembly	TP75-30H	TP75-30HC
40 mm diameter fixed heater / cooler assembly	TP75-40H	TP75-40HC
50 mm diameter fixed heater / cooler assembly	TP75-50H	TP75-50HC

Recirculating / Cooling Tank



Recirculating / Cooling tank for TERAPRESS-S Metallographic Compression Mounting Presses
Catalog no. TP-TANK

COMPRESSION MOUNTING CONSUMABLES



	PHENOLICS	ACRYLIC	EPOXY (glass-filled)	DIALYL PHTHALATE
Type	Thermoset	Thermoplastic	Thermoset	Thermoset
Cost	Low	Moderate	Moderate	Moderate
Ease of Use	Excellent	Moderate	Good	Good
Color	Black, red, green	Clear	Gray	Blue
Cycle Time (1.25-inch mount) TERAPRESS TP-7500S (minimum)	4-5 minutes	8-10 minutes	5-7 minutes	5-7 minutes
Edge Retention	Fair	Good	Excellent	Excellent
Clarity	None	Excellent	None	None
Hardness	Low	Medium	High	High

	PHENOLICS	ACRYLIC	EPOXY (glass-filled)	DIALYL PHTHALATE
Shore-D hardness	82	80	88	88
Shrinkage (in/in)	0.006	0.001-0.003	0.001-0.003	0.001-0.003
Chemical resistance	Glycol, petrochemicals, solvents, acids	Alcohol, dilute acids, solvents	Solvents, acids, alkalies & oxidizers	Solvents, acid and alkalies

Phenolic Compression Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
Black Phenolic powder (5 lbs)	CM-2001B-5	5 lbs	28.00
Black Phenolic powder (25 lbs)	CM-2001B-25	25 lbs	125.00
Red Phenolic powder (5 lbs)	CM-2001R-5	5 lbs	30.00
Red Phenolic powder (25 lbs)	CM-2001R-25	25 lbs	135.00
Green Phenolic powder (5 lbs)	CM-2001G-5	5 lbs	30.00
Green Phenolic powder (25 lbs)	CM-2001G-25	25 lbs	135.00

TIP: Phenolic Colors

Use different phenolic colors to code jobs, specimen types or for different test dates. For example, changing the phenolic color each month will show which samples or jobs are getting old.

If the color dye in the mount bleeds out when rinsing with alcohol, this is an indication that the mount was not fully cured either at a high enough temperature or for the proper length of time.

Phenolic PREMIUM Compression Mounting with Mold Release Agent



PREMIUM Phenolic Powders

PACE Product Name	Catalog Number	Qty	Price (\$)
Black PREMIUM Phenolic powder (2.5 kg)	CM-2500B-2	2.5 kg	38.00
Black PREMIUM Phenolic powder (7.5 kg)	CM-2500B-8	7.5 kg	155.00
Red PREMIUM Phenolic powder (2.5 kg)	CM-2500R-5	2.5 kg	45.00
Red PREMIUM Phenolic powder (7.5 kg)	CM-2500R-8	7.5 kg	165.00
Green PREMIUM Phenolic powder (2.5 kg)	CM-2500G-5	2.5 kg	45.00
Green PREMIUM Phenolic powder (7.5 kg)	CM-2500G-8	7.5 kg	165.00

COMPRESSION MOUNTING CONSUMABLES

Acrylic Clear Compression Mounting

PACE Product Name	Catalog Number	Qty	Price (\$)
TRANSACRYLIC clear compression mounting powder (5 lbs)	CM-2101A-5	5 lbs	115.00
TRANSACRYLIC clear compression mounting powder (25 lbs)	CM-2101A-25	25 lbs	505.00



TIP: Acrylic Mounts

A common problem with acrylic mounts, known as the "cotton ball" effect, can occur with thermoplastic acrylic resins. The cause is due to the following:

Heating the compression mounting resin too fast or to a temperature which causes a liquid layer to form around the non-melted powder. This creates trapped air that cannot escape. It is recommended for the high heating efficiency of PACE Technologies mounting presses, that the mounting press use a maximum curing temperature that does not exceed 130°C. Note: All mounting presses provide a different rates of heating so results may vary from one manufacturer to another.

Acrylic PREMIUM Clear Compression Mounting

PACE Product Name	Catalog Number	Qty	Price (\$)
TRANSACRYLIC clear compression mounting powder (1 kg)	CM-2101A-1	1 kg	52.50
TRANSACRYLIC clear compression mounting powder (2.5 kg)	CM-2101A-2	2.5 kg	125.00
TRANSACRYLIC clear compression mounting powder (7.5 kg)	CM-2101A-8	7.5 kg	365.00



Diallyl Phthalate Compression Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
Diallyl Phthalate blue compression mounting powder (5 lbs)	DY-2301A-5	5 lbs	155.00
Diallyl Phthalate blue compression mounting powder (25 lbs)	DY-2301A-25	25 lbs	605.00

Glass Filled Epoxy Compression Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
EPOCOMP Epoxy Resin powder (5 lbs)	EP-2201A-5	5 lbs	145.00
EPOCOMP Epoxy Resin powder (25 lbs)	EP-2201A-25	25 lbs	580.00
EPOCOMP Fine Epoxy Resin powder (5 lbs)	EPF-2201-5	5 lbs	155.00
EPOCOMP Fine Epoxy Resin powder (25 lbs)	EPF-2201-25	25 lbs	610.00

TIP: Glass Filled Mounts

- ◆ Glass filled epoxies and diallyl phthalates are excellent mounting compounds for protecting the specimen edges during grinding and polishing.
- ◆ Glass filled resins can be expensive, so to reduce the cost per mount, it is recommended that the epoxy or diallyl phthalate be used at the specimen interface and then layered with a lower cost mounting compound such as a phenolic. A common combination is red phenolic / glass filled epoxy.

PREMIUM Glass Filled Epoxy-Phenolic Compression Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
PREMIUM Glass Filled Epoxy-Phenolic edge retention compression mounting resin (2.5 kg)	EPF-2500-2	2.5 kg	195.00
PREMIUM Glass Filled Epoxy-Phenolic edge retention compression mounting resin (8 kg)	EPF-2500-8	7.5 kg	725.00

COMPRESSION MOUNTING CONSUMABLES

Conductive Compression Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
Conductive (graphite) powder (1 lb)	CONDUCTO-1P	1 lb	40.50
Conductive (graphite) powder (5 lbs)	CONDUCTO-5P	5 lbs	195.00
Conductive (graphite) powder (25 lbs)	CONDUCTO-25P	25 lbs	760.00
Conductive (copper) powder (1 lb)	CONDUCTO-CU-1	1 lb	72.00
Conductive (copper) powder (5 lbs)	CONDUCTO-CU-5	5 lbs	295.00
Conductive (copper) powder (25 lbs)	CONDUCTO-CU-25	25 lbs	1350.00

TIP: Conductive Mounts

- ◆ Conductive mounts are used to provide conductivity to the mount for use with electron microscopy
- ◆ Conductive mounts use either graphite powder or copper as the conductive filler

Conductive Premium Compression Mounting

PACE Product Name	Catalog Number	Qty	Price (\$)
Conductive Premium (graphite) powder (1 kg)	CONDUCTO-G1000	1 kg	105.00
Conductive Premium (graphite) powder (2.5 kg)	CONDUCTO-G2500	2.5 kg	210.00
Conductive Premium (graphite) powder (7.5 kg)	CONDUCTO-G7500	7.5 kg	575.00
Conductive Premium (copper) powder (1 kg)	CONDUCTO-CU1000	1 kg	135.00
Conductive Premium (copper) powder (2.5 kg)	CONDUCTO-CU2500	2.5 kg	295.00
Conductive Premium (copper) powder (7.5 kg)	CONDUCTO-CU7500	7.5 kg	815.00



Miscellaneous Compression Mounting Accessories

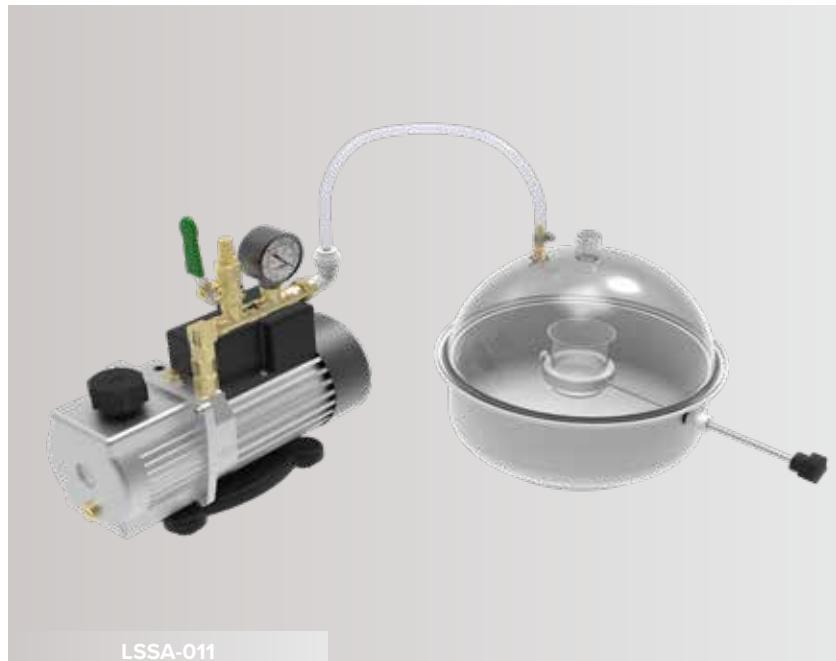


PACE Product Name	Catalog Number	Qty	Price (\$)
Mold release (8 oz)	MR-1000-08	8 oz	19.50
Mold release (16 oz)	MR-1000-16	16 oz	29.50
Mold release (1 gallon)	MR-1000-128	1 gallon	135.00
Utility heat protective gloves (pair)	GLOVES	pair	12.50
Small disposable protective gloves (100/box)	GLOVES-S100	100/box	25.00
Medium disposable protective gloves (100/box)	GLOVES-M100	100/box	25.00
Large disposable protective gloves (100/box)	GLOVES-L100	100/box	25.00
Metal MKLIP specimen clips (100/pkg)	MKLIP-0100	100/pkg	70.50
Plastic SKLIP spring specimen clips (100/pkg)	SKLIP-0100	100/pkg	39.00
Plastic SKLIP spring specimen clips (1000/pkg)	SKLIP-1000	1000/pkg	305.00
Plastic KLIP specimen clips (100/pkg)	KLIP-0100	100/pkg	42.00
Plastic MULTICLIP specimen clips (100/pkg)	MULTICLIP-0100	100/pkg	55.50
Plastic UNIKLIP specimen clips (100/pkg)	UNIKLIP-0100	100/pkg	35.00
30 ml measuring scoop	MS-1000-30	each	3.00
Scribing tool	SCRIBE	each	35.00

Compression Mounting Recommended Procedures:

- ◆ Clean specimens to remove cutting and handling residue
- ◆ Remove debris from mold assembly
- ◆ Apply thin coat of mold release compound to mold assembly
- ◆ Raise mold ram to up position
- ◆ Center specimen on ram
- ◆ Lower ram assembly
- ◆ Pour predetermined amount of resin into mold
- ◆ Lock mold assembly cover
- ◆ Slowly raise ram into up position
- ◆ Apply recommended heat and maintain force for specified period of time
- ◆ Cool to near room temperature
- ◆ Remove mounted specimen
- ◆ Clean mold and ram assembly

CASTABLE MOUNTING



VACUUM CHAMBER LSSA-011

Castable Vacuum Mounting Press

- Pour under vacuum
- Tilting, retractable pouring arm
- Cure at room pressure
- Easy to Use
- Robust and durable design
- Economical

	ACRYLICS	EPOXY	POLYESTER
Type	Acrylic resin and hardener	Epoxy resin and hardener	Polyester resin and hardener
Peak Temperature	150°F (65°C)	100°F-375°F (38-190°C)	100°F (38°C)
Shore-D Hardness	80 (90+ for SUPERMOUNT)	82	76
Cure Time	8-15 minutes	30 minutes for 8 hours	6-8 hours
Comments	Some shrinkage	Moderate hardness, low shrinkage, transparent	Transparent and clear

CASTABLE RESINS	RESIN MIXTURE	PROPERTIES
CASTAMOUNT Acrylic	3-parts powder and 2-parts liquid	Translucent, fast cure
PREMIUM Acrylic	3-parts powder and 2-parts liquid	Translucent, fast cure
ACRYLIC PLUS Acrylic	2-parts powder and 1-part liquid	Semi-clear, fast cure, lower cost
SUPERMOUNT Acrylic	3-parts powder and 2-parts liquid	Grayish/Black, hard, low shrinkage, fast cure
Epoxy - standard Epoxy PLUS	5:1 resin:hardener (wt.) 11:2 resin:hardener (wt.)	Clear to translucent, low shrinkage, 4-8 hour cure
Quick Mount Epoxy	Epoxy (2-liquids) 10:1 resin:hardener (wt.)	Translucent, slightly yellow, 30 minute - 2 hour cure
ULTRATHIN 2 Epoxy ULTRATHIN 2 Epoxy PLUS	10:1 resin:hardener (wt.) 18:5 resin:hardener (wt.)	Clear, low viscosity for porous specimens, 2-6 hour cure
POLYCAST Polyester	Polyester (2-liquids)	Clear and relatively inexpensive

CASTABLE MOUNTING CHAMBER

Castable Metallographic Vacuum Mounting Chamber

2

year warranty
Limited Warranty

FEATURE	LSSA-011 DESCRIPTION
Bell jar	Tilting, retractable pouring arm
Mount sizes	1, 1.25, 1.5 and 2-inch -- 25, 30, 40 and 50 mm
Vacuum	Vacuum pump (sold separately)
Dimensions (WxDxH)	12 x 12 x 12-inch (300 x 300 x 300 mm)
Weight	2.2 lbs (1 kg)
Catalog Number	LSSA-011

Benefits:

- ◆ Able to pull vacuum and pour under vacuum
- ◆ Pour multiple samples
- ◆ High visibility chamber
- ◆ Easy to Use
- ◆ Robust and Durable

DESCRIPTION	110V VACUUM PUMP	220V VACUUM PUMP
Flow Rate	2 CFM (48 liters / minutes)	2 CFM (48 liters / minutes)
Ultimate Vacuum	50 micron	50 micron
Power	0.35 hp	0.35 hp
Inlet Port	1/4" SAE and 1/2" ACME ports	1/4" SAE and 1/2" ACME ports
Dimensions (WxDxH)	5 x 12 x 9.6-inch (130 cm x 310 cm x 240 cm)	5 x 12 x 9.6-inch (130 cm x 310 cm x 240 cm)
Weight	13.7 lbs (6.2 kg)	13.7 lbs (6.2 kg)
Catalog Number	VAC-110	VAC-220

Castable Mounting:

Castable resins are monomer resins which utilize a catalyst or hardener for polymerization. Polymerization results in cross-linking of the polymer to form a relatively hard mount. Castable resins also have the advantage of simultaneously mounting multiple samples at one time for increased throughput. A number of resin systems are used for metallographic mounting, these include:

- ◆ Epoxy (2-part) liquid resins
- ◆ Acrylic (castable) resin powders with a liquid hardener
- ◆ Polyester (clear and can be used for large castings) 2-part liquid resin/hardener



Machinery Directive 2006/42/EC
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

ACRYLIC MOUNTING CONSUMABLES

Acrylic Castable Mounting:

Castable acrylics are easy to use and are very robust. The main advantage of mounting with castable acrylics is the fast curing time. Depending upon the mixing ratio, castable acrylic mounts are typically ready to use within 8-15 minutes. Also unlike epoxy resins, the ratio of the various acrylic parts (powder to liquid) can be altered up to 25% with no adverse effects to the final properties of the mount. This is because both the liquid and powder are acrylics containing various additives and curing agents. By varying the ratio of the liquid to powder, the curing time and viscosity can be altered.



PACE Product Name	Catalog Number	Qty	Price (\$)
CASTAMOUNT Acrylic kit (1 lb resin with 12 oz liquid hardener)	AK-5000-K1	1 lb	65.00
CASTAMOUNT Acrylic kit (5 lbs resin with 1/2 gallon liquid hardener)	AK-5000-K5	5 lbs	270.00
CASTAMOUNT Acrylic Powders			
CASTAMOUNT Acrylic powder (1 lb)	AR-5000-P1	1 lb	55.00
CASTAMOUNT Acrylic powder (5 lbs)	AR-5000-P5	5 lbs	240.00
CASTAMOUNT Acrylic powder (25 lbs)	AR-5000-P25	25 lbs	1075.00
CASTAMOUNT Acrylic powder (100 lbs)	AR-5000-P100	100 lbs	4050.00
CASTAMOUNT Acrylic Liquids			
CASTAMOUNT Acrylic hardener (12 oz)	AH-5000-H12	12 oz	28.50
CASTAMOUNT Acrylic hardener (32 oz)	AH-5000-H32	32 oz	48.50
CASTAMOUNT Acrylic hardener (1/2 gallon)	AH-5000-H64	1/2 gallon	72.50
CASTAMOUNT Acrylic hardener (1 gallon)	AH-5000-H128	1 gallon	115.00
CASTAMOUNT Acrylic hardener (5 gallon)	AH-5000-H640	5 gallon	505.00

TIP: Acrylics

Acrylics can be submerged into a water bath during curing. This reduces the exotherm heat and thus reduces the shrinkage of the mount at the specimen interface. A secondary advantage is that the water also absorbs the odor.

PREMIUM Acrylics (Castable Mounting)

PACE Product Name	Catalog Number	Qty	Price (\$)
PREMIUM Acrylic kit (1 kg resin with 500 ml liquid hardener)	PAR-5000-K1	1 kg	195.00
PREMIUM Acrylic kit (2.5 kg resin with 2 liter liquid hardener)	PAR-5000-K2	2.5 kg	405.00
PREMIUM Acrylic Powders			
PREMIUM Acrylic powder (1 kg)	PAR-5000-P1000	1 kg	170.00
PREMIUM Acrylic powder (2.5 kg)	PAR-5000-P2500	2.5 kg	370.00
PREMIUM Acrylic powder (7.5 kg)	PAR-5000-P7500	7.5 kg	945.00
PREMIUM Acrylic Liquids			
PREMIUM Acrylic hardener (500 ml)	PAH-5000-H500	500 ml	74.00
PREMIUM Acrylic hardener (1 liter)	PAH-5000-H1L	1 liter	135.00
PREMIUM Acrylic hardener (5 liters)	PAH-5000-H5L	5 liter	525.00

ACRYLIC PLUS Acrylics (Castable Mounting)



PACE Product Name	Catalog Number	Qty	Price (\$)
ACRYLIC PLUS Castable Mounting Resin Kit (1 lb resin with 12 oz liquid hardener)	ACYP-5000-K1	1 lb	62.00
ACRYLIC PLUS Castable Mounting Resin Kit (5 lbs resin with 1/2 gallon liquid hardener)	ACYP-5000-K5	5 lbs	245.00
ACRYLIC PLUS Acrylic Powders			
ACRYLIC PLUS Resin powder (1 lb)	ACYP-5000-P1	1 lb	55.00
ACRYLIC PLUS Resin powder (5 lbs)	ACYP-5000-P5	5 lbs	235.00
ACRYLIC PLUS Resin powder (25 lbs)	ACYP-5000-P25	25 lbs	1105.00
ACRYLIC PLUS Resin powder (100 lbs)	ACYP-5000-P100	100 lbs	2285.00
ACRYLIC PLUS Acrylic Liquids			
ACRYLIC PLUS Resin hardener (12 oz)	ACYP-5000-H12	12 oz	28.50
ACRYLIC PLUS Resin hardener (32 oz)	ACYP-5000-H32	32 oz	48.50
ACRYLIC PLUS Resin hardener (1/2 gallon)	ACYP-5000-H64	1/2 gallon	72.50
ACRYLIC PLUS Resin hardener (1 gallon)	ACYP-5000-H128	1 gallon	115.00
ACRYLIC PLUS Resin hardener (5 gallon)	ACYP-5000-H640	5 gallon	505.00

SUPERMOUNT Glass Filled Acrylics (Castable Mounting)



PACE Product Name	Catalog Number	Qty	Price (\$)
SUPERMOUNT Glass Filled Acrylic Kit (gray) (1 lb resin with 12 oz liquid hardener)	GKAK-5000-K1	1 lb	72.50
SUPERMOUNT Glass Filled Acrylic Kit (gray) (5 lbs resin with 1/2 gallon liquid hardener)	GKAK-5000-K5	5 lbs	290.00
SUPERMOUNT PLUS Acrylic Powders			
SUPERMOUNT Resin powder (1 lb)	GRAR-5000-P1	1 lb	62.00
SUPERMOUNT Resin powder (5 lbs)	GRAR-5000-P5	5 lbs	265.00
SUPERMOUNT Resin powder (25 lbs)	GRAR-5000-P25	25 lbs	1225.00
SUPERMOUNT Resin powder (100 lbs)	GRAR-5000-P100	100 lbs	4095.00
SUPERMOUNT Acrylic Liquids			
SUPERMOUNT Resin hardener (12 oz)	GRAH-5000-H12	12 oz	28.50
SUPERMOUNT Resin hardener (32 oz)	GRAH-5000-H32	32 oz	48.50
SUPERMOUNT Resin hardener (1/2 gallon)	GRAH-5000-H64	1/2 gallon	72.50
SUPERMOUNT Resin hardener (1 gallon)	GRAH-5000-H128	1 gallon	115.00
SUPERMOUNT Resin hardener (5 gallon)	GRAH-5000-H640	5 gallon	505.00

EPOXY MOUNTING CONSUMABLES

Epoxy Castable Mounting:

The most common and best performing castable resins are epoxy based. Epoxy resins are typically two-part liquid systems consisting of a resin and hardener. Mixing ratios vary depending upon the volume of the mixture or the mount size. Larger mounts require a ratio of less hardener to resin. The advantages of mounting with epoxy resins include:

- ◆ Low shrinkage
- ◆ Relatively clear
- ◆ Relatively low exotherm
- ◆ Excellent adhesion
- ◆ Excellent chemical resistance
- ◆ Good hardness
- ◆ Relatively inexpensive

Epoxy Curing Characteristics:

- ◆ Epoxy curing times are dependent upon a number of variables including:
- ◆ Volume of mounting resin (larger mounts cure faster)
- ◆ Thermal mass of specimen (larger specimens absorb heat and therefore require longer curing times)
- ◆ Specimen material properties
- ◆ Initial resin temperature (higher resin temperatures cure faster)
- ◆ Ambient temperature (higher room temperatures cure faster)
- ◆ Relative humidity and shelf life (absorption of water degrades resin and shortens shelf life)
- ◆ Mounting mold (plastic and rubber molds absorb heat differently)

Epoxy Standard Cure (5:2 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
Standard Epoxy Resin			
Epoxy castable resin (32 oz)	EP-3000-32	32 oz	44.50
Epoxy castable resin (1-gallon)	EP-3000-128	1 gallon	132.00
Epoxy castable resin (5-gallons)	EP-3000-5G	5 gallons	605.00
Standard Epoxy Hardeners			
Epoxy hardener (8 oz)	EH-3000-08	8 oz	27.50
Epoxy hardener (32 oz)	EH-3000-32	32 oz	55.00
Epoxy hardener (1 gallon)	EH-3000-128	1 gallon	235.00

Epoxy PLUS Standard Cure (11:2 Resin: Hardener) Castable Mounting

PACE Product Name	Catalog Number	Qty	Price (\$)
EPOXY PLUS Resin			
Epoxy castable resin (32 oz)	EP-3000-32P	32 oz	44.50
Epoxy castable resin (1-gallon)	EP-3000-128P	1 gallon	132.00
Epoxy castable resin (5-gallons)	EP-3000-5GP	5 gallons	605.00
EPOXY PLUS Hardeners			
Epoxy hardener (8 oz)	EH-3000-08P	8 oz	38.00
Epoxy hardener (32 oz)	EH-3000-32P	32 oz	112.00
Epoxy hardener (1 gallon)	EH-3000-128P	1 gallon	410.00

Fast Curing Quick Mounting Epoxy (10:1 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
Quick Mounting Epoxy Resins			
Quick Mounting fast epoxy castable resin (32 oz)	ERF-3000-32	32 oz	63.00
Quick Mounting fast epoxy castable resin (1-gallon)	ERF-3000-128	1 gallon	178.50
Quick Mounting fast epoxy castable resin (5-gallons)	ERF-3000-5G	5 gallons	795.00
Quick Mounting Epoxy Hardeners			
Quick Mounting fast epoxy hardener (8 oz)	EHF-3000-08	8 oz	42.00
Quick Mounting fast epoxy hardener (32 oz)	EHF-3000-32	32 oz	128.00
Quick Mounting fast epoxy hardener (1 gallon)	EHF-3000-128	1 gallon	450.00

Low Viscosity ULTRATHIN 2 Epoxy (10:1 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty	Price (\$)
ULTRATHIN 2 Low Viscosity Epoxy Resins			
Low Viscosity castable epoxy resin (32 oz)	ULTRA-3000R-32	32 oz	78.00
Low Viscosity castable epoxy resin (1-gallon)	ULTRA-3000R-128	1 gallon	190.00
Low Viscosity castable epoxy resin (5-gallons)	ULTRA-3000R-5G	5 gallons	945.00
ULTRATHIN 2 Low Viscosity Epoxy Hardeners			
Low Viscosity castable epoxy hardener (8 oz)	ULTRA-3000H-08	8 oz	42.00
Low Viscosity castable epoxy hardener (32 oz)	ULTRA-3000H-32	32 oz	128.00
Low Viscosity castable epoxy hardener (1 gallon)	ULTRA-3000H-128	1 gallon	450.00

Low Viscosity ULTRATHIN 2 PLUS Epoxy (18:5 Resin: Hardener) Castable Mounting

PACE Product Name	Catalog Number	Qty	Price (\$)
ULTRATHIN 2 PLUS Low Viscosity Epoxy Resins			
Low Viscosity castable epoxy resin (32 oz)	ULTRA-3000R-32P	32 oz	78.00
Low Viscosity castable epoxy resin (1-gallon)	ULTRA-3000R-128P	1 gallon	215.00
Low Viscosity castable epoxy resin (5-gallons)	ULTRA-3000R-5GP	5 gallons	945.00
ULTRATHIN 2 PLUS Low Viscosity Epoxy Hardeners			
Low Viscosity castable epoxy hardener (8 oz)	ULTRA-3000H-08P	8 oz	42.00
Low Viscosity castable epoxy hardener (32 oz)	ULTRA-3000H-32P	32 oz	128.00
Low Viscosity castable epoxy hardener (1 gallon)	ULTRA-3000H-128P	1 gallon	450.00

TIP: Epoxies

- ◆ Preheat resin and sample to 35°C (95°F) to expedite the initial heating process and for decreasing overall curing time

POLYESTER MOUNTING CONSUMABLES

Polyester Castable Mounting:

Polyesters are typically used when a very clear mount is required. Polyester resins are also useful for mounting parts for display. In this case, the part appears suspended in the plastic. The procedure for molding samples to be displayed is to first determine the mixing ratio of the resin to hardener (catalyst). This ratio is variable depending upon the mass of the casting. The table to the right for Polyester catalyst mixing ratio's is based on ambient and resin temperatures of 70°F.

For larger volumes, the amount of hardener needs to be reduced significantly. The procedure for suspending the sample in the mount is to pour an initial layer and allow it to pot or gel (do not let it fully cure). The object or specimen is then placed on the "rubbery" polyester layer and another layer of the liquid polyester is poured. Multiple layers can be poured in this fashion if required.

Single Layer Casting (metallographic)		Multiple Layer Casting (display)	
Layer Thickness (inches)	Drops of catalyst per ounce of resin	Layer	Drops of catalyst per ounce of resin
1/8	15	1st layer	4-5
1/4	8	2nd layer	3-4
1/2	6	3rd layer	2-3
3/4	5	4th layer	1-2
1-1.5	4	5th layer or more	1

Polyester Characteristics:

- ◆ Very clear (water clear)
- ◆ High odor
- ◆ Best resin system for making large casting

Polyester Resin (Clear Castable Mounting)



PACE Product Name	Catalog Number	Qty	Price (\$)
Clear Polyester castable resin (1 gallon)	POLYCAST-128	1 gallon	125.00
Polyester Hardener (2 oz)	POLYHARD-02	2 oz	11.00
Polyester Color Dye Set (3 colors)	DYE-1000	3 colors	40.50

TIP: Polyesters

Polyesters can be submerged into a water bath during curing. This reduces the exotherm heat and thus reduces the shrinkage of the mount at the specimen interface. A secondary advantage is that the water also absorbs the odor.

CASTABLE MOLDS & ACCESSORIES

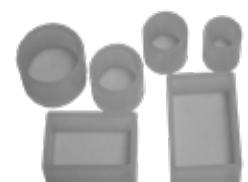
Castable Mounting Molds

PACE Product Name	Catalog Number	Qty	Price (\$)
Reusable Plastic Molds			
1.0-inch reusable two piece plastic mold (12/pkg)	METPREP-0100	12/pkg	31.00
1.25-inch reusable two piece plastic mold (12/pkg)	METPREP-0125	12/pkg	32.50
1.5-inch reusable two piece plastic mold (12/pkg)	METPREP-0150	12/pkg	42.50
2.0-inch reusable two piece plastic mold (12/pkg)	METPREP-0200	12/pkg	58.50
Disposable Plastic Molds			
1.0-inch disposable red mount cap - 50/pkg	MOUNT-0100	50/pkg	27.50
1.25-inch disposable red mount cap - 50/pkg	MOUNT-0125	50/pkg	28.50
1.5-inch disposable red mount cap - 50/pkg	MOUNT-0150	50/pkg	29.50



PACE Product Name	Catalog Number	Qty	Price (\$)
Silicon Rubber Molds			
Blue Molds	Blue Molds	Clear Molds	
1.0-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0100	RMOUNT-0100C	3/pkg
1.25-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0125	RMOUNT-0125C	3/pkg
1.5-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0150	RMOUNT-0150C	3/pkg
2.0-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0200	RMOUNT-0200C	3/pkg
2.75 x 1-1/2 x 7/8-inch (70 x 39 x 22 mm) Silicone Rubber Molds	RMOUNT-315R	RMOUNT-315C	each
3 x 2 x 7/8-inch (76 x 51 x 22 mm) Silicone Rubber Molds	RMOUNT-302R	RMOUNT-302C	each

Silicon Rubber Molds - Blue



Silicon Rubber Molds - Clear

Castable Mounting Accessories



PACE Product Name	Catalog Number	Qty	Price (\$)
1-gallon castable pump dispenser	ED-3000-01	each	17.50
1.25-inch specimen storage container - 25/pkg	STORE-0125	25/pkg	42.00
Mold release (8 oz)	MR-1000-08	each	19.50
Mold release (16 oz)	MR-1000-16	each	29.50
Mixing Cups			
3 oz Graduated Paper Mixing cups (100/pkg)	MCUPS-0100	100/pkg	15.25
9 oz Plastic Mixing cups (50/pkg)	PCUPS-050	50/pkg	7.75
Vacuum Impregnator Pouring cups (50/pkg)	POUR-CUP-050	50/pkg	52.00
Mounting Clips			
Metal MKLIP Spring mounting clip (100/pkg)	MKLIP-0100	100/pkg	70.50
Plastic SKLIP Spring mounting clip (100/pkg)	SKLIP-0100	100/pkg	39.00
Plastic KLIP specimen mounting clip (100/pkg)	KLIP-0100	100/pkg	42.00
Plastic MULTICLIP specimen clips (100/pkg)	MULTICLIP-0100	100/pkg	55.50
Plastic UNIKLIP specimen clips (100/pkg)	UNIKLIP-0100	100/pkg	35.00
Disposable Gloves			
Small Nitrile Gloves (100/box)	GLOVES-S100	100/pkg	25.00
Medium Nitrile Gloves (100/box)	GLOVES-M100	100/pkg	25.00
Large Nitrile Gloves (100/box)	GLOVES-L100	100/pkg	25.00



GRINDING & POLISHING



PENTA-5000A

PENTA-5000A

Metallographic Hand Grinder

- 5-station hand grinder
- Wet or dry grinding
- Manual grinder
- Easy to change abrasive rolls
- Robust and durable design
- Easy to use
- User friendly
- Low cost
- Easy to service



PENTA-7500S

NEW

PENTA-7500S

Metallographic Belt Grinder

- 4-inch x 36-inch belts
- Stainless steel belt adjustment mechanism
- Wet or dry grinding
- Manual grinder
- Features planarizing fixture
- Easy to change abrasive belts
- Robust and durable design
- Easy to use



PENTA-7500S Squaring and planarizing holder for metallographic mounts



1-inch Holder



1.25-inch Holder



1.5-inch Holder



2-inch Holder



25 mm Holder



30 mm Holder



40 mm Holder



50 mm Holder

METALLOGRAPHIC HAND GRINDERS

Manual Metallographic Hand Grinder

2

year warranty
Limited Warranty

FEATURE	PENTA 5000A DESCRIPTION
Grinding stations	240, 360, 600, 800 and 1200 grit silicon carbide rolls
Roll sizes	3-7/16-inch width x 60 feet length with 1-inch core
Construction	<ul style="list-style-type: none"> • SMC molding and stainless steel • Hard coat anodized rollers and paper support plates
Cooling / rinse system	Water
Dimensions (WxDxH)	22 x 24 x 9-inch (550 mm x 610 mm x 230 mm)
Weight	56 lbs (25 kg)
Catalog Number	PENTA-5000A

Benefits:

- ◆ 5-grit grinding stations, including one for 800 (P2400) and 1200 (P4000) grit fine SiC abrasives
- ◆ Easy paper advance for maintaining sharp fresh abrasive
- ◆ Low maintenance
- ◆ Simple and easy to use
- ◆ Ideal for low and high volume labs

Planarizing Metallographic Belt Grinder

FEATURE	PENTA 7500S DESCRIPTION
Single belt	4 x 36-inch (102 x 914 mm)
Electrical Specification	110V / 220V 50/ 60 Hz
Motor power	550 W (0.75 hp)
Cooling / rinse system	Water
Construction	Heavy duty welded steel / fabricated metal / Stainless steel
Dimensions (WxDxH)	20 x 25 x 15-inch (510 x 630 x 380 mm)
Weight	120 lbs (53 kg)
Catalog Number	PENTA-7500S

REQUEST A QUOTE
www.metallographic.com

Benefits:

- ◆ High torque motor (110V or 220V)
- ◆ Heat treated wear surface plate
- ◆ Quick belt changing mechanism
- ◆ Fine adjustment tracking control
- ◆ Specimen square holding device for maintaining or for squaring mounted specimens
- ◆ Rinse sink
- ◆ Emergency Stop button
- ◆ Water-tight ON/OFF switch

PENTA-7500S Accessories	Catalog Number
1-inch sleeve for square holder (each)	P75-SH-100
1.25-inch sleeve for square holder (each)	P75-SH-125
1.5-inch sleeve for square holder (each)	P75-SH-150
2-inch sleeve for square holder (each)	P75-SH-200
25 mm sleeve for square holder (each)	P75-SH-25
30 mm sleeve for square holder (each)	P75-SH-30
40 mm sleeve for square holder (each)	P75-SH-40
50 mm sleeve for square holder (each)	P75-SH-50



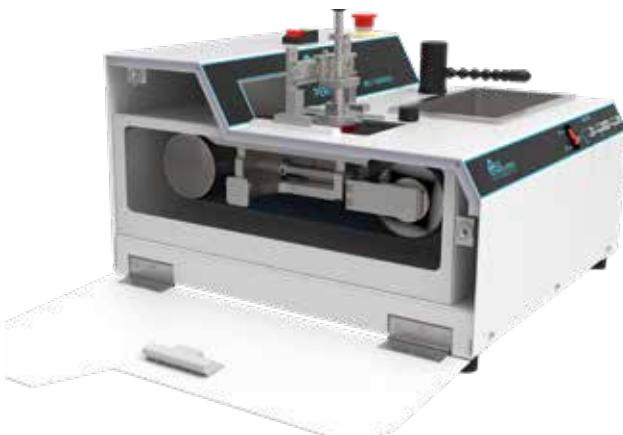
Machinery Directive 2006/42/EC
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

ABRASIVE BELTS, POWDERS & ROLLS

Specimen Planar Grinding:

In general, it is better to cut as close to the areas to be investigated than to grind with very coarse abrasives such as 60, 80 and 120 grit grinding papers; however, if the specimen requires coarse abrasive grinding it is HIGHLY recommended that a belt grinder with a planar grinding / squaring fixture be used. The squaring fixture is important so that mounted specimens remain both square and flat.

Note: It is nearly impossible to maintain a square sample by hand on a belt grinder. Square specimen mounts are very important for subsequent specimen preparation on automated single specimen preparation machines. PACE Technologies is the only metallographic equipment manufacturer that offers a planar grinding fixture for its PENTA 7500S belt grinder.



PENTA 7500S Metallographic Belt Grinder

Abrasive Belts (4-inch x 36-inch)



Zirconia (blue), Alumina (red) & Silicon Carbide (black) Abrasive Grinding Belts

PACE Product Name	Catalog Number	Qty	Price (\$)
60 grit Zirconia Abrasive Belts	ZRO2-B060	5/pkg	80.00
120 grit Zirconia Abrasive Belts	ZRO2-B120	5/pkg	80.00
120 grit Alumina Abrasive Belts	ALO-B120	5/pkg	75.00
60 grit SiC Abrasive Belts	SIC-B060	10/pkg	125.00
80 grit SiC Abrasive Belts	SIC-B080	10/pkg	125.00
120 grit SiC Abrasive Belts	SIC-B120	10/pkg	125.00
180 grit SiC Abrasive Belts	SIC-B180	10/pkg	125.00
240 grit SiC Abrasive Belts	SIC-B240	10/pkg	125.00

ABRASIVE BELT TYPE BENEFIT

Alumina	Hard and durable abrasive, not as sharp as SiC; however, alumina lasts longer than SiC
Silicon Carbide	Very hard and friable. Fast initial cutting, however SiC abrasive breaks down very fast so it is a "short-lived" abrasive
Zirconia	Very durable and hard abrasive. It is a longer lasting abrasive and is an excellent choice for belt grinders. The only drawback is that it requires higher grinding forces as compared to SiC and alumina abrasives



PENTA 5000A
Metallographic Hand Grinder

Silicon Carbide (SiC) Abrasive Powders



PENTA-7500S Squaring and planarizing holder for metallographic mounts

PACE Product Name	Catalog Number	Qty	Price (\$)
120 grit (P120-grit) SiC Powder (1 lb)	SIC-120-P1	1 lb	28.50
120 grit (P120-grit) SiC Powder (5 lbs)	SIC-120-P5	5 lbs	115.00
240 grit (P280-grit) SiC Powder (1 lb)	SIC-240-P1	1 lb	27.50
240 grit (P280-grit) SiC Powder (5 lbs)	SIC-240-P5	5 lbs	110.00
320 grit (P400-grit) SiC Powder (1 lb)	SIC-320-P1	1 lb	27.50
320 grit (P400-grit) SiC Powder (5 lbs)	SIC-320-P5	5 lbs	110.00
400 grit (P800-grit) SiC Powder (1 lb)	SIC-400-P1	1 lb	27.50
400 grit (P800-grit) SiC Powder (5 lbs)	SIC-400-P5	5 lbs	110.00
600 grit (P1200-grit) SiC Powder (1 lb)	SIC-600-P1	1 lb	27.50
600 grit (P1200-grit) SiC Powder (5 lbs)	SIC-600-P5	5 lbs	110.00
800 grit (P2400-grit) SiC Powder (1 lb)	SIC-800-P1	1 lb	35.50
800 grit (P2400-grit) SiC Powder (5 lbs)	SIC-800-P5	5 lbs	145.00
1000 grit (P3000-grit) SiC Powder (1 lb)	SIC-1000-P1	1 lb	35.50
1000 grit (P3000-grit) SiC Powder (5 lbs)	SIC-1000-P5	5 lbs	145.00
1200 grit (P4000-grit) SiC Powder (1 lb)	SIC-1200-P1	1 lb	35.50
1200 grit (P4000-grit) SiC Powder (5 lbs)	SIC-1200-P5	5 lbs	145.00

Silicon Carbide Powders:

- The main application for grinding with silicon carbide particles is in conjunction with flat lapping on hard metal plates such as cast iron. For metallographic specimen preparation, silicon carbide powders are used for grinding petrographic thin section specimens.

Silicon Carbide (SiC) Abrasive Rolls (3-7/16-inch width, 60-feet length, 1-inch core)

PACE Product Name	Catalog Number	Qty	Price (\$)
120 grit SiC Abrasive Roll (each)	SIC-120R-60	each	88.00
240 grit SiC Abrasive Roll (each)	SIC-240R-60	each	62.00
320 grit SiC Abrasive Roll (each)	SIC-320R-60	each	62.00
360 grit SiC Abrasive Roll (each)	SIC-360R-60	each	62.00
400 grit SiC Abrasive Roll (each)	SIC-400R-60	each	62.00
600 grit SiC Abrasive Roll (each)	SIC-600R-60	each	62.00
800 grit SiC Abrasive Roll (each)	SIC-800R-60	each	90.00
1200 grit SiC Abrasive Roll (each)	SIC-1200R-60	each	90.00



MANUAL METALLOGRAPHIC POLISHERS



NANO-1000S

NANO-1000S

8-10 inch Single Wheel Manual Grinder/Polisher

- Single wheel
- 8 and 10-inch wheel diameter options
- 1 hp dynamic torque servo motor (100-1000 rpm)
- Three programmable preset speeds and times for quick speed or time changes
- Easy to use control panel with 3-inch LCD screen
- Auto timer control
- User friendly, robust and durable



NANO-2000S

NANO-2000S

8-10 inch Dual Wheel Manual Grinder/Polisher

- Dual wheel
- 8 and 10-inch wheel diameter options
- 1 hp dynamic torque servo motor (100-1000 rpm)
- Three programmable preset speeds and times for quick speed or time changes
- Easy to use control panel with 3-inch LCD screen
- Auto timer control
- User friendly, robust and durable



High Torque Dynamic Servo Motor

8-inch Working Wheel



Anodized 8-inch working wheel for
NANO-S polishers
Catalog no. PW-800A

10-inch Working Wheel



Anodized 10-inch working wheel for
NANO-S polishers
Catalog no. PW-1000A

8 / 10-inch Splash Guard



Splash Guard for NANO-S Polisher
Catalog no. PTM-125-001

8 / 10-inch Cover



Polishing wheel cover for NANO-S polishers
Catalog no. PTM-125-007

8 & 10-inch Metallographic Polishers

2

year warranty
Limited Warranty

FEATURE	NANO-1000S DESCRIPTION	NANO-2000S DESCRIPTION
Motor power	1 hp (750 W) dynamic torque servo motor	1 hp (750 W) dynamic torque servo motor
Power head upgrade	FEMTO-1100S / FEMTO-1500S	FEMTO-1100S / FEMTO-1500S
Polishing wheels	Single - 8 &10-inch diameter	Double - 8 &10-inch diameter
Electrical specification	110 / 220V (50/60 Hz)	110 / 220V (50/60 Hz)
Speed (rpm)	Variable (100 - 1000 rpm) - Grinding (600-1000 rpm) - Polishing (100-600 rpm)	Variable (100 - 1000 rpm) - Grinding (600-1000 rpm) - Polishing (100-600 rpm)
Anodized Working wheels: 8-inch 10-inch	Part no. PW-800A Part no. PW-1000A	Part no. PW-800A Part no. PW-1000A
Dimensions (W x D x H)	16 x 15 x 15-inch (420 x 380 x 380 mm)	30 x 22 x 15-inch (750 x 570 x 380 mm)
Weight	63 lbs (29 kg)	80 lbs (36 kg)
Catalog Number	NANO-1000S	NANO-2000S
Optional	Recirculating filtering tank (RC-1000A)	Recirculating filtering tank (RC-1000A)

REQUEST A QUOTE
www.metallographic.com

Benefits:

- ◆ Variable speed 100-1000 rpm, 1 rpm increments
- ◆ CCW and CW direction control
- ◆ Rapid programmable speed and time selection
- ◆ Timer (count down to zero and turns off) range from 1 second up to 99 minutes and 60 seconds
- ◆ Emergency stop switch
- ◆ Flexible / retractable water spout
- ◆ 1 hp (750W) high torque dynamic servo motor for constant torque over the full range of motor speeds
- ◆ Splash guard and cover
- ◆ Electrical connections for FEMTO-1100S/1500S auto polishing



Paper rings for plain-backed papers
Catalog no. PTM-125-005 (8-inch)



Paper rings for plain-backed papers
Catalog no. PTM-125-006 (10-inch)

NANO-S 8 & 10-inch Polisher Accessories	Catalog Number
8-inch diameter hard coat anodized aluminum working wheel	PW-800A
10-inch diameter hard coat anodized aluminum working wheel	PW-1000A
8 & 10-inch splash guard	PTM-125-001
8 & 10-inch cover	PTM-125-007
8-inch 304 stainless steel plain-backed grinding paper ring	PTM-125-005
10-inch 304 stainless steel plain-backed grinding paper ring	PTM-125-006



Machinery Directive 2006/42/EC
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

MANUAL METALLOGRAPHIC POLISHERS



NANO-1200S

NEW

NANO-1200S

12-14 inch Single Wheel Manual Grinder/Polisher

- Single wheel
- 12 and 14-inch wheel diameter options
- 1.3 hp (1000W) motor (100-1000 rpm)
- Three programmable preset speeds and times for quick speed or time changes
- Easy to use control panel
- Auto timer control
- User friendly, robust and durable

12-inch Working Wheel



Anodized 12-inch working wheel for
NANO-1200S polishers
Catalog no. PW-1200A

14-inch Working Wheel



Anodized 14-inch working wheel for
NANO-1200S polishers
Catalog no. PW-1400A

NANO-1200S Splash Guard



Splash Guard for NANO-1200S Polisher
Catalog no. PTM-225-207

12-inch Paper Ring



12-inch Paper ring for plain-backed papers
Catalog no. PTM-225-005 (12-inch)

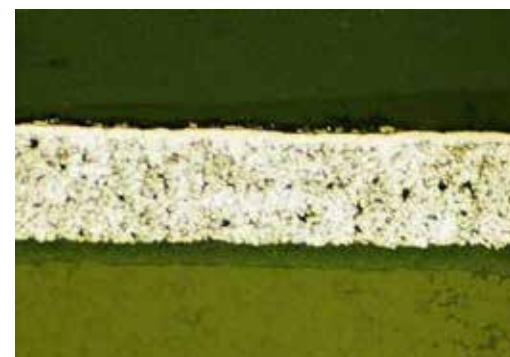
14-inch Paper Ring



14-inch Paper ring for plain-backed papers
Catalog no. PTM-225-006 (14-inch)



SiC particles in a Si₃N₄ matrix , 1000X (DIC)



AlN substrate with a molybdenum/ nickel, gold coating
400X (B.F.)

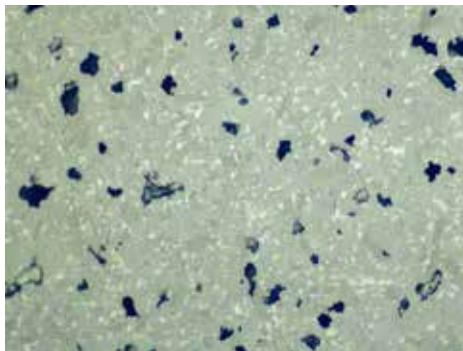
12 & 14-inch Metallographic Polishers

2

year warranty
Limited Warranty

FEATURE	NANO-1200S DESCRIPTION
Motor power	1.3 hp (1000 W)
Power head upgrade	FEMTO-2200S / FEMTO-2500S
Polishing wheels	Single - 12 &14-inch diameter
Electrical specification	110 or 220V (50/60 Hz) pre wired at factory
Speed (rpm)	Variable (100 - 1000 rpm) - Grinding (600-1000 rpm) - Polishing (100-600 rpm)
Anodized Working wheels: 12-inch 14-inch	Part no. PW-1200A Part no. PW-1400A
Dimensions (W x D x H)	20 x 16 x 25-inch (510 x 420 x 640 mm)
Weight	95 lbs (43 kg)
Catalog Number	NANO-1200S
Optional	Recirculating filtering tank (RC-1000A)

NANO-1200S 12 & 14-inch Polisher Accessories	Catalog Number
12-inch diameter hard coat anodized aluminum working wheel	PW-1200A
14-inch diameter hard coat anodized aluminum working wheel	PW-1400A
12 & 14-inch splash guard	PTM-225-207
12-inch 304 stainless steel plain-backed grinding paper ring	PTM-225-005
14-inch plastic plain-backed grinding paper ring	PTM-225-006



BeO, 400X (B.F.) as polished condition



NANO-1200S / FEMTO-2200S
Autopolisher

Benefits:

- ◆ Variable speed 100-1000 rpm
- ◆ CCW and CW direction control
- ◆ Rapid programmable speed and time selection
- ◆ Timer (count down to zero and turns off) range from 1 second up to 99 minutes and 60 seconds
- ◆ Emergency stop switch
- ◆ Swinging water spout
- ◆ 1.3 hp (1000W) motor
- ◆ Splash guard
- ◆ Electrical connections for FEMTO-2200S/2500S auto polishing

REQUEST A QUOTE
www.metallographic.com



ANCILLARY POLISHING SYSTEMS



ZETA-2000S

NEW

ZETA-2000S

Abrasive and Lubricant Dispenser

- 4 (24v) dedicated, programmable peristaltic pumps.
- Setting adjustments for frequency, duration, start time, total time
- 7-inch touchscreen interface
- Compatible with NANO polishing machines as well as competitors' polishing devices
- Controlled priming for each pump and dispensing lines for more immediate application of the abrasive / lubricant
- Flushing/ priming sequence for changing of abrasive/lubricant options
- Variable flow 1.2~90 ml/minute
- Flex line for easy adjustment of dispensing nozzles
- 110/220V compatible
- Easy to use, robust and durable



RC-1000A

RC-1000A

Recirculating / Filter System

- Series of three replaceable filters (0.2, 0.5 and 1 micron)
- Positive pressure 24V pump (40W) (connected to 110V/220V power supply)
- 1.3 GPM (5 liters/min) maximum flow
- Easy to operate

ZETA-2000S Metallographic Abrasive Dispenser

2

year warranty
Limited Warranty



FEATURE	ZETA-2000S DESCRIPTION
Pumps	4 (24v) dedicated, programmable peristaltic pumps Setting adjustments for: - Frequency - Duration - Start time - Total time
Flow rates	1.2 - 90 ml/minute
Cleaning	Water flushing
Electrical specification	110 / 220V (50/60 Hz)
Dimensions (W x D x H)	9.5 x 11 x 12-inch (240 x 70 x 300 mm)
Weight	20 lbs (9.1 kg)
Catalog Number	ZETA-2000S

Benefits:

- ◆ Microprocessor controlled
- ◆ Can be used manually on competitors' equipment
- ◆ Interfaces with the FEMTO-S Auto Polishing heads for automated abrasive fluid dispensing
- ◆ Capable of dispensing NANOMETER alumina and SIAMAT colloidal silica and subsequently back flushing the lines to keep them clean and reusable

REQUEST A QUOTE

www.metallographic.com

RC-1000A Recirculating / Filter System

2

year warranty
Limited Warranty



FEATURE	RC-1000A DESCRIPTION
Filtering	Coarse (2-straining filters) Fine Filters (0.2, 0.5 and 1 µm)
Tank capacity	14 gallons (53 L)
Pump	24VDC Diaphragm Pump (1.3 GPM, 5 liters/min)
Electrical specification	110 / 220V (50/60 Hz)
Pressure	60 psi (0.42 MPa)
Dimensions (W x D x H)	32 x 16 x 20-inch (800 x 420 x 500 mm)
Weight	30 lbs (14 kg)
Catalog Number	RC-1000A

Benefits:

- ◆ Eliminates need for water and sewer hook-up
- ◆ Allows the polishing machine to be mobile
- ◆ Environmentally friendly
- ◆ Self-contained system



Machinery Directive 2006/42/EC
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

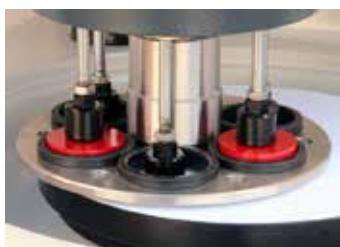
AUTOMATED METALLOGRAPHIC POLISHERS



FEMTO-1500S



Central Fixed Force



Individual Force

FEMTO-1500S

Individual / Central Force Autopolishing Head

- FEMTO-1500S is a dual Individual and Central force specimen polishing head
- Compatible with the NANO-1000S and NANO-2000S polishers
- 7-inch touchscreen interface
- 0-300 rpm Variable Speed Head
- 0.5 hp (400W) high torque dynamic servo motor
- Contra or Complementary Direction with NANO-S polisher
- User friendly / Easy to Use
- Robust and Durable



FEMTO-1100S



Individual Force

FEMTO-1100S

Individual Force Autopolishing Head

- FEMTO-1100S is an Individual force polishing head
- Compatible with the NANO-1000S and NANO-2000S polishers
- 7-inch touchscreen interface
- 0-300 rpm Variable Speed Head
- 0.54 hp (400W) high torque dynamic servo motor
- Contra or Complementary Direction with NANO-S polisher
- User friendly / Easy to Use
- Robust and Durable



Machinery Directive 2006/42/EC
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

FEMTO 1500S Automated Metallographic Polishers

2

year warranty
Limited Warranty

FEATURE	NANO-1000S / FEMTO-1500S DESCRIPTION	NANO-2000S / FEMTO-1500S DESCRIPTION
Polishing Wheels	8 & 10-inch single wheel	8 & 10-inch double wheel
Force application	Individual pistons (1-6 samples) Central force (3-6 samples)	Individual pistons (1-6 samples) Central force (3-6 samples)
Sample Holder	Quick release chuck	Quick release chuck
Motor power (FEMTO)	0.5 hp (400 W) dynamic torque servo motor	0.5 hp (400 W) dynamic torque servo motor
Motor power (NANO)	1 hp (750 W) dynamic torque servo motor	1 hp (750 W) dynamic torque servo motor
Electrical specification	110 / 220V (50/60 Hz)	110 / 220V (50/60 Hz)
Speed (rpm)	0-300 rpm	0-300 rpm
Relative Head:Base Direction	Complementary and Contra	Complementary and Contra
Dimensions (W x D x H)	16 x 21 x 26-inch (410 x 530 x 670 mm)	29 x 22 x 26-inch (750 x 560 x 670 mm)
Weight	128 lbs (58.2 kg) with polisher base	185 lbs (84 kg) with polisher base
Optional	ZETA-2000S abrasive dispenser	ZETA-2000S abrasive dispenser
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank

Benefits:

- ◆ Central and Individual polishing force
- ◆ Produces flatter specimens with central force, especially useful for specimens having materials of different hardness (e.g. thermal spray coatings, electronic components, heat treated steels, etc.)
- ◆ Individual force procedures require fewer initial grinding steps and the samples can be removed and reinserted with the need to planarize
- ◆ Specimens can be polished in both the contra and complementary head / base directions

FEMTO 1100S Automated Metallographic Polishers

2

year warranty
Limited Warranty

FEATURE	NANO-1000S / FEMTO-1100S DESCRIPTION	NANO-2000S / FEMTO-1100S DESCRIPTION
Polishing Wheels	8 & 10-inch single wheel	8 & 10-inch double wheel
Force application	Individual pistons (1-6 samples)	Individual pistons (1-6 samples)
Sample Holder	Fixed holder	Fixed holder
Motor power (FEMTO)	0.5 hp (400 W) dynamic torque servo motor	0.5 hp (400 W) dynamic torque servo motor
Motor power (NANO)	1 hp (750 W) dynamic torque servo motor	1 hp (750 W) dynamic torque servo motor
Force	1.1 - 13.5 lbs (5- 60 N)	1.1 - 13.5 lbs (5- 60 N)
Speed (rpm)	0-300 rpm	0-300 rpm
Relative Head:Base Direction	Complementary and Contra	Complementary and Contra
Electrical specification	110 / 220V (50/60 Hz)	110 / 220V (50/60 Hz)
Dimensions (W x D x H)	16 x 21 x 26-inch (410 x 530 x 670 mm)	29 x 22 x 26-inch (750 x 560 x 670 mm)
Weight	130 lbs (60 kg) with polisher base	185 lbs (85 kg) with polisher base
Optional	ZETA-2000S abrasive dispenser	ZETA-2000S abrasive dispenser
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank

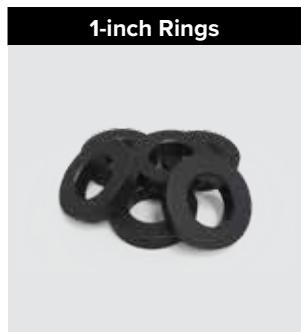
Benefits:

- ◆ Individual specimen polishing force
- ◆ Reduced number of preparation steps and lower cost for consumables
- ◆ Samples can be re-polished without having to planarize specimens in holder

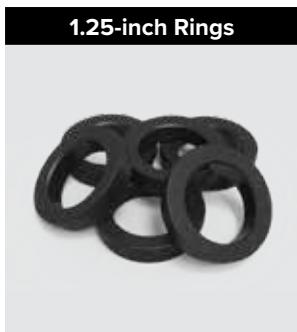
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AUTOMATED METALLOGRAPHIC POLISHERS

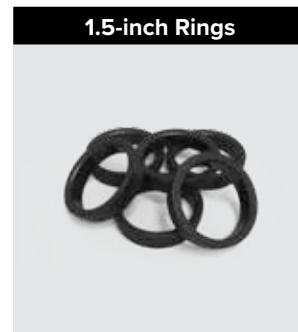
FEMTO 1100S/1500S Individual Holder



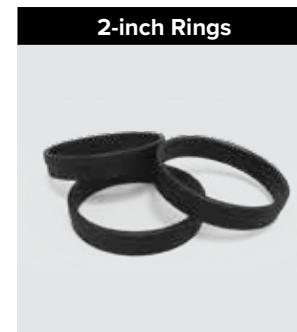
1-inch diameter rings for
FEMTO-1100S / 1500S (6/set)
Catalog no. SR-0100



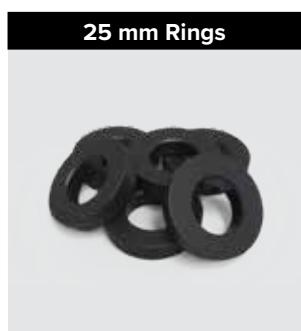
1.25-inch diameter rings for
FEMTO-1100S / 1500S (6/set)
Catalog no. SR-0125



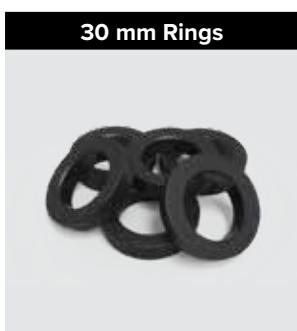
1.5-inch diameter rings for
FEMTO-1100S / 1500S (6/set)
Catalog no. SR-0150



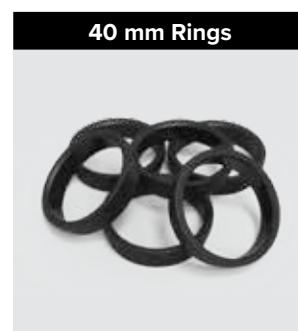
2.0-inch diameter rings for
FEMTO-1100S / 1500S (3/set)
Catalog no. SR-0200



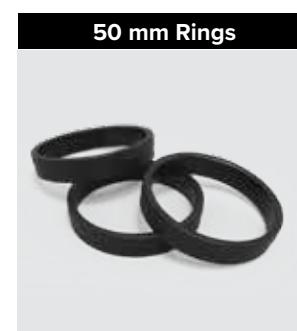
25 mm diameter rings for
FEMTO-1100S / 1500S (6/set)
Catalog no. SR-25mm



30 mm diameter rings for
FEMTO-1100S / 1500S (6/set)
Catalog no. SR-30mm



40 mm diameter rings for
FEMTO-1100S / 1500S (6/set)
Catalog no. SR-40mm



50 mm diameter rings for
FEMTO-1100S / 1500S (3/set)
Catalog no. SR-50mm

FEMTO 1500S Central Holders



Central 1-inch or 25 mm specimen
holder for FEMTO-1500S
Catalog no. QRC-SH100A-1500



Central 1.25-inch or 30 mm
specimen holder for FEMTO-1500S
Catalog no. QRC-SH125A-1500



Central 1.5-inch or 40 mm specimen
holder for FEMTO-1500S
Catalog no. QRC-SH150A-1500



Central 2-inch or 50 mm specimen
holder for FEMTO-1500S
Catalog no. QRC-SH200A-1500



FEMTO-1100S individual specimen holder, requires 6 plastic rings ranging from 1-inch up to 1.5-inch or 25 mm up to 40 mm (ordered separately) **Catalog no. SH-1100**



FEMTO-1500S individual specimen holder, requires 6 plastic rings ranging from 1-inch up to 1.5-inch or 25 mm up to 40 mm (ordered separately) **Catalog no. SH-1150**

Individual Specimen Holder	FEMTO-1100S	FEMTO-1500S
Individual holder (6-ring) (1 to 1.5-inch & 25-40 mm mounts)	SH-1100	SH-1150
1-inch diameter rings (6/pkg)	SR-0100	SR-0100
1.25-inch diameter rings (6/pkg)	SR-0125	SR-0125
1.5-inch diameter rings (6/pkg)	SR-0150	SR-0150
25 mm diameter rings (6/pkg)	SR-25mm	SR-25mm
30 mm diameter rings (6/pkg)	SR-30mm	SR-30mm
40 mm diameter rings (6/pkg)	SR-40mm	SR-40mm



2-inch single specimen holder mounting fixture for FEMTO-1100S, requires one set of 3, 2-inch or 50 mm plastic rings (ordered separately) **Catalog no. SH-1200**



2-inch single specimen holder mounting fixture for FEMTO-1500S, requires one set of 3, 2-inch or 50 mm plastic rings (ordered separately) **Catalog no. SH-1250**

Individual Specimen Holder	FEMTO-1100S	FEMTO-1500S
Individual holder (3-ring) (2-inch & 50 mm mounts)	SH-1200	SH-1250
2-inch diameter rings (3/pkg)	SR-0200	SR-0200
50 mm diameter rings (3/pkg)	SR-50mm	SR-50mm
Individual holder for glass slide fixtures	SH-GHOLDER-1100	SH-GHOLDER-1500
Glass slide fixture for 27 x 47 mm & 1 x 3-inch slides (each)	SR-G	SR-G



Central force loading plate
Catalog no. CF-LP-1500

Central Specimen Holder	FEMTO-1500S
1-inch / 25 mm central specimen holder (3-6 samples)	QRC-SH100A-1500
1.25-inch / 30 mm central specimen holder (3-6 samples)	QRC-SH125A-1500
1.5-inch / 40 mm central specimen holder (3-6 samples)	QRC-SH150A-1500
2-inch / 50 mm central specimen holder (3 samples)	QRC-SH200A-1500
Central Force Loading plate	CF-LP-1500

AUTOMATED METALLOGRAPHIC POLISHERS



NANO-1200S/FEMTO-2200S

FEMTO-2200S/2500S

Autopolishing Head for Larger Working Areas

- FEMTO-2500S is a dual Individual and Central force specimen polishing head
- FEMTO-2200S is an Individual force polishing head
- Compatible with the NANO-1200S polisher
- 0-300 rpm Variable Speed Head
- Contra or Complementary Direction
- User friendly / Easy to Use
- Robust and Durable

Individual vs. Central Force Automated Polishing

APPLICATION	ADVANTAGES	DISADVANTAGES
Individual Force	Reduced number of preparation steps and lowers cost for consumables	Can result in loss of flatness across the specimen if heavy duty coarse grinding is required
	Sample can be re-polished without having to planarize specimens in the holder	It is recommended that the grinding and polishing steps only be done at matching head and base speeds with the rotation being in the same direction
Central Force	Flatter specimens	Minimum of 3-samples are required in the holder
	Specimens can be polished in both the contra and complementary head / base directions	Typically requires 1-3 additional coarser grinding steps to planarize all specimens Additional grinding steps increase both consumables cost and total preparation time Coarser grinding can result in more surface and subsurface damage to the specimen Need to planarize specimens again if they are removed from the fixed holder

FEMTO 2200S/2500S Automated Metallographic Polishers

2

year warranty
Limited Warranty

FEATURE	NANO-1200S / FEMTO-2500S DESCRIPTION	NANO-1200S / FEMTO-2200S DESCRIPTION
Polishing Wheels	12 & 14-inch single wheel	12 & 14-inch single wheel
Force application	Individual pistons (1-6 samples) Central force (3+ samples)	Individual pistons (1-6 samples)
Electrical specification	110 / 220V (50/60 Hz) 1000 W (1.33 hp)	110 / 220V (50/60 Hz) 1000 W (1.33 hp)
Speed (rpm)	0-300 rpm	0-300 rpm
Relative Head:Base Direction	CW and CCW	CW and CCW
Dimensions (W x D x H)	33 x 27 x 28-inch (845 x 680 x 710 mm)	33 x 27 x 28-inch (845 x 680 x 710 mm)
Weight	150 lbs (68 kg) with polisher base	150 lbs (68 kg) with polisher base
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank



Central Fixed Force



Individual Force

Benefits:

- ◆ Central and Individual polishing force
- ◆ Produces flatter specimens with central force, especially useful for specimens having materials of different hardness (e.g. thermal spray coatings, electronic components, heat treated steels, etc.)
- ◆ Individual force procedures require fewer initial grinding steps and the samples can be removed and reinserted with the need to planarize
- ◆ Specimens can be polished in both the contra and complementary head / base directions

REQUEST A QUOTE
www.metallographic.com

Individual vs. Central Force Typical Preparation Requirements

STEP	INDIVIDUAL FORCE	CENTRAL FORCE
Planar Grinding	n/a	120, 240 grit SiC
Rough Grinding	360, 600 grit SiC	360, 600 grit SiC
Fine Grinding	800, 1200 grit SiC	800, 1200 grit SiC
Intermediate Polishing	1 micron polycrystalline diamond on a woven pad	1 micron polycrystalline diamond on a woven pad
Final Polishing	0.05 micron NANOMETER alumina on a napped pad	0.05 micron NANOMETER alumina on a napped pad



Machinery Directive 2006/42/EC
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

AUTOMATED METALLOGRAPHIC POLISHERS

FEMTO-2200S/2500S Individual Holder

1-inch Rings



1-inch diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-0100

1.25-inch Rings



1.25-inch diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-0125

1.5-inch Rings



1.5-inch diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-0150

2-inch Rings



2.0-inch diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-0200

25 mm Rings



25 mm diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-25mm

30 mm Rings



30 mm diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-30mm

40 mm Rings



40 mm diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-40mm

50 mm Rings



50 mm diameter rings for FEMTO-2200S / 2500S (6/set)
Catalog no. SR-50mm

FEMTO-2500S Central Holders

FEMTO-2500S 1-inch / 25 mm Central Sample Holder



Central 1-inch or 25 mm specimen holder for FEMTO-2500S (3-12 samples)
Catalog no. QRC-SH100A-2500

FEMTO-2500S 1.25-inch / 30 mm Central Sample Holder



Central 1.25-inch or 30 mm specimen holder for FEMTO-2500S (3-12 samples)
Catalog no. QRC-SH125A-2500

FEMTO-2500S 1.5-inch / 40 mm Central Sample Holder



Central 1.5-inch or 40 mm specimen holder for FEMTO-2500S (3-6 samples)
Catalog no. QRC-SH150A-2500

FEMTO-2500S 2-inch / 50 mm Central Sample Holder



Central 2.0-inch or 50 mm specimen holder for FEMTO-2500S (3-6 samples)
Catalog no. QRC-SH200A-2500



FEMTO-2200S 6-Ring Sample Holder
FEMTO-2200S individual specimen holder, requires 6 plastic rings ranging from 1-inch up to 1.5-inch or 25 mm up to 40 mm (ordered separately) **Catalog no. SH-2100**



FEMTO-2500S 6-Ring Sample Holder
FEMTO-2500S individual specimen holder, requires 6 plastic rings ranging from 1-inch up to 1.5-inch or 25 mm up to 40 mm (ordered separately) **Catalog no. SH-2150**

Individual Specimen Holder	FEMTO-2200S	FEMTO-2500S
Individual holder (6-ring) (1 to 1.5-inch & 25-40 mm mounts)	SH-2200	SH-2250
1-inch diameter rings (6/pkg)	SR-0100	SR-0100
1.25-inch diameter rings (6/pkg)	SR-0125	SR-0125
1.5-inch diameter rings (6/pkg)	SR-0150	SR-0150
25 mm diameter rings (6/pkg)	SR-25mm	SR-25mm
30 mm diameter rings (6/pkg)	SR-30mm	SR-30mm
40 mm diameter rings (6/pkg)	SR-40mm	SR-40mm



FEMTO-2200 6-Ring Sample Holder
2-inch single specimen holder mounting fixture for FEMTO -2200S, requires one set of 3, 2-inch or 50 mm plastic rings (ordered separately) **Catalog no. SH-2200**



FEMTO-2500 6-Ring Sample Holder
2-inch single specimen holder mounting fixture for FEMTO 2500S, requires one set of 6, 2-inch or 50 mm plastic rings (ordered separately) **Catalog no. SH-2250**

Individual Specimen Holder	FEMTO-2200S	FEMTO-2500S
Individual holder (3-ring) (2-inch & 50 mm mounts)	SH-2200	SH-2250
2.0-inch diameter rings (3/pkg)	SR-0200	SR-0200
50 mm diameter rings (3/pkg)	SR-50mm	SR-50mm
Individual holder for glass slide fixtures	SH-GHOLDER-2200	SH-GHOLDER-2500
Glass slide fixture for 27 x 47 mm & 1 x 3-inch slides (each)	SR-G	SR-G



FEMTO-2500S Central Sample Loading Plate
Central force loading plate **Catalog no. CF-LP-2500**

Central Specimen Holder	FEMTO-2500S
1-inch / 25 mm central specimen holder (3-12 samples)	QRC-SH100A-2500
1.25-inch / 30 mm central specimen holder (3-12 samples)	QRC-SH125A-2500
1.5-inch / 40 mm central specimen holder (3-6 samples)	QRC-SH150A-2500
2-inch / 50 mm central specimen holder (3-6 samples)	QRC-SH200A-2500
Central Force Loading plate	CF-LP-2500

VIBRATORY METALLOGRAPHIC POLISHERS

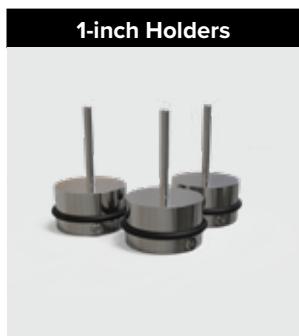


GIGA-S

GIGA-S

Vibratory Polisher

- Interchangeable bowl for the ability to polish on a 9 or 12-inch surface
- Utilizes a piezoelectric (PZT) motor for true electronic vibration
- Easy magnetic locking bowl attachment for quick cleaning and change out of polishing medium
- Two part bowl design for leak free operation
- New Pulse Mode feature for stain free polishing if left unattended after procedure has ended
- Removable, hinged, lid for easy cleaning
- Simple to use
- Robust and Durable



1-inch diameter GIGA holder
Catalog no. VIB-0100



1.25-inch diameter GIGA holder
Catalog no. VIB-0125



1.5-inch diameter GIGA holder
Catalog no. VIB-0150



2-inch diameter GIGA holder
Catalog no. VIB-0200



1-inch diameter GIGA weight
Catalog no. VIB-WT-0100



1.25-inch diameter GIGA weight
Catalog no. VIB-WT-0125



1.5-inch diameter GIGA weight
Catalog no. VIB-WT-0150



2-inch diameter GIGA weight
Catalog no. VIB-WT-0200

GIGA-S Vibratory Metallographic Polishers

2

year warranty
Limited Warranty

FEATURE	GIGA-S DESCRIPTION
Polishing Bowl size	9 or 12-inch
Drive Mechanism	PZT Motor
Electrical specification	110 / 220V (50/60 Hz)
Construction	Aluminum casting with SMC cover (injection molded)
Frequency	0~220Hz
Motor voltage	200V (600 W)
Dimensions (W x D x H) (note: hood can also be removed)	Hood closed: 16 x 20 x 16-inch (420 x 500 x 410 mm) Hood open: 16 x 20 x 30-inch (420 x 500 x 750 mm)
Weight	135 lbs (62 kg)

Benefits:

- ◆ Superior surface finishes
- ◆ Eliminates subsurface damage (has been shown to produce the best surface finish for EBSD sample preparation)
- ◆ Able to polish multiple samples simultaneously
- ◆ With correct CMP polishing abrasive, flatter or more planar finishes can be obtained over materials having a wide range of hardness'

1 / 1.25-inch Mounting Plate



Mounting plate for 1 & 1.25-inch specimen holders
Catalog no. PLATE-0100

1.5 / 2-inch Mounting Plate



Mounting plate for 1.5 & 2-inch specimen holders
Catalog no. PLATE-0200

Plastic 9 &12-inch Polishing Bowls



Plastic 2-piece Interchangeable GIGA-S Polishing Bowls

Anodized Aluminum 9 & 12-inch Polishing Bowls



Anodized Aluminum 2-piece Interchangeable GIGA-S Polishing Bowls

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Vibratory Polishing Holder

Catalog Number

1-inch diameter 304 stainless steel specimen holders (each)

VIB-0100

1.25-inch diameter 304 stainless steel specimen holders (each)

VIB-0125

1.5-inch diameter 304 stainless steel specimen holders (each)

VIB-0150

2-inch diameter 304 stainless steel specimen holders (each)

VIB-0200

1-inch weight, 304 stainless steel (each)

VIB-WT-0100

1.25-inch weight, 304 stainless steel (each)

VIB-WT-0125

1.5-inch weight, 304 stainless steel (each)

VIB-WT-0150

2-inch weights 304 stainless steel (each)

VIB-WT-0200

Mounting plate for 1-inch and 1.25-inch holders

PLATE-0100

Mounting plate for 1.5-inch and 2-inch holders

PLATE-0200

9-inch plastic Interchangeable bowl

GS-9IN-BOWL

12-inch plastic Interchangeable bowl

GS-12IN-BOWL

9-inch aluminum Interchangeable bowl

GS-9IN-BOWL-AL

12-inch aluminum Interchangeable bowl

GS-12IN-BOWL-AL



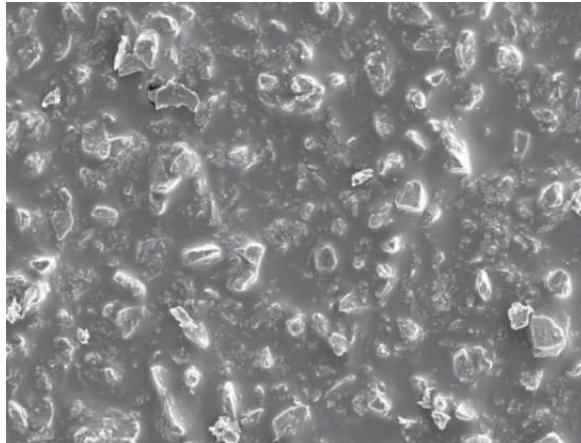
Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

GRINDING CONSUMABLES

Silicon Carbide Abrasives:

SiC is a manufactured abrasive produced by a high temperature reaction between silica and carbon. It has a hexagonal-rhombohedral crystal structure and a hardness of approximately 2500 HV. It is an ideal abrasive for cutting and grinding metallographic specimens because of its high hardness and sharp edges. It is also somewhat brittle, and therefore it cleaves easily to produce sharp new edges (self sharpening). SiC is an excellent abrasive for maximizing cutting rates while minimizing surface and subsurface damage. For metallographic preparation, SiC abrasives are used in abrasive blades and for coated abrasive grinding papers ranging from very coarse 60 grit to very fine 1200 (P4000) grit sizes.

Bonded or coated abrasive papers of SiC are designed so that the abrasive will have a large number of cutting points (negative abrasive rank angle). This is achieved by aligning the abrasive particles approximately normal to the backing. Note that coated abrasives are not quite coplanar, thus SiC papers produce the maximum efficiency (cut rate, stock removal and minimal damage) because new abrasive is exposed as the old abrasive breaks down.



SiC Grinding Characteristics:

- Easy to use
- Repeatable
- Relatively lower cost to other options
- Available with and without a pressure sensitive adhesive (PSA) backing

8-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



120 grit 8-inch SiC Paper
with PSA (25/pkg)

Catalog no. **SIC-120P8-25**

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P08C	5 each	65.00
8-inch 60 grit SiC (PSA)-25/pkg	SIC-060P8-25	25/pkg	55.00
8-inch 80 grit SiC (PSA)-25/pkg	SIC-080P8-25	25/pkg	55.00
8-inch 120 grit SiC (PSA)-25/pkg	SIC-120P8-25	25/pkg	45.00
8-inch 180 grit SiC (PSA)-25/pkg	SIC-180P8-25	25/pkg	45.00
8-inch 240 grit SiC (PSA)-25/pkg	SIC-240P8-25	25/pkg	36.00
8-inch 320 grit SiC (PSA)-25/pkg	SIC-320P8-25	25/pkg	36.00
8-inch 360 grit SiC (PSA)-25/pkg	SIC-360P8-25	25/pkg	36.00
8-inch 400 grit SiC (PSA)-25/pkg	SIC-400P8-25	25/pkg	36.00
8-inch 600 grit SiC (PSA)-25/pkg	SIC-600P8-25	25/pkg	36.00
8-inch 800 grit SiC (PSA)-25/pkg	SIC-800P8-25	25/pkg	69.00
8-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P8-25	25/pkg	69.00
8-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P8-25	25/pkg	69.00

SILICON CARBIDE ABRASIVE PAPER

8-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



1200 grit 8-inch SiC Paper with PSA (50/pkg)

Catalog no. SIC-1200P8-50

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 60 grit Premium (PSA)-50/pkg	SIC-060P8-50	50/pkg	120.00
8-inch 80 grit Premium (PSA)-50/pkg	SIC-080P8-50	50/pkg	120.00
8-inch 120 grit Premium (PSA)-50/pkg	SIC-120P8-50	50/pkg	110.00
8-inch 180 grit Premium (PSA)-50/pkg	SIC-180P8-50	50/pkg	110.00
8-inch 240 / P220 grit Premium (PSA)-50/pkg	SIC-240P8-50	50/pkg	105.00
8-inch 320 / P400 grit Premium (PSA)-50/pkg	SIC-320P8-50	50/pkg	105.00
8-inch 360 / P500 grit Premium (PSA)-50/pkg	SIC-360P8-50	50/pkg	105.00
8-inch 400 / P800 grit Premium (PSA)-50/pkg	SIC-400P8-50	50/pkg	105.00
8-inch 600 / P1200 grit Premium (PSA)-50/pkg	SIC-600P8-50	50/pkg	105.00
8-inch 800 / P2400 grit Premium (PSA)-50/pkg	SIC-800P8-50	50/pkg	165.00
8-inch 1000 / P3000 grit Premium (PSA)-50/pkg	SIC-1000P8-50	50/pkg	165.00
8-inch 1200 / P4000 grit Premium (PSA)-50/pkg	SIC-1200P8-50	50/pkg	165.00

8-inch SiC Papers with Adhesive Backing, PSA (100/pkg)

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 60 grit SIC (PSA)-100/pkg	SIC-060P8-100	100/pkg	150.00
8-inch 80 grit SIC (PSA)-100/pkg	SIC-080P8-100	100/pkg	145.00
8-inch 120 grit SIC (PSA)-100/pkg	SIC-120P8-100	100/pkg	122.00
8-inch 180 grit SIC (PSA)-100/pkg	SIC-180P8-100	100/pkg	122.00
8-inch 240 grit SIC (PSA)-100/pkg	SIC-240P8-100	100/pkg	122.00
8-inch 320 grit SIC (PSA)-100/pkg	SIC-320P8-100	100/pkg	122.00
8-inch 360 grit SIC (PSA)-100/pkg	SIC-360P8-100	100/pkg	122.00
8-inch 400 grit SIC (PSA)-100/pkg	SIC-400P8-100	100/pkg	122.00
8-inch 600 grit SIC (PSA)-100/pkg	SIC-600P8-100	100/pkg	122.00
8-inch 800 grit SIC (PSA)-100/pkg	SIC-800P8-100	100/pkg	215.00
8-inch 1000 grit SIC (PSA)-100/pkg	SIC-1000P8-100	100/pkg	215.00
8-inch 1200 grit SIC (PSA)-100/pkg	SIC-1200P8-100	100/pkg	215.00



1200 grit 8-inch SiC Paper with PSA (100/pkg)

Catalog no. SIC-1200P8-100

8-inch SILICON CARBIDE ABRASIVE PAPER

8-inch Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)



360 grit 8-inch SiC Plain-backed Paper (50/pkg)

Catalog no. **SIC-2208-360**

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 60 grit Premium (Plain)-50/pkg	SIC-2208-060	50/pkg	62.00
8-inch 80 grit Premium (Plain)-50/pkg	SIC-2208-080	50/pkg	62.00
8-inch 120 grit Premium (Plain)-50/pkg	SIC-2208-120	50/pkg	55.00
8-inch 180 grit Premium (Plain)-50/pkg	SIC-2208-180	50/pkg	55.00
8-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2208-240	50/pkg	55.00
8-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2208-320	50/pkg	55.00
8-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2208-360	50/pkg	55.00
8-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2208-400	50/pkg	55.00
8-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2208-600	50/pkg	55.00
8-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2208-800	50/pkg	110.00
8-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2208-1000	50/pkg	110.00
8-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2208-1200	50/pkg	110.00
8-inch Double-sided adhesive -10/pkg	DSA-08	10/pkg	35.00

8-inch SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 60 grit SIC (Plain)-100/pkg	SIC-2108-060	100/pkg	122.00
8-inch 80 grit SIC (Plain)-100/pkg	SIC-2108-080	100/pkg	122.00
8-inch 120 grit SIC (Plain)-100/pkg	SIC-2108-120	100/pkg	78.00
8-inch 180 grit SIC (Plain)-100/pkg	SIC-2108-180	100/pkg	78.00
8-inch 240 grit SIC (Plain)-100/pkg	SIC-2108-240	100/pkg	72.00
8-inch 320 grit SIC (Plain)-100/pkg	SIC-2108-320	100/pkg	72.00
8-inch 360 grit SIC (Plain)-100/pkg	SIC-2108-360	100/pkg	72.00
8-inch 400 grit SIC (Plain)-100/pkg	SIC-2108-400	100/pkg	72.00
8-inch 600 grit SIC (Plain)-100/pkg	SIC-2108-600	100/pkg	72.00
8-inch 800 grit SIC (Plain)-100/pkg	SIC-2108-800	100/pkg	155.00
8-inch 1000 grit SIC (Plain)-100/pkg	SIC-2108-1000	100/pkg	155.00
8-inch 1200 grit SIC (Plain)-100/pkg	SIC-2108-1200	100/pkg	155.00
8-inch Double-sided adhesive -10/pkg	DSA-08	10/pkg	35.00



360 grit 8-inch SiC Plain-backed Paper (100/pkg)

Catalog no. **SIC-2108-360**

Abrasive Grinding

Process Description

The machining parameters which affect the preparation of metallographic specimens include: grinding/polishing pressure, relative velocity distribution and the direction of grinding/polishing.

Preston's Equation has been used to describe the mechanical contributions of pressure and velocity to removal rates. Preston's Equation states that the removal rate is proportional to the velocity times the pressure.

$$\text{Preston's Equation} \quad R = kPV$$

R= material removal rate

k= Preston coefficient

P= normal lapping force

V= relative tangential velocity between the lapping plate and work piece

Grinding Pressure

Grinding and polishing pressure is dependent upon the applied force (pounds or Newtons) and the area of the specimen and mounting material. Pressure is defined as the Force/Area (psi, N/m² or Pa). For specimens significantly harder than the mounting compound, pressure is better defined as the force divided by the specimen surface area. Thus, for larger hard specimens higher grinding/polishing pressures increase stock removal rates, however higher pressure also increases the amount of surface and subsurface damage. Note for SiC grinding papers, as the abrasive grains dull and cut rates decrease, increasing grinding pressures can extend the life of the SiC paper.

Higher grinding and polishing pressures can also generate additional frictional heat which may actually be beneficial for the chemical mechanical polishing (CMP) of ceramics, minerals and composites. Likewise for extremely friable specimens such as nodular cast iron, higher pressures and lower relative velocity distributions can aid in retaining inclusions and secondary phases.

Grinding Direction

The orientation of the specimen can have a significant impact on the preparation results, especially for specimens with coatings. In general, when grinding and polishing materials with coatings the brittle component should be kept in compression. In other words, for brittle coatings the direction of the abrasive should be through the coating and into the substrate. Conversely, for brittle substrates with ductile coatings, the direction of the abrasive should be through the brittle substrate into the ductile coating.



Material Removal Differential (MRD)

The term MRD (material removal differential) has been used to describe the negative affect that occurs when the sample does not grind equally across the entire surface of the sample and to some extent the entire surface of the sample mount (see example).

A number of factors contribute the MRD, these include:

- Uneven wear on the abrasive paper, film or foil
- Mount does not track over the edge and/or center of the grinding paper
- Wide range in velocity distributions (contra direction)
- Large differences in hardness between the mount and the sample

MRD is typically more pronounced for SiC papers as the SiC abrasive is very hard and brittle and breaks down relatively fast.

To eliminate MRD:

- Align the sample holder on the FEMTO polishing head so that the sample tracks across the entire radius of the grinding paper.
- Rotate the FEMTO and NANO head at the same velocity and in the same direction.

10-inch SILICON CARBIDE ABRASIVE PAPERS

Silicon Carbide Converter:

PACE Technologies is an actual metallographic supplier that converts its own SiC papers, which provides better quality control, distribution and flexibility for supplying metallographic silicon carbide papers.

SiC Conversion Characteristics:

- ◆ PSA laminating
- ◆ Die cutting
- ◆ Relatively lower cost to produce
- ◆ Focus on metallographic vs. industrial graded products



10-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



60 grit 10-inch SiC Paper
with PSA (25/pkg)
Catalog no. SIC-060P10-25

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P10C	5 each	88.00
10-inch 60 grit SiC (PSA)-25/pkg	SIC-060P10-25	25/pkg	72.00
10-inch 80 grit SiC (PSA)-25/pkg	SIC-080P10-25	25/pkg	72.00
10-inch 120 grit SiC (PSA)-25/pkg	SIC-120P10-25	25/pkg	59.00
10-inch 180 grit SiC (PSA)-25/pkg	SIC-180P10-25	25/pkg	59.00
10-inch 240 grit SiC (PSA)-25/pkg	SIC-240P10-25	25/pkg	55.00
10-inch 320 grit SiC (PSA)-25/pkg	SIC-320P10-25	25/pkg	55.00
10-inch 360 grit SiC (PSA)-25/pkg	SIC-360P10-25	25/pkg	55.00
10-inch 400 grit SiC (PSA)-25/pkg	SIC-400P10-25	25/pkg	55.00
10-inch 600 grit SiC (PSA)-25/pkg	SIC-600P10-25	25/pkg	55.00
10-inch 800 grit SiC (PSA)-25/pkg	SIC-800P10-25	25/pkg	79.00
10-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P10-25	25/pkg	79.00
10-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P10-25	25/pkg	79.00

10-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



240 grit 10-inch SiC Paper with PSA (50/pkg)

Catalog no. SIC-240P10-50

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 60 grit Premium (PSA)-50/pkg	SIC-060P10-50	50/pkg	175.00
10-inch 80 grit Premium (PSA)-50/pkg	SIC-080P10-50	50/pkg	175.00
10-inch 120 grit Premium (PSA)-50/pkg	SIC-120P10-50	50/pkg	155.00
10-inch 180 grit Premium (PSA)-50/pkg	SIC-180P10-50	50/pkg	155.00
10-inch 240 / P220 grit Premium (PSA)-50/pkg	SIC-240P10-50	50/pkg	130.00
10-inch 320 / P400 grit Premium (PSA)-50/pkg	SIC-320P10-50	50/pkg	130.00
10-inch 360 / P400 grit Premium (PSA)-50/pkg	SIC-360P10-50	50/pkg	130.00
10-inch 400 / P800 grit Premium (PSA)-50/pkg	SIC-400P10-50	50/pkg	130.00
10-inch 600 / P1200 grit Premium (PSA)-50/pkg	SIC-600P10-50	50/pkg	130.00
10-inch 800 / P2400 grit Premium (PSA)-50/pkg	SIC-800P10-50	50/pkg	190.00
10-inch 1000 / P3000 grit Premium (PSA)-50/pkg	SIC-1000P10-50	50/pkg	190.00
10-inch 1200 / P4000 grit Premium (PSA)-50/pkg	SIC-1200P10-50	50/pkg	190.00

10-inch SiC Papers with Adhesive Backing, PSA (100/pkg)



240 grit 10-inch SiC Paper with PSA (100/pkg)

Catalog no. SIC-240P10-100

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 60 grit SIC (PSA)-100/pkg	SIC-060P10-100	100/pkg	205.00
10-inch 80 grit SIC (PSA)-100/pkg	SIC-080P10-100	100/pkg	205.00
10-inch 120 grit SIC (PSA)-100/pkg	SIC-120P10-100	100/pkg	162.00
10-inch 180 grit SIC (PSA)-100/pkg	SIC-180P10-100	100/pkg	162.00
10-inch 240 grit SIC (PSA)-100/pkg	SIC-240P10-100	100/pkg	155.00
10-inch 320 grit SIC (PSA)-100/pkg	SIC-320P10-100	100/pkg	155.00
10-inch 360 grit SIC (PSA)-100/pkg	SIC-360P10-100	100/pkg	155.00
10-inch 400 grit SIC (PSA)-100/pkg	SIC-400P10-100	100/pkg	155.00
10-inch 600 grit SIC (PSA)-100/pkg	SIC-600P10-100	100/pkg	155.00
10-inch 800 grit SIC (PSA)-100/pkg	SIC-800P10-100	100/pkg	242.00
10-inch 1000 grit SIC (PSA)-100/pkg	SIC-1000P10-100	100/pkg	242.00
10-inch 1200 grit SIC (PSA)-100/pkg	SIC-1200P10-100	100/pkg	242.00

10-inch SILICON CARBIDE ABRASIVE PAPERS

Grinding Relative Velocity

Current autopolishing grinding and polishing machines are designed with the specimens mounted in a disk holder and machined on a disk platen surface. This disk on disk rotation allows for a variable velocity distribution depending upon the head speed relative to the base speed.

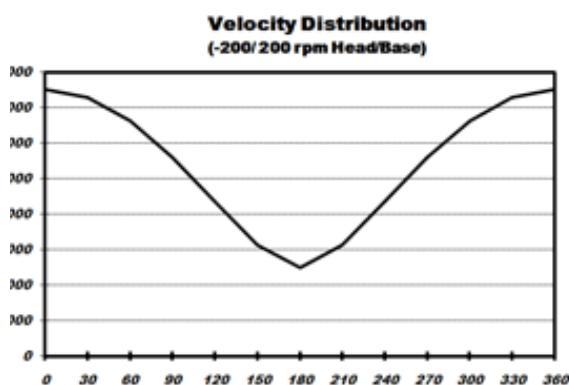
NOTE: Matching the head and base speed, while running in the same direction produces better flatness and lower surface damage because this minimizes the velocity distribution across the sample as it rotates.

For high stock removal, a slower head speed relative to a higher base speed produces the most aggressive grinding and polishing operation. The drawback to high velocity distributions is that the abrasive (especially SiC papers) may not breakdown uniformly, this can result in non-uniform removal across the specimen surface. Another disadvantage is that the high velocity

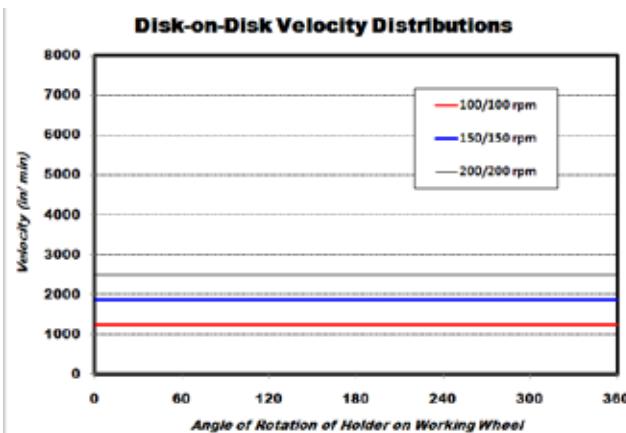
distributions can create substantially more specimen damage, especially in brittle phases. In all cases, it is not recommended to have the head rotating contra direction to the base because of the non-uniform removal and abrasive break-down which occurs.

Minimal relative velocity distributions can be obtained by rotating the head specimen disk at the same rpm and same direction as the base platen. This condition is best for retaining inclusions and brittle phases as well as for obtaining a uniform finish across the entire specimen. The disadvantage to low relative velocity distributions is that stock removal rates can be quite low.

In practice, the best condition to run the polishing machine is by matching the head and base speeds at 200-300 rpm and in the same direction. For polishing it is recommended that the speed be reduced to 100/100 rpm base/head speed. For final polishing under chemical mechanical polishing (CMP) conditions where frictional heat can enhance the chemical process, high speeds and high relative velocity distributions can be useful as long as brittle phases are not present (e.g. monolithic ceramics such as silicon nitride and alumina).



High relative velocity distribution for non-matching head and base speeds.



Constant relative velocity distribution for matching head and base speeds

Head Speed (rpm)	Base Speed (rpm)	Relative Velocity Distribution	Characteristic	Application
100-150	300-600	High	-Aggressive stock removal -Differential grinding across the specimen surface	Useful for gross removal on hard specimens
200-300	200-300	Low	-Matching head and base speed in the same direction eliminates relative velocity distributions -Uniform stock removal -Low stock removal -Produces minimal damage	-Provides superior flatness over the specimen -Useful for retaining inclusions and brittle phases

250 mm (~10-inch) Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)



800 grit 10-inch SiC Plain-backed Paper (50/pkg)

Catalog no. SIC-2210-800

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 60 grit Premium (Plain)-50/pkg	SIC-2210-060	50/pkg	120.00
10-inch 80 grit Premium (Plain)-50/pkg	SIC-2210-080	50/pkg	120.00
10-inch 120 grit Premium (Plain)-50/pkg	SIC-2210-120	50/pkg	120.00
10-inch 180 grit Premium (Plain)-50/pkg	SIC-2210-180	50/pkg	120.00
10-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2210-240	50/pkg	105.00
10-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2210-320	50/pkg	105.00
10-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2210-360	50/pkg	105.00
10-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2210-400	50/pkg	105.00
10-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2210-600	50/pkg	105.00
10-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2210-800	50/pkg	155.00
10-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2210-1000	50/pkg	155.00
10-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2210-1200	50/pkg	155.00
10-inch Double-sided adhesive -10/pkg	DSA-10	10/pkg	55.00

250 mm (~10-inch) SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)



800 grit 10-inch SiC Plain-backed Paper (100/pkg)

Catalog no. SIC-2110-800

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 60 grit SiC (Plain)-100/pkg	SIC-2110-060	100/pkg	170.00
10-inch 80 grit SiC (Plain)-100/pkg	SIC-2110-080	100/pkg	170.00
10-inch 120 grit SiC (Plain)-100/pkg	SIC-2110-120	100/pkg	145.00
10-inch 180 grit SiC (Plain)-100/pkg	SIC-2110-180	100/pkg	145.00
10-inch 240 grit SiC (Plain)-100/pkg	SIC-2110-240	100/pkg	138.00
10-inch 320 grit SiC (Plain)-100/pkg	SIC-2110-320	100/pkg	138.00
10-inch 360 grit SiC (Plain)-100/pkg	SIC-2110-360	100/pkg	138.00
10-inch 400 grit SiC (Plain)-100/pkg	SIC-2110-400	100/pkg	138.00
10-inch 600 grit SiC (Plain)-100/pkg	SIC-2110-600	100/pkg	138.00
10-inch 800 grit SiC (Plain)-100/pkg	SIC-2110-800	100/pkg	192.00
10-inch 1000 grit SiC (Plain)-100/pkg	SIC-2110-1000	100/pkg	192.00
10-inch 1200 grit SiC (Plain)-100/pkg	SIC-2110-1200	100/pkg	192.00
10-inch Double-sided adhesive -10/pkg	DSA-10	10/pkg	55.00

12-inch SILICON CARBIDE ABRASIVE PAPERS

12-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



240 grit 12-inch SiC Paper with PSA (25/pkg)

Catalog no. **SIC-240P12-25**

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P12C	5 each	125.00
12-inch 60 grit SiC (PSA)-25/pkg	SIC-060P12-25	25/pkg	108.00
12-inch 80 grit SiC (PSA)-25/pkg	SIC-080P12-25	25/pkg	108.00
12-inch 120 grit SiC (PSA)-25/pkg	SIC-120P12-25	25/pkg	90.00
12-inch 180 grit SiC (PSA)-25/pkg	SIC-180P12-25	25/pkg	90.00
12-inch 240 grit SiC (PSA)-25/pkg	SIC-240P12-25	25/pkg	84.00
12-inch 320 grit SiC (PSA)-25/pkg	SIC-320P12-25	25/pkg	84.00
12-inch 360 grit SiC (PSA)-25/pkg	SIC-360P12-25	25/pkg	84.00
12-inch 400 grit SiC (PSA)-25/pkg	SIC-400P12-25	25/pkg	84.00
12-inch 600 grit SiC (PSA)-25/pkg	SIC-600P12-25	25/pkg	84.00
12-inch 800 grit SiC (PSA)-25/pkg	SIC-800P12-25	25/pkg	130.00
12-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P12-25	25/pkg	130.00
12-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P12-25	25/pkg	130.00

12-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



600 grit 12-inch SiC Paper with PSA (50/pkg)

Catalog no. **SIC-600P12-50**

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 60 grit Premium (PSA)-50/pkg	SIC-060P12-50	50/pkg	245.00
12-inch 80 grit Premium (PSA)-50/pkg	SIC-080P12-50	50/pkg	245.00
12-inch 120 grit Premium (PSA)-50/pkg	SIC-120P12-50	50/pkg	210.00
12-inch 180 grit Premium (PSA)-50/pkg	SIC-180P12-50	50/pkg	210.00
12-inch 240 grit Premium (PSA)-50/pkg	SIC-240P12-50	50/pkg	195.00
12-inch 320 grit Premium (PSA)-50/pkg	SIC-320P12-50	50/pkg	195.00
12-inch 360 grit Premium (PSA)-50/pkg	SIC-360P12-50	50/pkg	195.00
12-inch 400 grit Premium (PSA)-50/pkg	SIC-400P12-50	50/pkg	195.00
12-inch 600 grit Premium (PSA)-50/pkg	SIC-600P12-50	50/pkg	195.00
12-inch 800 grit Premium (PSA)-50/pkg	SIC-800P12-50	50/pkg	285.00
12-inch 1000 grit Premium (PSA)-50/pkg	SIC-1000P12-50	50/pkg	285.00
12-inch 1200 grit Premium (PSA)-50/pkg	SIC-1200P12-50	50/pkg	285.00

12-inch SiC Papers with Adhesive Backing, PSA (100/pkg)



600 grit 12-inch SiC Paper
with PSA (100/pkg)

Catalog no. SIC-600P12-100

Abrasives Grinding Recommend Procedures Application (Fixed-abrasive Grinding)

- Start with the finest abrasive possible (typically 240 or 320 grit abrasive paper) Note: Only use coarser grit for very heavy stock removal
- Apply lubricant to abrasive surface
- Most commonly water
- Water soluble oils for water sensitive specimens
- Rinse specimens thoroughly before proceeding to the next finer abrasive

Grinding Surface Backing

Grinding papers come with different types of backing

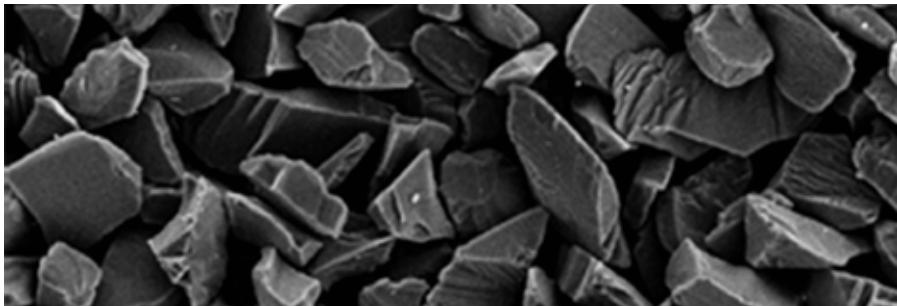
- Plain-backed or non-adhesive backing
- PSA or pressure sensitive backing
- Foil or polyester plastic backing

Plain-backed papers are the least expensive, however, they require either a double sided adhesive or a paper holding ring. The disadvantage to using a paper holding ring is that the mounted specimen cannot track over the edge of the grinding paper. Thus the paper does not break down uniformly and thus can produce over grinding of the mount away from the sample. This artifact results in the polished mount exhibiting a crescent moon which can affect the edge of the specimen. This artifact has also been known as "mooning" or MRD (material removal differential).

PSA-backed or adhesive backed papers are removable grinding papers. They are more expensive than the plain-backed papers and the foil papers. They are very easy to use and avoid the problems with "mooning" and MRD if the sample tracks over both the center and edge of the grinding papers.

Foil-backed or polyester backed grinding papers are easy to use and are more economical than adhesive backed papers. The system uses a receiver adhesive disk that can be washed in order to extend its life.

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 60 grit SiC (PSA)-100/pkg	SIC-060P12-100	100/pkg	275.00
12-inch 80 grit SiC (PSA)-100/pkg	SIC-080P12-100	100/pkg	275.00
12-inch 120 grit SiC (PSA)-100/pkg	SIC-120P12-100	100/pkg	240.00
12-inch 180 grit SiC (PSA)-100/pkg	SIC-180P12-100	100/pkg	240.00
12-inch 240 grit SiC (PSA)-100/pkg	SIC-240P12-100	100/pkg	230.00
12-inch 320 grit SiC (PSA)-100/pkg	SIC-320P12-100	100/pkg	230.00
12-inch 360 grit SiC (PSA)-100/pkg	SIC-360P12-100	100/pkg	230.00
12-inch 400 grit SiC (PSA)-100/pkg	SIC-400P12-100	100/pkg	230.00
12-inch 600 grit SiC (PSA)-100/pkg	SIC-600P12-100	100/pkg	230.00
12-inch 800 grit SiC (PSA)-100/pkg	SIC-800P12-100	100/pkg	360.00
12-inch 1000 grit SiC (PSA)-100/pkg	SIC-1000P12-100	100/pkg	360.00
12-inch 1200 grit SiC (PSA)-100/pkg	SIC-1200P12-100	100/pkg	360.00



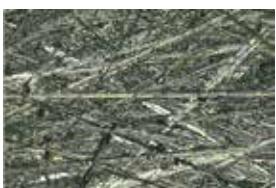
Silicon Carbide Powder with Sharp Friable Edges

Standard grit	Median Diameter (microns)	Surface Roughness on Steel, Rc 30 (Ra -nm)
60	250	-
80	180	1140
120	106	1050
180	75	880
220	63	300
320	40.5	230
400	25.8	120
600	15.3	110
800	6.5	25
1200	2.5	20

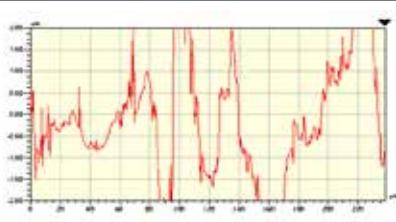
12-inch SILICON CARBIDE ABRASIVE PAPERS

Abrasive / Surface

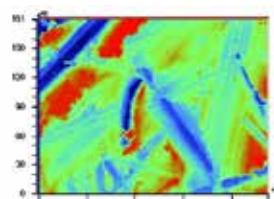
60-grit SiC



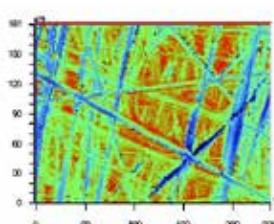
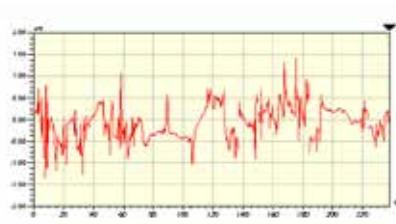
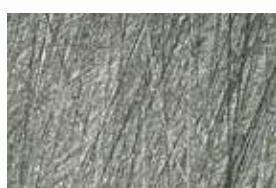
2-Line Profile



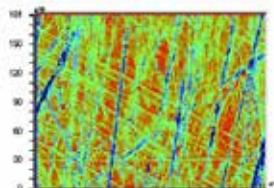
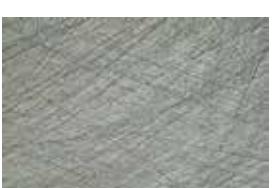
3-D Optical Contour Mapping



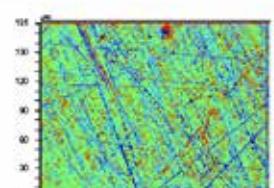
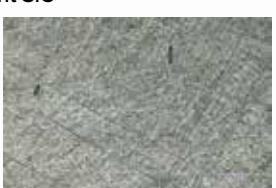
240-grit SiC



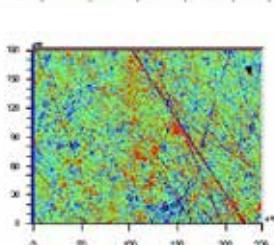
400-grit SiC



600-grit SiC



1200-grit SiC



12-inch Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)



1000 grit 12-inch SiC Plain-backed Paper (50/pkg)
Catalog no. SIC-2212-1000

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 60 grit Premium (Plain)-50/pkg	SIC-2212-060	50/pkg	145.00
12-inch 80 grit Premium (Plain)-50/pkg	SIC-2212-080	50/pkg	145.00
12-inch 120 grit Premium (Plain)-50/pkg	SIC-2212-120	50/pkg	120.00
12-inch 180 grit Premium (Plain)-50/pkg	SIC-2212-180	50/pkg	120.00
12-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2212-240	50/pkg	120.00
12-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2212-320	50/pkg	120.00
12-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2212-360	50/pkg	120.00
12-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2212-400	50/pkg	120.00
12-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2212-600	50/pkg	120.00
12-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2212-800	50/pkg	225.00
12-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2212-1000	50/pkg	225.00
12-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2212-1200	50/pkg	225.00
12-inch Double-sided adhesive -10/pkg	DSA-12	10/pkg	67.50

12-inch SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)



1000 grit 12-inch SiC Plain-backed Paper (100/pkg)
Catalog no. SIC-2112-1000

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 60 grit SIC (Plain)-100/pkg	SIC-2112-060	100/pkg	185.00
12-inch 80 grit SIC (Plain)-100/pkg	SIC-2112-080	100/pkg	185.00
12-inch 120 grit SIC (Plain)-100/pkg	SIC-2112-120	100/pkg	170.00
12-inch 180 grit SIC (Plain)-100/pkg	SIC-2112-180	100/pkg	170.00
12-inch 240 grit SIC (Plain)-100/pkg	SIC-2112-240	100/pkg	158.00
12-inch 320 grit SIC (Plain)-100/pkg	SIC-2112-320	100/pkg	158.00
12-inch 360 grit SIC (Plain)-100/pkg	SIC-2112-360	100/pkg	158.00
12-inch 400 grit SIC (Plain)-100/pkg	SIC-2112-400	100/pkg	158.00
12-inch 600 grit SIC (Plain)-100/pkg	SIC-2112-600	100/pkg	158.00
12-inch 800 grit SIC (Plain)-100/pkg	SIC-2112-800	100/pkg	295.00
12-inch 1000 grit SIC (Plain)-100/pkg	SIC-2112-1000	100/pkg	295.00
12-inch 1200 grit SIC (Plain)-100/pkg	SIC-2112-1200	100/pkg	295.00
12-inch Double-sided adhesive -10/pkg	DSA-12	10/pkg	67.50

14-inch SILICON CARBIDE ABRASIVE PAPERS

14-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



120 grit 14-inch
SiC Paper with PSA (25/pkg)
Catalog no. SIC-120P14-25

PACE Product Name	Catalog Number	Qty	Price (\$)
14-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P14C	5 each	170.00
14-inch 60 grit SiC (PSA)-25/pkg	SIC-060P14-25	25/pkg	155.00
14-inch 80 grit SiC (PSA)-25/pkg	SIC-080P14-25	25/pkg	155.00
14-inch 120 grit SiC (PSA)-25/pkg	SIC-120P14-25	25/pkg	130.00
14-inch 180 grit SiC (PSA)-25/pkg	SIC-180P14-25	25/pkg	130.00
14-inch 240 grit SiC (PSA)-25/pkg	SIC-240P14-25	25/pkg	115.00
14-inch 320 grit SiC (PSA)-25/pkg	SIC-320P14-25	25/pkg	115.00
14-inch 360 grit SiC (PSA)-25/pkg	SIC-360P14-25	25/pkg	115.00
14-inch 400 grit SiC (PSA)-25/pkg	SIC-400P14-25	25/pkg	115.00
14-inch 600 grit SiC (PSA)-25/pkg	SIC-600P14-25	25/pkg	115.00
14-inch 800 grit SiC (PSA)-25/pkg	SIC-800P14-25	25/pkg	195.00
14-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P14-25	25/pkg	195.00
14-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P14-25	25/pkg	195.00

14-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



400 grit 14-inch
SiC Paper with PSA (100/pkg)
Catalog no. SIC-400P14-50

PACE Product Name	Catalog Number	Qty	Price (\$)
14-inch 60 grit Premium (PSA)-50/pkg	SIC-060P14-50	50/pkg	285.00
14-inch 80 grit Premium (PSA)-50/pkg	SIC-080P14-50	50/pkg	285.00
14-inch 120 grit Premium (PSA)-50/pkg	SIC-120P14-50	50/pkg	245.00
14-inch 180 grit Premium (PSA)-50/pkg	SIC-180P14-50	50/pkg	245.00
14-inch 240 grit Premium (PSA)-50/pkg	SIC-240P14-50	50/pkg	235.00
14-inch 320 grit Premium (PSA)-50/pkg	SIC-320P14-50	50/pkg	235.00
14-inch 360 grit Premium (PSA)-50/pkg	SIC-360P14-50	50/pkg	235.00
14-inch 400 grit Premium (PSA)-50/pkg	SIC-400P14-50	50/pkg	235.00
14-inch 600 grit Premium (PSA)-50/pkg	SIC-600P14-50	50/pkg	235.00
14-inch 800 grit Premium (PSA)-50/pkg	SIC-800P14-50	50/pkg	540.00
14-inch 1000 grit Premium (PSA)-50/pkg	SIC-1000P14-50	50/pkg	540.00
14-inch 1200 grit Premium (PSA)-50/pkg	SIC-1200P14-50	50/pkg	540.00

14-inch SiC Papers with Adhesive Backing, PSA (100/pkg)



600 grit 14-inch
SiC Paper with PSA (25/pkg)
Catalog no. SIC-600P14-100

PACE Product Name	Catalog Number	Qty	Price (\$)
14-inch 60 grit SiC (PSA)-100/pkg	SIC-060P14-100	100/pkg	350.00
14-inch 80 grit SiC (PSA)-100/pkg	SIC-080P14-100	100/pkg	350.00
14-inch 120 grit SiC (PSA)-100/pkg	SIC-120P14-100	100/pkg	320.00
14-inch 180 grit SiC (PSA)-100/pkg	SIC-180P14-100	100/pkg	320.00
14-inch 240 grit SiC (PSA)-100/pkg	SIC-240P14-100	100/pkg	310.00
14-inch 320 grit SiC (PSA)-100/pkg	SIC-320P14-100	100/pkg	310.00
14-inch 360 grit SiC (PSA)-100/pkg	SIC-360P14-100	100/pkg	310.00
14-inch 400 grit SiC (PSA)-100/pkg	SIC-400P14-100	100/pkg	310.00
14-inch 600 grit SiC (PSA)-100/pkg	SIC-600P14-100	100/pkg	310.00
14-inch 800 grit SiC (PSA)-100/pkg	SIC-800P14-100	100/pkg	720.00
14-inch 1000 grit SiC (PSA)-100/pkg	SIC-1000P14-100	100/pkg	720.00
14-inch 1200 grit SiC (PSA)-100/pkg	SIC-1200P14-100	100/pkg	720.00

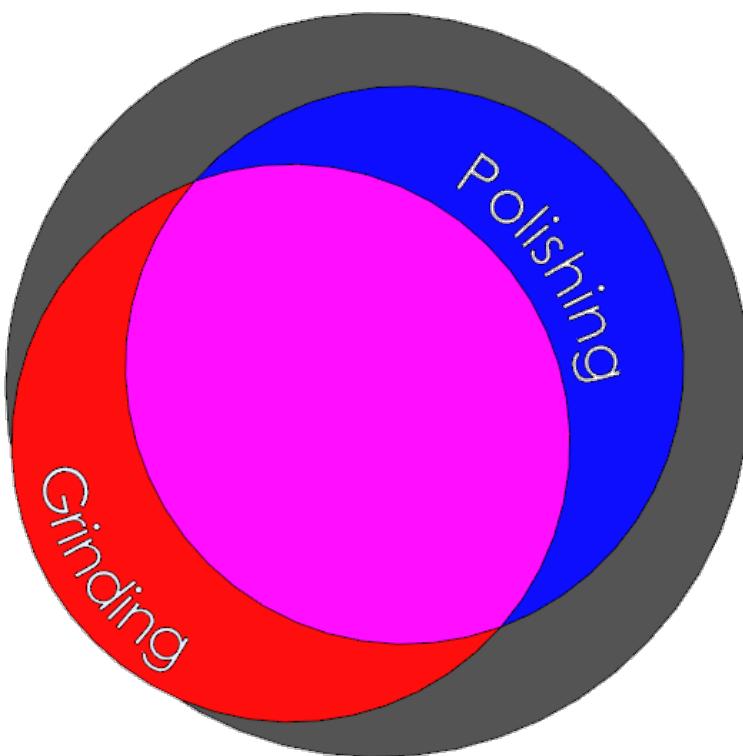


NANO-S / FEMTO-S Auto Polishers

14-inch SILICON CARBIDE ABRASIVE PAPERS

14-inch Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)

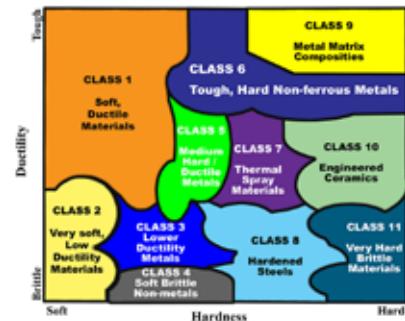
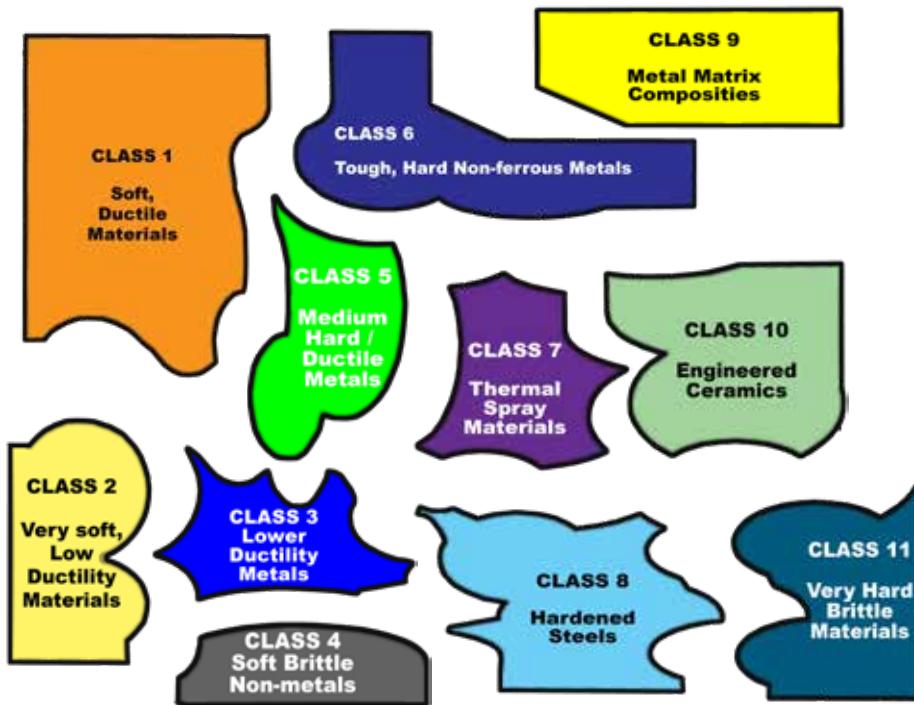
PACE Product Name	Catalog Number	Qty	Price (\$)
14-inch 60 grit Premium (Plain)-50/pkg	SIC-2214-060	50/pkg	175.00
14-inch 80 grit Premium (Plain)-50/pkg	SIC-2214-080	50/pkg	175.00
14-inch 120 grit Premium (Plain)-50/pkg	SIC-2214-120	50/pkg	160.00
14-inch 180 grit Premium (Plain)-50/pkg	SIC-2214-180	50/pkg	160.00
14-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2214-240	50/pkg	160.00
14-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2214-320	50/pkg	160.00
14-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2214-360	50/pkg	160.00
14-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2214-400	50/pkg	160.00
14-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2211-600	50/pkg	160.00
14-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2214-800	50/pkg	365.00
14-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2214-1000	50/pkg	365.00
14-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2214-1200	50/pkg	365.00
14-inch Double-sided adhesive -10/pkg	DSA-14	10/pkg	80.00



Relative Position of the Auto Head to the Polishing Wheel

The FEMTO is equipped with an auto locating positioning feature. This feature ensures proper utilization and breakdown of grinding papers; it also extends the lifetime of polishing cloths. The FEMTO head is swung over the working wheel of the NANO polishing machine. Once dropped, it auto corrects and drops into the selected location. Auto positioning removes the non-repeatability of standard hand positioning of a polishing head.

Metallographic Sample Preparation



Metallographic CLASS Procedures Chart

Metallographic sample preparation can be broken down into specific preparation Classes based on the materials hardness and ductility.

14-inch SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)



1200 grit 14-inch SiC Plain-backed Paper (100/pkg)

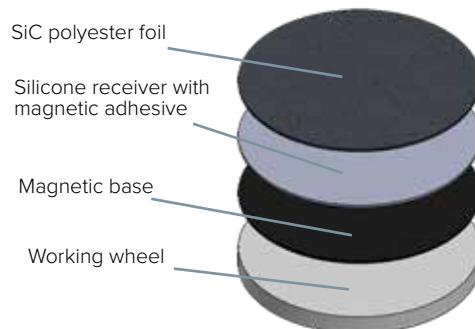
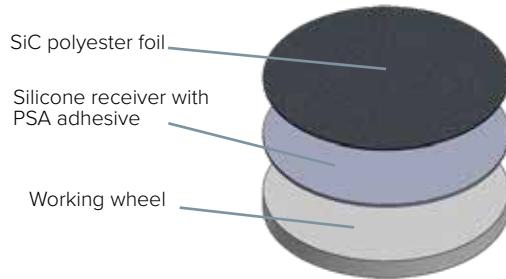
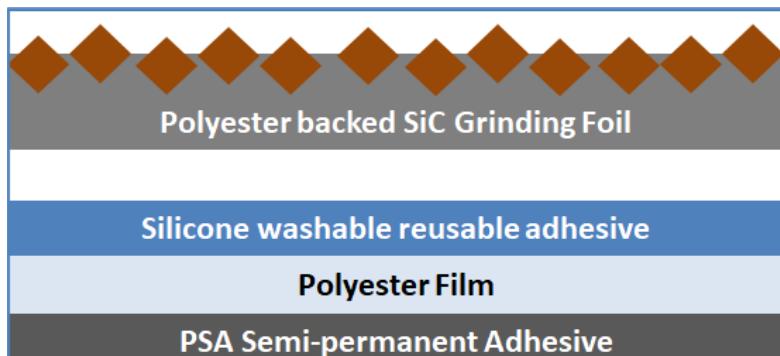
Catalog no. SIC-2114-1200

PACE Product Name	Catalog Number	Qty	Price (\$)
14-inch 60 grit SiC (Plain)-100/pkg	SIC-2114-060	100/pkg	245.00
14-inch 80 grit SiC (Plain)-100/pkg	SIC-2114-080	100/pkg	245.00
14-inch 120 grit SiC (Plain)-100/pkg	SIC-2114-120	100/pkg	225.00
14-inch 180 grit SiC (Plain)-100/pkg	SIC-2114-180	100/pkg	225.00
14-inch 240 grit SiC (Plain)-100/pkg	SIC-2114-240	100/pkg	195.00
14-inch 320 grit SiC (Plain)-100/pkg	SIC-2114-320	100/pkg	195.00
14-inch 360 grit SiC (Plain)-100/pkg	SIC-2114-360	100/pkg	195.00
14-inch 400 grit SiC (Plain)-100/pkg	SIC-2114-400	100/pkg	195.00
14-inch 600 grit SiC (Plain)-100/pkg	SIC-2114-600	100/pkg	195.00
14-inch 800 grit SiC (Plain)-100/pkg	SIC-2114-800	100/pkg	490.00
14-inch 1000 grit SiC (Plain)-100/pkg	SIC-2114-1000	100/pkg	490.00
14-inch 1200 grit SiC (Plain)-100/pkg	SIC-2114-1200	100/pkg	490.00
14-inch Double-sided adhesive -10/pkg	DSA-14	10/pkg	80.00

SILICON CARBIDE FOIL SYSTEM

Grinding Foils (alternative to PSA backed papers):

As an alternative to PSA (pressure sensitive adhesive) backed silicon carbide papers, PACE Technologies offers a non PSA-backed abrasive grinding foil system. Grinding foils utilize a polyester film backing which attaches to a reusable / washable silicone adhesive receiver disk. The grinding foil system offers a lower cost alternative to PSA-backed grinding papers.



120 grit (105 micron) front / back side SiC foil



120 GRIT (105μ)



600 grit (15 micron) front / back side SiC foil



600 GRIT (15μ)



Silicone (adhesive) Receiver Disk with PSA backing



240 grit (63 micron) front / back side SiC foil



240 GRIT (63μ)



800 grit (6 micron) front / back side SiC foil



800 GRIT (6μ)



360 grit (30 micron) front / back side SiC foil



360 GRIT (30μ)



1200 grit (2 micron) front / back side SiC foil



1200 GRIT (2μ)

SiC Foil Characteristics:

- ◆ Lower cost compared to PSA backed papers
- ◆ Reusable / Washable Silicone backing material
- ◆ Easy to use
- ◆ Compatible with competitors products

Receiver Disks for SiC Foils (2/pkg)



PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch Receivers for SiC Foils (PSA-backed)	REC-5008	2/pkg	105.00
10-inch Receivers for SiC Foils (PSA-backed)	REC-5010	2/pkg	135.00
12-inch Receivers for SiC Foils (PSA-backed)	REC-5012	2/pkg	165.00
8-inch Receivers for SiC Foils (magnetic-backed)	MREC-5008	2/pkg	125.00
10-inch Receivers for SiC Foils (magnetic-backed)	MREC-5010	2/pkg	160.00
12-inch Receivers for SiC Foils (magnetic-backed)	MREC-5012	2/pkg	185.00

8-inch SiC Foils with Polyester Film Backing (50/pkg)

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 120 grit (105 micron) - SiC Foils (50/pkg)	SIC-5108-120	50/pkg	62.00
8-inch 240 grit (63 micron) - SiC Foils (50/pkg)	SIC-5108-240	50/pkg	57.50
8-inch 360 grit (30 micron) - SiC Foils (50/pkg)	SIC-5108-360	50/pkg	57.50
8-inch 600 grit (15 micron) - SiC Foils (50/pkg)	SIC-5108-600	50/pkg	57.50
8-inch 800 grit (6.5 micron) - SiC Foils (50/pkg)	SIC-5108-800	50/pkg	72.50
8-inch 1200 grit (2.5 micron) - SiC Foils (50/pkg)	SIC-5108-1200	50/pkg	72.50



10-inch SiC Foils with Polyester Film Backing (50/pkg)



PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 120 grit (105 micron) - SiC Foils (50/pkg)	SIC-5110-120	50/pkg	92.50
10-inch 240 grit (63 micron) - SiC Foils (50/pkg)	SIC-5110-240	50/pkg	88.50
10-inch 360 grit (30 micron) - SiC Foils (50/pkg)	SIC-5110-360	50/pkg	88.50
10-inch 600 grit (15 micron) - SiC Foils (50/pkg)	SIC-5110-600	50/pkg	88.50
10-inch 800 grit (6.5 micron) - SiC Foils (50/pkg)	SIC-5110-800	50/pkg	110.00
10-inch 1200 grit (2.5 micron) - SiC Foils (50/pkg)	SIC-5110-1200	50/pkg	110.00

12-inch SiC Foils with Polyester Film Backing (50/pkg)

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 120 grit (105 micron) - SiC Foils (50/pkg)	SIC-5112-120	50/pkg	112.00
12-inch 240 grit (63 micron) - SiC Foils (50/pkg)	SIC-5112-240	50/pkg	112.00
12-inch 360 grit (30 micron) - SiC Foils (50/pkg)	SIC-5112-360	50/pkg	112.00
12-inch 600 grit (15 micron) - SiC Foils (50/pkg)	SIC-5112-600	50/pkg	112.00
12-inch 800 grit (6.5 micron) - SiC Foils (50/pkg)	SIC-5112-800	50/pkg	140.00
12-inch 1200 grit (2.5 micron) - SiC Foils (50/pkg)	SIC-5112-1200	50/pkg	140.00



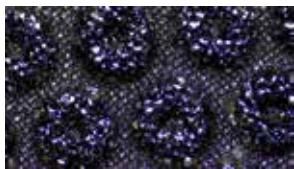
DIAMOND GRINDING

Diamond Grinding Disks:

Diamond grinding is most commonly used for grinding very hard brittle materials such as engineered ceramics. In practice, diamond grinding disks are also used to planar grind a wide range of other metals and minerals.



250 micron Metal Bonded Diamond Disk (20X close-up on left)



125 micron Metal Bonded Diamond Disk (20X close-up on left)



75 micron Metal Bonded Diamond Disk (20X close-up on left)



40 micron Metal Bonded Diamond Disk (20X close-up on left)



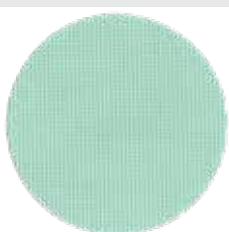
30 micron Metal Bonded Diamond Disk (20X close-up on left)



15 micron Metal Bonded Diamond Disk (20X close-up on left)

Diamond Bonding:

There are two types of bonding for diamond grinding disks: metal and resin. Metal bonded diamond grinding disks are more aggressive and can produce more damage. Resin bonded disks will break down easier to produce a better surface finish, however, they typically have lower life.



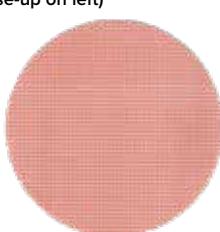
125 micron Resin Bonded Diamond Disk (10X close-up on left)



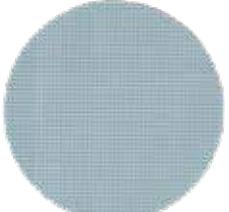
70 micron Resin Bonded Diamond Disk (10X close-up on left)



35 micron Resin Bonded Diamond Disk (10X close-up on left)



25 micron Resin Bonded Diamond Disk (10X close-up on left)



15 micron Resin Bonded Diamond Disk (10X close-up on left)

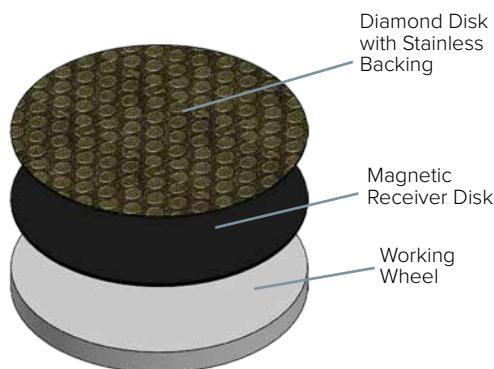


9 micron Resin Bonded Diamond Disk (10X close-up on left)

MAGNETIC BACKED DISKS

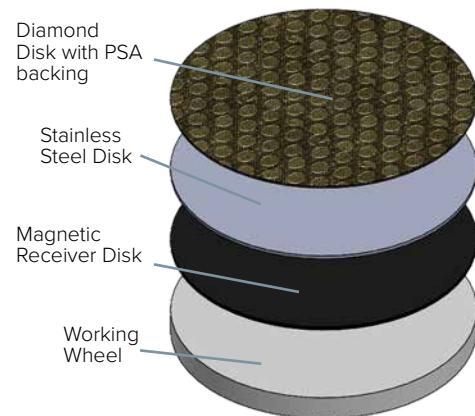
Diamond MD Grinding Disks:

As an alternative to PSA (pressure sensitive adhesives) diamond grinding disks, PACE Technologies offers magnetic backed (MD) abrasive diamond grinding disks. The magnetic diamond disks can be purchased pre-assembled on a magnetic stainless steel plate or the stainless steel plate can be purchased separately and the user can assemble the adhesive backed diamond grinding disks onto a magnetic stainless steel plate.



MD Grinding Disks:

- ◆ Easy to change disks
- ◆ More convenient for storage
- ◆ Do not need to dedicate a working wheel for each abrasive size



Magnetic Base Disks and Plates

PACE Product Name	Catalog No. (in)	Catalog No. (mm)	Qty	Price (\$)
8-in / 200 mm MAGNETON Base Disk (PSA)	MAG-B08	MAG-B200	each	52.00
10-in / 250 mm MAGNETON Base Disk (PSA)	MAG-B10	MAG-B250	each	58.00
12-inch / 300 mm MAGNETON Base Disk (PSA)	MAG-B12	MAG-B300	each	65.00
14-inch MAGNETON Base Disk (PSA)	MAG-B14	n.a.	each	85.00



MAGNETON Base Disk



MAGNEPAD Stainless Steel Magnetic Plate

PACE Product Name	Catalog No. (inch)	Catalog No. (mm)	Qty	Price (\$)
8-in / 200 mm MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	SSMAG-P200	each	58.00
10-in / 250 mm MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	SSMAG-P250	each	62.00
12-inch / 300 mm MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	SSMAG-P300	each	68.00
14-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P14	n.a.	each	95.00

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each	60.00
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each	65.00
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each	80.00
14-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P14	each	120.00



MAGNEPAD Teflon Coated Magnetic Plate

DIAMOND GRINDING ABRASIVES (8-inch)

8-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M250-08-PSA	each	215.00
8-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M125-08-PSA	each	215.00
8-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M075-08-PSA	each	199.50
8-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M040-08-PSA	each	199.50
8-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M030-08-PSA	each	199.50
8-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M015-08-PSA	each	199.50

8-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R125-08-PSA	each	135.00
8-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R070-08-PSA	each	135.00
8-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R035-08-PSA	each	135.00
8-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R025-08-PSA	each	135.00
8-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R015-08-PSA	each	135.00
8-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R009-08-PSA	each	135.00

8-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD08	each	150.00
8-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD08	each	150.00



8-inch ORION
Composite Disk

8-inch Magnetic Plates

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch MAGNETON Base Disk (PSA)	MAG-B08	each	52.00
8-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	each	58.00
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each	60.00



8-inch MAGNEPAD
Teflon Base Plate

8-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing



PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with Magnetic backing	DIA-M250-08-MAG	each	225.00
8-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M125-08-MAG	each	225.00
8-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M075-08-MAG	each	199.50
8-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing (each)	DIA-M040-08-MAG	each	199.50
8-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M030-08-MAG	each	199.50
8-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M015-08-MAG	each	199.50

8-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing



PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R125-08-MAG	each	155.00
8-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R070-08-MAG	each	155.00
8-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R035-08-MAG	each	155.00
8-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R025-08-MAG	each	155.00
8-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R015-08-MAG	each	155.00
8-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R009-08-MAG	each	155.00



Nitrided Steel with White Layer, Mag. 200X

DIAMOND GRINDING ABRASIVES (10-inch)

10-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M250-10-PSA	each	335.00
10-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M125-10-PSA	each	335.00
10-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M075-10-PSA	each	270.00
10-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M040-10-PSA	each	270.00
10-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M030-10-PSA	each	270.00
10-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M015-10-PSA	each	270.00

10-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R125-10-PSA	each	178.00
10-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R070-10-PSA	each	178.00
10-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R035-10-PSA	each	178.00
10-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R025-10-PSA	each	178.00
10-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R015-10-PSA	each	178.00
10-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R009-10-PSA	each	178.00

10-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD10	each	175.00
10-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD10	each	175.00



10-inch SIRIUS Composite Disk

10-inch Magnetic Plates

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch MAGNETON Base Disk (PSA)	MAG-B10	each	58.00
10-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	each	62.00
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each	65.00



10-inch MAGNEPAD Stainless Steel Base Plate

10-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing



PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M250-10-MAG	each	375.00
10-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M125-10-MAG	each	375.00
10-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M075-10-MAG	each	290.00
10-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M040-10-MAG	each	290.00
10-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M030-10-MAG	each	290.00
10-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M015-10-MAG	each	290.00

10-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing



PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R125-10-MAG	each	199.50
10-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R070-10-MAG	each	199.50
10-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R035-10-MAG	each	199.50
10-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R025-10-MAG	each	199.50
10-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R015-10-MAG	each	199.50
10-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R009-10-MAG	each	199.50



DIAMOND GRINDING ABRASIVES (12-inch)

12-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M250-12-PSA	each	415.00
12-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M125-12-PSA	each	415.00
12-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M075-12-PSA	each	395.00
12-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M040-12-PSA	each	395.00
12-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M030-12-PSA	each	395.00
12-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M015-12-PSA	each	395.00

12-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R125-12-PSA	each	265.00
12-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R070-12-PSA	each	265.00
12-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R035-12-PSA	each	265.00
12-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R025-12-PSA	each	265.00
12-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R015-12-PSA	each	265.00
12-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R009-12-PSA	each	265.00

12-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD12	each	195.00
12-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD12	each	195.00



12-inch ORION Composite Disk

12-inch Magnetic Plates

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch MAGNETON Base Disk (PSA)	MAG-B12	each	65.00
12-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	each	68.00
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each	80.00



12-inch MAGNEPAD Teflon Base Plate

12-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing

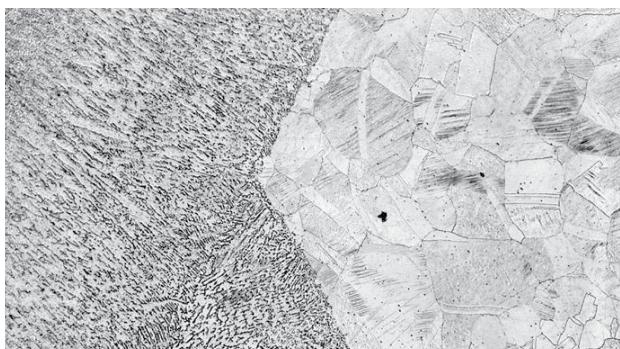


PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M250-12-MAG	each	450.00
12-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M125-12-MAG	each	450.00
12-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M075-12-MAG	each	385.00
12-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M040-12-MAG	each	385.00
12-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M030-12-MAG	each	385.00
12-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M015-12-MAG	each	385.00

12-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing



PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R125-12-MAG	each	295.00
12-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R070-12-MAG	each	295.00
12-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R035-12-MAG	each	295.00
12-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R025-12-MAG	each	295.00
12-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R015-12-MAG	each	295.00
12-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R009-12-MAG	each	295.00



Perfect Weld Joint, 50X

PREMIUM DIAMOND GRINDING DISKS

8-inch Premium Metal Bonded Diamond Grinding Disk with PSA Adhesive

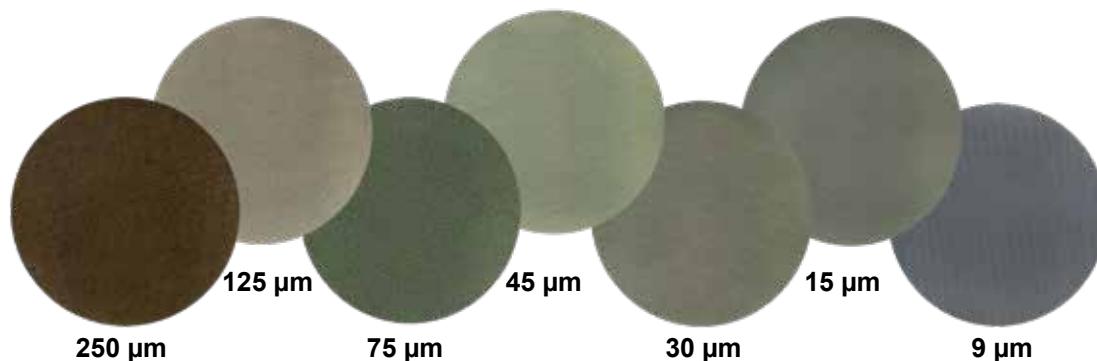
PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 250 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8250	each	450.00
8-inch 125 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8125	each	395.00
8-inch 75 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8075	each	395.00
8-inch 45 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8045	each	345.00
8-inch 30 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8030	each	345.00
8-inch 15 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8015	each	345.00
8-inch 9 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8009	each	345.00

10-inch Premium Metal Bonded Diamond Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 250 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10250	each	765.00
10-inch 125 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10125	each	710.00
10-inch 75 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10075	each	710.00
10-inch 45 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10045	each	710.00
10-inch 30 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10030	each	655.00
10-inch 15 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10015	each	655.00
10-inch 9 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10009	each	655.00

12-inch Premium Metal Bonded Diamond Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 250 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12250	each	1080.00
12-inch 125 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12125	each	1015.00
12-inch 75 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12075	each	870.00
12-inch 45 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12045	each	870.00
12-inch 30 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12030	each	870.00
12-inch 15 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12015	each	870.00
12-inch 9 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12009	each	870.00



Magnetic Plates

Magnetic Plates	8-inch	10-inch		12-inch		
PACE Product Name	Cat. No.	Price (\$)	Cat. No.	Price (\$)	Cat. No.	Price (\$)
MAGNETON Base Disk (PSA)	MAG-B08	52.00	MAG-B10	58.00	MAG-B12	65.00
MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	58.00	SSMAG-P10	62.00	SSMAG-P12	68.00
MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	60.00	MAG-P10	65.00	MAG-P12	80.00

8-inch Premium Metal Bonded Diamond Grinding Disk with Magnetic Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch 250 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-250M	each	475.00
8-inch 125 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-125M	each	420.00
8-inch 75 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-75M	each	420.00
8-inch 45 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-45M	each	370.00
8-inch 30 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-30M	each	370.00
8-inch 15 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-15M	each	370.00
8-inch 9 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-09M	each	370.00

10-inch Premium Metal Bonded Diamond Grinding Disk with Magnetic Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
10-inch 250 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-250M	each	790.00
10-inch 125 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-125M	each	735.00
10-inch 75 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-75M	each	735.00
10-inch 45 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-45M	each	735.00
10-inch 30 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-30M	each	685.00
10-inch 15 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-15M	each	685.00
10-inch 9 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-09M	each	685.00

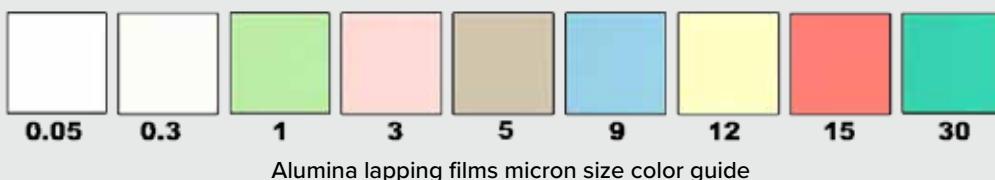
12-inch Premium Metal Bonded Diamond Grinding Disk with Magnetic Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
12-inch 250 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-250M	each	1100.00
12-inch 125 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-125M	each	1050.00
12-inch 75 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-75M	each	895.00
12-inch 45 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-45M	each	895.00
12-inch 30 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-30M	each	895.00
12-inch 15 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-15M	each	895.00
12-inch 9 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-09M	each	895.00

ABRASIVE LAPPING

Lapping Films (Superior Flatness):

The primary advantage of coated abrasives on lapping films is improved flatness across the specimen surface. This is especially true for specimens that have a large variation in the hardness for the specimen constituents. The abrasive is coated onto a polyester film versus a paper backing. The result is a harder base surface. Typically abrasive lapping films include, alumina and diamond. Diamond lapping films are quite common for grinding and polishing of electronic components, including silicon dies. Alumina is very useful for softer materials, such as aluminum, tin, lead, zinc; refractory materials such as rhenium, tungsten and niobium; as well as specimens having solder joints or soft coatings.



Lapping Film Characteristics:

- ◆ Produces flatter or more planar surfaces for materials having large variations in hardness
- ◆ Alternative to paper backed abrasive products

8-inch Alumina Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8105PB	100/pkg	135.00
0.3 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8103PB	100/pkg	135.00
1 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8001PB	100/pkg	122.00
3 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8003PB	100/pkg	122.00
5 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8005PB	100/pkg	122.00
9 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8009PB	100/pkg	122.00
12 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8012PB	100/pkg	122.00
15 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8015PB	100/pkg	122.00
30 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8030PB	100/pkg	122.00



1 micron Alumina PB Lapping Film



5 micron Alumina PB Lapping Film

8-inch Alumina Lapping Films with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8105PSA	100/pkg	185.00
0.3 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8103PSA	100/pkg	185.00
1 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8001PSA	100/pkg	168.00
3 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8003PSA	100/pkg	168.00
5 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8005PSA	100/pkg	168.00
9 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8009PSA	100/pkg	168.00
12 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8012PSA	100/pkg	168.00
15 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8015PSA	100/pkg	168.00
30 micron alumina PSA adhesive-backed lapping film (8-inch) - 100/pkg	ALO-8030PSA	100/pkg	168.00



3 micron Alumina PSA Lapping Film



9 micron Alumina PSA Lapping Film

ABRASIVE LAPPING FILMS (8-inch)

8-inch Diamond Lapping Films with Plain-backing



PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-01P8	5/pkg	125.00
0.25 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-025P8	5/pkg	125.00
0.50 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-05P8	5/pkg	125.00
1 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-1P8	5/pkg	125.00
3 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-3P8	5/pkg	125.00
6 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-6P8	5/pkg	125.00
9 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-9P8	5/pkg	125.00
15 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-15P8	5/pkg	125.00
30 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-30P8	5/pkg	199.50
45 micron diamond lapping film, (plain-backed) (8-inch) - 5/pkg	DA-45P8	5/pkg	199.50

8-inch Diamond Lapping Films with Adhesive (PSA) Backing



PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-01P8	5/pkg	145.00
0.25 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-025P8	5/pkg	145.00
0.50 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-05P8	5/pkg	145.00
1 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-1P8	5/pkg	145.00
3 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-3P8	5/pkg	145.00
6 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-6P8	5/pkg	145.00
9 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-9P8	5/pkg	145.00
15 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-15P8	5/pkg	145.00
30 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-30P8	5/pkg	225.00
45 micron diamond PSA adhesive-backed lapping film (8-inch)- 5/pkg	DAA-45P8	5/pkg	225.00



ABRASIVE LAPING FILMS (10-inch)

10-inch Alumina Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-10105PB	100/pkg	215.00
0.3 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-10103PB	100/pkg	215.00
1 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-1001PB	100/pkg	195.00
3 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-1003PB	100/pkg	178.50
5 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-1005PB	100/pkg	178.50
9 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-1009PB	100/pkg	178.50
12 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-1012PB	100/pkg	178.50
15 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-1015PB	100/pkg	178.50
30 micron alumina plain-backed lapping film (10-inch) - 100/pkg	ALO-1030PB	100/pkg	178.50



3 micron Alumina PB Lapping Film



9 micron Alumina PB Lapping Film

10-inch Alumina Lapping Films with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-10105PSA	100/pkg	320.00
0.3 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-10103PSA	100/pkg	320.00
1 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-1001PSA	100/pkg	310.00
3 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-1003PSA	100/pkg	299.00
5 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-1005PSA	100/pkg	299.00
9 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-1009PSA	100/pkg	299.00
12 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-1012PSA	100/pkg	299.00
15 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-1015PSA	100/pkg	299.00
30 micron alumina PSA adhesive-backed lapping film (10-inch) - 100/pkg	ALO-1030PSA	100/pkg	299.00



12 micron Alumina PSA Lapping Film



30 micron Alumina PSA Lapping Film





10-inch Diamond Lapping Films with Plain-backing



PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-01P10	5/pkg	185.00
0.25 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-025P10	5/pkg	185.00
0.50 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-05P10	5/pkg	185.00
1 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-1P10	5/pkg	185.00
3 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-3P10	5/pkg	185.00
6 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-6P10	5/pkg	185.00
9 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-9P10	5/pkg	185.00
15 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-15P10	5/pkg	185.00
30 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-30P10	5/pkg	225.00
45 micron diamond lapping film, (plain-backed) (10-inch) - 5/pkg	DA-45P10	5/pkg	225.00

10-inch Diamond Lapping Films with Adhesive (PSA) Backing



PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-01P10	5/pkg	215.00
0.25 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-025P10	5/pkg	215.00
0.50 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-05P10	5/pkg	215.00
1 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-1P10	5/pkg	215.00
3 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-3P10	5/pkg	215.00
6 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-6P10	5/pkg	215.00
9 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-9P10	5/pkg	215.00
15 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-15P10	5/pkg	215.00
30 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-30P10	5/pkg	260.00
45 micron diamond PSA adhesive-backed lapping film (10-inch)- 5/pkg	DAA-45P10	5/pkg	260.00

ABRASIVE LAPING FILMS (12-inch)

12-inch Alumina Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-12105PB	100/pkg	240.00
0.3 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-12103PB	100/pkg	240.00
1 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-1201PB	100/pkg	225.00
3 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-1203PB	100/pkg	215.00
5 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-1205PB	100/pkg	215.00
9 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-1209PB	100/pkg	215.00
12 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-1212PB	100/pkg	215.00
15 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-1215PB	100/pkg	215.00
30 micron alumina plain-backed lapping film (12-inch) - 100/pkg	ALO-1230PB	100/pkg	215.00



5 micron Alumina PB Lapping Film



12 micron Alumina PB Lapping Film

12-inch Alumina Lapping Films with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-12105PSA	100/pkg	355.00
0.3 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-12103PSA	100/pkg	355.00
1 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1201PSA	100/pkg	345.00
3 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1203PSA	100/pkg	345.00
5 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1205PSA	100/pkg	345.00
9 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1209PSA	100/pkg	345.00
12 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1212PSA	100/pkg	345.00
15 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1215PSA	100/pkg	345.00
30 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1230PSA	100/pkg	345.00



9 micron Alumina PSA Lapping Film



30 micron Alumina PSA Lapping Film





12-inch Diamond Lapping Films with Plain-backing



6 micron Diamond PB Lapping Film



15 micron Diamond PB Lapping Film

PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-01P12	3/pkg	225.00
0.25 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-025P12	3/pkg	225.00
0.50 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-05P12	3/pkg	225.00
1 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-1P12	3/pkg	225.00
3 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-3P12	3/pkg	225.00
6 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-6P12	3/pkg	225.00
9 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-9P12	3/pkg	225.00
15 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-15P12	3/pkg	225.00
30 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-30P12	3/pkg	275.00
45 micron diamond lapping film, (plain-backed) (12-inch) - 3/pkg	DA-45P12	3/pkg	275.00

12-inch Diamond Lapping Films with Adhesive (PSA) Backing



0.5 micron Diamond PSA Lapping Film



30 micron Diamond PSA Lapping Film

PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-01P12	3/pkg	265.00
0.25 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-025P12	3/pkg	265.00
0.50 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-05P12	3/pkg	265.00
1 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-1P12	3/pkg	265.00
3 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-3P12	3/pkg	265.00
6 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-6P12	3/pkg	265.00
9 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-9P12	3/pkg	265.00
15 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-15P12	3/pkg	265.00
30 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-30P12	3/pkg	310.00
45 micron diamond PSA adhesive-backed lapping film (12-inch)- 3/pkg	DAA-45P12	3/pkg	310.00

SPECIALTY ABRASIVE GRINDING SURFACES

Alumina Grinding Abrasives (Reduced Embedded Abrasives):

Alumina abrasives are typically used for grinding specimens that have a tendency to embed abrasive particles such as friable silicon carbide. Materials susceptible to embedding abrasive particles include low recrystallizing temperature metals such as tin, zinc and lead; electronic components containing solder joints; soft copper and aluminum metals; as well as, refractory metals such as rhenium, niobium and tungsten. Alumina abrasives are the better choice because they are more durable and do not fracture as easily.



Alumina Grinding Papers

8-inch Alumina Grinding Papers with Plain-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
P120 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P120	100/pkg	78.00
P220 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P220	100/pkg	78.00
P500 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P500	100/pkg	78.00
P1200 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P1200	100/pkg	78.00

10-inch Alumina Grinding Papers with Plain-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
P120 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P120	100/pkg	132.00
P220 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P220	100/pkg	132.00
P500 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P500	100/pkg	132.00
P1200 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P1200	100/pkg	132.00

12-inch Alumina Grinding Papers with Plain-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
P120 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P120	100/pkg	142.00
P220 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P220	100/pkg	142.00
P500 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P500	100/pkg	142.00
P1200 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P1200	100/pkg	142.00

Zirconia Grinding Abrasives (Very Durable Abrasive):

Zirconia is a very durable and hard abrasive. It is a longer lasting abrasive and is an excellent choice for belts grinders and for planar grinding steps on rotary grinder/polishers. The primary drawback is that zirconia grinding requires higher grinding forces as compared to SiC and alumina abrasives. It is also only available in coarser grit sizes.

8-inch Alumina Grinding Papers with PSA Adhesive-Backing



P220 grit 8-inch Alumina
PSA-backed Paper (100/pkg)
Catalog no. ALO-220P8-100

PACE Product Name	Catalog Number	Qty	Price (\$)
P120 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-120P8-100	100/pkg	132.00
P220 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-220P8-100	100/pkg	132.00
P500 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-500P8-100	100/pkg	132.00
P1200 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-1200P8-100	100/pkg	132.00

10-inch Alumina Grinding Papers with PSA Adhesive-Backing



P500 grit 10-inch Alumina
Plain-backed Paper (100/pkg)
Catalog no. ALO-2110-P500

PACE Product Name	Catalog Number	Qty	Price (\$)
P120 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-120P10-100	100/pkg	158.00
P220 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-220P10-100	100/pkg	158.00
P500 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-500P10-100	100/pkg	158.00
P1200 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-1200P10-100	100/pkg	158.00

12-inch Alumina Grinding Papers with PSA Adhesive-Backing



P1200 grit 12-inch Alumina
PSA-backed Paper (100/pkg)
Catalog no. ALO-1200P12-100

PACE Product Name	Catalog Number	Qty	Price (\$)
P120 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-120P12-100	100/pkg	265.00
P220 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-220P12-100	100/pkg	265.00
P500 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-500P12-100	100/pkg	265.00
P1200 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-1200P12-100	100/pkg	265.00

Zirconia Grinding Papers with PSA Adhesive-Backing



Zirconia Grinding Papers

PACE Product Name	Catalog Number	Qty	Price (\$)
120 grit Zirconia PSA adhesive-backed grinding paper (8-inch)-25/pkg	ZR-120P08-25	25/pkg	140.00
220 grit Zirconia PSA adhesive-backed grinding paper (8-inch)-25/pkg	ZR-220P08-25	25/pkg	140.00
120 grit Zirconia PSA adhesive-backed grinding paper (10-inch)-25/pkg	ZR-120P10-25	25/pkg	215.00
220 grit Zirconia PSA adhesive-backed grinding paper (10-inch)-25/pkg	ZR-220P10-25	25/pkg	215.00
120 grit Zirconia PSA adhesive-backed grinding paper (12-inch)-25/pkg	ZR-120P12-25	25/pkg	245.00
220 grit Zirconia PSA adhesive-backed grinding paper (12-inch)-25/pkg	ZR-220P12-25	25/pkg	245.00

METALLOGRAPHIC POLISHING

Metallographic Polishing

Metallographic polishing can be broken into two polishing categories: rough polishing and final polishing. Proper polishing requires the correct combination of polishing pad and abrasive, as well as, utilizing proper polishing machine conditions (speed, direction and force).

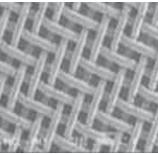
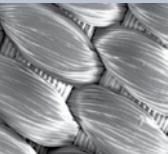
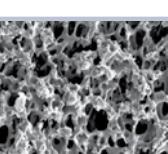
Minimizing Polishing Artifacts

To minimize polishing artifacts such as edge rounding, phase relief, smeared metal, grain pull-out and inclusion pull-out, the polishing time should be kept to a minimum. This can be accomplished by:

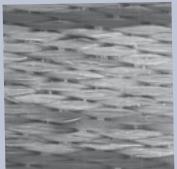
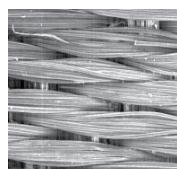
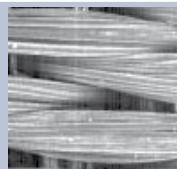
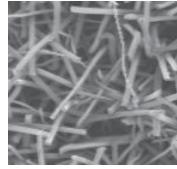
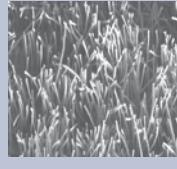
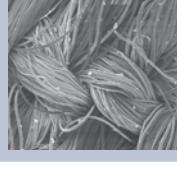
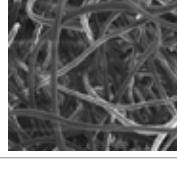
- ◆ minimizing sectioning damage
- ◆ grinding with the finest feasible abrasives
- ◆ using flat polishing base plates

Minimizing sectioning damage and using the correct grinding abrasives are fairly obvious. However, using a flat supporting plate is generally overlooked by most suppliers of metallographic equipment, and if they do consider plate flatness they generally do not go far enough. As a guideline, an 8-inch plate should have no more than a 0.0001 inch (2.5 micron) run out, which represents a 0.6 micron run out over a 1-inch diameter specimen. Recognize that final polishing abrasives have a typical size of 0.05-0.06 micron, thus these tolerances are required to minimize polishing times. In addition, if the specimen is not flat on the polishing plate then a differential pressure occurs across the specimen, which causes polishing relief. Likewise for a 12-inch diameter plate the run out should not exceed 0.0002 inches (5 micron). As a result both polishing times and differential polishing pressures can be minimized.

Suggestion: If your polishing plate is not flat within these tolerances they should be lapped to these tighter tolerances.

SEM Image	Polishing Pad Description	Abrasive Application	Product Image
	CERMESH Metal Mesh cloth - this is a wire mesh material useful for coarse and intermediate lapping/polishing. The texture of this wire allows for the abrasive to become semi-fixed; thus offering the advantage of increased stock removal, while minimizing damage	45, 30 or 15 micron diamond suspensions	
	POLYPAD Polishing Pad - this cloth is a synthetic polyester polishing pad which has a similar action to a nylon pad, with the exception that it is much more durable. It is used in the intermediate polishing steps	15, 9 or 6 micron diamond suspensions	
	TEXPAN Polishing Pad - this is the most commonly used polishing cloth material for the intermediate diamond polishing steps. TEXPAN Polishing pad is a non-woven polishing pad	9 or 6 micron diamond and 3 or 1 micron diamond with colloidal silica	
	Black CHEM 2 Polishing Pad this is a porometric polymer pad which has a consistency similar to a rubber type of pad. Black CHEM 2 pad has a low nap but behaves as an intermediate polishing pad with a performance between low napped and high napped pads	Colloidal silica or diamond and colloidal silica mixtures	

METALLOGRAPHIC POLISHING PADS

SEM Image	Polishing Pad Description	Abrasive Application	Product Image
	GOLDPAD Polishing Pad is a woven polishing pad for intermediate polishing primarily with 1-9 micron diamond	9 or 6 micron diamond and 3 or 1 micron diamond with colloidal silica	
	NY PAD Polishing Pad - this is a woven silk polishing pad for intermediate polishing primarily with intermediate diamond abrasives	9 or 6 micron diamond and 3 or 1 micron diamond with colloidal silica	
	DACRON II Polishing Cloth - this is a woven polishing pad for polishing primarily with 1-15 micron diamond abrasives. The DACRON II pad is the most popular intermediate polishing pad in Europe and is used mostly for polishing metals. Its higher nap provides a very soft and gentle polishing action	3 or 1 micron diamond or alumina	
	ATLANTIS Polishing Pad - is a woven low polishing pad with a foam backing for better matting to the specimen sample. It is an excellent polishing pad for 1-6 micron diamond	3 or 1 micron diamond or alumina	
	MICROPAD Polishing Cloth - this is the most common high napped final polishing pad for most metals and polymers. Its high nap provides it a very soft and gentle polishing action	1 micron or finer final polishing diamond or alumina	
	TRICOTE Polishing Pad - a tight high napped final polishing pad for most metals. It has a tighter nap than the MICROPAD Polishing Pads	1 micron or finer final polishing diamond or alumina	
	NAPPAD Polishing Pad - this is another high napped final polishing pad useful for most metals and polymers. It has a higher nap than MICROPAD, providing it with a very gentle polishing action which is very useful for polishing soft materials such as copper, aluminum and austenitic steels	Alumina or colloidal silica polishing	
	MOLTEC 2 Polishing Pad - this is wool polishing cloth used for final polishing and has a very high nap. It is most commonly used for final polishing metals where edge retention is a minimal consideration	Alumina or colloidal silica polishing	
	FELT PAD Polishing Pad - this is a thick felt pad used for final polishing glass and large surface area parts	Alumina or colloidal silica polishing	

METALLOGRAPHIC POLISHING PADS (8 & 9-inch)

8-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
8-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2008	5/pkg	102.00
8-inch POLYPAD polishing pad (10/pkg)	PP-6008	10/pkg	68.00
Intermediate Diamond Polishing			
8-inch TEXPAN polishing pad (10/pkg)	TP-5008	10/pkg	60.00
8-inch DACRON II ® polishing pad (5/pkg)	DC2-3008	5/pkg	90.00
8-inch NYPAD polishing pad (10/pkg)	NY-3008	10/pkg	70.00
8-inch GOLDPAD polishing pad (10/pkg)	GP-4008	10/pkg	68.00
8-inch ATLANTIS polishing pad (5/pkg)	ATL-3008	5/pkg	55.00
Final Polishing			
8-inch TRICOTE polishing pad (10/pkg)	TRI-4008	10/pkg	55.00
8-inch MICROPAD polishing pad (10/pkg)	MP-9008	10/pkg	55.00
8-inch NAPPAD polishing pad (10/pkg)	NP-7008	10/pkg	55.00
8-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7008	5/pkg	62.00
8-inch FELTPAD polishing pad (5/pkg)	FP-8125-08	5/pkg	62.00
CMP Polishing			
8-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8008	10/pkg	135.00



8-inch CERMESH Pad
Catalog no. **CERMESH-2008**



8-inch POLYPAD Pad
Catalog no. **PP-6008**



8-inch DACRON MAG Pad
Catalog no. **DC2-3008-MAG**



8-inch MOLTEC MAG Pad
Catalog no. **MT2-7008-MAG**

8-inch Polishing Pads with Magnetic Rubber-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
8-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2008-MAG	5/pkg	122.00
8-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6008-MAG	5/pkg	75.00
Intermediate Diamond Polishing			
8-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5008-MAG	5/pkg	62.00
8-inch DACRON II ® magnetic rubber polishing pad (5/pkg)	DC2-3008-MAG	5/pkg	125.00
8-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3008-MAG	5/pkg	65.00
8-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4008-MAG	5/pkg	62.00
8-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3008-MAG	5/pkg	68.00
Final Polishing			
8-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4008-MAG	5/pkg	78.00
8-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9008-MAG	5/pkg	62.00
8-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7008-MAG	5/pkg	60.00
8-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7008-MAG	5/pkg	72.00
8-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-08-MAG	5/pkg	75.00
CMP Polishing			
8-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8008-MAG	5/pkg	135.00

8-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
8-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2008-SSMAG	5/pkg	135.00
8-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6008-SSMAG	5/pkg	92.00
Intermediate Diamond Polishing			
8-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5008-SSMAG	5/pkg	85.00
8-inch DACRON II ® magnetic stainless steel polishing pad (5/pkg)	DC2-3008-SSMAG	5/pkg	155.00
8-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3008-SSMAG	5/pkg	90.00
8-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4008-SSMAG	5/pkg	80.00
8-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3008-SSMAG	5/pkg	80.00
Final Polishing			
8-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4008-SSMAG	5/pkg	85.00
8-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9008-SSMAG	5/pkg	80.00
8-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7008-SSMAG	5/pkg	82.00
8-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7008-SSMAG	5/pkg	80.00
8-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-08-SSMAG	5/pkg	80.00
CMP Polishing			
8-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8008-SSMAG	5/pkg	155.00

9-inch Polishing Pads with PSA Adhesive-Backing



GIGA-S Vibratory Polisher with 9-inch polishing bowl

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
9-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2009	5/pkg	155.00
9-inch POLYPAD polishing pad (10/pkg)	PP-6009	10/pkg	90.00
Intermediate Diamond Polishing			
9-inch TEXPAN polishing pad (10/pkg)	TP-5009	10/pkg	78.00
9-inch NYPAD polishing pad (10/pkg)	NY-3009	10/pkg	80.00
9-inch GOLDPAD polishing pad (10/pkg)	GP-4009	10/pkg	80.00
9-inch ATLANTIS polishing pad (5/pkg)	ATL-3009	5/pkg	65.00
Final Polishing			
9-inch TRICOTE polishing pad (10/pkg)	TRI-4009	10/pkg	72.00
9-inch MICROPAD polishing pad (10/pkg)	MP-9009	10/pkg	65.00
9-inch NAPPAD polishing pad (10/pkg)	NP-7009	10/pkg	70.00
9-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7009	5/pkg	80.00
9-inch FELTPAD polishing pad (5/pkg)	FP-8125-09	5/pkg	80.00
CMP Polishing			
9-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8009	10/pkg	158.00

METALLOGRAPHIC POLISHING PADS (10-inch)

10-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
10-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2010	5/pkg	175.00
10-inch POLYPAD polishing pad (10/pkg)	PP-6010	10/pkg	105.00
Intermediate Diamond Polishing			
10-inch TEXPAN polishing pad (10/pkg)	TP-5010	10/pkg	95.00
10-inch DACRON II ® polishing pad (5/pkg)	DC2-3010	5/pkg	115.00
10-inch NYPAD polishing pad (10/pkg)	NY-3010	10/pkg	90.00
10-inch GOLDPAD polishing pad (10/pkg)	GP-4010	10/pkg	90.00
10-inch ATLANTIS polishing pad (5/pkg)	ATL-3010	5/pkg	70.00
Final Polishing			
10-inch TRICOTE polishing pad (10/pkg)	TRI-4010	10/pkg	90.00
10-inch MICROPAD polishing pad (10/pkg)	MP-9010	10/pkg	78.00
10-inch NAPPAD polishing pad (10/pkg)	NP-7010	10/pkg	90.00
10-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7010	5/pkg	80.00
10-inch FELTPAD polishing pad (5/pkg)	FP-8125-10	5/pkg	80.00
CMP Polishing			
10-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8010	10/pkg	168.00



10-inch Black CHEM 2 Pad
Catalog no. BC2-8010



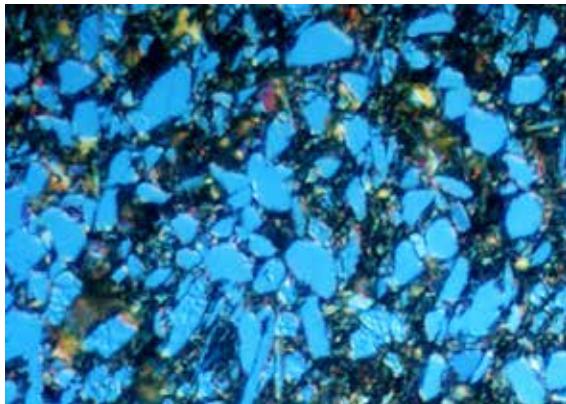
10-inch GOLDPAD Pad
Catalog no. GP-4010

10-inch Polishing Pads with Magnetic Rubber-Backing

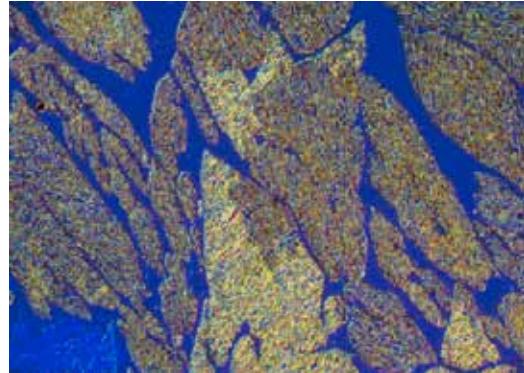
PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
10-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2010-MAG	5/pkg	205.00
10-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6010-MAG	5/pkg	95.00
Intermediate Diamond Polishing			
10-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5010-MAG	5/pkg	90.00
10-inch DACRON II ® magnetic rubber polishing pad (5/pkg)	DC2-3010-MAG	5/pkg	165.00
10-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3010-MAG	5/pkg	90.00
10-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4010-MAG	5/pkg	80.00
10-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3010-MAG	5/pkg	98.00
Final Polishing			
10-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4010-MAG	5/pkg	115.00
10-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9010-MAG	5/pkg	80.00
10-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7010-MAG	5/pkg	80.00
10-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7010-MAG	5/pkg	110.00
10-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-10-MAG	5/pkg	112.00
CMP Polishing			
10-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8010-MAG	5/pkg	165.00

10-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
10-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2010-SSMAG	5/pkg	220.00
10-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6010-SSMAG	5/pkg	135.00
Intermediate Diamond Polishing			
10-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5010-SSMAG	5/pkg	125.00
10-inch DACRON II ® magnetic stainless steel polishing pad (5/pkg)	DC2-3010-SSMAG	5/pkg	180.00
10-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3010-SSMAG	5/pkg	135.00
10-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4010-SSMAG	5/pkg	105.00
10-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3010-SSMAG	5/pkg	125.00
Final Polishing			
10-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4010-SSMAG	5/pkg	130.00
10-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9010-SSMAG	5/pkg	112.00
10-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7010-SSMAG	5/pkg	112.00
10-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7010-SSMAG	5/pkg	125.00
10-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-10-SSMAG	5/pkg	125.00
CMP Polishing			
10-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8010-SSMAG	5/pkg	180.00



Zirconium Diboride particles in a Titanium Matrix, etched, 1000X (DIC)



431 Stainless Steel, mag. 400X, etched with Modified Murakami's

METALLOGRAPHIC POLISHING PADS (12-inch)

12-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
12-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2012	5/pkg	215.00
12-inch POLYPAD polishing pad (10/pkg)	PP-6012	10/pkg	120.00
Intermediate Diamond Polishing			
12-inch TEXPAN polishing pad (10/pkg)	TP-5012	10/pkg	125.00
12-inch DACRON II ® polishing pad (5/pkg)	DC2-3012	5/pkg	165.00
12-inch NYPAD polishing pad (10/pkg)	NY-3012	10/pkg	125.00
12-inch GOLDPAD polishing pad (10/pkg)	GP-4012	10/pkg	125.00
12-inch ATLANTIS polishing pad (5/pkg)	ATL-3012	5/pkg	90.00
Final Polishing			
12-inch TRICOTE polishing pad (10/pkg)	TRI-4012	10/pkg	125.00
12-inch MICROPAD polishing pad (10/pkg)	MP-9012	10/pkg	105.00
12-inch NAPPAD polishing pad (10/pkg)	NP-7012	10/pkg	105.00
12-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7012	5/pkg	102.00
12-inch FELTPAD polishing pad (5/pkg)	FP-8125-12	5/pkg	102.00
CMP Polishing			
12-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8012	10/pkg	215.00



12-inch ATLANTIS Pad
Catalog no. ATL-3012



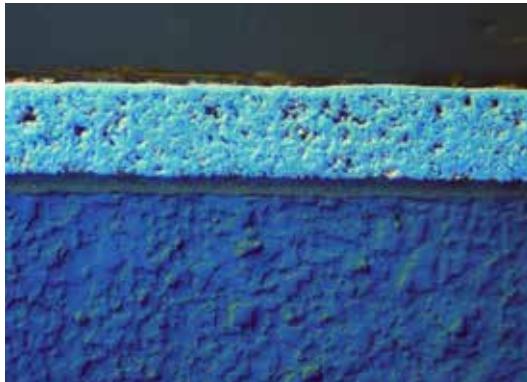
12-inch TRICOTE Pad
Catalog no. TRI-4012

12-inch Polishing Pads with Magnetic Rubber-Backing

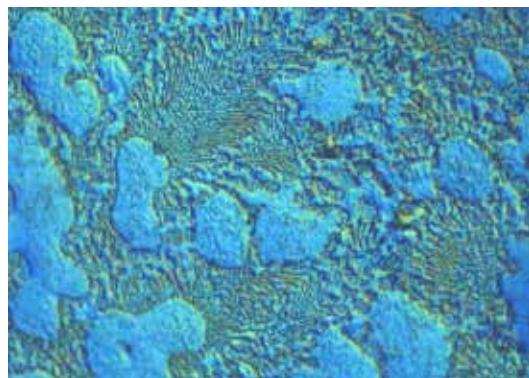
PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
12-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2012-MAG	5/pkg	310.00
12-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6012-MAG	5/pkg	125.00
Intermediate Diamond Polishing			
12-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5012-MAG	5/pkg	115.00
12-inch DACRON II ® magnetic rubber polishing pad (5/pkg)	DC2-3012-MAG	5/pkg	220.00
12-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3012-MAG	5/pkg	112.00
12-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4012-MAG	5/pkg	105.00
12-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3012-MAG	5/pkg	185.00
Final Polishing			
12-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4012-MAG	5/pkg	145.00
12-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9012-MAG	5/pkg	115.00
12-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7012-MAG	5/pkg	112.00
12-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7012-MAG	5/pkg	155.00
12-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-12-MAG	5/pkg	160.00
CMP Polishing			
12-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8012-MAG	5/pkg	210.00

12-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
12-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2012-SSMAG	5/pkg	265.00
12-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6012-SSMAG	5/pkg	165.00
Intermediate Diamond Polishing			
12-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5012-SSMAG	5/pkg	142.00
12-inch DACRON II ® magnetic stainless steel polishing pad (5/pkg)	DC2-3012-SSMAG	5/pkg	210.00
12-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3012-SSMAG	5/pkg	155.00
12-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4012-SSMAG	5/pkg	122.00
12-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3012-SSMAG	5/pkg	145.00
Final Polishing			
12-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4012-SSMAG	5/pkg	155.00
12-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9012-SSMAG	5/pkg	122.00
12-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7012-SSMAG	5/pkg	125.00
12-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7012-SSMAG	5/pkg	150.00
12-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-12-SSMAG	5/pkg	145.00
CMP Polishing			
12-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8012-SSMAG	5/pkg	235.00



AlN substrate with a molybdenum/nickel/gold coating, 400X (DIC)



Zinc-Aluminum Alloy, 1000X DIC
(etchant CrO₃, Na₂SO₄)

METALLOGRAPHIC POLISHING PADS (14-inch)

14-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
14-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2014	5/pkg	299.00
14-inch POLYPAD polishing pad (10/pkg)	PP-6014	10/pkg	175.00
Intermediate Diamond Polishing			
14-inch TEXPAN polishing pad (10/pkg)	TP-5014	10/pkg	185.00
14-inch DACRON II ® polishing pad (5/pkg)	DC2-3014	5/pkg	240.00
14-inch NYPAD polishing pad (10/pkg)	NY-3014	10/pkg	195.00
14-inch GOLDPAD polishing pad (10/pkg)	GP-4014	10/pkg	195.00
14-inch ATLANTIS polishing pad (5/pkg)	ATL-3014	5/pkg	135.00
Final Polishing			
14-inch TRICOTE polishing pad (10/pkg)	TRI-4014	10/pkg	175.00
14-inch MICROPAD polishing pad (10/pkg)	MP-9014	10/pkg	135.00
14-inch NAPPAD polishing pad (10/pkg)	NP-7014	10/pkg	185.00
14-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7014	5/pkg	145.00
14-inch FELTPAD polishing pad (5/pkg)	FP-8125-14	5/pkg	150.00
CMP Polishing			
14-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8014	10/pkg	305.00



12-inch MICROPAD
Catalog no. MP-9012



12-inch FELTPAD
Catalog no. FP-8125-12

14-inch Polishing Pads with Magnetic Rubber-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
14-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2014-MAG	5/pkg	360.00
14-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6014-MAG	5/pkg	175.00
Intermediate Diamond Polishing			
14-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5014-MAG	5/pkg	175.00
14-inch DACRON II ® magnetic rubber polishing pad (5/pkg)	DC2-3014-MAG	5/pkg	305.00
14-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3014-MAG	5/pkg	195.00
14-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4014-MAG	5/pkg	175.00
14-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3014-MAG	5/pkg	185.00
Final Polishing			
14-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4014-MAG	5/pkg	205.00
14-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9014-MAG	5/pkg	165.00
14-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7014-MAG	5/pkg	180.00
14-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7014-MAG	5/pkg	195.00
14-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-14-MAG	5/pkg	195.00
CMP Polishing			
14-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8014-MAG	5/pkg	320.00

14-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number	Qty	Price (\$)
Rough Polishing			
14-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2014-SSMAG	5/pkg	370.00
14-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6014-SSMAG	5/pkg	225.00
Intermediate Diamond Polishing			
14-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5014-SSMAG	5/pkg	205.00
14-inch DACRON II ® magnetic stainless steel polishing pad (5/pkg)	DC2-3014-SSMAG	5/pkg	305.00
14-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3014-SSMAG	5/pkg	205.00
14-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4014-SSMAG	5/pkg	175.00
14-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3014-SSMAG	5/pkg	185.00
Final Polishing			
14-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4014-SSMAG	5/pkg	215.00
14-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9014-SSMAG	5/pkg	170.00
14-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7014-SSMAG	5/pkg	170.00
14-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7014-SSMAG	5/pkg	205.00
14-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-14-SSMAG	5/pkg	205.00
CMP Polishing			
14-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8014-SSMAG	5/pkg	305.00

Magnetic Base Disks and Plates

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch MAGNETON Base Plate (PSA)	MAG-B08	each	52.00
10-inch MAGNETON Base Plate (PSA)	MAG-B10	each	58.00
12-inch MAGNETON Base Plate (PSA)	MAG-B12	each	65.00
14-inch MAGNETON Base Plate (PSA)	MAG-B14	each	85.00



MAGNETON
Base Plate



MAGNEPAD Stainless
Steel Base Plate

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	each	58.00
10-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	each	62.00
12-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	each	68.00
14-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P14	each	95.00



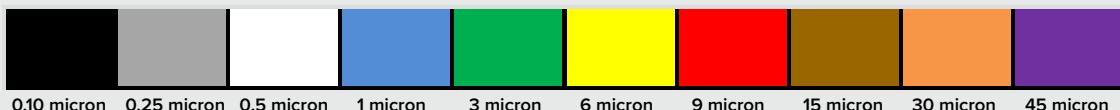
MAGNEPAD Coated
Base Plate

PACE Product Name	Catalog Number	Qty	Price (\$)
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each	60.00
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each	65.00
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each	80.00
14-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P14	each	120.00

DIAMOND POLISHING

Diamond Polishing:

The majority of specimens will use at least one, if not multiple, diamond polishing steps. For metallographic specimen preparation either a man-made synthetic polycrystalline diamond or a monocrystalline diamond is used and the diamond is either mixed into a suspending solution or is used in a paste form. For metallography, diamond is coded by the following color scheme:



Polycrystalline Diamond:

Diamond is the hardest known material (Mohs 10, 8000 HV). It has a cubic crystal structure and is available in either natural or an artificial product. For metallographic applications, both monocrystalline and polycrystalline diamond can be used, however, polycrystalline diamond has a number of advantages over monocrystalline diamond, especially for the finer particle sizes.



Polycrystalline Diamond Advantages:

- Higher cut rates (self-sharpening abrasive)
- Uniform surface finish
- More uniform particle size distribution
- Harder / tougher particles
- Blocky shaped cutting edges
- Higher surface area (300% greater than monocrystalline diamond)
- Hexagonal microcrystallites (equally hard in all directions)

Polycrystalline Diamond Suspensions (1-liter Color Coded)

PACE Product Name	Catalog Number	Qty	Price (\$)
1 micron (blue) DIAMAT PC diamond (1 liter)	PC-1001-1L	1-liter	195.00
3 micron (green) DIAMAT PC diamond (1 liter)	PC-1003-1L	1-liter	215.00
6 micron (yellow) DIAMAT PC diamond (1 liter)	PC-1006-1L	1-liter	220.00
9 micron (red) DIAMAT PC diamond (1 liter)	PC-1009-1L	1-liter	220.00
15 micron (brown) DIAMAT PC diamond (1 liter)	PC-1015-1L	1-liter	225.00
30 micron (orange) DIAMAT PC diamond (1 liter)	PC-1030-1L	1-liter	245.00
45 micron (purple) DIAMAT PC diamond (1 liter)	PC-1045-1L	1-liter	245.00



1 liter Dyed PC Diamond

Polycrystalline Diamond Suspensions (1-gallon Color Coded)

PACE Product Name	Catalog Number	Qty	Price (\$)
1 micron (blue) DIAMAT PC diamond (1 gallon)	PC-1001-1GLB	1-gallon	525.00
3 micron (green) DIAMAT PC diamond (1 gallon)	PC-1003-1GLG	1-gallon	540.00
6 micron (yellow) DIAMAT PC diamond (1 gallon)	PC-1006-1GLY	1-gallon	545.00
9 micron (red) DIAMAT PC diamond (1 gallon)	PC-1009-1GLR	1-gallon	545.00
15 micron (brown) DIAMAT PC diamond (1 gallon)	PC-1015-1GLBR	1-gallon	560.00
30 micron (orange) DIAMAT PC diamond (1 gallon)	PC-1030-1GLO	1-gallon	560.00
45 micron (purple) DIAMAT PC diamond (1 gallon)	PC-1045-1GLP	1-gallon	560.00



1 gallon Dyed PC Diamond

POLYCRYSTALLINE DIAMOND (HIGH VISCOSITY)

High Viscosity Polycrystalline Diamond Suspensions



PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0105-250	250 ml	58.00
0.05 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0105-500	500 ml	97.00
0.05 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0105-1GL	1 gallon	525.00
0.05 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0105-5L	5 liter	850.00
0.10 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0110-250	250 ml	58.00
0.10 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0110-500	500 ml	97.00
0.10 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0110-1GL	1 gallon	525.00
0.10 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0110-5L	5 liter	850.00
0.25 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0125-250	250 ml	58.00
0.25 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0125-500	500 ml	97.00
0.25 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0125-1GL	1 gallon	525.00
0.25 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0125-5L	5 liter	850.00
0.50 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0150-250	250 ml	58.00
0.50 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0150-500	500 ml	97.00
0.50 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0150-1GL	1 gallon	525.00
0.50 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0150-5L	5 liter	850.00
1 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1001-250	250 ml	58.00
1 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1001-500	500 ml	97.00
1 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1001-1GL	1 gallon	525.00
1 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1001-5L	5 liter	850.00
3 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1003-250	250 ml	64.00
3 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1003-500	500 ml	115.00
3 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1003-1GL	1 gallon	535.00
3 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1003-5L	5 liter	995.00
6 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1006-250	250 ml	72.00
6 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1006-500	500 ml	125.00
6 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1006-1GL	1 gallon	545.00
6 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1006-5L	5 liter	1050.00



1 micron High Viscosity Polycrystalline Diamond

POLYCRYSTALLINE DIAMOND (HIGH VISCOSITY)

High Viscosity Polycrystalline Diamond Suspensions

PACE Product Name	Catalog Number	Qty	Price (\$)
9 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1009-250	250 ml	72.00
9 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1009-500	500 ml	125.00
9 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1009-1GL	1 gallon	545.00
9 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1009-5L	5 liter	1050.00
15 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1015-250	250 ml	72.00
15 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1015-500	500 ml	125.00
15 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1015-1GL	1 gallon	545.00
15 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1015-5L	5 liter	1200.00
30 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1030-250	250 ml	85.00
30 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1030-500	500 ml	142.00
30 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1030-1GL	1 gallon	565.00
30 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1030-5L	5 liter	1200.00
45 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1045-250	250 ml	85.00
45 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1045-500	500 ml	142.00
45 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1045-1GL	1 gallon	565.00
45 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1045-5L	5 liter	1200.00



9 micron High Viscosity Polycrystalline Diamond



45 micron High Viscosity Polycrystalline Diamond

ZETA 2000S Diamond Dispenser

- ◆ 4 (24v) dedicated, programmable peristaltic pumps
- ◆ Setting adjustments for frequency, duration, start time, total time
- ◆ 7-inch touchscreen interface
- ◆ Compatible with NANO polishing machines as well as competitors' polishing devices
- ◆ Controlled priming for each pump and dispensing lines for more immediate application of the abrasive / lubricant
- ◆ Flow 1.2~90 ml/minute
- ◆ Flex line for easy adjustment



ZETA-2000S Dispenser

Polycrystalline Diamond Paste (5 gram syringes)



5 gram PC Diamond Paste

PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron polycrystalline diamond paste (5 grams)	PC-0210-05	5 grams	42.00
0.25 micron polycrystalline diamond paste (5 grams)	PC-0225-05	5 grams	42.00
0.50 micron polycrystalline diamond paste (5 grams)	PC-0250-05	5 grams	42.00
1 micron polycrystalline diamond paste (5 grams)	PC-2001-05	5 grams	44.00
3 micron polycrystalline diamond paste (5 grams)	PC-2003-05	5 grams	64.00
6 micron polycrystalline diamond paste (5 grams)	PC-2006-05	5 grams	64.00
9 micron polycrystalline diamond paste (5 grams)	PC-2009-05	5 grams	64.00
15 micron polycrystalline diamond paste (5 grams)	PC-2015-05	5 grams	72.00
30 micron polycrystalline diamond paste (5 grams)	PC-2030-05	5 grams	72.00
45 micron polycrystalline diamond paste (5 grams)	PC-2045-05	5 grams	72.00

Polycrystalline Diamond Paste (20 gram syringes)



20 gram PC Diamond Paste

PACE Product Name	Catalog Number	Qty	Price (\$)
0.10 micron polycrystalline diamond paste (20 grams)	PC-0210-20	20 grams	102.00
0.25 micron polycrystalline diamond paste (20 grams)	PC-0225-20	20 grams	102.00
0.50 micron polycrystalline diamond paste (20 grams)	PC-0250-20	20 grams	102.00
1 micron polycrystalline diamond paste (20 grams)	PC-2001-20	20 grams	125.00
3 micron polycrystalline diamond paste (20 grams)	PC-2003-20	20 grams	205.00
6 micron polycrystalline diamond paste (20 grams)	PC-2006-20	20 grams	205.00
9 micron polycrystalline diamond paste (20 grams)	PC-2009-20	20 grams	205.00
15 micron polycrystalline diamond paste (20 grams)	PC-2015-20	20 grams	220.00
30 micron polycrystalline diamond paste (20 grams)	PC-2030-20	20 grams	220.00
45 micron polycrystalline diamond paste (20 grams)	PC-2045-20	20 grams	220.00

Diamond Polishing Pastes:

Diamond pastes have been and continue to be commonly used for hand or manual polishing steps because they are easy to apply and the diamond can be better charged or fixed into the polishing pad as compared to diamond suspensions. They are less commonly used on automated polishing machines because diamond suspensions are easier to apply and they also have a built-in lubricant. The use of diamond pastes requires the application of an additional diamond extender or lubricant, which is typically a glycol or alcohol based solution.

POLYCRYSTALLINE DIAMOND (LOW VISCOSITY)

Polycrystalline Diamond Suspensions (Low Viscosity)

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0105-250	250 ml	58.00
0.05 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0105-500	500 ml	97.00
0.05 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0105-1GL	1 gallon	525.00
0.05 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0105-5L	5 liter	850.00
0.10 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0110-250	250 ml	58.00
0.10 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0110-500	500 ml	97.00
0.10 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0110-1GL	1 gallon	525.00
0.10 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0110-5L	5 liter	850.00
0.25 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0125-250	250 ml	58.00
0.25 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0125-500	500 ml	97.00
0.25 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0125-1GL	1 gallon	525.00
0.25 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0125-5L	5 liter	850.00
0.50 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0150-250	250 ml	58.00
0.50 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0150-500	500 ml	97.00
0.50 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0150-1GL	1 gallon	525.00
0.50 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0150-5L	5 liter	850.00
1 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1001-250	250 ml	58.00
1 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1001-500	500 ml	97.00
1 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1001-1GL	1 gallon	525.00
1 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1001-5L	5 liter	850.00
3 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1003-250	250 ml	64.00
3 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1003-500	500 ml	115.00
3 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1003-1GL	1 gallon	535.00
3 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1003-5L	5 liter	995.00
6 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1006-250	250 ml	72.00
6 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1006-500	500 ml	125.00
6 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1006-1GL	1 gallon	545.00
6 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1006-5L	5 liter	1050.00



0.10 micron Low Viscosity Polycrystalline Diamond



1 micron Low Viscosity Polycrystalline Diamond



3 micron Low Viscosity Polycrystalline Diamond



9 micron Low Viscosity Polycrystalline Diamond



30 micron Low Viscosity Polycrystalline Diamond

PACE Product Name	Catalog Number	Qty	Price (\$)
9 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1009-250	250 ml	72.00
9 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1009-500	500 ml	125.00
9 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1009-1GL	1 gallon	545.00
9 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1009-5L	5 liter	1050.00
15 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1015-250	250 ml	72.00
15 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1015-500	500 ml	125.00
15 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1015-1GL	1 gallon	545.00
15 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1015-5L	5 liter	1050.00
30 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1030-250	250 ml	85.00
30 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1030-500	500 ml	142.00
30 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1030-1GL	1 gallon	565.00
30 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1030-5L	5 liter	1200.00
45 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1045-250	250 ml	85.00
45 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1045-500	500 ml	142.00
45 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1045-1GL	1 gallon	565.00
45 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1045-5L	5 liter	1200.00

Polishing Pad Applications

- ◆ Rough Polishing: Coarse polishing with 15-45 micron abrasives
-CERMESH Metal Mesh cloth, POLYPAD Pad
- ◆ Intermediate Polishing: For removing most surface damage with 1-9 micron abrasives
-TEXPAN Pad, DACRON II Pad, NYPAD Pad, GOLDPAD Pad, ATLANTIS Pad (most popular)
- ◆ Final Polishing: For removing subsurface damage with 0.05-1 micron abrasives
-TRICOTE Pad, MICROPAD (most popular), NAPPAD Pad, MOLTEC 2 Pad, FELTPAD Pad
- ◆ CMP Polishing: CMP (chemical mechanical polishing with colloidal silica abrasives
-BLACK CHEM 2



MONOCRYSTALLINE DIAMOND (HIGH VISCOSITY)

Monocrystalline Diamond Suspensions (High Viscosity)

PACE Product Name	Catalog Number	Qty	Price (\$)
1 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1001-250	250 ml	33.00
1 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1001-500	500 ml	64.00
1 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1001-1GL	1 gallon	342.00
1 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1001-5L	5 liter	550.00
3 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1003-250	250 ml	37.50
3 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1003-500	500 ml	75.00
3 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1003-1GL	1 gallon	360.00
3 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1003-5L	5 liter	595.00
6 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1006-250	250 ml	42.00
6 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1006-500	500 ml	80.00
6 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1006-1GL	1 gallon	375.00
6 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1006-5L	5 liter	625.00
9 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1009-250	250 ml	42.00
9 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1009-500	500 ml	80.00
9 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1009-1GL	1 gallon	375.00
9 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1009-5L	5 liter	625.00
15 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1015-250	250 ml	42.00
15 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1015-500	500 ml	80.00
15 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1015-1GL	1 gallon	385.00
15 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1015-5L	5 liter	625.00
30 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1030-250	250 ml	48.00
30 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1030-500	500 ml	88.00
30 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1030-1GL	1 gallon	385.00
30 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1030-5L	5 liter	675.00
45 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1045-250	250 ml	48.00
45 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1045-500	500 ml	88.00
45 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1045-1GL	1 gallon	385.00
45 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1045-5L	5 liter	675.00



1 micron High Viscosity Monocrystalline Diamond



3 micron High Viscosity Monocrystalline Diamond



6 micron High Viscosity Monocrystalline Diamond

MONOCRYSTALLINE DIAMOND (PASTES)

Monocrystalline Diamond Paste (5 gram syringes)



5 gram Monocrystalline Diamond Paste

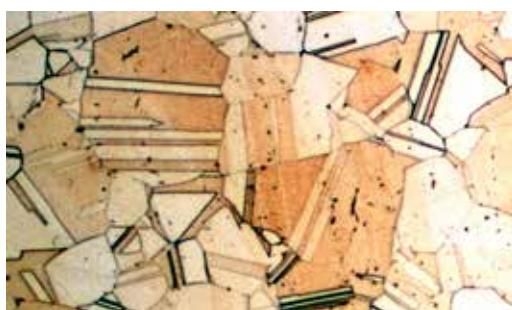
PACE Product Name	Catalog Number	Qty	Price (\$)
0.25 micron monocrystalline diamond paste (5 grams)	MA-0225-05	5 grams	18.00
0.50 micron monocrystalline diamond paste (5 grams)	MA-0250-05	5 grams	18.00
1 micron monocrystalline diamond paste (5 grams)	MA-2001-05	5 grams	18.00
3 micron monocrystalline diamond paste (5 grams)	MA-2003-05	5 grams	22.00
6 micron monocrystalline diamond paste (5 grams)	MA-2006-05	5 grams	22.00
9 micron monocrystalline diamond paste (5 grams)	MA-2009-05	5 grams	22.00
15 micron monocrystalline diamond paste (5 grams)	MA-2015-05	5 grams	24.00
30 micron monocrystalline diamond paste (5 grams)	MA-2030-05	5 grams	24.00
45 micron monocrystalline diamond paste (5 grams)	MA-2045-05	5 grams	24.00

Monocrystalline Diamond Paste (20 gram syringes)



20 gram Monocrystalline Diamond Paste

PACE Product Name	Catalog Number	Qty	Price (\$)
0.25 micron monocrystalline diamond paste (20 grams)	MA-0225-20	20 grams	55.00
0.50 micron monocrystalline diamond paste (20 grams)	MA-0250-20	20 grams	55.00
1 micron monocrystalline diamond paste (20 grams)	MA-2001-20	20 grams	55.00
3 micron monocrystalline diamond paste (20 grams)	MA-2003-20	20 grams	64.00
6 micron monocrystalline diamond paste (20 grams)	MA-2006-20	20 grams	64.00
9 micron monocrystalline diamond paste (20 grams)	MA-2009-20	20 grams	64.00
15 micron monocrystalline diamond paste (20 grams)	MA-2015-20	20 grams	70.00
30 micron monocrystalline diamond paste (20 grams)	MA-2030-20	20 grams	70.00
45 micron monocrystalline diamond paste (20 grams)	MA-2045-20	20 grams	70.00



Twin Boundaries in Brass

MONOCRYSTALLINE DIAMOND (LOW VISCOSITY)

Monocrystalline Diamond Suspensions (Low Viscosity)

PACE Product Name	Catalog Number	Qty	Price (\$)
1 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1001-250	250 ml	33.00
1 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1001-500	500 ml	64.00
1 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1001-1GL	1 gallon	342.00
1 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1001-5L	5 liter	550.00
3 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1003-250	250 ml	37.50
3 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1003-500	500 ml	75.00
3 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1003-1GL	1 gallon	360.00
3 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1003-5L	5 liter	725.00
6 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1006-250	250 ml	42.00
6 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1006-500	500 ml	80.00
6 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1006-1GL	1 gallon	375.00
6 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1006-5L	5 liter	625.00
9 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1009-250	250 ml	42.00
9 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1009-500	500 ml	80.00
9 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1009-1GL	1 gallon	375.00
9 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1009-5L	5 liter	625.00
15 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1015-250	250 ml	42.00
15 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1015-500	500 ml	80.00
15 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1015-1GL	1 gallon	385.00
15 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1015-5L	5 liter	625.00
30 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1030-250	250 ml	48.00
30 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1030-500	500 ml	88.00
30 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1030-1GL	1 gallon	385.00
30 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1030-5L	5 liter	675.00
45 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1045-250	250 ml	48.00
45 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1045-500	500 ml	88.00
45 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1045-1GL	1 gallon	385.00
45 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1045-5L	5 liter	675.00



15 micron Low Viscosity Monocrystalline Diamond



30 micron Low Viscosity Monocrystalline Diamond



45 micron Low Viscosity Monocrystalline Diamond

DIAMOND EXTENDERS / LUBRICANTS

Extenders / Lubricants:

Diamond lubricants or extenders are required for diamond pastes; however, they are also useful for thinning diamond suspensions. By alternating between the diamond suspension and the extender the diamond can better fall out of suspension and therefore embed into the polishing pad surface. Extenders / lubricants are typically glycol or alcohol based products.



Diamond Extenders / Lubricants

PACE Product Name	Catalog Number	Qty	Price (\$)
DIALUBE water based lube (16 oz)	DL-3000-16	16 oz	12.50
DIALUBE water based lube (32 oz)	DL-3000-32	32 oz	24.00
DIALUBE water based lube (1/2 gallon)	DL-3000-64	1/2 gallon	45.00
DIALUBE water based lube (1 gallon)	DL-3000-128	1 gallon	80.00
DIALUBE Blue alcohol based lube (32 oz)*	AOD-3000-32	32 oz	19.00
DIALUBE Blue alcohol based lube (1 gallon)*	AOD-3000-128	1 gallon	65.00
DIALUBE Blue alcohol based lube (5 gallons)*	AOD-3000-640	5 gallons	295.00
DIALUBE Purple alcohol based lube (32 oz)*	ADL-3000-32	32 oz	19.50
DIALUBE Purple alcohol based lube (1 gallon)*	ADL-3000-128	1 gallon	65.00
DIALUBE Purple alcohol based lube (5 gallons)*	ADL-3000-640	5 gallons	295.00
POLYLUBE non-aqueous lube (32 oz)	PDL-3000-32	32 oz	19.50
POLYLUBE non-aqueous lube (1 gallon)	PDL-3000-128	1 gallon	65.00
POLYLUBE Red (anti-corrosion lube) (32 oz)	PDL-3000R-32	32 oz	19.50
POLYLUBE Red (anti-corrosion lube) (1 gallon)	PDL-3000R-128	1 gallon	65.00

* May require dangerous goods shipping, extra charges may apply

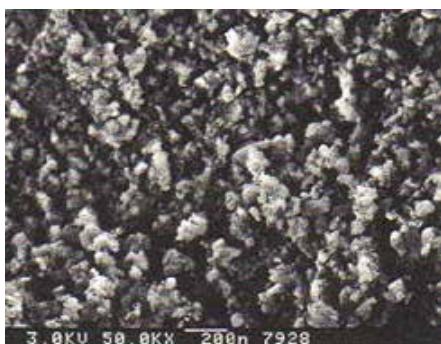
FINAL POLISHING

Final Polishing:

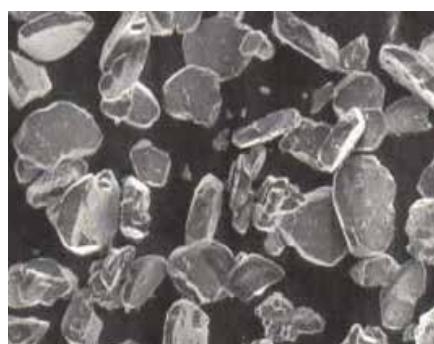
Final polishing can be accomplished with alumina, diamond, colloidal silica, ceria (cerium oxide) and rouge (iron oxide). However, the most commonly used abrasive for final polishing metals is alumina. Alumina abrasives are classified as calcined, levigated or polycrystalline based on their manufacturing process, crystal structure (hardness) and their sizing process.

Characteristics of Alumina Abrasives

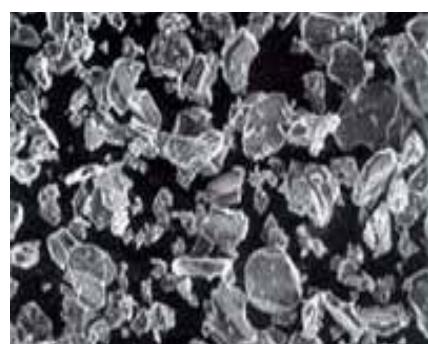
PROPERTY	POLYCRYSTALLINE	CALCINED	LEVIGATED
Crystal structure	Polycrystalline alpha alumina	Monocrystalline alpha alumina	Monocrystalline gamma or alpha alumina
Shape	Rough spherical particles	Hexagonal platelets	Hexagonal platelets
Particle size	0.05-0.25 microns	0.5-15 microns	<1 micron
Specific gravity	3.95 gm/cc	3.95 gm/cc	3.95 gm/cc
Hardness	Knoop 2000 (Mohs 9)	Knoop 2000 (Mohs 9)	Mohs 8-9
Applications	Available in a slurry at either a pH 4 or pH 10, primarily for metal polishing	Available in powders, slurries or suspensions, rough polishing	More commonly known as Linde A (0.3 micron) Linde B (0.05 micron) Linde C (1 micron)



Polycrystalline Alumina



Calcined Alumina



Levigated Alumina



NANOMETER Polycrystalline Alumina



Low Viscosity Alumina Slurry



Deagglomerated Alumina Powder

POLYCRYSTALLINE ALUMINA

Polycrystalline Alumina:

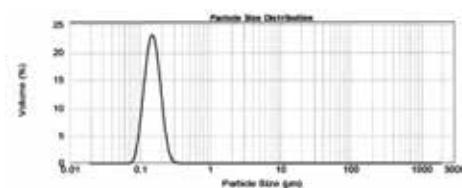
Polycrystalline or nanometer alumina is a colloidal alumina manufactured by a proprietary process. Polycrystalline abrasives are milled at either a low or higher pH value in order to avoid agglomeration which occurs near the point of zero charge (PZC). For alumina the PZC is around pH 7. This processing offers two significant improvements over conventional calcined alumina processes:

- ◆ Tighter, more controlled particle size distributions
- ◆ Harder alpha alumina crystal structure

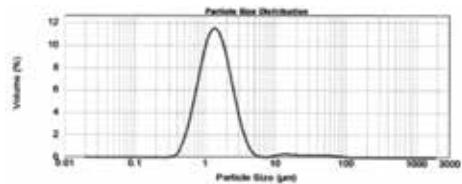
A tighter, more controlled particle size distribution is the result of less particle aggregation. For example, standard calcined 0.05 micron gamma alumina products form aggregate sizes as large as 5 microns. In some cases, these aggregates can be broken down during polishing with harder specimens; however, they are a problem when polishing softer metals (such as aluminum, tin, lead, copper and soft steels) with calcined alumina abrasives.

Nanometer polycrystalline alumina is specifically milled to produce a much smaller aggregate particle size distribution (<0.5 micron)(see PSD charts). Polycrystalline alumina is also a harder alpha alumina particle, therefore making it a more efficient cutting abrasive. Thus, polycrystalline alumina is a much more controlled polishing abrasive as compared to calcined gamma alumina abrasives.

In general, the more modern polycrystalline alumina abrasives outperform traditional calcined and levigated alumina abrasives for final polishing because they produce a much more consistent and better surface finish.



Particle size distribution for 0.05 micron NANOMETER Alumina



Particle size distribution for 0.05 micron Deagglomerated Alumina

Benefits of Polycrystalline Alumina:

- ◆ Improved surface finishes over gamma alumina
- ◆ Less random scratching
- ◆ Higher cutting rates than gamma alumina
- ◆ More uniform surface finish
- ◆ Tighter particle size distributions than gamma alumina
- ◆ Low viscosity for easier dispensing
- ◆ Semi-permanent suspensions

NANOMETER 0.05 micron Polycrystalline Alpha Alumina Slurries

PACE Product Name	Catalog Number	Qty	Price (\$)
16 oz Nanometer alumina (pH 10)	NA-1005-16	16 oz	45.00
32 oz Nanometer alumina (pH 10)	NA-1005-32	32 oz	76.00
1/2 gallon Nanometer alumina (pH 10)	NA-1005-64	1/2 gallon	135.00
1 gallon Nanometer alumina (pH 10)	NA-1005-128	1 gallon	225.00
16 oz Acidic Nanometer alumina (pH 4)	NA-1020-16	16 oz	52.50
32 oz Acidic Nanometer alumina (pH 4)	NA-1020-32	32 oz	90.00
1/2 gallon Acidic Nanometer alumina (pH 4)	NA-1020-64	1/2 gallon	145.00
1 gallon Acidic Nanometer alumina (pH 4)	NA-1020-128	1 gallon	265.00

ALUMINA SLURRIES

Alumina Suspensions (For Electronics and Soft Materials - High Viscosity)

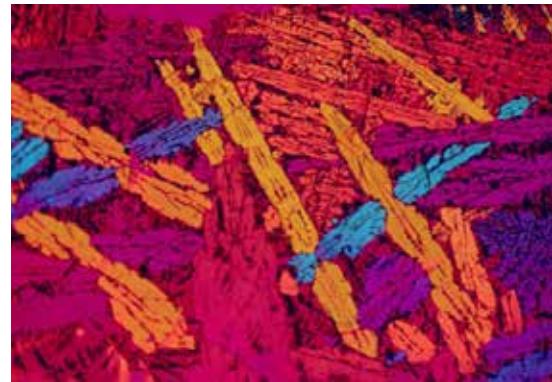
PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron Electronics Grade Deagglomerated Alumina (6 oz)	NANO2-1005-06E	6 oz	58.00
0.05 micron Electronics Grade Deagglomerated Alumina (16 oz)	NANO2-1005-16E	16 oz	135.00
0.05 micron Electronics Grade Deagglomerated Alumina (32 oz)	NANO2-1005-32E	32 oz	245.00
0.05 micron Electronics Grade Deagglomerated Alumina (1 gallon)	NANO2-1005-128E	1 gallon	905.00
0.3 micron Electronics Grade Deagglomerated Alumina (6 oz)	NANO2-1003-06E	6 oz	58.00
0.3 micron Electronics Grade Deagglomerated Alumina (16 oz)	NANO2-1003-16E	16 oz	135.00
0.3 micron Electronics Grade Deagglomerated Alumina (32 oz)	NANO2-1003-32E	32 oz	245.00
0.3 micron Electronics Grade Deagglomerated Alumina (1 gallon)	NANO2-1003-128E	1 gallon	905.00
1 micron Electronics Grade Deagglomerated Alumina (6 oz)	NANO2-1010-06E	6 oz	58.00
1 micron Electronics Grade Deagglomerated Alumina (16 oz)	NANO2-1010-16E	16 oz	135.00
1 micron Electronics Grade Deagglomerated Alumina (32 oz)	NANO2-1010-32E	32 oz	245.00
1 micron Electronics Grade Deagglomerated Alumina (1 gallon)	NANO2-1010-128E	1 gallon	905.00



Deagglomerated NANO2 Alumina Suspensions

Alumina Suspensions for Electronics and Soft Materials:

- ◆ Double deagglomerated processing
- ◆ Less random scratching
- ◆ More uniform surface finish
- ◆ Tighter particle size distributions
- ◆ High viscosity for manual dispensing
- ◆ Semi-permanent suspensions



Slag, 100X (Polarized light), as polished condition

Low Viscosity Alumina Suspensions:

- ◆ Low viscosity for easier dispensing
- ◆ Basic alumina polishing suspension ranging from 0.05 micron to 5 micron sizes
- ◆ Reasonably priced
- ◆ Traditional polishing compounds



Low Viscosity NANO Alumina Suspensions

Alumina Slurries (NANO Low Viscosity)

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1005-06	6 oz	25.00
0.05 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1005-16	16 oz	55.00
0.05 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1005-32	32 oz	102.00
0.05 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1005-128	1 gallon	215.00
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0.3 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1003-06	6 oz	25.00
0.3 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1003-16	16 oz	55.00
0.3 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1003-32	32 oz	102.00
0.3 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1003-128	1 gallon	215.00
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0.50 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1105-06	6 oz	25.00
0.50 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1105-16	16 oz	55.00
0.50 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1105-32	32 oz	102.00
0.50 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1105-128	1 gallon	215.00
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1 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1010-06	6 oz	25.00
1 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1010-16	16 oz	55.00
1 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1010-32	32 oz	102.00
1 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1010-128	1 gallon	215.00
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3 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1030-06	6 oz	25.00
3 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1030-16	16 oz	55.00
3 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1030-32	32 oz	102.00
3 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1030-128	1 gallon	215.00
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5 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1050-06	6 oz	25.00
5 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1050-16	16 oz	55.00
5 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1050-32	32 oz	102.00
5 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1050-128	1 gallon	215.00

ALUMINA POWDERS

Deagglomerated Alumina Powders (For Electronics and Soft Materials)

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron electronics grade deagglomerated alumina powder (1 lb)	ALD-1005-01E (formerly ALR-1005-01E)	1 lb	205.00
0.05 micron electronics grade deagglomerated alumina powder (5 lbs)	ALD-1005-05E (formerly ALR-1005-05E)	5 lbs	945.00
0.3 micron electronics grade deagglomerated alumina powder (1 lb)	ALD-0103-01E (formerly ALR-0103-01E)	1 lb	205.00
0.3 micron electronics grade deagglomerated alumina powder (5 lbs)	ALD-0103-05E (formerly ALR-0103-05E)	5 lbs	945.00
1 micron electronics grade deagglomerated alumina powder (1 lb)	ALD-0110-01E (formerly ALR-0110-01E)	1 lb	205.00
1 micron electronics grade deagglomerated alumina powder (5 lbs)	ALD-0110-05E (formerly ALR-0110-05E)	5 lbs	945.00

Alumina Powders

PACE Product Name	Catalog Number	Qty	Price (\$)
0.05 micron deagglomerated alumina powder (1 lb)	ALD-1005-01 (formerly ALR-1005-01)	1 lb	105.00
0.05 micron deagglomerated alumina powder (5 lbs)	ALD-1005-05 (formerly ALR-1005-05)	5 lbs	475.00
0.3 micron deagglomerated alumina powder (1 lb)	ALD-0103-01 (formerly ALD-0103B-01)	1 lb	92.50
0.3 micron deagglomerated alumina powder (5 lbs)	ALD-0103-05 (formerly ALD-0103B-05)	5 lbs	395.00
0.3 micron alumina powder (high density) (1 lb)	ALR-0103-01	1 lb	62.00
0.3 micron alumina powder (high density) (5 lbs)	ALR-0103-05	5 lbs	275.00
0.5 micron alumina powder (1 lb)	ALR-0105-01	1 lb	65.00
0.5 micron alumina powder (5 lbs)	ALR-0105-05	5 lbs	290.00
1 micron alumina powder (1 lb)	ALR-0110-01	1 lb	65.00
1 micron alumina powder (5 lbs)	ALR-0110-05	5 lbs	290.00
3 micron alumina powder (1 lb)	ALR-0130-01	1 lb	29.50
3 micron alumina powder (5 lbs)	ALR-0130-05	5 lbs	95.00
5 micron alumina powder (1 lb)	ALR-0150-01	1 lb	29.50
5 micron alumina powder (5 lbs)	ALR-0150-05	5 lbs	95.00
9 micron alumina powder (5 lbs)	ALR-0190-05	5 lbs	58.00
12 micron alumina powder (5 lbs)	ALR-1200-05	5 lbs	58.00
15 micron alumina powder (5 lbs)	ALR-1500-05	5 lbs	58.00
20 micron alumina powder (5 lbs)	ALR-2000-05	5 lbs	58.00
30 micron alumina powder (5 lbs)	ALR-3000-05	5 lbs	58.00
40 micron alumina powder (5 lbs)	ALR-4000-05	5 lbs	58.00



CMP ABRASIVES

CMP Polishing Slurries:

CMP (Chemical-Mechanical Polishing) slurries are a combination of colloidal silica and polycrystalline alumina. The colloidal silica provides a chemical polishing action, whereas, the polycrystalline alumina provides a mechanical polishing action. CMP slurries, especially when used in conjunction with vibratory polishing produce flatter surface features and faster polishing rates.



CMP Polishing Slurries

CMP Slurry (Polycrystalline Alumina - Colloidal Silica Mixture)

PACE Product Name	Catalog Number	Qty	Price (\$)
16 oz Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-16	16 oz	36.00
32 oz Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-32	32 oz	62.00
1/2 gallon Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-64	1/2 gallon	105.00
1 gallon Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-128	1 gallon	170.00

Colloidal Silica and CMP Polishing Procedures:

Colloidal silica polishing can be used by itself as a polishing abrasive, or in combination with other harder abrasives (CMP Polishing). For polishing hard, and oftentimes brittle materials such as glass and ceramics, the primary polishing mechanism is chemical. For metals, composites and microelectronic components, colloidal silica functions more as a traditional abrasive and mechanically polishes the surface.

For CMP polishing with colloidal silica abrasives, the porous **BLACK CHEM 2** Polishing Pad works well because it allows for the polishing process to generate more heat and thus enhances the chemical polishing rate. **GOLDPAD** and **TEXPAN** polishing pads are also useful for polishing glass, ceramics and composites utilizing a combination of colloidal silica and diamond.

Colloidal silica suspensions also have very good dispersion characteristics, thus the particles are usually very uniform and work well for polishing metals. However, for polishing metals, care must be taken so that the colloidal silica does not dry out as this would effectively result in producing much larger crystallized abrasive particles.

The other key to successful polishing with colloidal silica and CMP abrasives is to clean the specimen surface immediately after the polishing step. The most basic cleaning process should take place, which includes running clean distilled water on the polishing pad for the last 15-30 seconds of the polishing step.

If cleaning is not accomplished before the colloidal silica or CMP abrasive crystallizes on the specimen surface, then either the polishing process should be repeated or the sample can be cleaned with a caustic cleaning solution. A commonly used cleaning solution for most materials after polishing with colloidal silica is a mixture of ammonium hydroxide (NH_4OH) with 30% hydrogen peroxide (H_2O_2).

Note: This solution may adversely react and etch copper and copper alloys.

COLLOIDAL SILICA

Colloidal Silica Polishing:

Colloidal silica abrasives for metallographic polishing typically range in particle size from 20 nm up to 70 nm (0.02-0.07 micron). The concentration of particles typically ranges between 25-50% solids. Even at these high concentrations, colloidal silica can be maintained in a nearly perfect suspension. The electrochemical stability of colloidal silica makes it an excellent chemical mechanical polishing abrasive for polishing ceramics. The main drawback to polishing with colloidal silica is that it will crystallize as it dehydrates. This is particularly troublesome around the lid of an open bottle. One way to reduce this crystallization is to add an ingredient to the colloidal silica suspension in order to reduce the evaporation rate of the water. A comparison of the two main types of colloidal silica, SIAMAT and SIAMAT 2 Colloidal Silica are listed in the following table.

Characteristics of Colloidal Silica Abrasives

PROPERTY	SIAMAT COLLOIDAL SILICA	SIAMAT 2 COLLOIDAL SILICA	SIAMAT BLUE COLLOIDAL SILICA
Particle Size	0.06 micron	0.02 micron	0.05 micron
pH	9.5-10.0	9.2-10.0	9.5-10.0
Concentration	45-50% solids	45-50% solids	45-50% solids
Specific gravity	1.39	1.25	1.39
Viscosity	15 cP	20 cP	15 cP
Applications	Precision surface finishing abrasive for ceramics and glass. Ideal as a CMP abrasive when used by itself or with diamond polishing abrasives	Precision surface finishing abrasive for metals and microelectronic materials	Similar to SIAMAT colloidal silica with blue dye added to distinguish the product from other abrasives suspensions

Colloidal Silica Polishing Suspensions

PACE Product Name	Catalog Number	Qty	Price (\$)
16 oz SIAMAT colloidal silica (0.06 micron)	SI-100A-16	16 oz	27.50
32 oz SIAMAT colloidal silica (0.06 micron)	SI-100A-32	32 oz	48.00
1/2 gallon SIAMAT colloidal silica (0.06 micron)	SI-100A-64	1/2 gallon	78.00
1 gallon SIAMAT colloidal silica (0.06 micron)	SI-100A-128	1 gallon	135.00
5 gallons SIAMAT colloidal silica (0.06 micron)	SI-100A-640	5 gallons	610.00
16 oz SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-16	16 oz	27.50
32 oz SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-32	32 oz	48.00
1/2 gallon SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-64	1/2 gallon	78.00
1 gallon SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-128	1 gallon	135.00
5 gallons SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-640	5 gallons	575.00
16 oz SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-16	16 oz	27.50
32 oz SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-32	32 oz	48.00
1/2 gallon SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-64	1/2 gallon	78.00
1 gallon SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-128	1 gallon	135.00
5 gallons SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-640	5 gallons	610.00



SIAMAT Colloidal Silica



SIAMAT Blue Colloidal Silica



Low Crystallizing SIAMAT 2 Colloidal Silica

CLEANING

UCLEAN-012 Ultrasonic Cleaner

FEATURE	UCLEAN-012 DESCRIPTION
Ultrasonic Frequency	40 KHz transducers
Ultrasonic Power	240 Watts
Timer	1-30 minutes
Heater	250W heating power
Maximum Temperature	176°F (80°C)
Volume of Tank	2.6 gallons (10 L)
Electrical specification	110 / 220V (50/60 Hz)
Volume of Tank	2.5 gallons (9.5 L)
Overall Dimensions (W x D x H)	13 x 11 x 11-inches (330 x 270 x 270 mm)
Tank Dimensions (W x D x H)	12 x 9.4 x 5.9 (300 x 240 x 150 mm)
Weight	14 lbs (6.3 kg)
Catalog Number	UCLEAN-012



Benefits:

- ◆ Reduces abrasive contamination in-between sample preparation steps
- ◆ With an IPA corrosion inhibitor specimens have less staining and etching

Cleaning:

Cleaning and drying are perhaps the most underrated processing steps in specimen preparation. Yet improper cleaning can lead to misleading results. Cleaning is required to remove polishing residue as well as particulates on the surface. Cleaning can be classified into two categories:

Intermediate Cleaning:

Intermediate cleaning is important in order to minimize cross contamination of abrasives and swarf material. Intermediate cleaning is best accomplished with rinsing and ultrasonics. For the best results the specimen and holder should be pre cleaned with water and a cotton swab to remove excess abrasive and swarf.

Final Cleaning:

Final cleaning is the most important cleaning step for removing residue prior to specimen examination. For difficult to clean specimens, ultrasonic cleaning in alcohol can be very helpful.

Cleaning / Drying / Storage Products

PACE Product Name	Catalog Number	Qty	Price (\$)
ULTRACLEAN 2 Ultrasonic Degreasing / Cleaning Solution (32 oz)	UC2-1000-32	32 oz	17.50
ULTRACLEAN 2 Ultrasonic Degreasing / Cleaning Solution (1/2 gallon)	UC2-1000-64	1/2 gallon	32.00
ULTRACLEAN 2 Ultrasonic Degreasing / Cleaning Solution (1 gallon)	UC2-1000-128	1 gallon	62.00
Compressed Non-flammable gas	AIR-0100	each	13.50
Organic Corrosion Inhibitor (100X concentrate in IPA)	PCC-7500-32	32 oz	22.00
Urethane Spray Coating	URE-1000	each	25.00
1.25-inch Plastic Storage Container	STORE-0125	25/pkg	42.00

ETCHING

Etching:

Etching is a process for revealing the structure of the material, common etching techniques include: Chemical, Electrolytic, Thermal, Plasma, Molten salt and Magnetic etching. The two most common techniques are chemical and electrochemical etching. Chemical etching is typically a combination of either an acid or base with an oxidizing or reducing agent in a solute such as alcohol. Electrochemical etching is a combination of chemical etching with an electrical voltage/current.

ETCHANT	COMPOSITION	CONC.	CONDITIONS	COMMENTS
ASTM No. 30	Ammonia Hydrogen Peroxide (3%) DI Water	62.5 ml 125 ml 62.5 ml	Mix Ammonia and water before adding peroxide. Must be used fresh. Swab 5-45 seconds	For etching copper, copper alloys and copper-silver alloys
Adlers Etchant	Copper ammonium chloride Hydrochloric acid Ferric chloride, hydrated DI Water	9 grams 150 ml 45 grams 5 ml	Immersion is recommended for 1-5 seconds	For etching 300 series stainless steel and other superalloys
Carpenters Stainless Steel Etch	FeCl ₃ CuCl ₂ Hydrochloric acid Nitric acid Ethanol	8.5 grams 2.4 grams 122 ml 6 ml 122 ml	Immersion etching at 20°C	For etching duplex and 300 series stainless steels
Inconel Etch	Distilled water Nitric acid Hydrochloric acid Hydrogen Peroxide	90 ml 50 ml 75 ml 35 ml	Immersion etching at 20°C	For etching Inconel alloys
Kalling's No. 2	CuCl ₂ Hydrochloric acid Ethanol	5 grams 100 ml 100 ml	Immersion or swabbing etch at 20°C	For etching duplex and 400 series stainless steels and Ni-Cu alloys and superalloys
Kellers Etch	Distilled water Nitric acid Hydrochloric acid Hydrofluoric acid	190 ml 5 ml 3 ml 2 ml	10-30 second immersion. Use only fresh etchant	Excellent for aluminum and titanium alloys
Klemm's Reagent	Sodium thiosulfate solution Potassium metabisulfite	250 ml Saturated 5 grams	Etch for a few seconds to minutes	For etching alpha-beta brass, bronze, tin, cast iron phosphides, ferrite, martensite, retained austenite, zinc and steel temper embrittlement
Kroll's Reagent	Distilled water Nitric acid Hydrofluoric acid	92 ml 6 ml 2 ml	Swab specimen up to 20 seconds	Excellent for titanium and alloys
Nital	Ethanol Nitric acid	100 ml 1-10 ml	Immersion up to a few minutes.	Most common etchant for iron, carbon and alloys steels and cast iron - Immerse sample for seconds to minutes; Mn-Fe, MnNi, Mn-Cu, Mn-Co alloys.
Marbles Reagent	CuSO ₄ Hydrochloric acid Water	10 grams 50 ml 50 ml	Immerse or swab for 5-60 seconds.	For etching Ni, Ni-Cu and Ni-Fe alloys and superalloys. Add a few drops of H ₂ SO ₄ to increase activity
Murakami's	K ₃ Fe(CN) ₆ KOH Water	10 grams 10 grams 100 ml	CAUTION: Pre-mix KOH and water before adding K ₃ Fe(CN) ₆	Cr and alloys (use fresh and immerse); iron and steels reveals carbides; Mo and alloys uses fresh and immerse; Ni-Cu alloys for alpha phases use at 75°C; WC and alloys use fresh and immerse; WC-Co and complex sintered carbides
Picral	Ethanol Picric acid	100 ml 2-4 grams	Seconds to minutes Do not let etchant crystallize or dry	Recommended for microstructures containing ferrite, carbide, pearlite, martensite and bainite. Also useful for magnetic alloys, cast iron, high alloy stainless steels and magnesium
Vilella's Reagent	Picric Acid Hydrochloric acid Ethanol	1 gram 5 ml 100 ml	Seconds to minutes	Good for ferrite-carbide structures (tempered martensite) in iron and steel

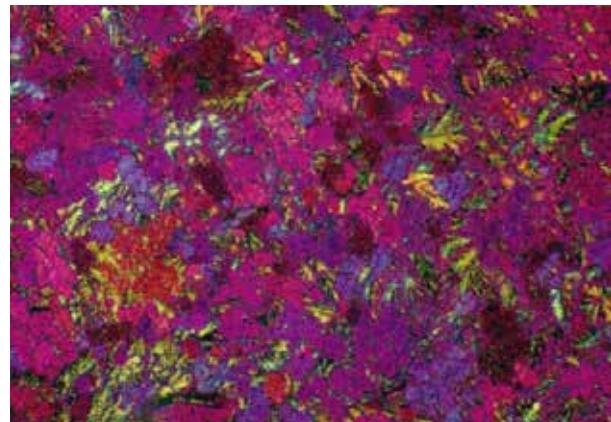
Common Aluminum and Titanium Etchants



PACE Product Name	Applications	Catalog Number	Qty	Price (\$)
Kellers	Most common etchant for aluminum alloys	Kellers	250 ml	110.00
Kroll's	Most common etchant for titanium	Krolls	250 ml	110.00
Titanium Attack Polish	Used as a CMP polishing compound for titanium	TI-AP-16	16 oz	110.00



Zinc-Aluminum Alloy, 200X B.F. (etchant CrO₃, Na₂SO₄)



Zinc-Aluminum Alloy, 100X Polarized (etchant CrO₃, Na₂SO₄)

Common Nickel, Iron, Chromium Alloy Etchants



PACE Product Name	Applications	Catalog Number	Qty	Price (\$)
Adlers	Fe-based Superalloys	Adlers	250 ml	110.00
Inconel Etch	Inconel alloys	Inconel	250 ml	110.00
Marble's	Nickel, nickel-iron alloys	Marbles	250 ml	110.00
Murakami's	Chromium alloys	Murakamis	250 ml	110.00
Waterless Kalling's	Iron and nickel base alloys	Waterless Kallings	250 ml	110.00



Inconel 625, Etched with Adlers, Mag 200X

ETCHING

Etching database:

The purpose of etching is to optically enhance the microstructural features such as grain size, phase identification and other microstructural features. Etching selectively alters these microstructural features based on composition, stress or crystal structure.

PACE Technologies has compiled a database of over 3000 etchants which can be accessed at:

<https://database.metallographic.com/pace-etchant.php>

Common Stainless Steel Etchants

ETCHANT	Applications	Catalog Number	Qty	Price (\$)
Adlers etchant	Very effective for etching austenitic 300 series stainless steels	Adlers	250 ml	110.00
Carpenters	300 Series Stainless Steel Etchant	Carpenters	250 ml	110.00
Kalling's No. 2	Martensitic 400 series stainless steels	Kallings No. 2	250 ml	110.00
Frys Reagent	Precipitation hardened stainless steels	Frys Reagent	250 ml	110.00
V2A etchant	Austenitic stainless steels	V2A Etchant	250 ml	110.00



Common Copper and Brass Etchants

ETCHANT	Applications	Catalog Number	Qty	Price (\$)
ASTM No. 30	Copper etchant	ASTM No. 30	250 ml	110.00
Copper No. 1	Copper & Brass (nitric acid and DI water)	Copper No. 1	250 ml	110.00
Copper No. 2	Copper & Brass (HCl and ferric chloride)	Copper No. 2	250 ml	110.00
Klemms	Stain etch for brass	Klemms	250 ml	110.00



Miscellaneous Etching Supplies

PACE Product Name	Catalog Number	Qty	Price (\$)
6-inch Cotton Tipped Etchant Applicator	AP-SWAB	100/pkg	7.50



Common Steel Etchants



ETCHANT	APPLICATIONS	CATALOG NUMBER	QTY	PRICE (\$)
2% Nital		Nital-2	250 ml	110.00
3% Nital		Nital-3	250 ml	110.00
5% Nital	2% is the most common etchant for non-heat treated or welded steels	Nital-5	250 ml	110.00
8% Nital		Nital-8	250 ml	110.00
Picral	Heat treated steels	Picral	250 ml	110.00
Vilella's	Most common etchant for carburized/ heat treated steels	Vilella's	250 ml	110.00

Oxide Ceramic Etchants

ETCHANT	CONCENTRATION	CONDITIONS	COMMENTS
Thermal etching	Air	Minutes to hours at 100-200° Celsius below the sintering temperature	Al ₂ O ₃ , Al ₂ O ₃ -MgO
Molten Salt	Potassium hydrogen fluoride melt	5-10 minutes in Pt crucible	Al ₂ O ₃ , Al ₂ SiO ₅
Distilled water Phosphoric acid	15 ml 85 ml	Boiling for 5 minutes to 2 hours	Al ₂ O ₃
Distilled water Sulfuric acid	50 ml 50 ml	Boiling for 1-5 minutes	ZrO ₂

Carbide Ceramic Etchants

ETCHANT	CONCENTRATION	CONDITIONS	COMMENTS
Molten Salt	Sodium or potassium bicarbonate melt	10 minutes in Pt crucible	SiC
Hydrochloric acid Hydrogen peroxide (30%)	10 ml 10 ml	Seconds to minutes	WC

Nitride Ceramic Etchants

ETCHANT	CONCENTRATION	CONDITIONS	COMMENTS
Thermal etching	High purity Nitrogen	Several hours at 1600° Celsius	Si ₃ N ₄
Molten Salt	Potassium hydroxide melt	Seconds to minutes in Pt crucible	Si ₃ N ₄
Hydrofluoric acid	100%	10-15 minutes	Si ₃ N ₄

HARDNESS TESTING

ALPHA-MHT-1000Z MICROHARDNESS TESTER



ALPHA-MHT-1000Z

ALPHA-MHT-1000Z

- Vickers or Knoop
- Auto-turret
- Built-in printer
- Load range 10-1000 grams
- Scales (HV, HK)
- LED display
- User friendly
- Robust and durable design



ALPHA-MHT-1000Z Control Panel

ALPHA-MHT-2000Z2 MICROHARDNESS TESTER



ALPHA-MHT-2000Z2

ALPHA-MHT-2000Z2

- Vickers or Knoop
- Auto-turret
- Built-in printer
- Load range 10-2000 grams
- Scales (HV, HK)
- Auto hardness conversion to other scales (HRA, HRB, HRC, HV, HK, HBW, etc)
- Long lasting Halogen lamp
- Touch screen display
- Robust and durable design



ALPHA-MHT-2000Z2 Touch Screen



EN 61000-6-1:2007, EN 61000-6-3:2007+A1:2011+AC:2012,
EN 61000-3-2:2014, EN 61000-3-3:2013
Electromagnetic Compatibility directive 2014/30/EU

MICROHARDNESS TESTERS

Microhardness Testers

2

year warranty
Limited Warranty

FEATURE	ALPHA-MHT-1000Z	ALPHA-MHT-2000Z2
Indenter types	Vickers or Knoop	Vickers or Knoop
Objective Magnification	10X (observation) & 40X (measurement)	10X (observation) & 40X (measurement)
Indenter Positioning	Auto turret	Auto turret
Testing force (gf)	10, 25, 50, 100, 200, 300, 400, 500, 1000	10, 25, 50, 100, 200, 300, 400, 500, 1000, 2000
Auto Hardness Conversion	HK, HRA, HRBW, HRC, HRD, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HBW	HK, HRA, HRBW, HRC, HRD, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW
Testing Range	1 HV ~ 3000 HV	1 HV ~ 3000 HV
X-Y Anvil Size	4 x 4-inch (100 x 100 mm)	4 x 4-inch (100 x 100 mm)
X-Y Anvil Travel	1 x 1-inch (25 x 25 mm)	1 x 1-inch (25 x 25 mm)
Dwell Time	5-60 seconds	5-60 seconds
Maximum Sample Height	3.5-inches (90 mm)	3.5-inches (90 mm)
Throat Depth	4-inches (100 mm)	4-inches (100 mm)
Illumination	Halogen	Halogen
Dimensions (W x D x H)	12.8 x 19 x 21.5-inch (325 x 480 x 545 mm)	12.8 x 19 x 21.5-inch (325 x 480 x 545 mm)
Electrical Specifications	110V / 220V 50/60 Hz	110V / 220V 50/60 Hz
Weight	68 lbs (31 kg)	70 lbs (32 kg)
Microhardness indentation measurement software (optional)	HARDNESS PRO	HARDNESS PRO
C-Mount camera attachment (optional)	823-361	823-361
Sample leveler (optional)	823-741	823-741
Direct Certification (optional)	3rd Party	3rd Party
Catalog Number	ALPHA-MHT-1000Z	ALPHA-MHT-2000Z2

Benefits:

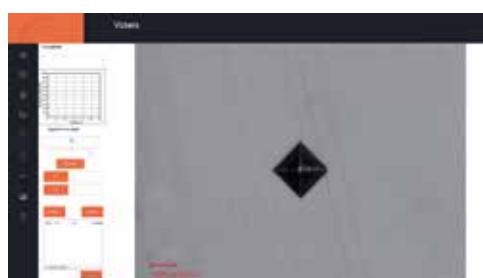
- ◆ Auto Turret to avoid indenter damage
- ◆ User friendly
- ◆ Built-in digital micrometer
- ◆ Counter balanced loading
- ◆ Economical
- ◆ 3rd party Direct Certification (optional)

REQUEST A QUOTE

www.metallographic.com



Sample Leveler (part no. 823-741)



HARDNESS PRO Measurement Software



C-Mount camera adapter (part no. 823-361)

MICROHARDNESS TESTERS

ALPHA-MHT-1000VK DUAL MICROHARDNESS TESTER



ALPHA-MHT-1000VK

ALPHA-MHT-1000VK

- Dual Vickers AND Knoop
- Auto-turret
- Load range 10-1000 grams
- Scales (HV and HK)
- Dwell time 0-95 seconds
- Auto hardness conversion to other scales (HRA, HRB, HRC, HV, HK, HBW, etc)
- Robust and durable design



Dual Vickers and Knoop Indenters with individual 40X (2) objectives



ALPHA-MHT-AUTO

ALPHA-MHT-AUTO

- Automated Microhardness Testing
- Vickers or Knoop
- Auto-turret
- Load range 10-1000 grams
- Scales (HV, HK)
- Dwell time 0-60 seconds
- Maximum sample height 6.7-inches (170 mm)
- X-Y Anvil travel range 4.3 x 4.3-inches (110 x 110 mm)
- Auto hardness conversion to other scales (HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW)
- Robust and durable design

Microhardness Testers

2

year warranty
Limited Warranty

FEATURE	ALPHA-MHT-1000VK	ALPHA-MHT-AUTO
Indenter types	Dual Vickers and Knoop	Vickers or Knoop
Objective Magnification	10X (observation) and 20X & 40X (2)(measurement)	10X and 40X
Indenter Positioning	Auto turret	Automatic (Loading/Dwell/Unloading)
Testing force (gf)	10, 25, 50, 100, 200, 300, 400, 500, 1000	10, 25, 50, 100, 200, 300, 400, 500, 1000
Auto Hardness Conversion	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW
Testing Range	1 HV ~ 3000 HV	1 HV ~ 3000 HV
X-Y Anvil Size	4 x 4-inch (100 x 100 mm)	4.3 x 4.3-inch (110 x 110 mm)
X-Y Anvil Travel	1 x 1-inch (25 x 25 mm)	2 x 1-inch (50 x 50 mm)
Dwell Time	0-95 seconds	0-60 seconds
Maximum Sample Height	3.5-inches (90 mm)	6.7-inches (170 mm)
Throat Depth	4-inches (100 mm)	5.1-inches (130 mm)
Illumination	Halogen	Halogen
Dimensions (W x D x H)	17 x 19 x 17-inch (425 x 490 x 425mm)	13.2 x 22 x 26.6-inch (335 x 560 x 675 mm)
Electrical Specifications	110V / 220V 50/60 Hz	110V / 220V 50/60 Hz
Weight	77 lbs (35 kg)	115 lbs (52 kg)
Microhardness indentation measurement software (optional)	HARDNESS PRO	Built-in
C-Mount camera attachment (optional)	823-361	Built-in
Sample leveler (optional)	823-741	823-741
Direct Certification (optional)	3rd Party	3rd Party
Catalog Number	ALPHA-MHT-1000VK	ALPHA-MHT-AUTO

Benefits:

- ◆ Fully automated ALPHA-MHT-AUTO
- ◆ Dual Vickers AND Knoop indenters ALPHA-MHT-1000VK
- ◆ Auto Turret to avoid indenter damage
- ◆ User friendly
- ◆ Built-in digital micrometer
- ◆ Counter balanced loading
- ◆ Economical
- ◆ 3rd party Direct Certification (optional)

REQUEST A QUOTE

www.metallographic.com



EN 61000-1:2010, EN 61000-3-3:2013
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

HARDNESS TESTING CONSUMABLES

Microhardness Test Blocks and Accessories

PACE Product Name	Catalog Number	Qty	Price (\$)
Vickers (1 gram to 1000 grams) for all microhardness hardness ranges	MV010	each	675.00
Knoop (1 gram to 1000 grams) for all microhardness hardness ranges	MK010	each	675.00
Vickers microhardness Diamond Penetrator -certified	P1110	each	1400.00
Knoop microhardness Diamond Penetrator - certified	P1120	each	1400.00

Rockwell Hardness Test Blocks

PACE Product Name	Catalog Number	Qty	Price (\$)
A-Scale, C diamond, 60 kg, A60-A84, Steel Rockwell hardness test block	RA10	each	115.00
A-Scale, C diamond, 60 kg, A20-A59, Brass Rockwell hardness test block	RA20	each	115.00
A-Scale, A diamond (carbide), 60 kg, A88 & up, Carbide Rockwell hardness test block	RA30	each	460.00
B-Scale, 1/16-inch ball, 100 kg, B10-B92, Steel Rockwell hardness test block	RB10	each	115.00
B-Scale, 1/16-inch ball, 100 kg, B90-B130, Steel Rockwell hardness test block	RB20	each	115.00
C-Scale, C Diamond, 150 kg, All, Steel Rockwell hardness test block	RC10	each	115.00
D-Scale, C Diamond, 100 kg, All, Steel Rockwell hardness test block	RD10	each	115.00
E-Scale, 1/8-inch ball, 100 kg, All, Brass Rockwell hardness test block	RE10	each	115.00
F-Scale, 1/16-inch ball, 60 kg, All, Brass Rockwell hardness test block	RF10	each	115.00
G-Scale, 1/16-inch ball, 150 kg, G82-91, Brass Rockwell hardness test block	RG10	each	115.00
H-Scale, 1/8-inch ball, 60 kg, All, Brass Rockwell hardness test block	RH10	each	115.00
K-Scale, 1/8-inch ball, 150 kg, All, Brass Rockwell hardness test block	RK10	each	115.00
L-Scale, 1/4-inch ball, 60 kg, All, Brass Rockwell hardness test block	RL10	each	115.00
M-Scale, 1/4-inch ball, 100 kg, All, Brass Rockwell hardness test block	RM10	each	115.00
P-Scale, 1/4-inch ball, 150 kg, All, Brass Rockwell hardness test block	RP10	each	115.00
R-Scale, 1/2-inch ball, 60 kg, All, Brass Rockwell hardness test block	RR10	each	115.00
S-Scale, 1/2-inch ball, 100 kg, All, Brass Rockwell hardness test block	RS10	each	115.00
V-Scale, 1/2-inch ball, 150 kg, All, Brass Rockwell hardness test block	RV10	each	115.00

Rockwell Anvils

PACE Product Name	Catalog Number	Qty	Price (\$)
Pedestal Spot (1/4-inch) Rockwell Anvil	A1010	each	265.00
1-1/2-inch Flat Rockwell Anvil	A1020	each	265.00
2-1/2-inch Flat Rockwell Anvil	A1030	each	305.00
Shallow V Rockwell Anvil	A1040	each	305.00
Standard V Rockwell Anvil	A1050	each	305.00



Rockwell Ball Penetrators

PACE Product Name	Catalog Number	Qty	Price (\$)
1/16-inch Carbide Ball Penetrator Indentron Certified	P20101	each	390.00
1/16-inch Carbide Ball, Certified	P20150	each	24.00
1/8-inch Carbide Ball Penetrator Indentron Certified	P20201	each	328.00
1/8-inch Carbide Ball, Certified	P20250	each	55.00
1/4-inch Carbide Ball Penetrator Indentron Certified	P20301	each	395.00
1/4-inch Carbide Ball, Certified	P20350	each	55.00
1/2-inch Carbide Ball Penetrator Indentron Certified	P20401	each	440.00
1/2-inch Carbide Ball, Certified	P20450	each	78.00

Superficial Rockwell Hardness Test Blocks

PACE Product Name	Catalog Number	Qty	Price (\$)
15 N Scale, N Diamond, 15 kg, All, Steel, Superficial hardness test blocks	S15N10	each	115.00
30 N Scale, N Diamond, 30 kg, All, Steel, Superficial hardness test blocks	S30N10	each	115.00
45 N Scale, N Diamond, 45 kg, All, Steel, Superficial hardness test blocks	S45N10	each	115.00
15 T Scale, 1/16-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15T10	each	115.00
30 T Scale, 1/16-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30T10	each	115.00
45 T Scale, 1/16-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45T10	each	115.00
15 W Scale, 1/8-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15W10	each	115.00
30 W Scale, 1/8-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30W10	each	115.00
45 W Scale, 1/8-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45W10	each	115.00
15 X Scale, 1/4-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15X10	each	115.00
30 X Scale, 1/4-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30X10	each	115.00
45 X Scale, 1/4-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45X10	each	115.00
15 Y Scale, 1/2-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15Y10	each	115.00
30 Y Scale, 1/2-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30Y10	each	115.00
45 Y Scale, 1/2-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45Y10	each	115.00

ROCKWELL HARDNESS TESTERS



OMEGA-RT2



OMEGA-RT-60/150



OMEGA-RST-15/150

OMEGA-RT2

- Manual Rockwell Tester
- 60 Kgf, 100 Kgf and 150 Kgf loading
- Analog display
- Robust and durable design
- Manual loading control
- User friendly
- Economical

OMEGA-RT-60/150

- Semi-Automated Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- Automatic conversion to 18 different hardness scales
- LCD displays hardness
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

OMEGA-RST-15/150

- Semi-Automated Dual Rockwell / Superficial Tester
- Total test force 15, 30, 45, 60, 100 and 150 Kgf loading
- Automatic conversion to 18 different hardness scales
- LCD displays hardness
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

Manual Rockwell Hardness Tester

2

year warranty
Limited Warranty

FEATURE	OMEGA-RT2
Rockwell Scales	HRA, HRB,HRC
Preliminary test force	10 Kgf (98.07N)
Full test force	60 Kgf, 100 Kgf, 150 Kgf
Loading control	Manual
Instrument Throat Height	6.5-inch (165 mm)
Maximum Sample Height	7.3-inch (185 mm)
Hardness Resolution	0.5 HR
Dimensions (W x D x H)	9.6 x 20.5 x 27.6-inch (245 x 520 x 700mm)
Weight	172 lbs (78 kg)

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Semi-Automated Rockwell Hardness Testers

2

year warranty
Limited Warranty

FEATURE	OMEGA-RT-60/150	OMEGA-RST-15/150
Rockwell Tester	Standard Rockwell Tester	Dual Rockwell / Superficial Rockwell Tester
Automation	Semi-Automated	Semi-Automated
Rockwell Scales	HRA, HRD, HRC, HRFW, HRBW, HRGW, HRHW, HREW, HRKW, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15T, HR30Y, HR45Y	HRA, HRD, HRC, HRFW, HRBW, HRGW, HREW, HRKW, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15T, HR30Y, HR45Y
Preliminary test force	10 Kgr (98.07N)	3 Kgr (Superficial) 10 Kgr (Rockwell)
Full test force	60 Kgf, 100 Kgf, 150 Kgf	15, 30, 45, 60, 100, and 150 Kgf
Hardness resolution	0.1 HR	0.1 HR
Dwell time	Adjustable 0-60 seconds	Adjustable 0-60 seconds
Auto Hardness conversion	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW
Instrument Throat Height	6.5-inch (165 mm)	6.3-inch (165 mm)
Power	110 or 220V	110 or 220V
Dimensions (W x D x H)	8.5 x 20 x 28 inch (215 x 520 x 700mm)	8.5 x 20 x 28 inch (215 x 520 x 700mm)
Weight	172 lbs (78 kg)	175 lbs (80 Kg)
Direct Certification (optional)	3rd Party	3rd Party



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ROCKWELL HARDNESS TESTERS

OMEGA-RT MANUAL ROCKWELL TESTER



OMEGA-RT

OMEGA-RT

- Manual Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- Analog display
- Robust and durable design
- Manual loading control
- Easy to use
- Economical

OMEGA-DIGI-RT ROCKWELL TESTER



OMEGA-DIGI-RT

OMEGA-DIGI-RT

- Digital Semi-Automated Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- Automatic conversion to 16 different hardness scales
- Touch screen display
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

OMEGA-DIGI-RST SUPERFICIAL ROCKWELL TESTER



OMEGA-DIGI-RST

OMEGA-DIGI-RST

- Digital Semi-Automated Dual Rockwell / Superficial Tester
- Total test force 15, 30, 45, 60, 100 and 150 Kgf loading
- Automatic conversion to 16 different hardness scales
- Touch screen display
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

Manual Rockwell Hardness Tester

2

year warranty
Limited Warranty

FEATURE	OMEGA-RT (Rockwell)	OMEGA-ST (Superficial Rockwell)
Rockwell Scales	HRA, HRB, HRC	HR15N, HR30N, HR45N, HR15T, HR30T, HR45T
Preliminary test force	10 Kgf (98.07N)	3 Kgf (29.4N)
Full test force	60 Kgf, 100 Kgf, 150 Kgf	15 Kgf, 30 Kgf, 45 Kgf
Loading control	Manual	Manual
Instrument Throat Height	6.5-inch (165 mm)	6.5-inch (165 mm)
Dimensions (W x D x H)	7.2 x 21.5 x 29.7 inch (182 x 546 x 755 mm)	7.2 x 21.5 x 29.7 inch (182 x 546 x 755 mm)
Weight	200 lbs (90 kg)	200 lbs (90 kg)

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Semi-Automated Rockwell Hardness Testers

2

year warranty
Limited Warranty

FEATURE	OMEGA-DIGI-RT	OMEGA-DIGI-RST
Rockwell Tester	Standard Rockwell Tester	Dual Rockwell / Superficial Rockwell Tester
Automation	Semi-Automated	Semi-Automated
Hardness Scales	Rockwell: HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRR, HRP, HRS, HRV	Rockwell: HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRR, HRP, HRS, HRV Superficial Rockwell: HR15N, HR30N, HR45N, HR15T, HR30T, HR45T
Preliminary test force	10 Kgr (98.07N)	3 Kgr (Superficial) 10 Kgr (Rockwell)
Full test force	60 Kgf, 100 Kgf, 150 Kgf	15, 30, 45, 60, 100, and 150 Kgf
Hardness resolution	0.1 HR	0.1 HR
Dwell time	Adjustable 1-60 seconds	Adjustable 1-60 seconds
Auto Hardness conversion	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HR15Y, HRB	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HR15Y, HRB
Maximum Height of Specimen	6.9-inch (175 mm)	11.0-inch (280 mm)
Power	110 or 220V	110 or 220V
Dimensions (W x D x H)	7 x 21.5 x 30 inches (182 x 546 x 755 mm)	8.8 x 24 x 35 inches (225 x 615 x 885 mm)
Weight	198 lbs (90 Kg)	265 lbs (120 Kg)
Direct Certification (optional)	3rd Party	3rd Party



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AUTOMATED ROCKWELL TESTERS

OMEGA-AUTO-RT HARDNESS TESTER



OMEGA-AUTO-RT

OMEGA-AUTO-ST HARDNESS TESTER



OMEGA-AUTO-ST

OMEGA-AUTO-RST HARDNESS TESTER



OMEGA-AUTO-RST

OMEGA-AUTO-RT

- Fully-automated Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- One touch operation
- Auto load change
- Auto lifting
- Auto loading
- Auto measuring
- Auto conversion
- Ability to set upper and lower limits
- Robust and durable design

OMEGA-AUTO-ST

- Fully-automated Superficial Rockwell Tester
- Total test force 15 Kgf, 30 Kgf and 45 Kgf loading (Superficial)
- One touch operation
- Auto load change
- Auto lifting
- Auto loading
- Auto measuring
- Auto conversion
- Color touch screen
- Ability to set upper and lower limits
- Robust and durable design

OMEGA-AUTO-RST

- Fully-automated Dual Rockwell / Superficial Rockwell Tester
- 15 Kgf, 30 Kgf and 45 Kgf loading (Superficial)
60 Kgf, 100 Kgf and 150 Kgf loading (Rockwell)
- One touch operation
- Auto load change
- Auto lifting
- Auto loading
- Auto measuring
- Auto conversion
- Color touch screen
- Ability to set upper and lower limits
- Robust and durable design

Automated Rockwell Hardness Testers

2 year warranty
Limited Warranty

FEATURE	OMEGA-AUTO-RT	OMEGA-AUTO-ST	OMEGA-AUTO-RST
Rockwell Type	Rockwell	Superficial Rockwell	Dual Rockwell / Superficial Rockwell
Rockwell Scales	HRA, HRB,HRC,HRD,HRE, HRF, HRG,HRH,HRK,HRL, HRM, HRR, HRP, HRS,HRV	HRA, HRB,HRC,HRD,HRE, HRF, HRG,HRH,HRK,HRL, HRM, HRR, HRP, HRS,HRV	HRA, HRB,HRC,HRD,HRE, HRF, HRG,HRH,HRK,HRL, HRM, HRR, HRP, HRS,HRV
Preliminary Test Force	10 Kgr (Rockwell)	3 Kgr (Superficial)	3 Kgr (Superficial) 10 Kgr (Rockwell)
Full Test Force	60 Kgf, 100 Kgf, 150 Kgf (Rockwell)	15 Kgf, 30 Kgf, 45 Kgf (Superficial)	15 Kgf, 30 Kgf 45 Kgf (Superficial) 60 Kgf, 100 Kgf, 150 Kgf (Rockwell)
Hardness resolution	0.1 HR	0.1 HR	0.1 HR
Dwell Time	Adjustable 1-60 seconds	Adjustable 1-60 seconds	Adjustable 1-60 seconds
Auto Hardness conversion	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB
Max Height of Specimen	11 inches (280 mm)	11 inches (280 mm)	11 inches (280 mm)
Power	110 or 220V	110 or 220V	110 or 220V
Dimensions (W x D x H)	9 x 24 x 34.8 inches (225 x 615 x 885 mm)	9 x 24 x 34.8 inches (225 x 615 x 885 mm)	9 x 24 x 34.8 inches (225 x 615 x 885 mm)
Weight	275.6 lbs (125 Kg)	275.6 lbs (125 Kg)	275.6 lbs (125 Kg)
Direct Certification (optional)	3rd Party	3rd Party	3rd Party
Catalog Number	OMEGA-AUTO-RT	OMEGA-AUTO-ST	OMEGA-AUTO-RST

Benefits:

- ◆ Automated Testers
- ◆ One touch operation
- ◆ Stores up to 2000 single test measurements
- ◆ Stores 1000 groups of test results
- ◆ Eliminates user error for more reproduceable results

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BRINELL TESTERS

OMEGA-HB BRINELL HARDNESS TESTER



OMEGA-HB

OMEGA-HB

- Manual Brinell Tester
- Test Forces 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500 and 3000 Kgf
- Test range (~3.2 to 650 HBW)
- User friendly
- Robust and durable design

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OMEGA-HB-3000 BRINELL HARDNESS TESTER



OMEGA-HB-3000

OMEGA-HB-3000

- Digital Brinell Tester with Built-In Optics
- Semi-automated
- Built-in eyepiece filar
- Test Forces 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500 and 3000 Kgf
- Test range (~3.2 to 650 HBW)
- LCD display
- User friendly
- Robust and durable design

OMEGA-AUTO-HB BRINELL HARDNESS TESTER



OMEGA-AUTO-HB

OMEGA-AUTO-HB

- Fully-automated BRINELL Tester
- Testing range of ~3.2 to 650 HBW
- One key operation
- Displays data statistics, hardness conversion, and limitation setting
- Loading by high accuracy force sensor
- Compensation of force loss during loading with micro central processing unit
- Test forces 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 500, 3000 Kgf
- Robust and durable design

Brinell Hardness Testers

2

year warranty
Limited Warranty

FEATURE	OMEGA-HB	OMEGA-HB-3000	OMEGA-AUTO-HB
Brinell Tester	Manual	Semi-Automated	Automated
Optical Measurement	Manual 20X Optical Scope	Built-in 20X eyepiece filar	Built-in 20X eyepiece filar
Test forces (Kgf)	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000
Testing range	~3.2 to 650 HBW	~3.2 to 650 HBW	~3.2 to 650 HBW
Max. height of specimen	8.1-inch (205 mm)	8.8-inch (225 mm)	10 inches (260 mm)
Max. throat depth	5.3-inch (135 mm)	5.3-inch (135 mm)	6 inches (150 mm)
Power	110 or 220V	110 or 220V	110 or 220V
Dimensions (W x H x D)	9.3 x 21.5 x 29.7-inch (235 x 545 x 755 mm)	9.3 x 21.5 x 31.1-inch (235 x 545 x 790 mm)	12 x 24.5 x 39-inch (313 x 622 x 992 mm)
Weight	290 lbs (130 kg)	290 lbs (130 kg)	375 lbs (170 kg)
Catalog Number	OMEGA-HB	OMEGA-HB-3000	OMEGA-AUTO-HB

Brinell Consumable Test Blocks

PACE Product Name	Catalog Number	Qty	Price (\$)
3000 kg load, 10 mm ball Brinell test block for all hardness ranges	B3000	each	210.00
2000 kg load, 10 mm ball Brinell test block for all hardness ranges	B2000	each	210.00
1500 kg load, 10 mm ball Brinell test block for all hardness ranges	B1500	each	210.00
1000 kg load, 10 mm ball Brinell test block for all hardness ranges	B1000	each	210.00
500 kg load, 10 mm ball Brinell test block for all hardness ranges	B0500	each	210.00
250 kg load, 10 mm ball Brinell test block for all hardness ranges	B0250	each	210.00
187.5 kg load, 10 mm ball Brinell test block for all hardness ranges	B0187	each	210.00

Brinell Indenters / Carbide Balls

PACE Product Name	Catalog Number	Qty	Price (\$)
2.5 mm Brinell carbide balls (each) - certified	P3032	each	38.00
5 mm Brinell carbide balls (each) - certified	P3031	each	65.00
10 mm Brinell carbide balls (each) - certified	P3020	each	80.00
2.5 mm Brinell Indenter with carbide ball - certified	P3132	each	480.00
5 mm Brinell Indenter with carbide ball - certified	P3131	each	565.00
10 mm Brinell Indenter with carbide ball - certified	P3134	each	675.00



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MACRO VICKERS TESTERS

OMEGA Macro Vickers Hardness Testers

2

year warranty
Limited Warranty



OMEGA-5000-HV

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OMEGA-5000-HV

- Semi-automated Macro Vickers Tester
- 1, 2, 2.5, 3, 5, 10, 20, 30 and 50 Kgf loading
- 10X and 20X objectives
- Touch screen control
- Auto turret
- Auto focusing
- Auto measurement
- Robust and durable design

FEATURE	OMEGA-5000-VZ
Test forces	1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
Eyepieces	10X
Objectives	10X, 20X
Total Magnification	100X, 200X
Loading Method	Automatic (Loading/Dwell/Unloading)
Dwell time	Adjustable 5-60 seconds
Shifting between Objective and Indenter	Automatic Shifting
Resolution	0.25µm / 0.125µm
Illumination	Halogen
Maximum Sample Height	6.7-inch (170 mm)
Power	110 or 220V
Dimensions (W x H x D)	11 x 21 x 25 inch (280 x 530 x 630mm)
Weight	77 lbs (35 kg)
Part No.	OMEGA-5000-HV

Macro Vickers Test Blocks

PACE Product Name	Catalog Number	Qty	Price (\$)
Heavy Load Vickers (1 kg to 50 kg)	MV020	each	675.00

Steel Hardness Conversion Table:

This table compares the relative tensile strength to the approximate hardness of steel for the Brinell, Rockwell B, Rockwell C and Vickers scales.

Brinell Hardness (HB)	Rockwell (HRC)	Rockwell (HRB)	Vickers (HV)	Tensile Strength (N/mm²)
3000 kg 10 mm Ball	150 kg Diamond	100 kg 1/16-inch Ball	Diamond 120 kg	Approx.
800	72			
745	68			
695	64			
641	61			
592	57		727	
552	55		649	
504	52	118	549	
456	48	116	490	1569
402	43	114	424	1390
348	38	110	361	1187
300	32	107	303	1020
255	26	102	258	870
203	16	94	201	680
154	1	82	152	515
105		62	112	378



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METALLOGRAPHIC MICROSCOPY

IM-3000B INVERTED METALLURGICAL MICROSCOPE



IM-3000B Microscope

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IM-3000B Microscope

- Basic Metallographic Microscope
 - Brightfield Illumination
 - Polarized Light Illumination
- 5 position turret for 4.5X, 10X, 20X, 50X and 100X Infinite Plan Achromatic Objectives
- Dual widefield eyepieces
- Mechanical X-Y stage control
- Bright Halogen Light Source
- Multiple camera ports
- Robust and durable design
- Economical Basic Metallurgical Microscope

IM-5000 INVERTED METALLURGICAL MICROSCOPE



IM-5000 Microscope

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IM-5000 Microscope

- Powerful Metallographic Microscope
 - Brightfield Illumination
 - Darkfield Illumination
 - Polarized Light
 - Differential Interference Contrast (DIC) Illumination
- 5 position turret for 5X, 10X, 20X, 50X and 100X DIC Objectives
- Dual widefield eyepieces
- Mechanical X-Y stage control
- Bright Halogen Light Source
- Multiple camera ports
- Robust and durable design
- Economical High Performance Metallurgical Microscope

METALLOGRAPHIC MICROSCOPES

IM-3000B Brightfield Metallographic Microscope

2

year warranty
Limited Warranty

FEATURE	IM-3000B DESCRIPTION
Illumination Techniques	Brightfield and Polarized Light
Objectives:	Infinite Plan Achromatic 4.5X/0.1 Infinite Plan Achromatic 10X/0.25 Infinite Plan Achromatic 20X/0.4 Infinite Plan Achromatic 50X/0.75 Infinite Plan Achromatic 100X/0.90
Eyepiece:	Wide field WF 10X (field no. 22 mm)
Trinocular Head:	Trinocular, 45 degree inclination ratio Observation: 80%, photo 20%
Focusing System:	Coaxial coarse/fine focus (2 micron) Travel (stage to focal plane) up 1 mm, down 7 mm
Nosepiece:	Quintuple
Mechanical Stage:	X-Y stage Travel range: 1.6 x 1.6-inches (40 x 40 mm) Size: 8.9 x 7-inch (226 x 178 mm)
Illumination:	12V/50W Halogen Lamp
Color Filters:	Grey, Blue, Green color filters & ground glass
Electrical Specification	110V/220V (50/60 Hz) (single phase)

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IM-3000B Infinite Plan Achromatic Objectives

IM-5000 Brightfield, Darkfield & DIC Microscope

2

year warranty
Limited Warranty

FEATURE	IM-5000 DESCRIPTION
Illumination Techniques	Brightfield, Darkfield, Polarized Light & Differential Interference contrast (DIC)
Objectives:	PL L5X/0.12 BD (working distance 10 mm) PL L10X/0.25 BD (working distance 10 mm) PL L20/0.40 BD (working distance 5 mm) PL L50X/0.70 BD (working distance 1.3 mm) PL L100X/0.90 BD (working distance 0.7 mm)
Eyepiece:	Wide field WF 10X (field no. 22 mm)
Trinocular Head:	Trinocular, 45 degree inclination ratio Observation: 80%, photo 20%
Focusing System:	Coaxial coarse/fine focus (2 micron) Travel (stage to focal plane) up 1 mm, down 7 mm
Nosepiece:	Quintuple
Mechanical Stage:	X-Y stage Travel range: 1.6 x 1.6-inches (40 x 40 mm) Size: 8.9 x 7-inch (226 x 178 mm)
Illumination:	12V/50W Halogen Lamp
Color Filters:	Grey, Blue, Green color filters & ground glass
Electrical Specification	110V/220V (50/60 Hz) (single phase)



IM-5000 Objectives



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2014/30/EU Electromagnetic Compatibility Directive

STEREO MICROSCOPES

ZMS0745T STEREO METALLURGICAL MICROSCOPE



ZMS0745T Microscope

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ZMS0745T Stereo Microscope

- Stereo imaging for better 3-dimensional viewing (excellent for weld analysis)
- Dual eyepieces
- 10X zoom
- High depth of focus
- X-Y stage (optional)
- Trinocular head for camera attachment
- Robust and durable design
- Economical Stereographic Metallurgical Microscope

VM-100 DIGITAL STEREO MICROSCOPE



VM-100 Microscope

VM-500-PLUS DIGITAL STEREO MICROSCOPE



VM-500-PLUS Microscope

NEW

VM-500-PLUS Digital Stereo Microscope

- Digital High Resolution Stereo Microscope
- Auto Focus
- Photo and video recording capability
- Built-in zoom
- Unit includes monitor
- Adjustable bottom and top LED illumination
- Includes built-in measuring software
- Robust and durable design

ZMSO7475T Stereo Metallographic Microscope

2

year warranty
Limited Warranty

FEATURE	ZMSO745T DESCRIPTION	ACCESSORIES	CATALOG NUMBER
Illumination Techniques	Oblique Illumination	Eyepieces: SWH10X/23mm SWH15X/17mm SWH20X/14mm	416-101 416-151 416-201
Total Magnification	7-45X (with 10X eyepieces)	Magnifiers: 0.37X magnifying objective 0.5X magnifying objective 0.7X magnifying objective 1.5X magnifying objective 2X magnifying objective	416-311 416-321 416-331 416-341 416-351
Eyepiece Options	10X (standard), 15X and/or 20X (optional)	Digital camera	CAM-31 or CAM-91
Trinocular Head	Inclined 45 degrees from main body (360 degree rotation)	1X CCD adapter	417-101
Diopter Adjustment	+/- 6 degrees	4-Division LED Lightsouce (ML-144D)	413-136
Interpupillary Adjustment	2 ~ 3-inch (52 ~ 76 mm)	Fiber optic light source (150 W)	413-227
Focus Range	3-inch (76 mm)	Mechanical stage with X-Y micrometers	419-162
Stage Size	5-inch (125 mm)		
Color Filters:	Grey, Blue, Green color filters & ground glass		
Catalog Number	ZMSO745T		

VM Digital Stereo Metallographic Microscope

2

year warranty
Limited Warranty

FEATURE	VM-100 DESCRIPTION	VM-500-PLUS DESCRIPTION
Illumination Techniques	Oblique Illumination	Oblique Illumination with Auto Focus
Optical Objective	0.7 X ~ 4.5X Horizontal zoom lens (Zoom ratio: 6.5:1)	0.7 X ~ 4.5X Horizontal zoom lens (Zoom ratio: 6.5:1)
Camera Parameter	2 million pixel (1920 x 1080) Image size: 1/2.86-inch Frames per second: 30 fps	2 million pixel (1920 x 1080) Image size: 1/2.86-inch Frames per second: 1080P@60 fps
Measuring Function	<ul style="list-style-type: none"> White balance, brightness control, digital noise reduction Photograph and video recording VGA/USB Out put, SD card storage Cross hairline, Picture frozen, 10 X digital magnification 	<ul style="list-style-type: none"> White balance, brightness control, digital noise reduction Photograph and video recording VGA/USB Out put, Cross hairline, Picture frozen, 10 X digital magnification
Measuring Function	Optional PC System and measuring software can measure image in field of view	Linear dimensions such as distance, perimeter, area, angle, radian, width, height, and radius elements are measured
Interpupillary Adjustment	2 ~ 3-inch (52 ~ 76 mm)	
Microscope Stand	Z-axis Travel: 6-inch (150 mm), Coarse/fine lifting system	Z-axis Travel: 4-inch (100 mm), Coarse/fine lifting system
Electrical Parameters	90~240 V; 50~60 Hz	90~240 V; 50~60 Hz
Dimensions (W x D x H)	11.4 x 11 x 15.7 inches (290 x 280 x 400 mm)	14.8 x 11.2 x 19.7 inches (375 x 285 x 500 mm)
Weight	10 lbs (4.7 kg)	14 lbs (6.5 kg)
Catalog Number	VM-100	VM-500-PLUS



EN 61000-1:2010, EN 61000-3-3:2013
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

IMAGE ANALYSIS SOFTWARE

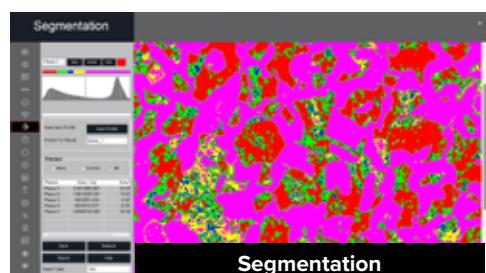
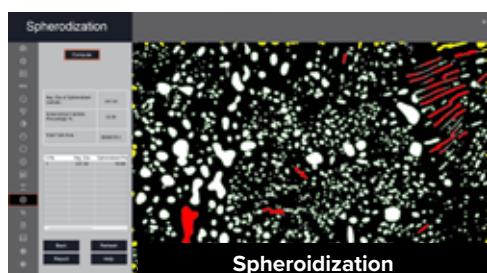
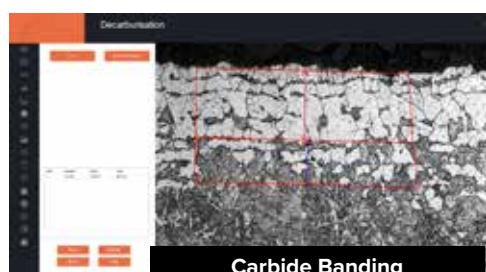
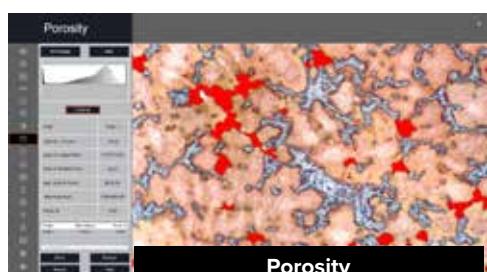
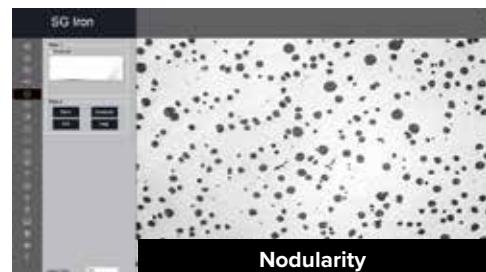
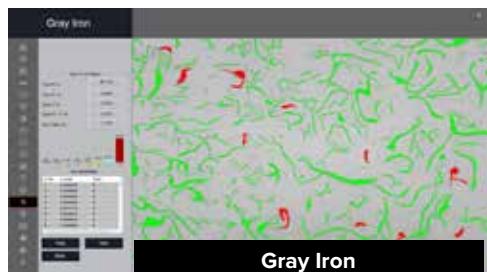
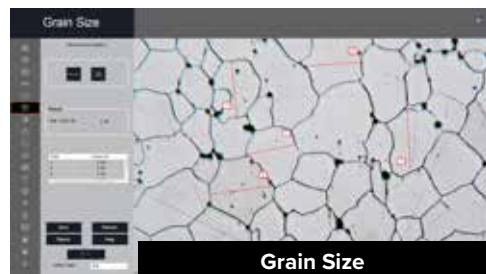
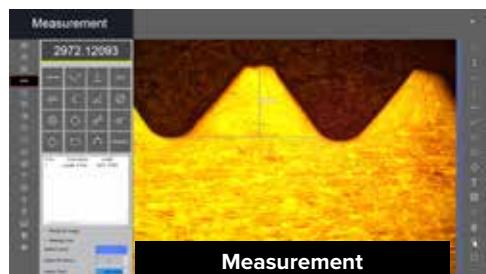
MATERIALS PLUS

- Metallographic Image Analysis Modules
- Basic Measurements
- Grain Size
- Gray Iron
- Spheroidal or Ductile Gray Iron
- Carbide
- Porosity
- Inclusion Rating
- Coating Thickness
- Spheroidization
- Decarburization
- Segmentation
- DAS - Dendritic Spacing
- Stitching



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METALLOGRAPHIC SOFTWARE

Measurement Modules

MODULE	MEASUREMENT	MEASUREMENT BASIS	ICON / web link
Measurement	Manually draw lines on traces, shapes	Straight length, angle, curved length, width, area, radius, perimeter, area by keyboard	 MEASUREMENT
Grain Size	Heyn lineal intercept procedure, Abrams Three-Circle Procedure, Random Line Intersection Methods, Jeffries Planimetric Method, Comparison Procedure Method	ASTM E112	 GRAIN SIZE
Gray Iron	Graphite flakes are described by the type and distribution of graphite in cast iron with the following three classifications: Type VII for graphite form, A-E distribution of graphite and graphite size (1-largest to 8-smallest)	ASTM A-247	 GRAY IRON
SG Iron	Nodularity describes the type and distribution of graphite in cast iron with the following three classifications: Types I-VI for graphite form, A-E distribution of graphite and graphite size (1-largest to 8-smallest)	ASTM A-247-67	 SG IRON
Carbide Banding	Estimates the amount of iron carbide or cementation in steels and cast irons. Carbide is measured as a volume fraction	ASTM E562 & E1245	 CARBIDE BANDING
Porosity	Porosity are voids in the material caused by entrapped air and incomplete or poor sintering. Porosity can be measured as a volume fraction	ASTM E562 & E1245	 POROSITY
Inclusion	Characterizes the type, size and severity of the inclusion in wrought steel. The types include: SULFIDE (A TYPE), ALUMINA (B TYPE) SILICATE (C TYPE), GLOBULAR (D TYPE). Size is characterized as H-heavy or T-thin. Severity Level is based on the number or length	ASTM E45	 INCLUSION
Coating Thickness	Measures a coating thickness after cross sectioning the specimen	ASTM B487	 COATING THICKNESS
Spheroidization	Nodules acquire blue color and non-nodules are set to a red color. Nodules are designated by Roman numbers from I to VI and by size using Arabic numbers 1 to 8. The results are reported along with the calculated nodules/sq mm	ASTM A892	 SPHEROIDIZATION
Decarburization	Decarburization is the loss of carbon at the metal surface due to chemical reaction(s) with the contacting media. The analysis estimates the average or greatest depth of decarburization in hardened or non-hardened steel products	ASTM E1077	 DECARBURIZATION
Segmentation or Phase Analysis	Phases are defined as physically homogenous and distinct constituents of the material. The phases are partitioned or segmented based on the intensity / gray scale of the various constituents and are characterized and measured using area or volume fraction measurements	ASTM E562 & E1245	 SEGMENTATION
DAS (Dendrites)	Dendritic Arm Spacing (DAS) measures the mean spacing, minimum and maximum spacing as well as the standard distribution.		 DENDRITES
Stitching	Stitching is the process of combining multiple images together for higher magnification analysis over a larger area. For example, this would be very useful for analyzing the thickness of a thin coating over a larger range.		 STITCHING

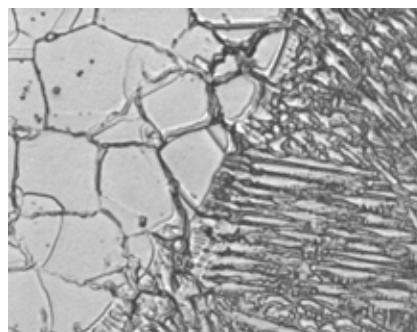
WELD CHECK & HARDNESS PRO SOFTWARE

WELD CHECK

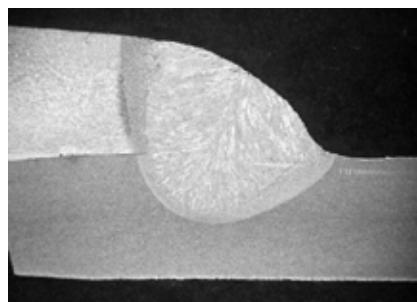
- Welding Features
- Leg Lengths
- Depth of Penetration
- Throat Height
- Root size
- Angle measurements
- Plate thickness and % weld penetration
- Toe undercut
- Face and Root reinforcement thickness

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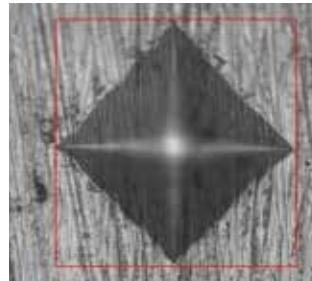
Inconel 625 Weld, 500X (B.F.),
INCONEL Etch for a few seconds



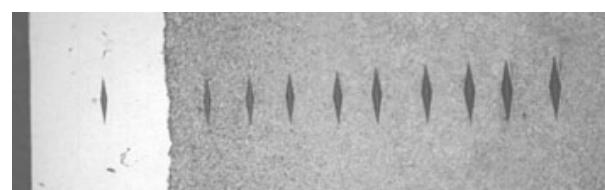
Plain Carbon Steel Weld, 50X (B.F.),
2% Nital for a few seconds

HARDNESS PRO

- Automatic or Interactive measurement of Vickers, Knoop and Brinell Indents
- Manual measurement on live image or acquired image
- Automated calculation of the best circumference minimizes the average quadratic error
- Image acquisition in high resolution 64-bit Colors
- In the event, that the automatic measurement fails, the program offers the possibility to manually measure through the acquisition of three points in Brinell, D1 and D2 in Vickers and Simple L in Knoop
- Accuracy up to 0.001 µm
- Multi-field analysis
- Case Hardness depth (CHD) measurement is automatic



Vickers indent

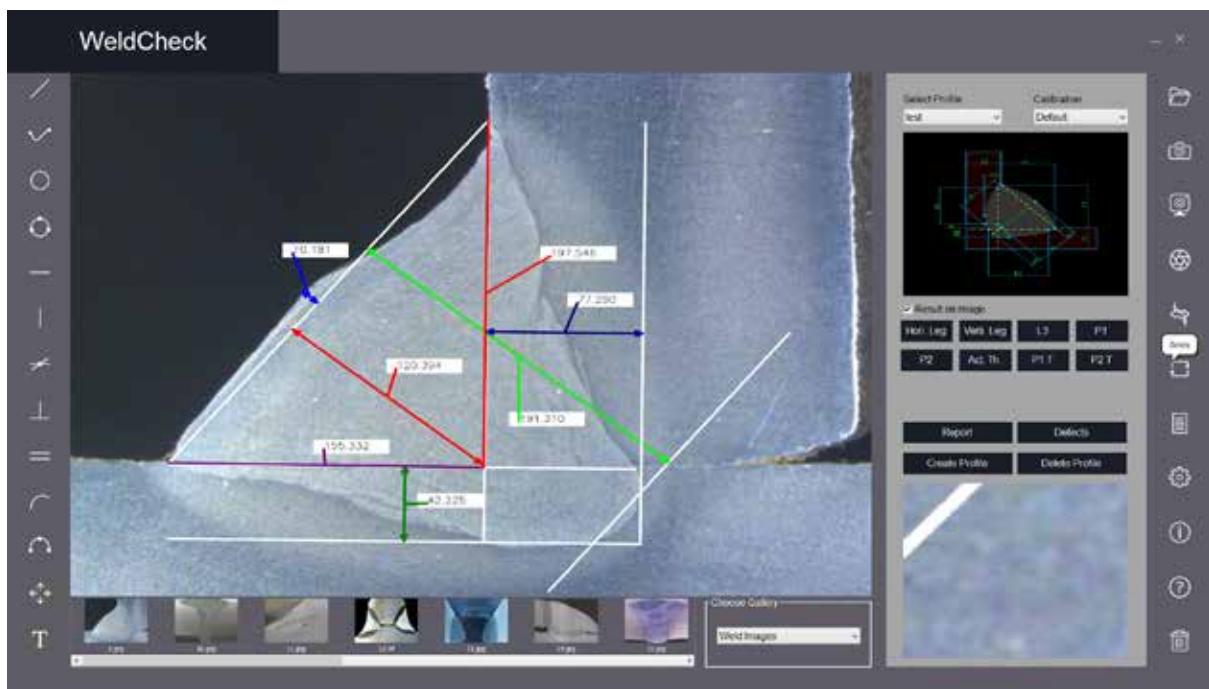


Knoop Indent

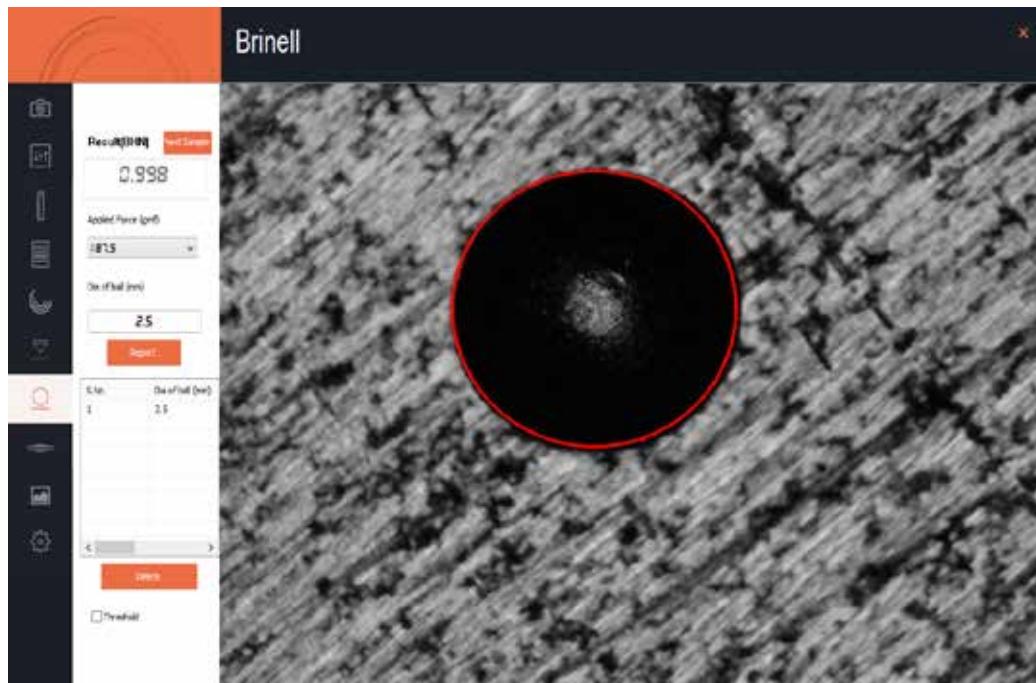
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WELD CHECK Measurement Module



HARDNESS PRO Measurement Module



LABORATORY FURNITURE

SPECIMEN STORAGE CABINET



SPEC-STORE

LABORATORY SAFETY CABINETS



CAB-C

CAB-F

LABORATORY FUME HOOD



FUME-HOOD

SPEC-STORE

- Removable and interchangeable trays so the user can design the cabinet's interior to their personalized needs
- Trays store 1-inch, 1.25-inch, 1.5 inch or 2-inch diameter specimens (sold separately)
- User can remove trays from a drawer to store polishing pads if desired
- Robust and durable design

SAFETY CABINETS

- Heavy Duty Steel Cabinets
- Yellow Ventilated Flammable Cabinet
- Blue Ventilated Chemical Cabinet
- Corrosion resistant shelves
- Robust and durable design

FUME HOOD

- Digital feedback speed control
- LED speed display
- Easy to use
- Flexible
- Ideal for all materials
- User friendly
- Easy service access
- Sink with water tap
- Built-in plumbing for air/gas
- Large storage cabinet
- Built-in 110 VAC outlets
- Robust and durable design

Specimen Storage Cabinet

DESCRIPTION	SPECIFICATIONS
Cabinet	Specimen Storage
Drawers / Shelves	10 stainless steel drawers
Specimen spacer trays (2 per drawer)	1-inch and 25 mm - 50 mounts/tray 1.25-inch and 30 mm - 45 mounts/tray 1.5-inch - 28 mounts/tray 40 mm - 28 mounts/tray 2-inch and 50 mm - 18 mounts/tray
Dimensions (WxDxH)	21.75 x 18 x 27-inches (552 x 470 x 686 mm)
Weight	100 lbs (46 kgs)
Catalog Number	SPEC-STORE

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Safety Storage Cabinets

CABINET	CHEMICAL	FLAMMABLE
Dimensions (WxDxH)	43 x 18 x 44-inches (1092 x 457 x 1118 mm)	43 x 18 x 65-inches (1092 x 457 x 1651 mm)
Weight	220 lbs (100 kg)	304 lbs (140 kg)
Color	Blue	Yellow
Catalog Number	CAB-C	CAB-F

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Fume Hood

DESCRIPTION	SPECIFICATIONS
Overall Dimensions (WxDxH)	47.2 x 32 x 118-inches (1200 x 810 x 3000 mm)
Chamber Dimensions (WxDxH)	37 x 26 x 47-inches (940 x 660 x 1200 mm)
Sink Dimensions (WxDxH)	4.25 x 8.75 x 4.75-inches (120 x 220 x 120 mm)
Electrical Specification	110V
Weight	540 lbs (245 kg)
Catalog Number	FUME-HOOD

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LABORATORY BENCHES

MEGA ABRASIVE CUTTER BENCH

LABORATORY EQUIPMENT BENCHES

MICROSCOPE BENCHES

WALL CABINET



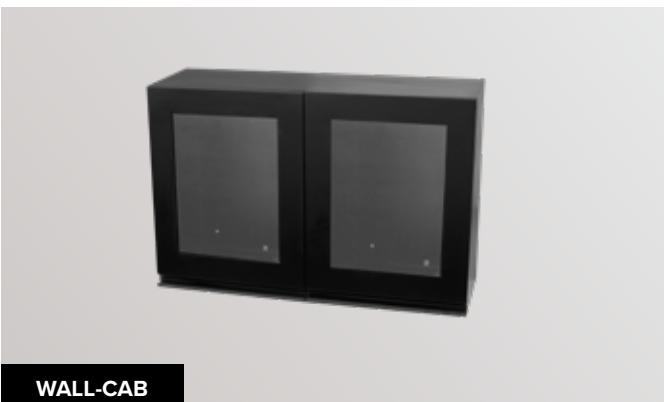
MEGA-BENCH



BENCHES



MBENCHES



WALL-CAB

MEGA-BENCH

- One drawer and double door cabinet
- Can support up to 661 lbs (300 kgs)
- Engineered to support the MEGA bench top abrasive cutters
- Optional replaceable protective bench cover available
- Robust and durable design

LAB EQUIPMENT BENCHES

- Designed to fit with one another or stand-alone
- Double door cabinets and single drawer on the S-Benches and D-Benches, one cabinet on the C-bench
- Supports up to 661 lbs (300 kgs)
- Optional replaceable protective bench covers and back panels available
- Robust and durable design

MICROSCOPE BENCHES

- Excellent for microscopes and microhardness testers
- Designed to include chair access
- Optional replaceable protective bench covers and back panels available
- Robust and durable design

Wall Cabinets

- Excellent for storage of metallographic consumables
- Robust and durable design

MEGA Abrasive Cutter Bench

DESCRIPTION	SPECIFICATIONS
Cabinet	Designed for MEGA Abrasive Cutters
Dimensions (WxDxH)	39.4 x 29.5 x 33.5-inches (1000 x 750 x 851 mm)
Weight	133 lbs (60 kg)
Catalog Number	MEGA-T2-BENCH & MEGA-T3-BENCH

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Laboratory Equipment Benches

DESCRIPTION	SPECIFICATIONS		
Cabinet	Short Equipment Bench	Long Equipment Bench	Corner Bench
Dimensions (WxDxH)	39.25 x 29.5 x 33.5 -inches (997 x 749 x 851 mm)	78.75 x 29.5 x 33.5-inches (2000 x 749 x 851 mm)	55.5 x 48.75 x 33.5 (1388 x 1238 x 851 mm)
Weight	153 lbs (70 kg)	297 lbs (135 kg)	120 lbs (55 kg)
Catalog Number	S-BENCH	D-BENCH	C-BENCH

Microscope Benches

DESCRIPTION	SPECIFICATIONS	
Cabinet	Short Microscope Bench	Long Microscope Bench
Dimensions (WxDxH)	78 x 29.5 x 33.5 -inches (2000 x 749 x 851 mm)	103 x 29.5 x 33.5-inches (2610 x 749 x 851 mm)
Weight	153 lbs (70 kg)	337 lbs (153 kg)
Catalog Number	S-MBENCH	D-MBENCH

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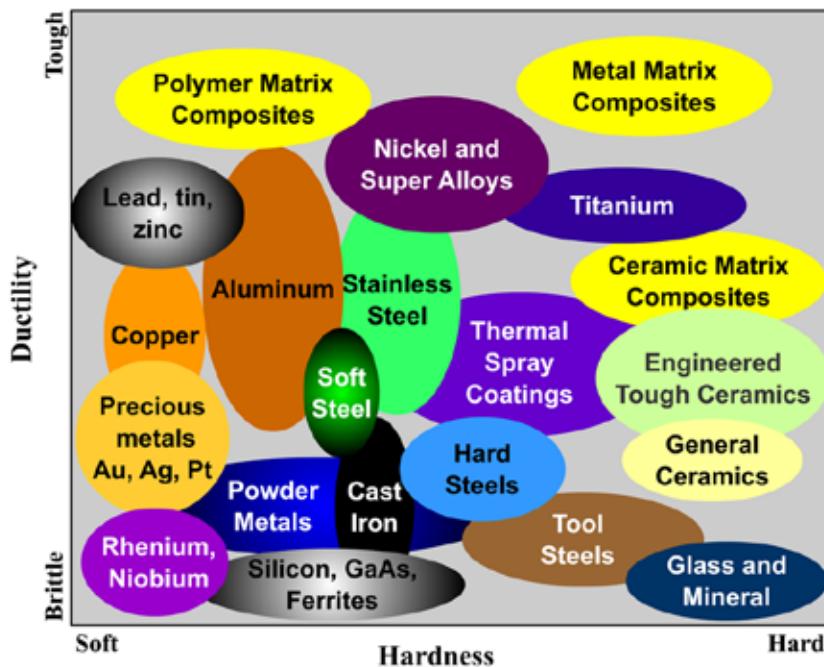
Wall Cabinets

DESCRIPTION	SPECIFICATIONS
Dimensions (WxDxH)	35 x 12 x 24-inches (900 x 300 x 600 mm)
Weight	55 lbs (25 kg)
Catalog Number	WAL-CAB

METALLOGRAPHIC PROCEDURES

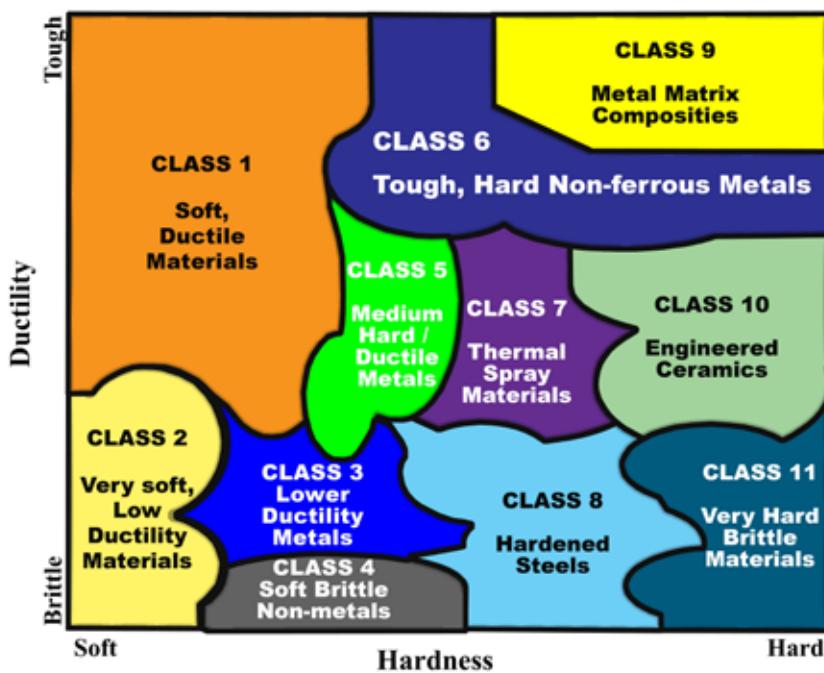
SAMPLE PREPARATION BASICS:

Metallographic specimen preparation requires a knowledge of the specimen properties, the most important characteristics being hardness and ductility of the metallographic specimen. Based on these material properties, the proper metallographic consumables and equipment parameters can be determined. The following charts plot the relative hardness and ductility for most metallographic materials.



SAMPLE PREPARATION CLASSES:

From this chart the hardness / ductility is categorized into eleven different classes. Each of these classes then represents a sample preparation method based on the mechanical properties of the material.



Class	Materials	Overview
CLASS 1	Soft, ductile materials (e.g. aluminum, copper, lead, tin, zinc, PMCs)	Relatively easy to prepare most materials in this Class with the use of alumina abrasives and 1-2 polishing steps
CLASS 2	Very soft, low ductility materials (e.g. rhenium, niobium, gold, silver)	Can be difficult to prepare because these materials are very soft and abrasives can become embedded into the specimen
CLASS 3	Low ductility metals (e.g. powder metals and cast irons)	Initial grinding with SiC abrasives is recommended, however, rough polishing must minimize pull-out
CLASS 4	Soft, brittle nonmetals (e.g. silicon, GaAs, electronic devices, ferrites)	Subsurface damage must be minimized in cutting, grinding and polishing of these materials. This requires the proper selection and application of the abrasive
CLASS 5	Medium hard, ductile metals (e.g. soft steels, stainless steels)	Relatively easy to prepare most materials in this Class with the use of SiC abrasives and 1-2 polishing steps
CLASS 6	Tough, hard, non-ferrous metals (e.g. super alloys, titanium)	Relatively easy to prepare most materials in this Class with the use of SiC abrasives and 1-2 polishing steps
CLASS 7	Thermal spray materials	Can pose significant preparation challenges depending upon the properties of the coating. See specific preparation procedures
CLASS 8	Hardened steels (e.g. high carbon and tool steels)	Relatively easy to prepare most materials in this Class with the use of SiC abrasives and 1-2 polishing steps
CLASS 9	Metal Matrix Composites	Very dependent upon both the matrix and filler materials properties. See specific preparation procedures
CLASS 10	Engineered Ceramics (e.g. zirconia, silicon nitride)	Successful preparation is typically accomplished with colloidal silica by CMP polishing
CLASS 11	Very hard, brittle materials (e.g. glass, minerals, CERMETS)	Minimize initial damage and use CMP polishing with colloidal silica abrasives



PROCEDURE RECOMMENDATIONS

CLASS 1 - Ductile Materials

Examples include aluminum, copper, tin, lead, zinc and polymer matrix composites (PMC's).

Description:

CLASS 1 materials are relatively soft materials which have a wide range of industrial uses.

Preparation Challenges:

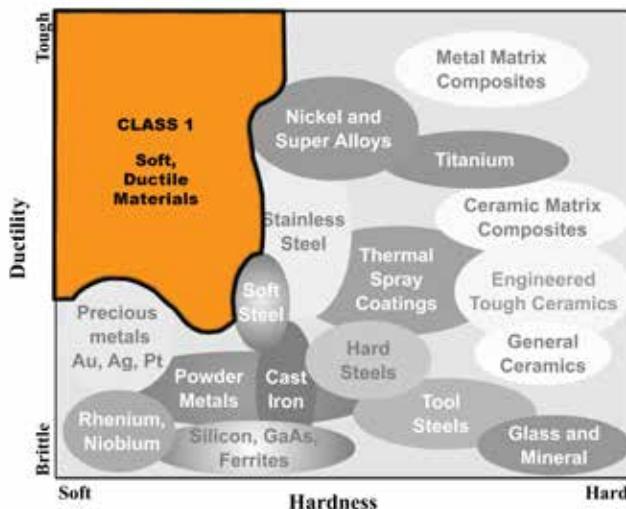
The difficulty in preparing these materials arises from the fact that these materials are very soft and often have oxide inclusions (aluminum and copper). Proper specimen preparation minimizes abrasive embedding and retains the specimen oxides, thus eliminating scratching and smearing. If the specimen is not prepared properly, the microstructure will not be accurately represented.

Sectioning:

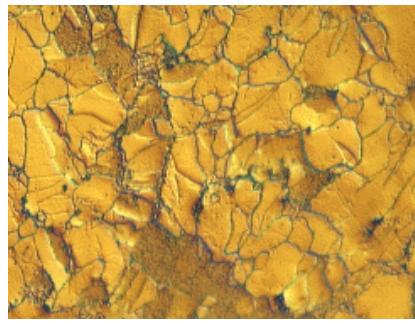
MAXCUT abrasive blade (MAX-C or MAX-E series)

Mounting:

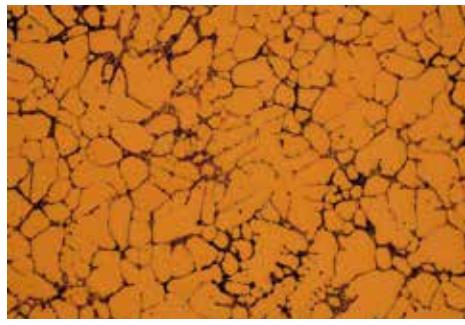
Compression mounting with Phenolic, Epoxy or Diallyl Phthalate compression mounting resins



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
P120 grit ALO paper P240 grit ALO paper	Water	5-10 lbs	100/100	Planar 1 min.	Off Off	N/A	
P500 grit ALO paper P1200 grit ALO paper	Water	5-10 lbs	100/100	1 min. 1 min.	Off Off		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	100/100	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on NAPPAD polishing pad	-	5-10 lbs	100/100	1 min.	15 seconds / 5 seconds		



Pure zinc, 100X (DIC), Etchant 10 grams NaOH in 100 ml D.I. water for 5 seconds



Tough Pitch Copper, 100X (B.F.), Etchant NH4OH/H2O2 for 5 seconds

CLASS 2 - Very Soft, Ductile Materials

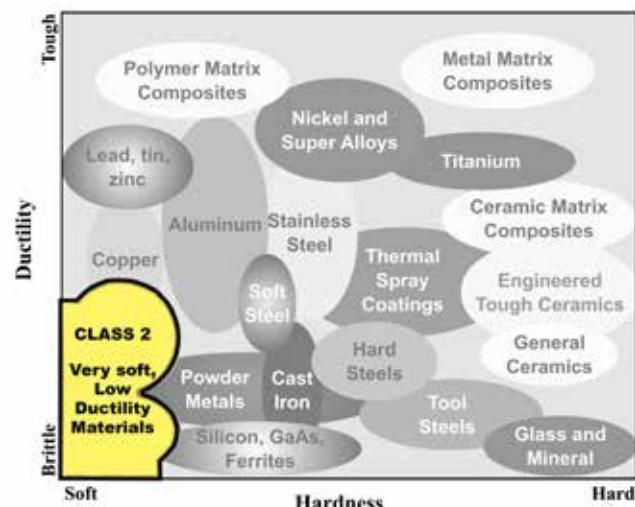
Examples include refractory metals (tungsten, rhenium, niobium, molybdenum), rare earths, precious metals.

Description:

CLASS 2 materials include refractory metals such as rhenium, niobium and tungsten which have very high melting temperatures; however, they are typically very soft and require the same specimen preparation considerations as other very soft metals.

Preparation Challenges:

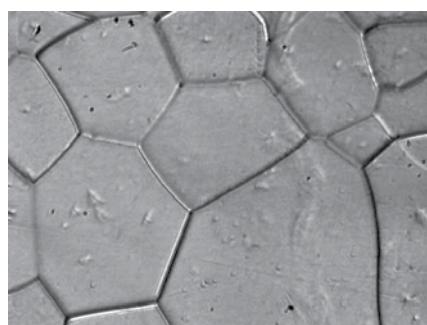
For very soft materials, any loose or fractured abrasive particles can become easily embedded. This makes specimen preparation very difficult because it gums up diamond grinding disks or the specimen can become embedded with fractured SiC particles when ground with SiC papers. The key to preparation of these materials is to use tougher alumina abrasives and to chemically etch the specimen in-between each grinding step. The purpose of etching is to remove the embedded particles so as not to carry them over to the next grinding step as contamination.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
P120 grit ALO paper P240 grit ALO paper	Water	5-10 lbs	100/100	Planar 1 min.	Off Off	N/A	
P500 grit ALO paper P1200 grit ALO paper	Water	5-10 lbs	100/100	1 min. 1 min.	Off Off		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	100/100	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on MICROPAD polishing pad	-	5-10 lbs	100/100	1 min.	15 seconds / 5 seconds		



99.9% Silver, etched with ammonia peroxide, 200X B.F



Rhenium (BF), etched

PROCEDURE RECOMMENDATIONS

CLASS 3 - Lower Ductility Metals

Examples of lower ductility metals include powder metals and cast iron.

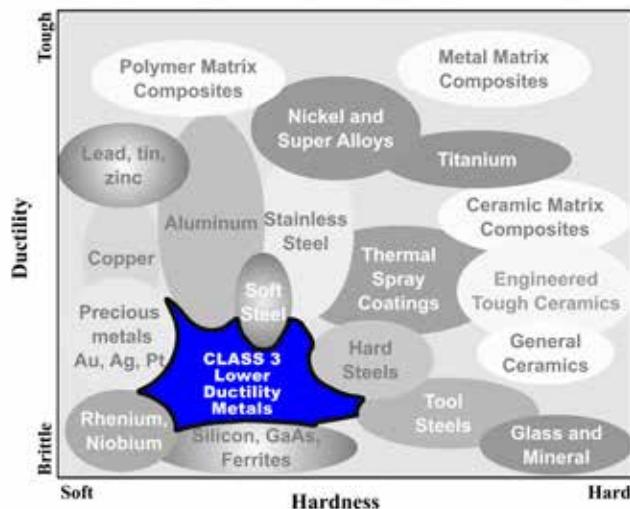
Description:

Powder metallurgy is an example of a CLASS 3 low ductility materials which is a very useful manufacturing process for parts designed with hard-to-machine geometries. The process includes pressing a metal powder into its shape and then sintering it just below the melting temperature of the alloy.

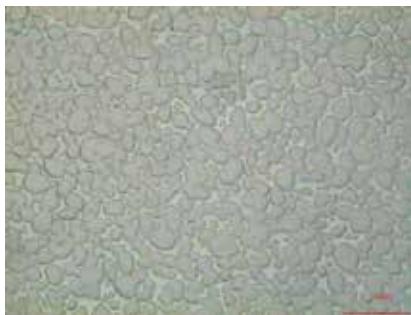
Preparation Challenges:

The metallographic specimen preparation of powder metallurgy samples is affected by the specimen's composition, packing and sintering conditions. Microstructural features of interest include: porosity, grain size, inclusions and orientation of voids. Proper metallurgical preparation takes into account that the microstructure may be porous and perhaps somewhat brittle due to inadequate sintering conditions.

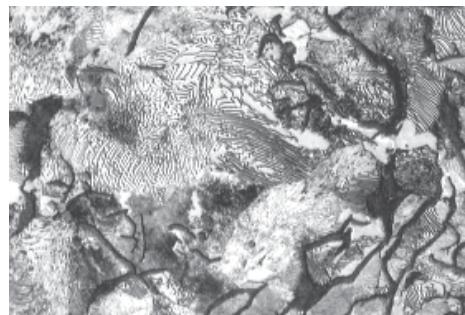
Vacuum impregnation is often used to support voids and porosity before initial grinding. In addition, metal smeared into pores can be removed by an intermediate etch in-between polishing steps.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
120 grit SiC paper 240 grit SiC paper	Water	5-10 lbs	200/200	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper 800 grit SiC paper 1200 grit SiC paper	Water	5-10 lbs	200/200	1 min. 1 min. 1 min. 1 min.	Off Off Off Off		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on TRICOTE polishing pad	-	5-10 lbs	100/100	30 sec.	15 seconds / 5 seconds		



Tungsten refractory metal, 200X (DIC), etched with Murakami's reagent



Graphite cast iron, 2% nital etchant, 500X

CLASS 4 - Soft, Brittle Nonmetals (Electronics)

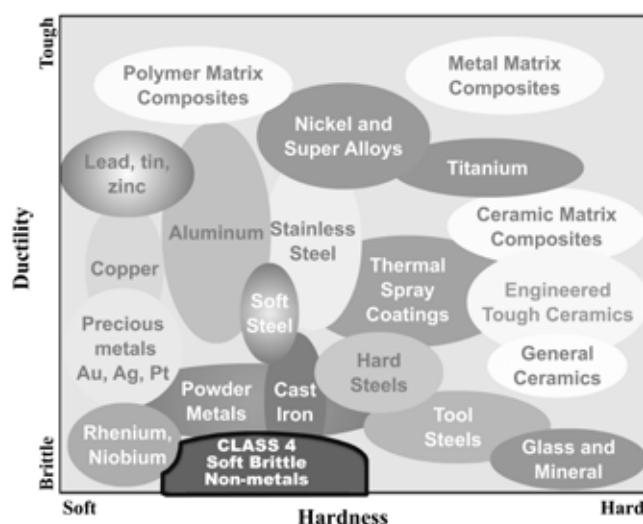
Examples include ceramic capacitors, silicon, GaAs, ferrites, PZT's, MEMS devices.

Description:

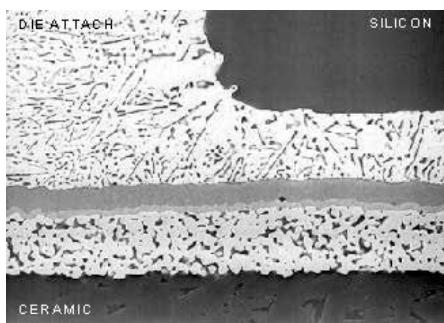
Ceramic capacitors are an example of a CLASS 4 softer more brittle types of material. These materials are typically very small, inexpensive devices used in cell phones, computers and other electronic products. MLC devices are constructed of alternating layers of metal and ceramic, with the ceramic material acting as the dielectric.

Preparation Challenges:

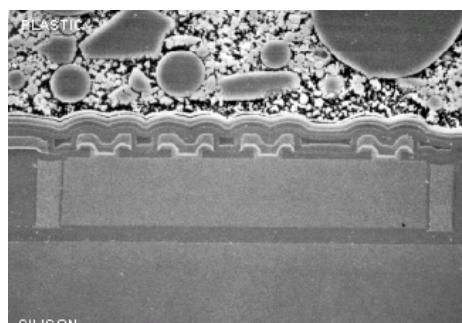
Microstructural analysis of a BaTiO₃ ceramic capacitor includes looking for missing metal layers, as well as examining for gaps and voids in the ceramic substrate. Microstructural preparation of multi-layer BaTiO₃ ceramic capacitors requires minimizing polishing relief and damage to the coating or ceramic substrate. This is accomplished by filling the existing voids with a castable resin under vacuum and then curing at a higher pressure. Initial grinding is required to open up the capacitor. The goal is to minimize microstructural damage at this step. Rough and final polishing are recommended on woven polishing pads using diamond and colloidal silica, respectively.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
30 micron Diamond Film 15 micron Diamond Film	POLYLUBE Diamond Extender	5-10 lbs	200/200	Planar 3 min.	Off Off	N/A	
9 micron Diamond Film 6 micron Diamond Film 3 micron Diamond Film	POLYLUBE Diamond Extender	5-10 lbs	200/200	2 min. 2 min. 2 min.	Off Off Off		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	1 min.	15 seconds / 3 seconds		
MICROPAD polishing pad	Colloidal Silica	5-10 lbs	200/200	30 sec.	15 seconds / 5 seconds		



Electronic die cross section



Electronic die cross section

PROCEDURE RECOMMENDATIONS

CLASS 5 -Medium Hard, Ductile Metals

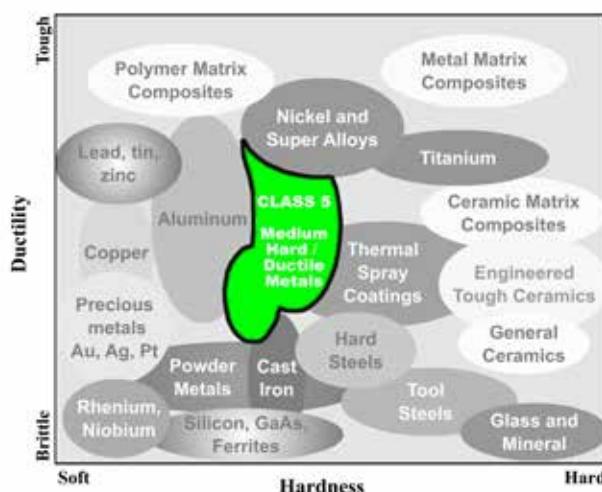
Examples include stainless steel, soft and medium hard steels.

Description:

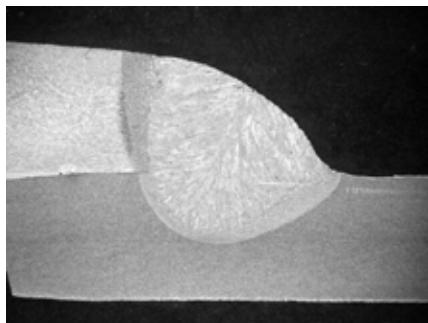
CLASS 5 steels are ferrous alloys of iron containing relatively low concentrations of carbon (<2%). Steels also have a wide range of properties due to their ability to be heat treated and annealed. Depending upon the carbon concentration and other alloying elements, the microstructure of steel can be modified by heating, quenching and stress relief (annealing). Common microstructures include pearlite and ferrite for slow cooled low carbon steels and martensite for fast cooled high carbon steels. Pearlite and ferrite are relatively soft and ductile, whereas martensite is hard and brittle.

Preparation Challenges:

Metallographic specimen preparation is relatively straight forward.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
120 grit SiC paper 240 grit SiC paper	Water	5-10 lbs	200/200	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper 800 grit SiC paper 1200 grit SiC paper	Water	5-10 lbs	200/200	1 min. 1 min. 1 min. 1 min.	Off Off Off Off		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on TRICOTE polishing pad	-	5-10 lbs	100/100	30 sec.	15 seconds / 5 seconds		



Carbon Steel Weld, mag. 50X, Etched 2% Nital



1018 Water Quenched steel, 400X (B.F.), etched with 2% nital, Structure is Bainite

CLASS 6 - Tough, Hard Nonferrous Metals

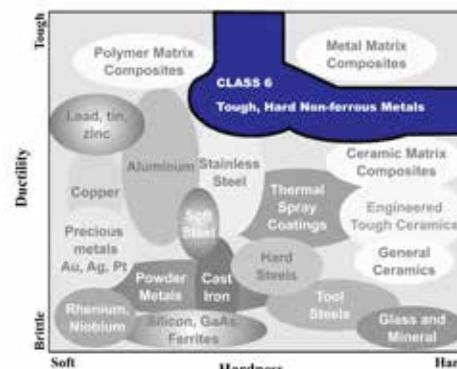
Examples include titanium, Inconel, Ni-Cr alloys, superalloys, nickel and cobalt alloys.

Description:

CLASS 6 materials include titanium alloys which are very useful because they have a good strength-to-weight ratio. This makes them ideal for use in areas ranging from aerospace to sports equipment.

Preparation Challenges:

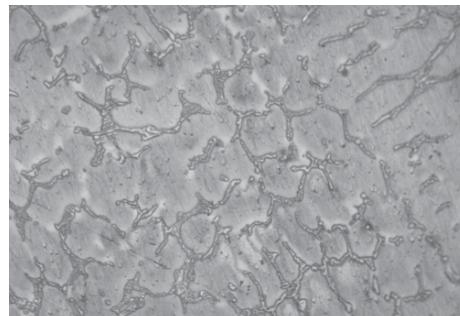
Metallographic preparation of titanium and titanium alloys is fairly straight forward by conventional metallographic techniques.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
120 grit SiC paper 240 grit SiC paper	Water	5-10 lbs	300/300	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper	Water	5-10 lbs	300/300	1 min. 1 min.	Off Off		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEXPAN polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on TRICOTE polishing pad	-	5-10 lbs	200/200	30 sec.	15 seconds / 5 seconds		



Fe-Ni-Co-Al Alloy, 400X (Polarized Light)



Inconel-625, Mag. 100X, Etchant-Carpenters

PROCEDURE RECOMMENDATIONS

CLASS 7 - Thermal Spray Materials

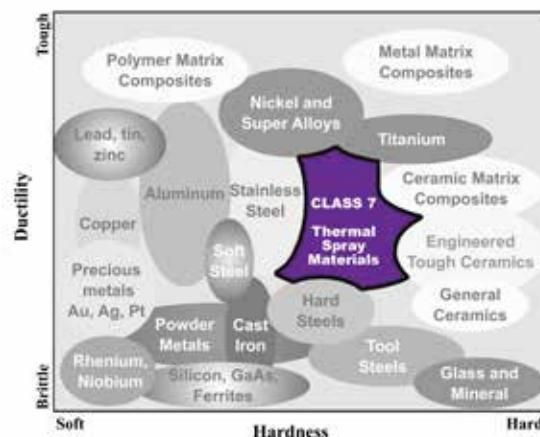
Examples include powder spray coatings, ceramic coatings, intermetallic coatings.

Description:

CLASS 7 Thermal spraying techniques are coating processes in which melted (or heated) materials are sprayed onto a surface. Thermal spraying can provide various coating thicknesses (20 microns to several mm) over a large area. Coating materials available for thermal spraying include metals, alloys, ceramics, plastics and composites.

Preparation Challenges:

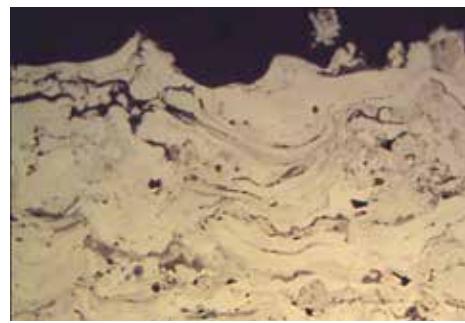
Metallographic preparation of thermal spray coatings can be tricky; however, minimizing damage and understanding the chemical and mechanical properties of the coating and substrate will greatly improve successful specimen preparation. Note for WC-Co coatings, the cobalt is reactive with water so final polishing with 0.25 micron diamond replaces traditional alumina water based suspensions/slurries.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
240 grit SiC paper	Water	5-10 lbs	200/200	Planar	Off	N/A	
320 grit SiC paper 400 grit SiC paper 600 grit SiC paper 800 grit SiC paper 1200 grit SiC paper	Water	5-10 lbs	200/200	1 min. 1 min. 1 min. 1 min. 1 min.	Off Off Off Off Off		
3 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	2 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on MICROPAD polishing pad	Vibratory Polishing			15-30 minutes			



Nickel Chrome Thermal Spray Coating, as polished, Mag 1000x (B.F.)



Nickel-Aluminum Thermal Spray Coating, as polished, Mag 500x (B.F.)

CLASS 8 - Hardened Steels

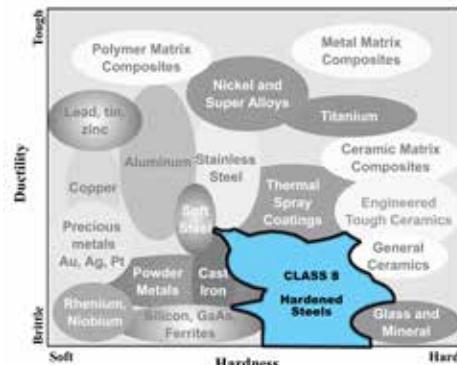
Examples include case hardened steels, tool steels, and through-hardened steels.

Description:

CLASS 8 Iron and steels play an important role in the world of structural and mechanical metals. Steel, in particular, is very useful because its hardness, wearability and toughness can be altered significantly by heat treating and annealing processes. Tool steels have high hardness ($Rc > 60$) and generally are used with alloying metals such as vanadium, molybdenum and manganese.

Preparation Challenges:

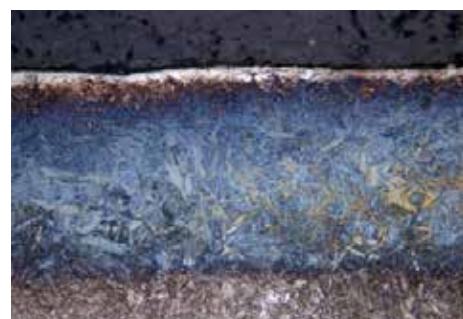
Metallographic specimen preparation is relatively straight forward.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
120 grit SiC paper 240 grit SiC paper	Water	5-10 lbs	300/300	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper	Water	5-10 lbs	300/300	1 min. 1 min.	Off Off		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEXPAN polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on NAPPAD polishing pad	-	5-10 lbs	200/200	30 sec.	15 seconds / 5 seconds		



1095 Steel, Water Quenched, etched with Picral, 1000X B.F. Martensite structure



Nitrided steel, 200X (BF), Etchant Picral

PROCEDURE RECOMMENDATIONS

CLASS 9 - Metal Matrix Composites

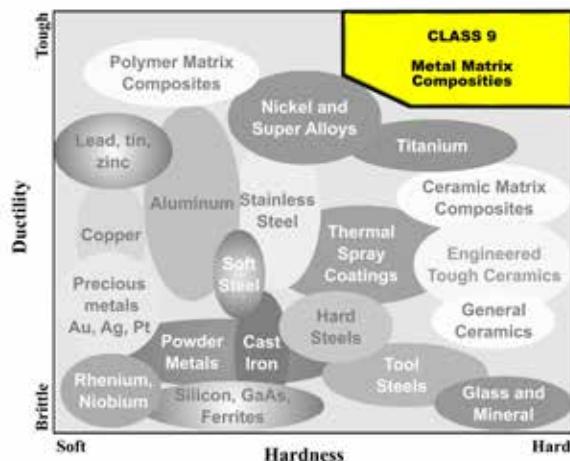
Examples include ceramic fibers in a metal matrix and/or ceramic particles in a metal matrix.

Description:

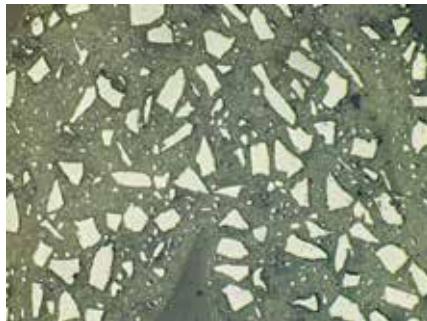
CLASS 9 Metal matrix composite applications have been found in high performance sporting goods and high performance military applications. They are primarily used to combine the hardness and energy absorbing characteristics of the ceramic with the bonding and ductility characteristics of the metal.

Preparation Challenges:

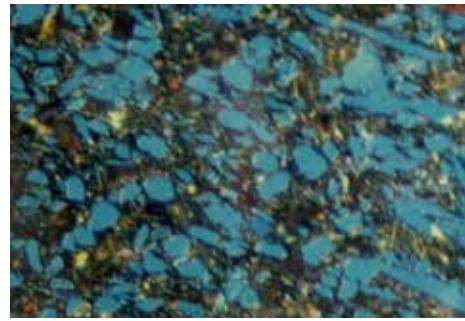
Hard particles in a metal matrix can be difficult to microstructurally prepare because of particle pull-out, as well as excessive polishing relief between the hard particles and the softer matrix.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
75 micron diamond grinding disk	Water	5-10 lbs	300/300	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Metal Mesh cloth	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
3 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		



SiC particles in an Aluminum Matrix, 400X (DIC)



Zirconium Diboride particles in a Titanium Matrix Etched, 1000X (DIC)

CLASS 10 - Engineered Ceramics

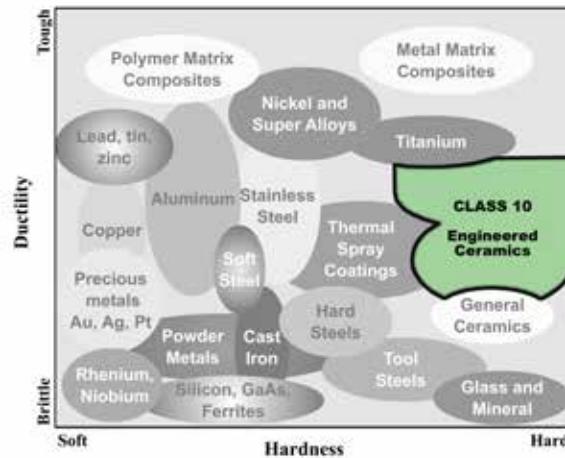
Examples include silicon nitride, zirconia, SiSiC, silicon carbide, boron carbide, alumina and ceramic matrix composites

Description:

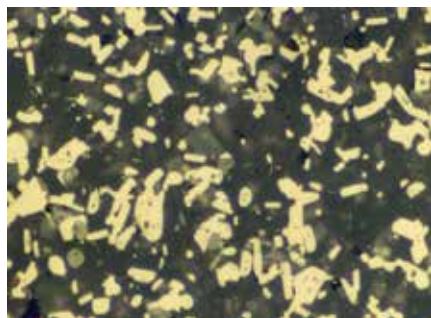
CLASS 10 Engineered ceramics have found increasing applications for high temperature, corrosion resistance, low wearability and a number of other applications. An example of a CLASS 10 specimen preparation technique is for aluminum oxynitride (AlON) which is a ceramic composed of aluminum, oxygen and nitrogen. It is a semi-transparent ceramic that is harder than glass.

Preparation Challenges:

Engineered ceramics are very hard therefore specimen preparation procedures generally require a CMP (chemical mechanical polishing) component to remove induced microstructural damage. When examining the surface, it is recommended that a sputter coating be used to increase surface reflectivity.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
75 micron diamond grinding disk	Water	5-10 lbs	300/300	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Metal Mesh cloth	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEX PAN polishing pad	SIAMAT colloidal silica	10 lbs	300/300	5 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	SIAMAT colloidal silica	10 lbs	300/300	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEX PAN polishing pad	-	10 lbs	300/300	5 min.	15 seconds / 3 seconds		



AlON ceramic, B.F. 1000x (as polished)



SiAlON ceramic, etched in molten KOH, Mag 20 KX

PROCEDURE RECOMMENDATIONS

CLASS 11 - Very Hard Hard Brittle Materials & CERMETS

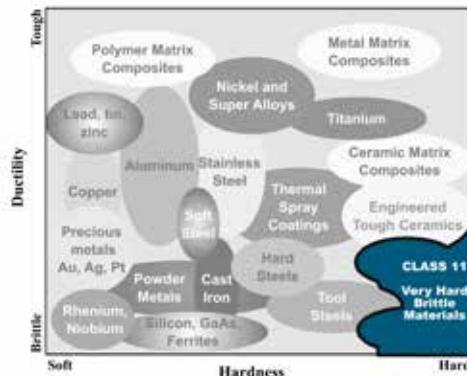
Examples include cermets such as tungsten carbide, glass and minerals.

Description:

CLASS 11 CERMETS, glass and minerals are typically very hard. CERMETS are typically very wear resistant and very tough materials, whereas minerals and glass tend to be more brittle.

Preparation Challenges:

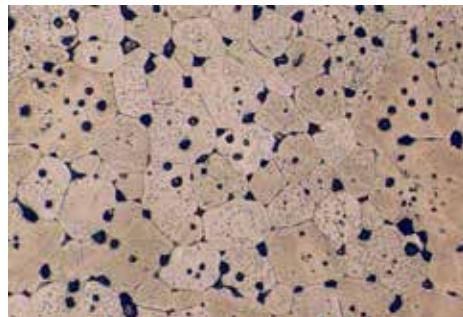
The key to proper specimen preparation of CERMET materials such as tungsten carbide is to grind with a semi-fixed abrasive (polycrystalline diamond on a metal mesh cloth), followed by combining diamond abrasives with a CMP (chemical mechanical polishing) abrasive such as SIAMAT™ colloidal silica.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
75 micron diamond grinding disk	Water	5-10 lbs	300/300	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Mesh cloth	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
3 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		



Tungsten carbide, 2000X (DIC), etched with 50% HNO₃ and 50% HCl



Periclase, 200X (B.F.) Thermal etching at 1200 Celsius for 2 hours

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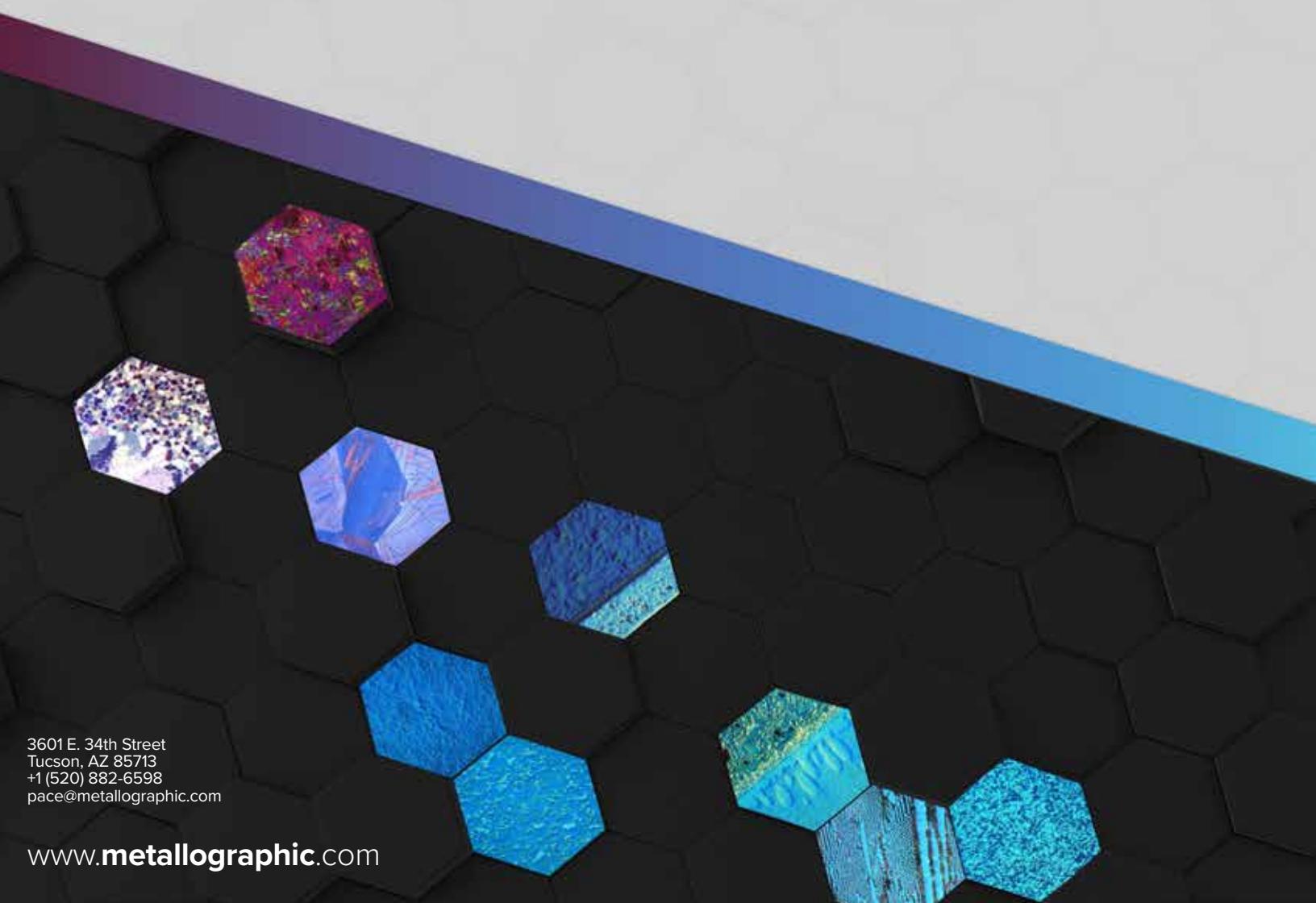
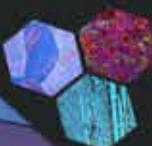
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