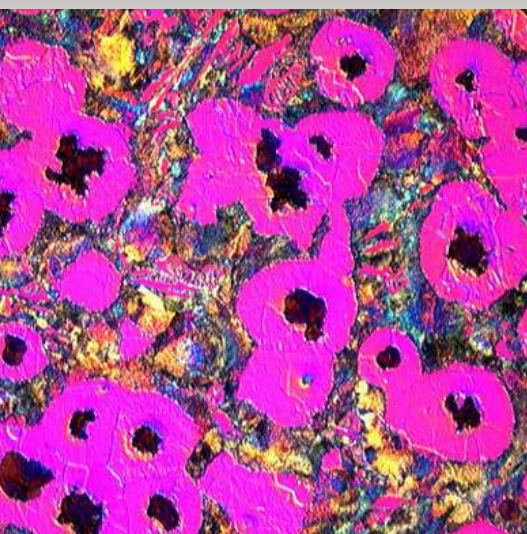




2022 PRODUCT CATALOG GUIDE

METALLOGRAPHIC PRODUCTS





PACE TECHNOLOGIES HAS CONTINUED TO EXPAND ITS PRODUCT LINE AND MANUFACTURING CAPABILITIES. **WE** HAVE REDESIGNED OUR EQUIPMENT TO BE STATE-OF-THE-ART, UTILIZING DYNAMIC CONSTANT TORQUE SERVO MOTORS IN OUR CUTTERS AND POLISHERS AND TRUE **PZT** MOTORS FOR OUR VIBRATORY POLISHERS. **IN** ADDITION, **WE** HAVE SIGNIFICANTLY IMPROVED OUR CONTROL INTERFACES TO OFFER THE END USER MORE FLEXIBILITY AND MORE CONTROL OVER THEIR SAMPLE PREPARATION PROCEDURES.

WE HAVE ALSO CONTINUED TO BECOME MORE VERTICALLY INTEGRATED IN OUR SUPPLY CHAIN. **INCLUDING:** CONVERTING OUR OWN GRINDING PAPERS, PRODUCING OUR OWN DIAMOND SUSPENSIONS AND FORMULATING OUR OWN CUTTING AND POLISHING LUBRICANTS. **THIS** VERTICAL INTEGRATION ALLOWS US TO BETTER CONTROL OUR PRODUCT QUALITY, AS WELL AS, BETTER MANAGE OUR COST.

AT PACE TECHNOLOGIES, OUR GOAL IS CUSTOMER SATISFACTION. **WE** OFFER USER-FRIENDLY TECHNICAL AND ORDERING INFORMATION, INSTANT COMMUNICATIONS AND TRANSPARENT PRICING. **OUR** EMPLOYEES PRACTICE A "CUSTOMER-FIRST" PHILOSOPHY EVERYDAY, AND CUSTOMER DEDICATION HAS MADE **PACE TECHNOLOGIES** TODAY'S LEADER IN THE SUPPLY OF METALLOGRAPHIC CONSUMABLES AND EQUIPMENT.

OUR 5F PROGRAM MANTRA:

- F**IRST TO **Q**UOTE
- F**IRST TO **F**OLLOW-**U**P
- F**IRST TO **S**HIP
- F**ULL **T**RAINING AND **T**ECHNICAL **S**UPPORT
- F**ASTEST **S**ERVICE (**24/7** **W**EB-BASED **S**ERVICE)

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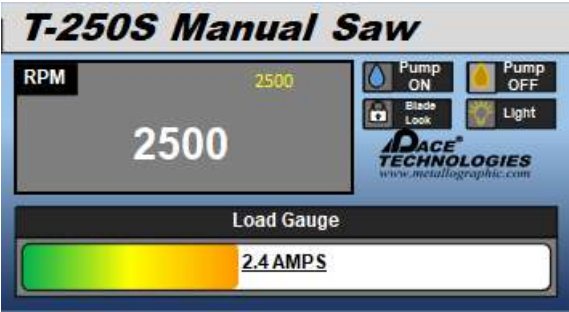
NEW

MEGA T250S

10-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



10-inch Metallographic Abrasive Cutter

2 year warranty
Limited warranty

FEATURE	MEGA-T250S DESCRIPTION
Cut-off blade size	10-inch (~250 mm)
Arbor size	32 mm
Cutting capacity (H X D)	Maximum 2.25 x 6-inch (55 x 150 mm)
Cutting capacity	Maximum diameter 3-inch (75 mm)
Wheel feed	Manual
Table feed	Manual
Y pulse feed	Manual
Y constant feed	Manual
Vertical movement (z-axis)	3.94-inch (100 mm)
Table feed movement (y-axis)	4.3-inch (110 mm)
Table movement (x-axis) for parallel cuts	n.a.
T-slotted table dimensions	11 x 18.25-inch (280 x 470 mm)
T-slotted width	0.5-inch (50 mm)
Operation	Manual
Cooling unit	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor - 5.5 hp (4 KW/15Nm)
Motor speed	Variable (1500-3500 rpm)
Electrical specification	208Y / 380V 3-phase (50/60 Hz) Optional Transformer (480-380V 3-phase)
Dimensions (WxDxH)	Hood closed: 35.4 x 30.3 x 25.6-inch (900 x 770 x 650 mm)
	Hood open: 35.4 x 31.5 x 33.5-inch (900 x 800 x 850 mm)
Weight	375 lbs (170 kg)
Cutter Support Bench (optional)	MEGA-BENCH
Catalog Number	MEGA-T250S

Benefits:

- Touch screen control
- Wheel and table feed controlled cutting
- Cutting capacity up to 3-inches (75 mm) solid stock sample using 10-inch (250 mm) blade
- Variable speed control
- High leverage handle for better control
- Powerful 5.5 hp (4 KW) 3-phase servo motor for constant torque
- Twin t-slotted stainless steel table
- Electronic braking system

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

ABRASIVE CUTTING

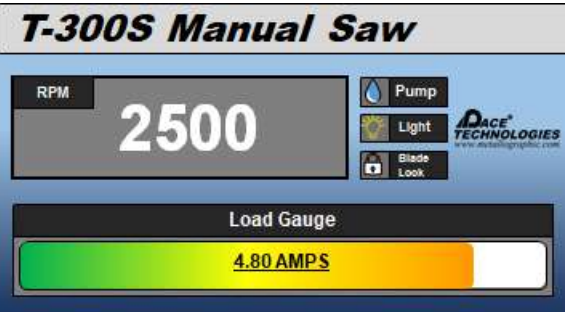


MEGA-T300S

MEGA T300S

12-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

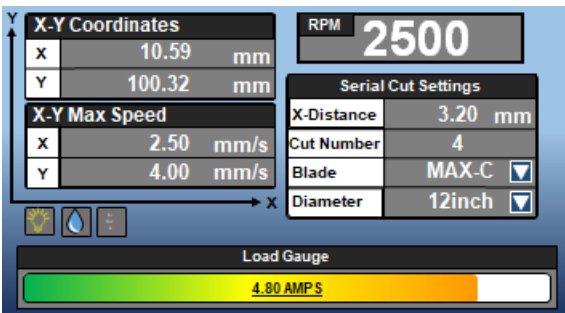


MEGA-T300A

MEGA T300A

12-inch AUTOMATED metallographic abrasive cutter

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



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)
Arbor size	32 mm	32 mm
Cutting capacity (H X D)	Maximum 2.75 x 10-inch (70 x 250 mm)	Maximum 2.75 x 10-inch (70 x 250 mm)
Cutting capacity	Maximum diameter 4-inch (110 mm)	Maximum diameter 4-inch (110 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y constant feed	Manual	Auto with feed rate: 0.0005 to 0.20-inch/sec. (0.01-5 mm/sec.)
Vertical movement (z-axis)	7.5-inch (190 mm)	7.5-inch (190 mm)
Table feed movement (y-axis)	8-inch (200 mm)	8-inch (200 mm)
Table movement (x-axis) for parallel cuts	n.a.	2-inch (50 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)
Operation	Manual	Auto / Manual
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor - 5.5 hp (4 KW/15Nm)	Constant torque variable speed Servo Motor - 5.5 hp (4 KW/15Nm)
Motor speed	Variable (1500-3500 rpm)	Variable (1500-3500 rpm)
Cutting force (current settings)	2-15 amps	2-15 amps
Electrical specification	208Y / 380V 3-phase (50/60 Hz) Optional Transformer (480-380V 3-phase)	208Y / 380V 3-phase (50/60 Hz) Optional Transformer (480-380V 3-phase)
Dimensions (WxDxH)	Hood closed: 33.5 x 37.5 x 30-inch (850 x 950 x 766 mm) Hood open: 33.5 x 37.5 x 35.5-inch (850 x 950 x 900 mm)	Hood closed: 33.5 x 37.5 x 30-inch (850 x 950 x 766 mm) Hood open: 33.5 x 37.5 x 35.5-inch (850 x 950 x 900 mm)
Weight	500 lbs (230 kg)	500 lbs (230 kg)
Cutter Support Bench (optional)	MEGA-BENCH	MEGA-BENCH
Catalog Number	MEGA-T300S	MEGA-T300A

Benefits:

- 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
- Powerful 5.5 hp (4 KW) 3-phase servo motor for constant torque
- Twin t-slotted stainless steel table
- Electronic braking system

ABRASIVE CUTTING

METALLOGRAPHIC ABRASIVE CUTTERS



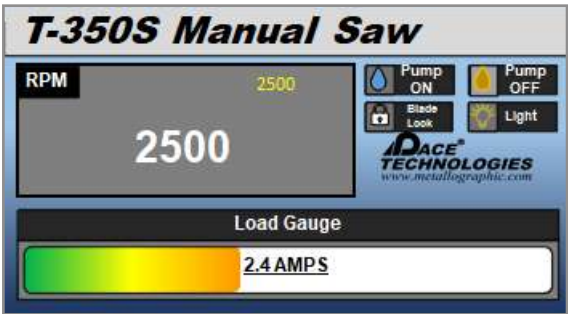
MEGA-T350S

NEW

MEGA T350S

14-inch MANUAL metallographic abrasive cutters

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



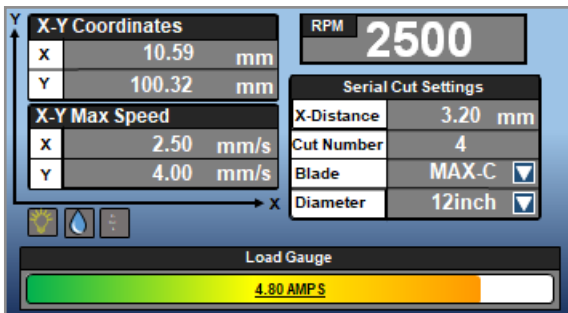
MEGA-T350A

NEW

MEGA T350A

14-inch AUTOMATED metallographic abrasive cutters

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



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)
Arbor size	32 mm	32 mm
Cutting capacity (H X D)	Maximum 3.15 x 12-inch (80 x 300 mm)	Maximum 3.15 x 12-inch (80 x 300 mm)
Cutting capacity	Maximum diameter 5-inch (125 mm)	Maximum diameter 5-inch (125 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y constant feed	Manual	Auto with feed rate: 0.0005 to 0.20-inch/sec. (0.01-5 mm/sec.)
Vertical movement (z-axis)	5.25-inch (150 mm)	5.25-inch (150 mm))
Table feed movement (y-axis)	8-inch (200 mm)	8-inch (200 mm)
Table movement (x-axis) for parallel cuts	n.a.	2-inch (50 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)
Operation	Manual	Auto / Manual
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor - 5.5 hp (4 KW/13Nm)	Constant torque variable speed Servo Motor - 5.5 hp (4 KW/13Nm)
Motor speed	Variable (1500-3500 rpm)	Variable (1500-3500 rpm)
Cutting force (current settings)	2-15 amps	2-15 amps
Electrical specification	2208Y / 380V 3-phase (50/60 Hz) Optional Transformer (480-380V 3-phase)	2208Y / 380V 3-phase (50/60 Hz) Optional Transformer (480-380V 3-phase)
Dimensions (WxDxH)	Hood closed: 33.5 x 37.5 x 60-inch (850 x 950 x 1520 mm)	Hood closed: 33.5 x 37.5 x 60-inch (850 x 950 x 1520 mm)
	Hood open: 33.5 x 37.5 x 65.5-inch (850 x 950 x 1670 mm)	Hood open: 33.5 x 37.5 x 65.5-inch (850 x 950 x 1670 mm))
Weight	600 lbs (275 kg)	600 lbs (275 kg)
Catalog Number	MEGA-T350S	MEGA-T350A

Benefits:

- Touch screen control
- Wheel and table feed controlled cutting
- Cutting capacity up to 5 inches (125 mm) solid stock sample using 14-inch (350 mm) blade
- Variable speed control
- High leverage handle for better control
- Powerful 5.5 hp (4 KW) 3-phase servo motor for constant torque
- Twin t-slotted stainless steel table
- Electronic braking system

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

ABRASIVE CUTTING

METALLOGRAPHIC ABRASIVE CUTTERS



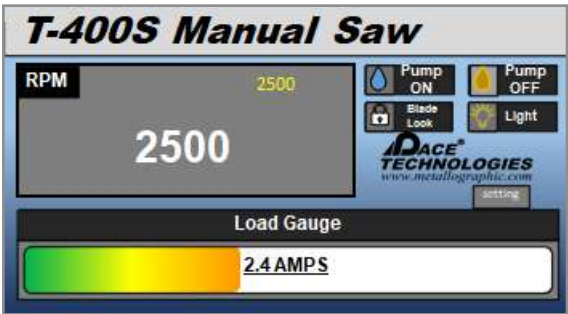
MEGA-T400S

NEW

MEGA T400S

16-inch MANUAL metallographic abrasive cutters

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



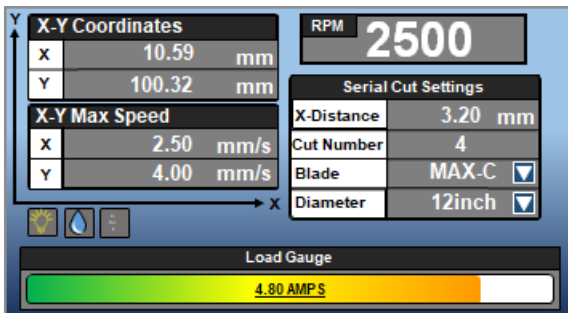
MEGA-T400A

NEW

MEGA T400A

16-inch AUTOMATED metallographic abrasive cutters

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



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)
Arbor size	32 mm	32 mm
Cutting capacity (H X D)	Maximum 3.15 x 12-inch (80 x 300 mm)	Maximum 3.15 x 12-inch (80 x 300 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 constant feed	Manual	Auto with feed rate: 0.0005 to 0.20-inch/sec. (0.01-5 mm/sec.)
Vertical movement (z-axis)	5.12-inch (130 mm)	5.12-inch (130 mm)
Table feed movement (y-axis)	5.5-inch (140 mm)	5.5-inch (140 mm) 0.44-inch/sec. (11.2 mm/sec.)
Table movement (x-axis) for parallel cuts	n.a.	1.05-inch (26.9 mm) 0.071-inch/sec. (1.8 mm/sec.)
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)
Operation	Manual	Auto / Manual
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor - 6.7 hp (5 KW/15Nm)	Constant torque variable speed Servo Motor - 6.7 hp (5 KW/15Nm)
Motor speed	Variable (1500-3500 rpm)	Variable (1500-3500 rpm)
Cutting force (current settings)	2-15 amps	2-15 amps
Dimensions (WxDxH)	Hood closed: 48.2 x 51.4 x 63-inch (1220 x 1300 x 1600 mm)	Hood closed: 48.2 x 51.4 x 63-inch (1220 x 1300 x 1600 mm)
	Hood open: 48.2 x 51.4 x 65.5-inch (1220 x 1300 x 2040 mm)	Hood open: 48.2 x 51.4 x 65.5-inch (1220 x 1300 x 2040 mm)
Weight	880 lbs (400 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
- Powerful 6.7 hp (5 KW) 3-phase servo motor for constant torque
- Twin t-slotted stainless steel table
- Electronic braking system

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

MEGA Accessories

Left Cam Lock Vise



Quick release clamping vise (left hand)
Catalog no. QCL-1000

Right Cam Lock Vise



Quick release clamping vise (right hand)
Catalog no. QCR-1000

Back Support



Back support plate for Quick Release clamping vises
Catalog no. QCB-1000

Fastener Vise



MEGA fastener vise
Catalog no. MEGA-711

Small Vertical Vise



1.8-inch (45 mm) height adapter for Vertical vise
Catalog no. MG-H

Large Vertical Vise



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

Vertical Height Adapter



3.5-inch (90 mm) Vertical clamping vise with shoe for MEGA-T400S
Catalog no. MG-01

Saddle Vise



MEGA saddle vise
Catalog no. MEGA-702

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
Note: Abrasive blades break down during cutting and thus produce a significant amount of debris
- 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 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
MAXCUT Abrasive Cutting Fluid (32 oz)	MAXCUT-1000-32	32 oz
MAXCUT Abrasive Cutting Fluid (1/2 gallon)	MAXCUT-1000-64	1/2 gallon
MAXCUT Abrasive Cutting Fluid (1 gallon)	MAXCUT-1000-128	1 gallon
MAXCUT Abrasive Cutting Fluid (5 gallons)	MAXCUT-1000-5G	5 gallons
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (32 oz)	MAXCUT2-1000-32	32 oz
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (1/2 gallon)	MAXCUT2-1000-64	1/2 gallon
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (1 gallon)	MAXCUT2-1000-128	1 gallon
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (5 gallons)	MAXCUT2-1000-5G	5 gallons
Propylene Glycol Based Corrosion Inhibitor Additive (32 oz)	PCC-5000-32	32 oz

Abrasive Cutting Blades

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

PACE Product Name	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	3440	MAX-C250	10/box
Hard non-ferrous materials (titanium)	3440	MAX-C250	10/box
Soft steel	4500	MAX-E250	10/box
Case Hardened steel	4585 / 3055	MAX-D250 / MAX-VHS250	10/box
Nickel, Superalloys	3820	MAX-A250	10/box
Very hard ferrous materials (>50 Rc)	3055	MAX-VHS250	10/box
Universal Thin Blade	3820	MAX-A250	10/box
General Industrial Blade	4500	MAX-I250	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	6100	DMAX-250	each



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

PACE Product Name	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	3185	MAX-C300	10/box
Hard non-ferrous materials (titanium)	3185	MAX-C300	10/box
Soft steel	3800	MAX-E300	10/box
Case Hardened steel	3820 / 2500	MAX-D300 / MAX-VHS300	10/box
Nickel, Superalloys	3185	MAX-A300	10/box
Very hard ferrous materials (>50 Rc)	2500	MAX-VHS300	10/box
Universal Thin Blade	3185	MAX-A300	10/box
General Industrial Blade	3800	MAX-I300	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	5000	DMAX-305	each



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

PACE Product Name	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	3460	MAX-C350	10/box
Hard non-ferrous materials (titanium)	3460	MAX-C350	10/box
Soft steel	3200	MAX-E350	10/box
Case Hardened steel	3275 / 2220	MAX-D350 / MAX-VHS350	10/box
Nickel, Superalloys	2730	MAX-A350	10/box
Very hard ferrous materials (>50 Rc)	2220	MAX-VHS350	10/box
Universal Thin Blade	2730	MAX-A350	10/box
General Industrial Blade	3200	MAX-I350	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	4350	DMAX-350	each

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

PACE Product Name	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	2390	MAX-C400	10/box
Hard non-ferrous materials (titanium)	2390	MAX-C400	10/box
Soft steel	3800	MAX-E400	10/box
Case Hardened steel	3800 / 1925	MAX-D400 / MAX-VHS400	10/box
Nickel, Superalloys	2860	MAX-A400	10/box
Very hard ferrous materials (>50 Rc)	1925	MAX-VHS400	10/box
Universal Thin Blade	2860	MAX-A400	10/box
General Industrial Blade	3800	MAX-I400	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	3800	DMAX-400	each

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)

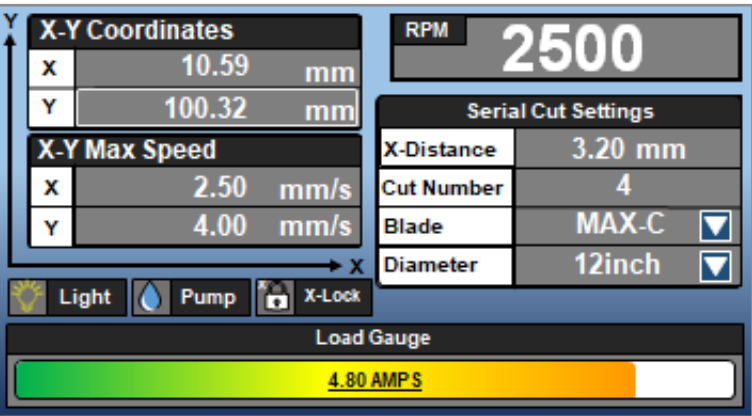
BLADE (M.O.S.)	10-INCH	12-INCH	14-INCH	16-INCH
MAX-A	3820	3185	2730	2860
MAX-C	3440	3185	3460	2390
MAX-D	4585	3820	3275	3800
MAX-E	4500	3800	3200	3800
MAX-I	4500	3800	3200	3800
MAX-VHS	3055	2500	2220	1925
DMAX	6100	5000	4350	3800

Tips: Abrasive Cutting:

1. Properly fixture or clamp the sample/specimen
2. Select the proper abrasive blade
3. Set the correct cutting speed
4. Use appropriate cutting fluid and direct the flow to the cutting zone
5. Cut specimen while monitoring motor amperage. The correct blade will minimize the current draw on the motor
6. After completion of the cutting operation, clean and dry the cutter fixtures, table and cutting chamber
7. 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 (inches)

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



MEGA-S Abrasive Cutter Control Screen



MEGA-T400 t-slot table



PICO-155S



PICO-155P



PICO-200

PICO 155S

- Precise cutting
- Microprocessor controlled with touch screen control
- Internal coolant pump
- Digital feedback speed control
- LED interface display
- Highly reproducible
- Easy to use

PICO 155P

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

PICO 200

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

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)	50-1500 rpm continuously adjustable with digital speed display	50-1500 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 14.5-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 14.5-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

Benefits:

- Microprocessor controlled (PICO-155S)
- 50-1500 rpm speeds
- Accepts 3-7 inch (75-175 mm) wafering blades
- Built-in digital micrometer
- Counter balanced loading
- Sliding weight gravity feed loading up to 1500 grams
- Built-in coolant system with internal pump
- Magnetic safety switch
- Emergency stop switch
- Optional cutting table attachment

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	1.0 hp (750 W)
Electrical Specification	110V/220V (50/60 Hz) (single phase)
Dimensions (WxDxH)	18 x 20 x 13.8-inch (46 cm x 50 cm x 35 cm)
Weight	93 lbs (420 kg)
Catalog Number	PICO-200

Benefits:

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

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

PICO 155P/155S Accessories

32 mm Circular Vise



Sample holder for small round and mounted specimens (1.25-inch/32 mm)
Catalog no. P150-707

40 mm Circular Vise



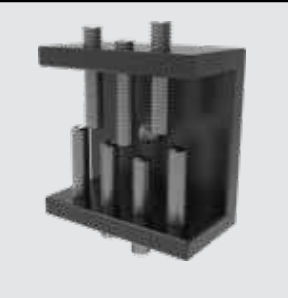
Sample holder for large round and mounted specimens (1.5-inch/40 mm)
Catalog no. P150-708

Teardrop Vise



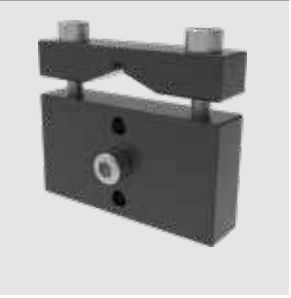
Specimen teardrop holder for 0.6-1.6-inch (18-40 mm)
Catalog no. P150-710

Irregular Sample Vise



Sample vise for irregular shaped samples
Catalog no. P150-706

Single Saddle Vise



Universal specimen vise (single saddle)
Catalog no. P150-702

Double Saddle Vise



Sample holder with double parallel vise for long specimens (double saddle)
Catalog no. P150-703

Large Universal Vise



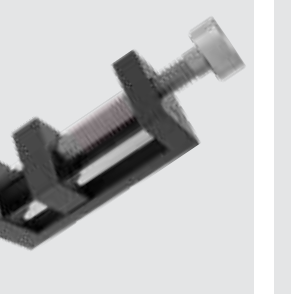
Large single saddle vise with support lip
Catalog no. P150-702b

Adhering Vise



Specimen vise for adhering or gluing samples
Catalog no. P150-709

Fastener Vise



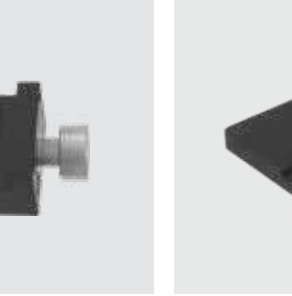
Fastener vise for longitudinal sectioning of fasteners, tubes, etc.
Catalog no. P150-711

Dressing Fixture



Dressing stone attachment
Catalog no. P150-701

Cutting Table



Cutting table attachment for manual cutting of flat specimens and PCB's
Catalog no. P150-601

50 mm Flanges



50 mm diameter arbor flanges
Catalog no. P150-306

75 mm Flanges



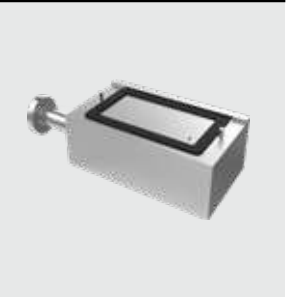
75 mm diameter arbor flanges
Catalog no. P150-712

1x3-inch Glass Slide



Vacuum glass slide holder for 1x3-inch petrographic slides
Catalog no. P155-GHL

27x46 mm Glass Slide



Vacuum glass slide holder for 27x46 mm petrographic slides
Catalog no. P155-GHS

Sample Support Arm



Sample support arm with multiple specimen vise positioning locations
Catalog no. P150-407

Swivel Support Arm



Sample support arm with swivel for angular cutting
Catalog no. P150-713

Weight Stack



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**

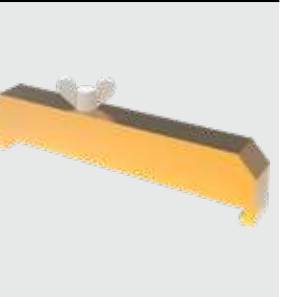
PICO 200 Accessories

Vertical Clamping Vise



PICO 200 vertical clamping vise
Catalog no. P200V

Cutting Guide



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
3-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0030LC	each
3-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0035LC	each
3-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0035HC	each
3-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0035	each

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



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

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



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

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

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



7-inch (175 mm) Diamond Blades (1/2-inch arbor, 0.024-inch thick)

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



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

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



Precision Abrasive Blades (1/2-inch arbor)

PACE Product Name	Catalog Number	Qty
6 x 0.0625-inch Alumina Abrasive Blade (ferrous metals)	MAX-D150	10
6 x 0.0385-inch SiC Abrasive Blade (non-ferrous metals)	MAX-C150	10
7 x 0.0285-inch Abrasive Blade (general purpose)	MAX-7000S	10



Wafer Cutting Accessories



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

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
4-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-004GP	each
5-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-005GP	each
6-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-006GP	each
7-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-007GP	each
8-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-008GP	each

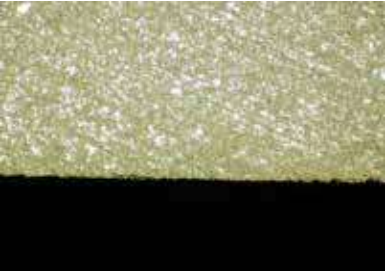
Diamond Wafering Blades (low concentration) with Corrosion Resistant Stainless Steel Core (1/2-inch arbor)

PACE Product Name	Catalog Number	Qty
4-inch stainless steel low concentration diamond Wafering Blade	WB-004LCS	each
5-inch stainless steel low concentration diamond Wafering Blade	WB-005LCS	each
6-inch stainless steel low concentration diamond Wafering Blade	WB-006LCS	each
7-inch stainless steel low concentration diamond Wafering Blade	WB-007LCS	each
8-inch stainless steel low concentration diamond Wafering Blade	WB-008LCS	each

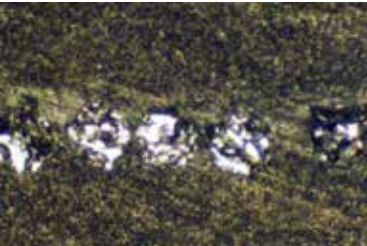
MATERIAL	CHARACTERISTIC	SPEED (RPM)	LOAD	BLADE (grit/conc)
Silicon substrates	Soft/Brittle	<300	Low	Fine/Low
Gallium arsenide	Soft/Brittle	<200	Low	Fine/Low
Boron composites	Hard/Brittle	500	Medium	Fine/Low
Ceramic fiber composites	Hard/Brittle	1000	Medium	Fine/Low
Glass	Brittle	1000	Medium	Fine/Low
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

Tips: 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
4-inch stainless steel high concentration diamond Wafering Blade	WB-004HCS	each
5-inch stainless steel high concentration diamond Wafering Blade	WB-005HCS	each
6-inch stainless steel high concentration diamond Wafering Blade	WB-006HCS	each
7-inch stainless steel high concentration diamond Wafering Blade	WB-007HCS	each
8-inch stainless steel high concentration diamond Wafering Blade	WB-008HCS	each

Improved Precision Wafering Blades:

1. Stainless steel core for improved corrosion resistance
2. Very affordable and economical
3. High Quality Blade
4. Available with a general purpose diamond / CBN hybrid abrasive and with the traditional low and high medium grit diamond concentration



TERAPRESS TP-7100S

TERAPRESS TP-7100S

- Automatic
- Programmable
- Pneumatic (air pressure) press
- 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
- Robust and durable design
- Economical



TERAPRESS TP-7500S

TERAPRESS TP-7500S

- Automatic
- Programmable
- Hydraulic force
- 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

Pneumatic Metallographic Compression Mounting Press

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 (110V 20 amp) 2000 Watts (220V 10 amp)
Maxiumum Temperature	392°F (200°C)
Cooling System	Water with manual, temperature or time control
Dimensions (WxDxH)	21 x 19 x 19-inches (534 x 485 x 485 mm)
Weight	69 lbs (32 kg)
TP-TANK	Recirculating / Cooling Tank (14 gallon) with pump (optional)
Catalog Number	TP-7100S

2 year warranty
Limited warranty

Benefits:

- Fast cycle times
- 7-inch touchscreen interface
- Pre-loaded parameters for PACE Products
- Soft Start capabilities
- Interchangeable or fixed size molds
- Custom procedures list
- Heating graph for monitoring temperature and cycle progress

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

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 (110V 20 amp) 2000 Watts (220V 10 amp)
Maxiumum Temperature	392°F (200°C)
Cooling System	Water with manual, temperature or time control
Dimensions (WxDxH)	21 x 19 x 19-inches (534 x 485 x 485 mm)
Weight	108 lbs (50 kg)
TP-TANK	Recirculating / Cooling Tank (14 gallon) with pump (optional)
Catalog Number	TP-7500S

2 year warranty
Limited warranty

Benefits:

- Fast cycle times (<10 minutes)
- Up to 32 MPa pressure at the mount
- Interchangeable or fixed size molds
- Soft start capabilities
- Quiet operation
- 7-inch Touch screen controls
- Pre-loaded parameters
- Custom procedures list
- Heating graph for monitoring temperature and cycle progress
- No need for compressed air

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

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**

Interchangeable Molds:

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

Fixed Block Molds:

- 1. The heater/cooler is manufactured to match the size of the mold (does not require a mold sleeve)
- 2. Reduces cooling times for producing faster mounts
- 3. 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	TP75-0125C
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-0125C
2-inch diameter spacer	TPS-0200	TPS-0125C
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 Fixed Sized Heater / Mold Assembly



1.0-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0100H

1.25-inch Fixed Sized Heater / Mold Assembly



1.25-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0125H

1.5-inch Fixed Sized Heater / Mold Assembly



1.5-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0150H

2.0-inch Fixed Sized Heater / Mold Assembly



2.0-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0200H

25 mm Fixed Sized Heater / Mold Assembly



25 mm Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-25H

30 mm Fixed Sized Heater / Mold Assembly



30 mm Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-30H

40 mm Fixed Sized Heater / Mold Assembly



40 mm Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-40H

50 mm Fixed Sized Heater / Mold Assembly



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)	DIALLYL 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	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)	DIALLYL 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
Black Phenolic powder (5 lbs)	CM-2001B-5	5 lbs
Black Phenolic powder (25 lbs)	CM-2001B-25	25 lbs
Red Phenolic powder (5 lbs)	CM-2001R-5	5 lbs
Red Phenolic powder (25 lbs)	CM-2001R-25	25 lbs
Green Phenolic powder (5 lbs)	CM-2001G-5	5 lbs
Green Phenolic powder (25 lbs)	CM-2001G-25	25 lbs

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 cured either at a high enough temperature or for the proper length of time

Acrylic Clear Compression Mounting



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

TIP: Acrylic Mounts

A common problem with acrylic mounts, known as the "cotton ball" effect, can occur with thermoplastic acrylic resins, common causes include:

- Heating the compression mounting resin too fast causes a liquid layer to form around the non-melted powder. This creates trapped air that cannot escape
- Mounting force is too low and cannot compress the entrapped air

To eliminate the issue: lower the mounting temperature, increase the mounting force and increase the mounting time

COMPRESSION MOUNTING CONSUMABLES

Glass Filled Epoxy Compression Mounting



PACE Product Name	Catalog Number	Qty
EPOCOMP Epoxy Resin powder (5 lbs)	EP-2201A-5	5 lbs
EPOCOMP Epoxy Resin powder (25 lbs)	EP-2201A-25	25 lbs
EPOCOMP Fine Epoxy Resin powder (5 lbs)	EPF-2201A-5	5 lbs
EPOCOMP Fine Epoxy Resin powder (25 lbs)	EPF-2201A-25	25 lbs

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.

Diallyl Phthalate Compression Mounting



PACE Product Name	Catalog Number	Qty
Diallyl Phthalate blue compression mounting powder (5 lbs)	CM-2301A-5	5 lbs
Diallyl Phthalate blue compression mounting powder (25 lbs)	CM-2301A-25	25 lbs

Conductive Compression Mounting



PACE Product Name	Catalog Number	Qty
Conductive (graphite) powder (1 lb)	CONDUCTO-1	1 lb
Conductive (graphite) powder (5 lbs)	CONDUCTO-5	5 lbs
Conductive (graphite) powder (25 lbs)	CONDUCTO-25	25 lbs
Conductive (copper) powder (1 lb)	CONDUCTO-CU-1	1 lb
Conductive (copper) powder (5 lbs)	CONDUCTO-CU-5	5 lbs
Conductive (copper) powder (25 lbs)	CONDUCTO-CU-25	25 lbs

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

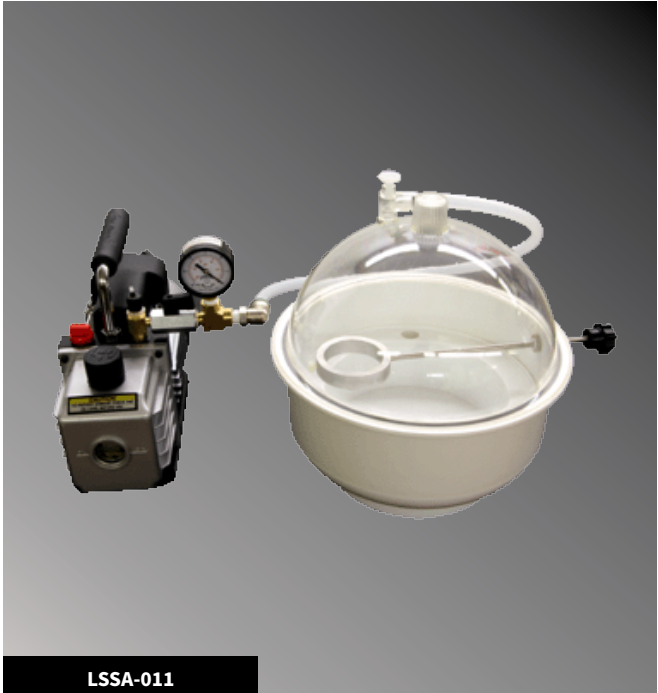
Miscellaneous Compression Mounting Accessories



PACE Product Name	Catalog Number	Qty
Mold release (8 oz)	MR-1000-08	8 oz
Mold release (16 oz)	MR-1000-16	16 oz
Mold release (1 gallon)	MR-1000-128	1 gallon
Utility heat protective gloves (pair)	GLOVES	pair
Small disposable protective gloves (100/box)	GLOVES-S100	100/box
Medium disposable protective gloves (100/box)	GLOVES-M100	100/box
Large disposable protective gloves (100/box)	GLOVES-L100	100/box
Metal MKLIP specimen clips (100/pkg)	MKLIP-0100	100/pkg
Plastic SKLIP spring specimen clips (100/pkg)	SKLIP-0100	100/pkg
Plastic SKLIP spring specimen clips (1000/pkg)	SKLIP-1000	1000/pkg
Plastic KLIP specimen clips (100/pkg)	KLIP-0100	100/pkg
Plastic MULTICLIP specimen clips (100/pkg)	MULTICLIP-0100	100/pkg
Plastic UNIKLIP specimen clips (100/pkg)	UNIKLIP-0100	100/pkg
30 ml measuring scoop	MS-1000-30	each
Scribing tool	SCRIBE	each

Compression Mounting Recommended Procedures:

1. Clean specimens to remove cutting and handling residue
2. Remove debris from mold assembly
3. Apply thin coat of mold release compound to mold assembly
4. Raise mold ram to up position
5. Center specimen on ram
6. Lower ram assembly
7. Pour predetermined amount of resin into mold
8. Lock mold assembly cover
9. Slowly raise ram into up position
10. Apply recommended heat and maintain force for specified period of time
11. Cool to near room temperature
12. Remove mounted specimen
13. Clean mold and ram assembly



VACUUM CHAMBER

LSSA-011

- Pour under vacuum with 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
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	5:1 resin:hardner (wt.)	Clear to translucent, low shrinkage, 4-8 hour cure
Epoxy PLUS	11:2 resin:hardner (wt.)	
Quick Mount Epoxy	Epoxy (2-liquids) 10:1 resin:hardner (wt.)	Translucent, slightly yellow, 30 minute - 2 hour cure
ULTRATHIN 2 Epoxy	10:1 resin:hardner (wt.)	Clear, low viscosity for porous specimens, 2-6 hour cure
ULTRATHIN Epoxy PLUS	18:5 resin:hardner (wt.)	
POLYCAST Polyester	Polyester (2-liquids)	Clear and relatively inexpensive

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

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

DESCRIPTION	110V VACUUM PUMP	220V VACUUM PUMP
Flow Rate	2.5 CFM (4.25 m3/h)	4.24 CFM (7.2 m3/h)
Ultimate Vacuum	10 Pa	0.2 Pa
Power	120W - 0.17 hp	370 W - 0.5 hp
Inlet Port	1/4" SAE and 1/2" ACME ports	7/16-inch - 20
Dimensions (WxDxH)	11 x 4.75 x 9-inch (28 cm x 12 cm x 23 cm)	13 x 5.5 x 10-inch (34 cm x 14 cm x 25 cm)
Weight	16.5 lbs (7.5 kg)	22 lbs (10 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 which includes:

- 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

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.

NOTE: The acrylic powder contains a catalyst that reacts with the liquid hardener to initiate the curing process. Fillers are added to increase hardness and to reduce shrinkage.

Characteristics of Castable Acrylics:

- Rapid mounting, producing very repeatable and consistent mounts
- Moderate shrinkage and good hardness
- Semi-transparent
- High odor

CASTAMOUNT Acrylics (Castable Mounting)



PACE Product Name	Catalog Number	Qty
CASTAMOUNT Acrylic kit (1 lb resin with 12 oz liquid hardener)	AK-5000-K1	1 lb
CASTAMOUNT Acrylic kit (5 lbs resin with 64 oz liquid hardener)	AK-5000-K5	5 lbs
CASTAMOUNT Acrylic Powders		
CASTAMOUNT Acrylic powder (1 lb)	AR-5000-P1	1 lb
CASTAMOUNT Acrylic powder (5 lbs)	AR-5000-P5	5 lbs
CASTAMOUNT Acrylic powder (25 lbs)	AR-5000-P25	25 lbs
CASTAMOUNT Acrylic powder (100 lbs)	AR-5000-P100	100 lbs
CASTAMOUNT Acrylic Liquids		
CASTAMOUNT Acrylic hardener (12 oz)	AH-5000-H12	12 oz
CASTAMOUNT Acrylic hardener (32 oz)	AH-5000-H32	32 oz
CASTAMOUNT Acrylic hardener (1/2 gallon)	AH-5000-H64	1/2 gallon
CASTAMOUNT Acrylic hardener (1 gallon)	AH-5000-H128	1 gallon
CASTAMOUNT Acrylic hardener (5 gallon)	AH-5000-H640	5 gallon

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.

ACRYLIC PLUS Acrylics (Castable Mounting)



PACE Product Name	Catalog Number	Qty
ACRYLIC PLUS Castable Mounting Resin Kit (1 lb resin with 12 oz liquid hardener)	ACYP-5000-K1	1 lb
ACRYLIC PLUS Castable Mounting Resin Kit (5 lbs resin with 64 oz liquid hardener)	ACYP-5000-K5	5 lbs
ACRYLIC PLUS Acrylic Powders		
ACRYLIC PLUS Resin powder (1 lb)	ACYP-5000-P1	1 lb
ACRYLIC PLUS Resin powder (5 lbs)	ACYP-5000-P5	5 lbs
ACRYLIC PLUS Resin powder (25 lbs)	ACYP-5000-P25	25 lbs
ACRYLIC PLUS Resin powder (100 lbs)	ACYP-5000-P100	100 lbs
ACRYLIC PLUS Acrylic Liquids		
ACRYLIC PLUS Resin hardener (12 oz)	ACYP-5000-H12	12 oz
ACRYLIC PLUS Resin hardener (32 oz)	ACYP-5000-H32	32 oz
ACRYLIC PLUS Resin hardener (1/2 gallon)	ACYP-5000-H64	1/2 gallon
ACRYLIC PLUS Resin hardener (1 gallon)	ACYP-5000-H128	1 gallon
ACRYLIC PLUS Resin hardener (5 gallon)	ACYP-5000-H640	5 gallon

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	
SUPERMOUNT Glass Filled Acrylic Kit (gray) (5 lbs resin with 64 oz liquid hardener)	GKAK-5000-K5	5 lbs	
SUPERMOUNT PLUS Acrylic Powders			
SUPERMOUNT Resin powder (1 lb)	GRAR-5000-P1	1 lb	
SUPERMOUNT Resin powder (5 lbs)	GRAR-5000-P5	5 lbs	
SUPERMOUNT Resin powder (25 lbs)	GRAR-5000-P25	25 lbs	
SUPERMOUNT Resin powder (100 lbs)	GRAR-5000-P100	100 lbs	
SUPERMOUNT Acrylic Liquids			
SUPERMOUNT Resin hardener (12 oz)	GRAH-5000-H12	12 oz	
SUPERMOUNT Resin hardener (32 oz)	GRAH-5000-H32	32 oz	
SUPERMOUNT Resin hardener (1/2 gallon)	GRAH-5000-H64	1/2 gallon	
SUPERMOUNT Resin hardener (1 gallon)	GRAH-5000-H128	1 gallon	
SUPERMOUNT Resin hardener (5 gallon)	GRAH-5000-H640	5 gallon	

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)

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

Call for Availability



PACE Product Name	Catalog Number	Qty
Quick Mounting Epoxy Resins		
Quick Mounting fast epoxy castable resin (32 oz)	ERF-3000-32	32 oz
Quick Mounting fast epoxy castable resin (1-gallon)	ERF-3000-128	1 gallon
Quick Mounting fast epoxy castable resin (5-gallons)	ERF-3000-5G	5 gallons
Quick Mounting Epoxy Hardeners		
Quick Mounting fast epoxy hardener (8 oz)	EHF-3000-08	8 oz
Quick Mounting fast epoxy hardener (32 oz)	EHF-3000-32	32 oz
Quick Mounting fast epoxy hardener (1 gallon)	EHF-3000-128	1 gallon

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

Call for Availability



PACE Product Name	Catalog Number	Qty
Standard Epoxy Resin		
Epoxy castable resin (32 oz)	EP-3000-32	32 oz
Epoxy castable resin (1-gallon)	EP-3000-128	1 gallon
Epoxy castable resin (5-gallons)	EP-3000-5G	5 gallons
Standard Epoxy Hardeners		
Epoxy hardener (8 oz)	EH-3000-08	8 oz
Epoxy hardener (32 oz)	EH-3000-32	32 oz
Epoxy hardener (1 gallon)	EH-3000-128	1 gallon



PACE Product Name	Catalog Number	Qty
ULTRATHIN Low Viscosity Epoxy Resins		
Low Viscosity castable epoxy resin (32 oz)	ULTRA-3000R-32	32 oz
Low Viscosity castable epoxy resin (1-gallon)	ULTRA-3000R-128	1 gallon
Low Viscosity castable epoxy resin (5-gallons)	ULTRA-3000R-5G	5 gallons
ULTRATHIN Low Viscosity Epoxy Hardeners		
Low Viscosity castable epoxy hardener (8 oz)	ULTRA-3000H-08	8 oz
Low Viscosity castable epoxy hardener (32 oz)	ULTRA-3000H-32	32 oz
Low Viscosity castable epoxy hardener (1 gallon)	ULTRA-3000H-128	1 gallon

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

NEW

PACE Product Name	Catalog Number	Qty
EPOXY PLUS Resin		
Epoxy castable resin (32 oz)	EP-3000-32P	32 oz
Epoxy castable resin (1-gallon)	EP-3000-128P	1 gallon
Epoxy castable resin (5-gallons)	EP-3000-5GP	5 gallons
EPOXY PLUS Hardeners		
Epoxy hardener (8 oz)	EH-3000-08P	8 oz
Epoxy hardener (32 oz)	EH-3000-32P	32 oz
Epoxy hardener (1 gallon)	EH-3000-128P	1 gallon

NEW

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

PACE Product Name	Catalog Number	Qty
ULTRATHIN PLUS Low Viscosity Epoxy Resins		
Low Viscosity castable epoxy resin (32 oz)	ULTRA-3000R-32P	32 oz
Low Viscosity castable epoxy resin (1-gallon)	ULTRA-3000R-128P	1 gallon
Low Viscosity castable epoxy resin (5-gallons)	ULTRA-3000R-5GP	5 gallons
ULTRATHIN PLUS Low Viscosity Epoxy Hardeners		
Low Viscosity castable epoxy hardener (8 oz)	ULTRA-3000H-08P	8 oz
Low Viscosity castable epoxy hardener (32 oz)	ULTRA-3000H-32P	32 oz
Low Viscosity castable epoxy hardener (1 gallon)	ULTRA-3000H-128P	1 gallon

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
Clear Polyester castable resin (1 gallon)	POLYCAST-128	1 gallon
Polyester Hardener (2 oz)	POLYHARD-02	2 oz
Polyester Color Dye Set (3 colors)	DYE-1000	3 colors

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



Reusable Plastic Molds



Disposable Plastic Molds



Silicon Rubber Molds

PACE Product Name	Catalog Number	Qty
Reusable Plastic Molds		
1.0-inch reusable two piece plastic mold (12/pkg)	METPREP-0100	12/pkg
1.25-inch reusable two piece plastic mold (12/pkg)	METPREP-0125	12/pkg
1.5-inch reusable two piece plastic mold (12/pkg)	METPREP-0150	12/pkg
2.0-inch reusable two piece plastic mold (12/pkg)	METPREP-0200	12/pkg
Disposable Plastic Molds		
1.0-inch disposable red mount cap - 50/pkg	MOUNT-0100	50/pkg
1.25-inch disposable red mount cap - 50/pkg	MOUNT-0125	50/pkg
1.5-inch disposable red mount cap - 50/pkg	MOUNT-0150	50/pkg
Silicon Rubber Molds		
1.0-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0100	3/pkg
1.25-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0125	3/pkg
1.5-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0150	3/pkg
2.0-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0200	3/pkg
2.75 x 1-1/2 x 7/8-inch (70 x 39 x 22 mm) Silicone Rubber Molds	RMOUNT-315R	each
3 x 2 x 7/8-inch (76 x 51 x 22 mm) Silicone Rubber Molds	RMOUNT-302R	each

Castable Mounting Accessories



STORE-0125



MR-1000



MCUPS-0100



MKLIP



SKLIP



MULTIKLIP



UNIKLIP

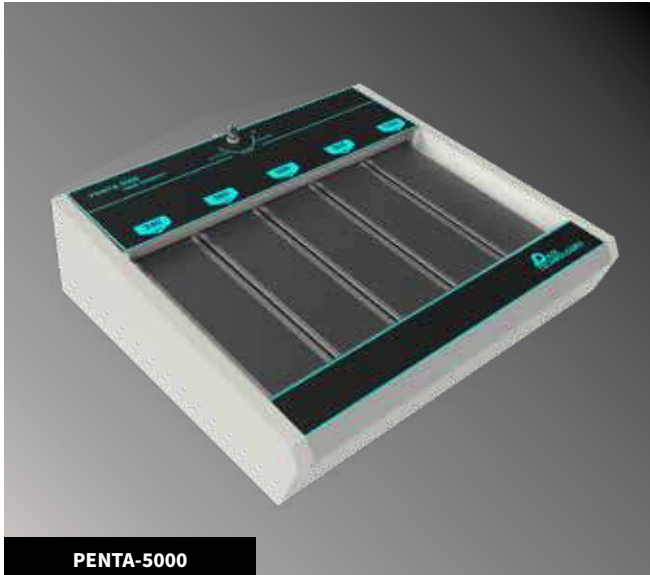


KLIP



Disposable Gloves

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



PENTA 5000

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



Manual Metallographic Hand Grinder

2 year warranty
Limited warranty

FEATURE	PENTA 5000 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	-SMC molding and stainless steel -Hard coat anodized rollers and paper support plates
Cooling rinse system	Water
Dimensions (WxDxH)	22.25 x 21 x 8-inch (565 x 535 x 203 mm)
Weight	55 lbs (25 kg)
Catalog Number	PENTA-5000

- 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



NEW

PENTA 7500

- 4-inch x 36-inch belts
- Wet or dry grinding
- Manual grinder
- Easy to change abrasive belts
- Robust and durable design
- Easy to use
- User friendly
- Low cost
- Easy to service



PENTA-7500 Squaring and planarizing holder for metallographic mounts

Planarizing Metallographic Belt Grinder

2 year warranty
Limited warranty

FEATURE	PENTA 7500 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
Dimensions (WxDxH)	20 x 24.75 x 14.75-inch (510 x 630 x 375 mm)
Weight	120 lbs (53 kg)
Catalog Number	PENTA-7500

- 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-7500 Accessories	Catalog Number
1-inch sleeve for square holder (each)	P75-100H
1.25-inch sleeve for square holder (each)	P75-125H
1.5-inch sleeve for square holder (each)	P75-150H
25 mm sleeve for square holder (each)	P75-25H
30 mm sleeve for square holder (each)	P75-30H
40 mm sleeve for square holder (each)	P75-40H

1-inch Sleeve

Catalog no. P75-100H

1.25-inch Sleeve

Catalog no. P75-125H

1.5-inch Sleeve

Catalog no. P75-150H

25 mm Sleeve

Catalog no. P75-25H

30 mm Sleeve

Catalog no. P75-30H

40 mm Sleeve

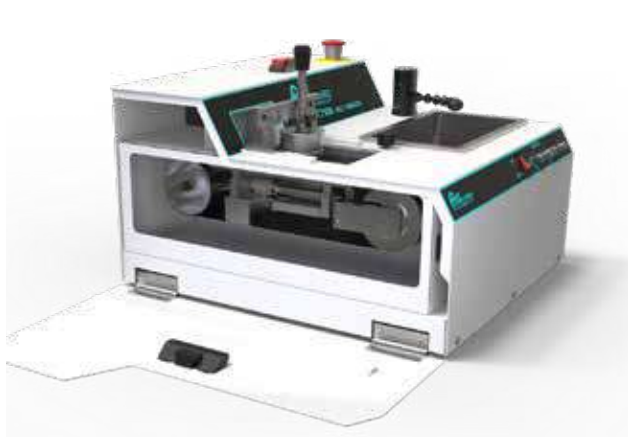
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CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

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 7500 belt grinder.



PENTA 7500 Metallographic Belt Grinder

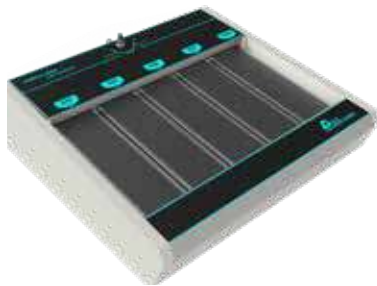
Abrasive Belts (4-inch x 36-inch)



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

PACE Product Name	Catalog Number	Qty
60 grit Zirconia Abrasive Belts	ZRO2-B060	5/pkg
120 grit Zirconia Abrasive Belts	ZRO2-B120	5/pkg
120 grit Alumina Abrasive Belts	ALO-B120	5/pkg
60 grit SiC Abrasive Belts	SIC-B060	10/pkg
80 grit SiC Abrasive Belts	SIC-B080	10/pkg
120 grit SiC Abrasive Belts	SIC-B120	10/pkg
180 grit SiC Abrasive Belts	SIC-B180	10/pkg
240 grit SiC Abrasive Belts	SIC-B240	10/pkg

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 5000 Metallographic Hand Grinder

Silicon Carbide (SiC) Abrasive Powders



SiC Abrasive Powders



PENTA-7500 Squaring and planarizing holder for metallographic mounts

PACE Product Name	Catalog Number	Qty
120 grit (P120-grit) SiC Powder (1 lb)	SIC-120-P1	1 lb
120 grit (P120-grit) SiC Powder (5 lbs)	SIC-120-P5	5 lbs
240 grit (P280-grit) SiC Powder (1 lb)	SIC-240-P1	1 lb
240 grit (P280-grit) SiC Powder (5 lbs)	SIC-240-P5	5 lbs
320 grit (P400-grit) SiC Powder (1 lb)	SIC-320-P1	1 lb
320 grit (P400-grit) SiC Powder (5 lbs)	SIC-320-P5	5 lbs
400 grit (P800-grit) SiC Powder (1 lb)	SIC-400-P1	1 lb
400 grit (P800-grit) SiC Powder (5 lbs)	SIC-400-P5	5 lbs
600 grit (P1200-grit) SiC Powder (1 lb)	SIC-600-P1	1 lb
600 grit (P1200-grit) SiC Powder (5 lbs)	SIC-600-P5	5 lbs
800 grit (P2400-grit) SiC Powder (1 lb)	SIC-800-P1	1 lb
800 grit (P2400-grit) SiC Powder (5 lbs)	SIC-800-P5	5 lbs
1000 grit (P3000-grit) SiC Powder (1 lb)	SIC-1000-P1	1 lb
1000 grit (P3000-grit) SiC Powder (5 lbs)	SIC-1000-P5	5 lbs
1200 grit (P4000-grit) SiC Powder (1 lb)	SIC-1200-P1	1 lb
1200 grit (P4000-grit) SiC Powder (5 lbs)	SIC-1200-P5	5 lbs

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-foot length, 1-inch core)

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



SiC Abrasive Rolls

MANUAL METALLOGRAPHIC POLISHERS



NANO-1000S



NANO-2000S

NEW NANO 1000S

- 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

NEW NANO 2000S

- Double 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

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	Part no. PW-800A	Part no. PW-800A
10-inch	Part no. PW-1000A	Part no. PW-1000A
Dimensions (W x D x H)	16.5 x 15 x 15.2-inch (420 x 380 x 385 mm)	29.5 x 22.5 x 15.2-inch (751 x 571 x 385 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)

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



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-inch Paper Ring



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

10-inch Paper Ring



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

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU



NANO 1200T

- Single wheel
- 12 and 14-inch wheel diameter options
- 1.5 hp 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

12 & 14-inch Metallographic Polishers

2 year warranty
Limited warranty

FEATURE	NANO-1200T DESCRIPTION
Motor power	1.5 hp (1100 W)
Power head upgrade	FEMTO-2200 / FEMTO-2500
Polishing wheels	Single - 12 &14-inch diameter
Electrical specification	110 / 220V (50/60 Hz)
Speed (rpm)	Variable (100 - 1000 rpm) - Grinding (600-1000 rpm) - Polishing (100-600 rpm)
Anodized Working wheels:	
12-inch	Part no. PW-1200A
14-inch	Part no. PW-1400A
Dimensions (W x D x H)	21x31x15-inch (535x790x380mm)
Weight	110 lbs (50 kg)
Catalog Number	NANO-1200T
Optional	Recirculating filtering tank (RC-1000A)

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
- Swinging water spout
- 1.5 hp (1100W) motor
- Splash guard
- Electrical connections for FEMTO-2200/2500 auto polishing

12-inch Working Wheel



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

14-inch Working Wheel



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

NANO-1200T Splash Guard



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

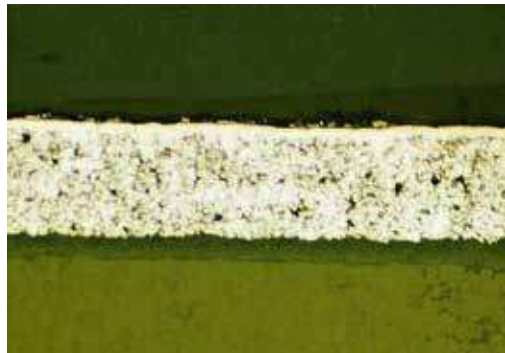
12-inch Paper Ring



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

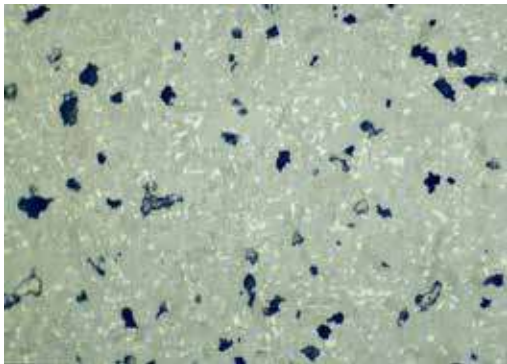


SiC particles in a Si₃N₄ matrix , 1000X (DIC)



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

NANO-1200T 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



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

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU



ZETA-2000



ZETA 2000

- 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 sequence for changing of abrasive/ lubricant options
- Flow 1.2~90 ml/min.
- Flex line for easy adjustment of dispensing nozzles
- 110/220V compatible
- Direct line water inlet
- Easy to use

ZETA Metallographic Abrasive Dispenser

2 year warranty
Limited warranty



FEATURE	ZETA-2000 DESCRIPTION
Pumps	4 (24v) dedicated, programmable peristaltic pumps
	Setting adjustments for:
	- Frequency
	- Duration
Flow rates	- Start time
	- Total time
Cleaning	Water flushing
Electrical specification	110 / 220V (50/60 Hz)
Dimensions (W x D x H)	9.5 x 10.6 x 12-inch (240 x 70 x 300 mm)
Weight	12 lbs (5.5 kg)
Catalog Number	ZETA-2000

- 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

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU



RC-1000A

RC-1000A

- Series of three replaceable filters (0.2, 0.5 and 1 micron)
- Positive pressure 24V pump (connected to 110V/220V power supply)
- 0.8 GPM maximum flow
- Easy to use and easy to operate

RC-1000A Metallographic 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)
Electrical specification	110 / 220V (50/60 Hz)
Dimensions (W x D x H)	31.5 x 16.5 x 19.5-inch (800 x 420 x 495 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

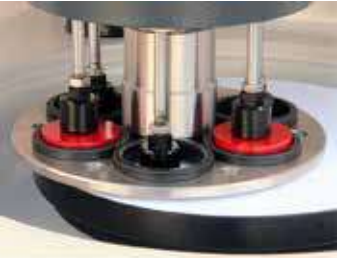
CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU



FEMTO-1500S



Central Fixed Force



Individual Force

FEMTO 1500S

- 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
- 0.54 hp (400W) high torque dynamic servo motor
- Single or Double Wheel Polisher
- Retractable water rinse on NANO polishing base
- Manual or Auto operation
- Contra or Complementary Direction with NANO-S polisher
- User friendly / Easy to Use

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)	0.54 hp (400 W) dynamic torque servo motor	0.54 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)	16.25 x 21 x 26.25-inch (413 x 533 x 667 mm)	29.25 x 22 x 26.25-inch (750 x 560 x 667 mm)
Weight	128 lbs (58.2 kg)	185 lbs (84 kg)
Optional	ZETA-2000 abrasive dispenser	ZETA-2000 abrasive dispenser
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank

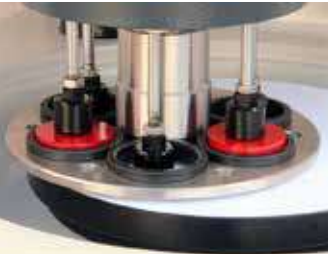
Benefits:

- Central and Individual polishing force
- Produces flatter specimens, especially useful for specimens having materials of different hardness (e.g. thermal spray coatings, electronic components, heat treated steels, etc.)
- Specimens can be polished in both the contra and complementary head / base directions

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU



FEMTO-1100S



Individual Force

FEMTO 1100S

- 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
- Single or Double Wheel Polisher
- Retractable water rinse on NANO polishing base
- Manual or Auto operation
- Contra or Complementary Direction with NANO-S polisher
- User friendly / Easy to Use

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)	0.54 hp (400 W) dynamic torque servo motor	0.54 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)	16.25 x 21 x 26.25-inch (413 x 533 x 667 mm)	29.25 x 22 x 26.25-inch (750 x 560 x 667 mm)
Weight	128 lbs (58.2 kg)	185 lbs (84 kg)
Optional	ZETA-2000 abrasive dispenser	ZETA-2000 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

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

FEMTO 1100S/1500S Individual Holder

1-inch Rings



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

1.25-inch Rings



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

1.5-inch Rings



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

2-inch Rings



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

25 mm Rings



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

30 mm Rings



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

40 mm Rings



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

50 mm Rings



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

FEMTO-1100S 6-Ring Sample Holder



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 6-Ring Sample Holder



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

FEMTO-1100S 3-Ring Sample Holder



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

FEMTO-1500S 3-Ring Sample Holder



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

FEMTO 1500S Central Holders

FEMTO-1500S 1-inch / 25 mm Central Sample Holder



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

FEMTO-1500S 1.25-inch / 30 mm Central Sample Holder



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

FEMTO-1500S 1.5-inch / 40 mm Central Sample Holder



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

FEMTO-1500S 2-inch / 50 mm Central Sample Holder



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

FEMTO-1500S Central Sample Loading Plate



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



NANO-1200T/FEMTO-2200

FEMTO
2200/2500

- FEMTO-2500 is a dual Individual and Central force specimen polishing head
- FEMTO-2200 is an Individual force polishing head
- Compatible with the NANO-1200T polisher
- 0-200 rpm Variable Speed Head
- Manual or Auto operation
- Contra or Complementary Direction
- User friendly / Easy to Use

FEMTO 2200/2500 Automated Metallographic Polishers

2 year warranty
Limited warranty

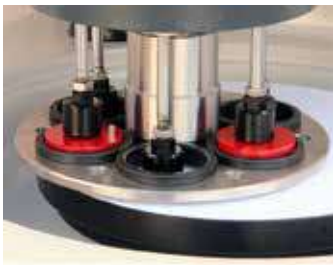
FEATURE	NANO-1200T / FEMTO-2500 DESCRIPTION	NANO-1200T / FEMTO-2200 DESCRIPTION
Polishing Wheels	12 & 14-inch single wheel	12 & 14-inch single wheel
Force application	Individual pistons (1-6 samples) Central force (3+ samples)	Individual pistons (1-6 samples)
Electrical specification	110 / 220V (50/60 Hz)	110 / 220V (50/60 Hz)
Speed (rpm)	0-200 rpm	0-200 rpm
Relative Head:Base Direction	CW and CCW	CW and CCW
Dimensions (W x D x H)	10 x 18 x 22 inch (254 x 457 x 560 mm)	10 x 18 x 22 inch (254 x 457 x 560 mm)
Weight	60 lbs (28 kg) without polisher base	60 lbs (28 kg) without polisher base
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank

Benefits:

- Central and Individual polishing force
- Produces flatter specimens, especially useful for specimens having materials of different hardness (e.g. thermal spray coatings, electronic components, heat treated steels, etc.)
- Specimens can be polished in both the contra and complementary head / base directions



Central Fixed Force



Individual Force

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

Individual vs. Central Force Automated Polishing

APPLICATION	ADVANTAGES	DISADVANTAGES
Individual Force	• Reduced number of preparation steps and lowers cost for consumables • Sample can be re-polished without having to planarize specimens in the holder	• Can result in loss of flatness across the specimen if heavy duty coarse grinding is required • 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 • Specimens can be polished in both the contra and complementary head / base directions	• Minimum of 3-samples are required in the holder • 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

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

FEMTO 2200/2500 Individual Holder

1-inch Rings



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

1.25-inch Rings



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

1.5-inch Rings



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

2-inch Rings



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

25 mm Rings



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

30 mm Rings



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

40 mm Rings



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

50 mm Rings



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

FEMTO-2200 6-Ring Sample Holder



FEMTO-2200 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-2500 6-Ring Sample Holder



FEMTO-2500 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-2200	FEMTO-2500
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 -1200, 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 2500, requires one set of 6, 2-inch or 50 mm plastic rings (ordered separately)
Catalog no. SH-2250

Individual Specimen Holder	FEMTO-2200	FEMTO-2500
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 2500 Central Holders

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



Central 1-inch or 25 mm specimen holder for FEMTO-2500
Catalog no. QRC-SH100A-2500

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



Central 1.25-inch or 30 mm specimen holder for FEMTO-2500
Catalog no. QRC-SH125A-2500

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



Central 1.5-inch or 40 mm specimen holder for FEMTO-2500
Catalog no. QRC-SH150A-2500

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



Central 2.0-inch or 50 mm specimen holder for FEMTO-2500
Catalog no. QRC-SH200A-2500

FEMTO-2500 Central Sample Loading Plate



Central force loading plate
Catalog no. CF-LP-2500

Central Specimen Holder	FEMTO-2500
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

- Easy lock bowl for quick cleaning and change out of polishing medium
- Two part bowl design for leak free operation
- Interchangeable bowl for the ability to polish on a 9 or 12-inch surface
- New Pulse Mode feature for stain free polishing if left unattended after procedure has ended
- Easy removal slots for removing adhesive backed polishing pads. No tool required
- Removable, hinged, lid for easy cleaning
- Simple to use

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 / 240V (50/60 Hz)
Construction	Aluminum casting with SMC cover (injection molded)
Frequency	0~240Hz
Motor voltage	24VDC
Dimensions (W x D x H) (note: hood can also be removed)	Hood closed: 16.5 x 19.5 x 16-inch (420 x 495 x 406 mm) Hood open: 16.5 x 19.5 x 29.5-inch (420 x 495 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-inch Holders

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

1.25-inch Holders

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

1.5-inch Holders

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

2-inch Holders

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

1-inch Weights

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

1.25-inch Weights

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

1.5-inch Weights

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

2-inch Weights

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

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

Stainless Steel 9 & 12-inch Polishing Bowls

Stainless Steel 2-piece Interchangeable GIGA-S Polishing Bowls

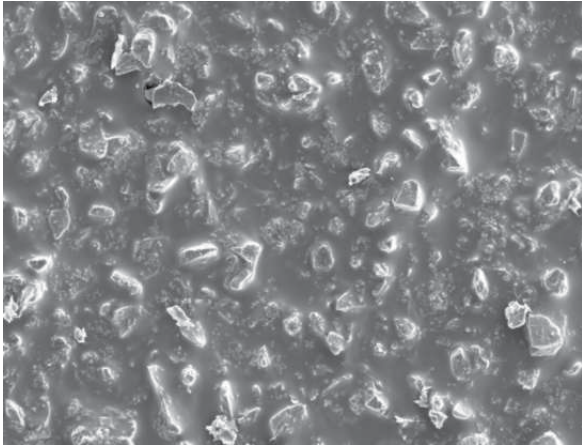
Vibratory Polishing Holder	Catalog Number
1-inch diameter 304 stainless steel specimen holders (each)	VIB-0100
1.25-inch diameter 304 stainless steel specimen holders (each)	VIB-0125
1.5-inch diameter 304 stainless steel specimen holders (each)	VIB-0150
2-inch diameter 304 stainless steel specimen holders (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 stainless steel Interchangeable bowl	GS-9IN-BOWL-SS
12-inch stainless steel Interchangeable bowl	GS-12IN-BOWL-SS

CE Machinery Directive 2006/42/EC
RoHS Directive 2011/65/EU

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 (100/pkg)



1200 grit 8-inch SiC Paper with PSA (100/pkg)
Catalog no. SIC-1200P8-100

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

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
8-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P08C	5 each
8-inch 60 grit SIC (PSA)-25/pkg	SIC-060P8-25	25/pkg
8-inch 80 grit SIC (PSA)-25/pkg	SIC-080P8-25	25/pkg
8-inch 120 grit SIC (PSA)-25/pkg	SIC-120P8-25	25/pkg
8-inch 180 grit SIC (PSA)-25/pkg	SIC-180P8-25	25/pkg
8-inch 240 grit SIC (PSA)-25/pkg	SIC-240P8-25	25/pkg
8-inch 320 grit SIC (PSA)-25/pkg	SIC-320P8-25	25/pkg
8-inch 360 grit SIC (PSA)-25/pkg	SIC-360P8-25	25/pkg
8-inch 400 grit SIC (PSA)-25/pkg	SIC-400P8-25	25/pkg
8-inch 600 grit SIC (PSA)-25/pkg	SIC-600P8-25	25/pkg
8-inch 800 grit SIC (PSA)-25/pkg	SIC-800P8-25	25/pkg
8-inch 1000 grit SIC (PSA)-25/pkg	SIC-1000P8-25	25/pkg
8-inch 1200 grit SIC (PSA)-25/pkg	SIC-1200P8-25	25/pkg

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



360 grit 8-inch SiC Plain-backed Paper (100/pkg)
Catalog no. SIC-2108-360

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

10-inch SILICON CARBIDE ABRASIVE PAPERS

Silicon Carbide Converter:

PACE Technologies is the only 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 (100/pkg)

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



240 grit 10-inch SiC Paper with PSA (100/pkg)
Catalog no. SIC-240P10-100

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

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



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

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

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



800 grit 10-inch SiC Plain-backed Paper (100/pkg)
Catalog no. SIC-2110-800

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
12-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P12C	5 each
12-inch 60 grit SiC (PSA)-25/pkg	SIC-060P12-25	25/pkg
12-inch 80 grit SiC (PSA)-25/pkg	SIC-080P12-25	25/pkg
12-inch 120 grit SiC (PSA)-25/pkg	SIC-120P12-25	25/pkg
12-inch 180 grit SiC (PSA)-25/pkg	SIC-180P12-25	25/pkg
12-inch 240 grit SiC (PSA)-25/pkg	SIC-240P12-25	25/pkg
12-inch 320 grit SiC (PSA)-25/pkg	SIC-320P12-25	25/pkg
12-inch 360 grit SiC (PSA)-25/pkg	SIC-360P12-25	25/pkg
12-inch 400 grit SiC (PSA)-25/pkg	SIC-400P12-25	25/pkg
12-inch 600 grit SiC (PSA)-25/pkg	SIC-600P12-25	25/pkg
12-inch 800 grit SiC (PSA)-25/pkg	SIC-800P12-25	25/pkg
12-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P12-25	25/pkg
12-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P12-25	25/pkg

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
12-inch 60 grit SiC (Plain)-100/pkg	SIC-2112-060	100/pkg
12-inch 80 grit SiC (Plain)-100/pkg	SIC-2112-080	100/pkg
12-inch 120 grit SiC (Plain)-100/pkg	SIC-2112-120	100/pkg
12-inch 180 grit SiC (Plain)-100/pkg	SIC-2112-180	100/pkg
12-inch 240 grit SiC (Plain)-100/pkg	SIC-2112-240	100/pkg
12-inch 320 grit SiC (Plain)-100/pkg	SIC-2112-320	100/pkg
12-inch 360 grit SiC (Plain)-100/pkg	SIC-2112-360	100/pkg
12-inch 400 grit SiC (Plain)-100/pkg	SIC-2112-400	100/pkg
12-inch 600 grit SiC (Plain)-100/pkg	SIC-2112-600	100/pkg
12-inch 800 grit SiC (Plain)-100/pkg	SIC-2112-800	100/pkg
12-inch 1000 grit SiC (Plain)-100/pkg	SIC-2112-1000	100/pkg
12-inch 1200 grit SiC (Plain)-100/pkg	SIC-2112-1200	100/pkg
12-inch Double-sided adhesive -10/pkg	DSA-12	10/pkg

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

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



NANO-S Polisher with ZETA-1000 Dispenser

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
14-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P14C	5 each
14-inch 60 grit SIC (PSA)-25/pkg	SIC-060P14-25	25/pkg
14-inch 80 grit SIC (PSA)-25/pkg	SIC-080P14-25	25/pkg
14-inch 120 grit SIC (PSA)-25/pkg	SIC-120P14-25	25/pkg
14-inch 180 grit SIC (PSA)-25/pkg	SIC-180P14-25	25/pkg
14-inch 240 grit SIC (PSA)-25/pkg	SIC-240P14-25	25/pkg
14-inch 320 grit SIC (PSA)-25/pkg	SIC-320P14-25	25/pkg
14-inch 360 grit SIC (PSA)-25/pkg	SIC-360P14-25	25/pkg
14-inch 400 grit SIC (PSA)-25/pkg	SIC-400P14-25	25/pkg
14-inch 600 grit SIC (PSA)-25/pkg	SIC-600P14-25	25/pkg
14-inch 800 grit SIC (PSA)-25/pkg	SIC-800P14-25	25/pkg
14-inch 1000 grit SIC (PSA)-25/pkg	SIC-1000P14-25	25/pkg
14-inch 1200 grit SIC (PSA)-25/pkg	SIC-1200P14-25	25/pkg

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
*14-inch 60 grit SIC (Plain)-50/pkg	SIC-2114-060	50/pkg
*14-inch 80 grit SIC (Plain)-50/pkg	SIC-2114-080	50/pkg
14-inch 120 grit SIC (Plain)-100/pkg	SIC-2114-120	100/pkg
14-inch 180 grit SIC (Plain)-100/pkg	SIC-2114-180	100/pkg
14-inch 240 grit SIC (Plain)-100/pkg	SIC-2114-240	100/pkg
14-inch 320 grit SIC (Plain)-100/pkg	SIC-2114-320	100/pkg
14-inch 360 grit SIC (Plain)-100/pkg	SIC-2114-360	100/pkg
14-inch 400 grit SIC (Plain)-100/pkg	SIC-2114-400	100/pkg
14-inch 600 grit SIC (Plain)-100/pkg	SIC-2114-600	100/pkg
14-inch 800 grit SIC (Plain)-100/pkg	SIC-2114-800	100/pkg
14-inch 1000 grit SIC (Plain)-100/pkg	SIC-2114-1000	100/pkg
14-inch 1200 grit SIC (Plain)-100/pkg	SIC-2114-1200	100/pkg
14-inch Double-sided adhesive -10/pkg	DSA-14	10/pkg

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



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

PACE Product Name	Catalog Number	Qty
*14-inch 60 grit SIC (PSA)-50/pkg	SIC-060P14-50	50/pkg
*14-inch 80 grit SIC (PSA)-50/pkg	SIC-080P14-50	50/pkg
14-inch 120 grit SIC (PSA)-100/pkg	SIC-120P14-100	100/pkg
14-inch 180 grit SIC (PSA)-100/pkg	SIC-180P14-100	100/pkg
14-inch 240 grit SIC (PSA)-100/pkg	SIC-240P14-100	100/pkg
14-inch 320 grit SIC (PSA)-100/pkg	SIC-320P14-100	100/pkg
14-inch 360 grit SIC (PSA)-100/pkg	SIC-360P14-100	100/pkg
14-inch 400 grit SIC (PSA)-100/pkg	SIC-400P14-100	100/pkg
14-inch 600 grit SIC (PSA)-100/pkg	SIC-600P14-100	100/pkg
14-inch 800 grit SIC (PSA)-100/pkg	SIC-800P14-100	100/pkg
14-inch 1000 grit SIC (PSA)-100/pkg	SIC-1000P14-100	100/pkg
14-inch 1200 grit SIC (PSA)-100/pkg	SIC-1200P14-100	100/pkg

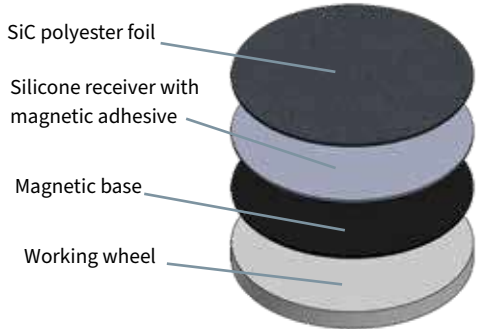
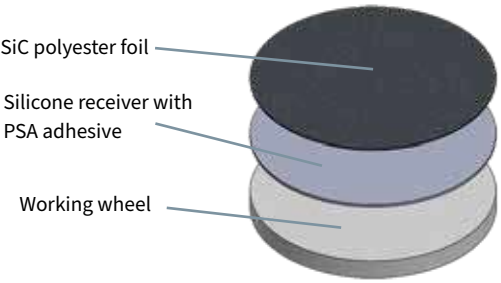
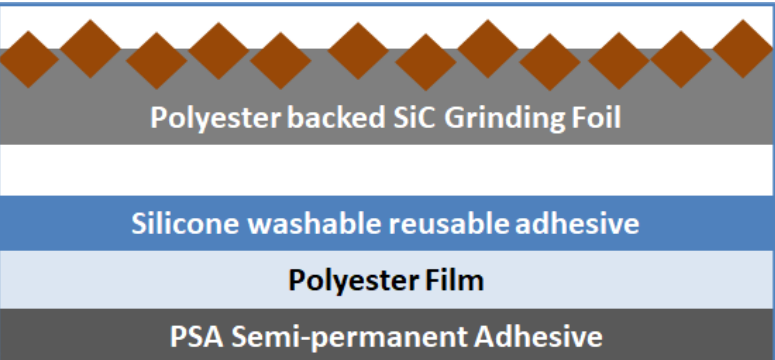


NANO-S / FEMTO-S Auto Polishers

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



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



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



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



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



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



Silicone (adhesive) Receiver Disk with PSA backing

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
8-inch Receivers for SiC Foils (PSA-backed)	REC-5008	2/pkg
10-inch Receivers for SiC Foils (PSA-backed)	REC-5010	2/pkg
12-inch Receivers for SiC Foils (PSA-backed)	REC-5012	2/pkg
8-inch Receivers for SiC Foils (magnetic-backed)	MREC-5008	2/pkg
10-inch Receivers for SiC Foils (magnetic-backed)	MREC-5010	2/pkg
12-inch Receivers for SiC Foils (magnetic-backed)	MREC-5012	2/pkg

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

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



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



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

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

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



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)



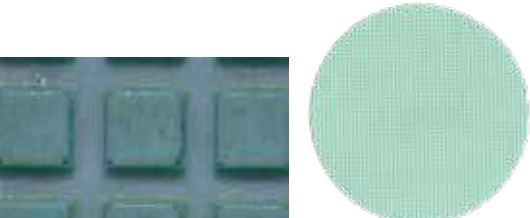
30 micron Metal Bonded Diamond Disk (20X close-up on left)



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)

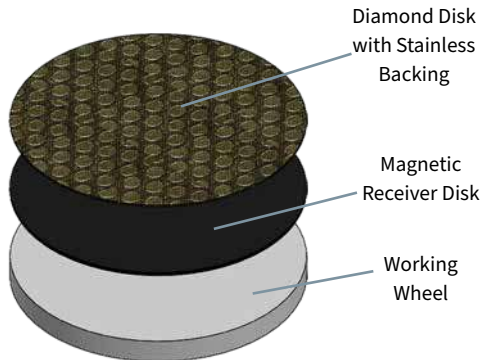


9 micron Resin Bonded Diamond Disk (10X close-up on left)

MAGNETIC BACKED DISKS

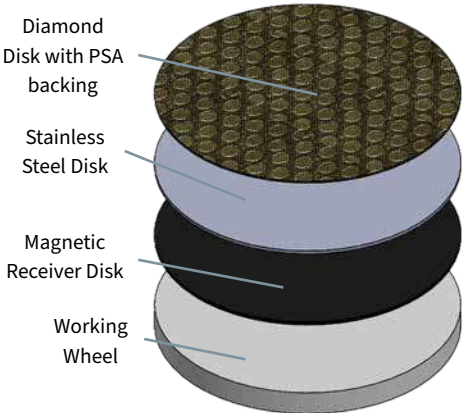
Diamond MD Grinding Disks:

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 Number	Qty
8-inch MAGNETON Base Disk (PSA)	MAG-B08	each
10-inch MAGNETON Base Disk (PSA)	MAG-B10	each
12-inch MAGNETON Base Disk (PSA)	MAG-B12	each
14-inch MAGNETON Base Disk (PSA)	MAG-B14	each



PACE Product Name	Catalog Number	Qty
8-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	each
10-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	each
12-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	each
14-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P14	each

PACE Product Name	Catalog Number	Qty
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each
14-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P14	each



DIAMOND GRINDING ABRASIVES (8-inch)

8-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive (each)

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

8-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive (each)

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

8-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty
8-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD08	each
8-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD08	each



8-inch ORION Composite Disk

8-inch Magnetic Plates

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



8-inch MAGNEPAD Teflon Base Plate

8-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing (each)

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



75 micron PSA Metal Bonded Diamond Disk



15 micron MAG Metal Bonded Diamond Disk

8-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing (each)

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



35 micron PSA Resin Bonded Diamond Disk



9 micron MAG Resin Bonded Diamond Disk

DIAMOND GRINDING ABRASIVES (10-inch)

10-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive (each)

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

10-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive (each)

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

10-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty
10-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD10	each
10-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD10	each



10-inch SIRIUS Composite Disk

10-inch Magnetic Plates

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



10-inch MAGNEPAD Stainless Steel Base Plate

10-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing (each)



125 micron PSA Metal Bonded Diamond Disk



30 micron MAG Metal Bonded Diamond Disk

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

10-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing (each)



70 micron PSA Resin Bonded Diamond Disk



15 micron MAG Resin Bonded Diamond Disk

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

DIAMOND GRINDING ABRASIVES (12-inch)

12-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive (each)

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

12-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive (each)

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

12-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty
12-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD12	each
12-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD12	each



12-inch ORION Composite Disk

12-inch Magnetic Plates

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



12-inch MAGNEPAD Teflon Base Plate

12-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing (each)



250 micron PSA Metal Bonded Diamond Disk



40 micron MAG Metal Bonded Diamond Disk

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

12-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing (each)



125 micron PSA Resin Bonded Diamond Disk



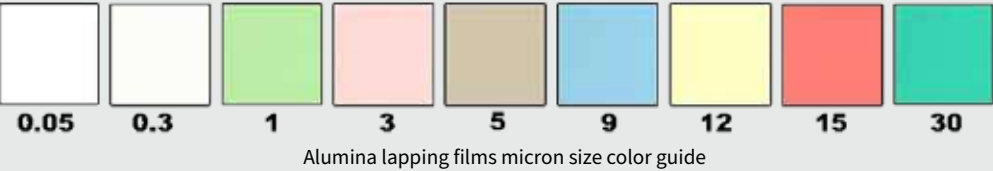
25 micron MAG Resin Bonded Diamond Disk

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

ABRASIVE LAPPING FILMS (8-inch)

Lapping Films (Superior Flatness):

The primary advantage of abrasives coated 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: silicon carbide, 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. Silicon carbide is very useful for metal coated specimens (see SiC foil system).



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
0.05 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8105PB	100/pkg
0.3 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8103PB	100/pkg
1 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8001PB	100/pkg
3 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8003PB	100/pkg
5 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8005PB	100/pkg
9 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8009PB	100/pkg
12 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8012PB	100/pkg
15 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8015PB	100/pkg
30 micron alumina plain-backed lapping film (8-inch) - 100/pkg	ALO-8030PB	100/pkg



8-inch Alumina Lapping Films with PSA Adhesive-Backing

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



8-inch Diamond Lapping Films with Plain-backing



1 micron Diamond PB Lapping Film



6 micron Diamond PB Lapping Film

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

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



0.10 micron Diamond PSA Lapping Film



9 micron Diamond PSA Lapping Film

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



ABRASIVE LAPPING FILMS (10-inch)

10-inch Alumina Lapping Films with Plain-Backing

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



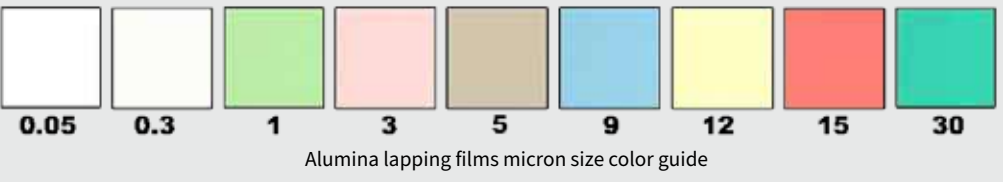
3 micron Alumina PB Lapping Film



9 micron Alumina PB Lapping Film

10-inch Alumina Lapping Films with PSA Adhesive-Backing

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



10-inch Diamond Lapping Films with Plain-backing

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



3 micron Diamond PB Lapping Film



9 micron Diamond PB Lapping Film

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

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



0.25 micron Diamond PSA Lapping Film



15 micron Diamond PSA Lapping Film

ABRASIVE LAPPING FILMS (12-inch)

12-inch Alumina Lapping Films with Plain-Backing

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



5 micron Alumina PB Lapping Film



12 micron Alumina PB Lapping Film

12-inch Alumina Lapping Films with PSA Adhesive-Backing

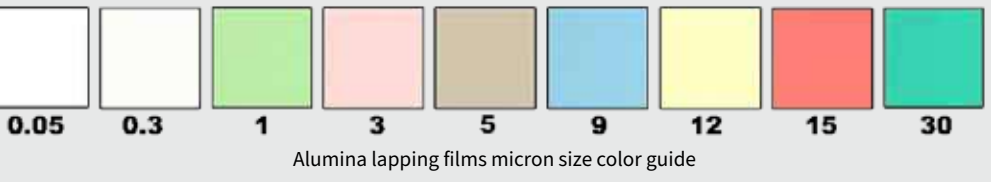
PACE Product Name	Catalog Number	Qty
0.05 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-12105PSA	100/pkg
0.3 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-12103PSA	100/pkg
1 micron alumina PSA adhesive-backed lapping film (12-inch) - 100/pkg	ALO-1201PSA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



9 micron Alumina PSA Lapping Film



30 micron Alumina PSA Lapping Film



12-inch Diamond Lapping Films with Plain-backing

PACE Product Name	Catalog Number	Qty
0.10 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-01P12	3/pkg
0.25 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-025P12	3/pkg
0.50 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-05P12	3/pkg
1 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-1P12	3/pkg
3 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-3P12	3/pkg
6 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-6P12	3/pkg
9 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-9P12	3/pkg
15 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-15P12	3/pkg
30 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-30P12	3/pkg
45 micron diamond lapping film, (plain-backed) (12-inch) - 5/pkg	DA-45P12	3/pkg



6 micron Diamond PB Lapping Film



15 micron Diamond PB Lapping Film

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

PACE Product Name	Catalog Number	Qty
0.10 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-01P12	3/pkg
0.25 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-025P12	3/pkg
0.50 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-05P12	3/pkg
1 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-1P12	3/pkg
3 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-3P12	3/pkg
6 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-6P12	3/pkg
9 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-9P12	3/pkg
15 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-15P12	3/pkg
30 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-30P12	3/pkg
45 micron diamond PSA adhesive-backed lapping film (12-inch)- 5/pkg	DAA-45P12	3/pkg



0.5 micron Diamond PSA Lapping Film



30 micron Diamond PSA Lapping Film

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
P120 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P120	100/pkg
P220 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P220	100/pkg
P500 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P500	100/pkg
P1200 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P1200	100/pkg

10-inch Alumina Grinding Papers with Plain-Backing

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

12-inch Alumina Grinding Papers with Plain-Backing

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

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.



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

8-inch Alumina Grinding Papers with PSA Adhesive-Backing

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



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

10-inch Alumina Grinding Papers with PSA Adhesive-Backing

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



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

12-inch Alumina Grinding Papers with PSA Adhesive-Backing

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

Zirconia Grinding Papers with PSA Adhesive-Backing



Zirconia Grinding Papers

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

METALLOGRAPHIC POLISHING PADS

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).

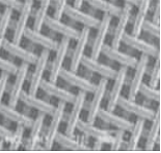
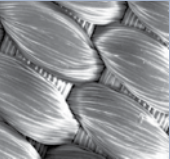
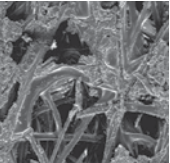
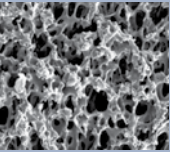
Minimizing Polishing Artifacts

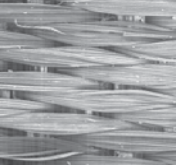
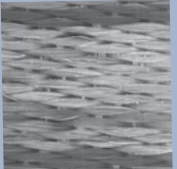
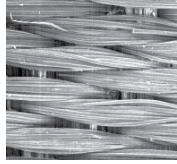
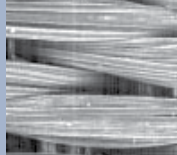
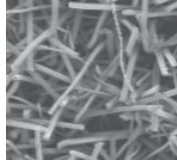
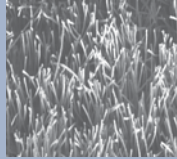
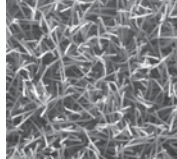
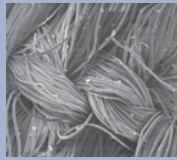
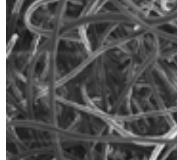
To minimize polishing artifacts such as edge rounding, phase relief, smeared metal, grain pull-out and inclusion pull-out, the polishing time should be kept to a minimum. This can be accomplished by:

- 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	

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	
	NYPAD 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
Rough Polishing		
8-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2008	5/pkg
8-inch POLYPAD polishing pad (10/pkg)	PP-6008	10/pkg
Intermediate Diamond Polishing		
8-inch TEXPAN polishing pad (10/pkg)	TP-5008	10/pkg
8-inch DACRON II ® polishing pad (5/pkg)	DC2-3008	5/pkg
8-inch NYPAD polishing pad (10/pkg)	NY-3008	10/pkg
8-inch GOLDPAD polishing pad (10/pkg)	GP-4008	10/pkg
8-inch ATLANTIS polishing pad (5/pkg)	ATL-3008	5/pkg
Final Polishing		
8-inch TRICOTE polishing pad (10/pkg)	TRI-4008	10/pkg
8-inch MICROPAD polishing pad (10/pkg)	MP-9008	10/pkg
8-inch NAPPAD polishing pad (10/pkg)	NP-7008	10/pkg
8-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7008	5/pkg
8-inch FELTPAD polishing pad (5/pkg)	FP-8125-08	5/pkg
CMP Polishing		
8-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8008	10/pkg



8-inch CERMESH Pad
Catalog no. CERMESH-2008



8-inch POLYPAD Pad
Catalog no. PP-6008

8-inch Polishing Pads with Magnetic Rubber-Backing

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

8-inch Polishing Pads with Magnetic Stainless Steel-Backing

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

9-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
9-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2009	5/pkg
9-inch POLYPAD polishing pad (10/pkg)	PP-6009	10/pkg
Intermediate Diamond Polishing		
9-inch TEXPAN polishing pad (10/pkg)	TP-5009	10/pkg
9-inch NYPAD polishing pad (10/pkg)	NY-3009	10/pkg
9-inch GOLDPAD polishing pad (10/pkg)	GP-4009	10/pkg
9-inch ATLANTIS polishing pad (5/pkg)	ATL-3009	5/pkg
Final Polishing		
9-inch TRICOTE polishing pad (10/pkg)	TRI-4009	10/pkg
9-inch MICROPAD polishing pad (10/pkg)	MP-9009	10/pkg
9-inch NAPPAD polishing pad (10/pkg)	NP-7009	10/pkg
9-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7009	5/pkg
CMP Polishing		
9-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8009	10/pkg



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



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

METALLOGRAPHIC POLISHING PADS (10-inch)

10-inch Polishing Pads with PSA Adhesive-Backing

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



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



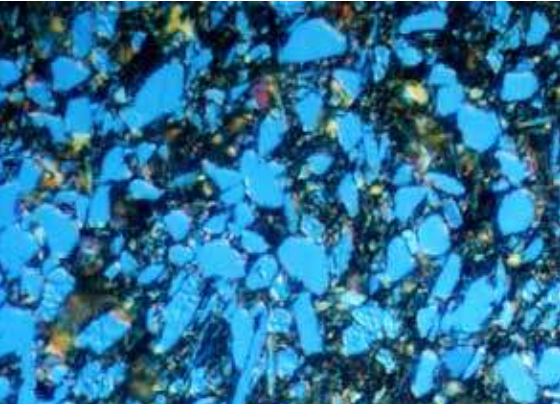
10-inch GOLDPAD Pad
Catalog no. GP-4010

10-inch Polishing Pads with Magnetic Rubber-Backing

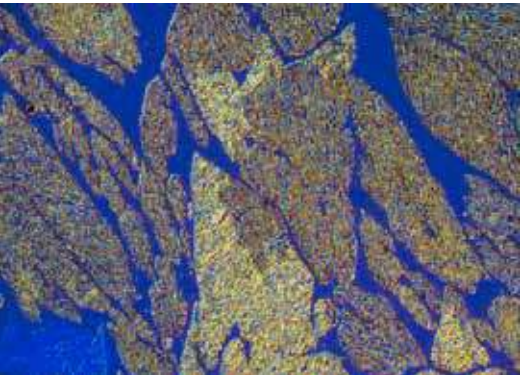
PACE Product Name	Catalog Number	Qty
Rough Polishing		
10-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2010-MAG	5/pkg
10-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6010-MAG	5/pkg
Intermediate Diamond Polishing		
10-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5010-MAG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

10-inch Polishing Pads with Magnetic Stainless Steel-Backing

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



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
Rough Polishing		
12-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2012	5/pkg
12-inch POLYPAD polishing pad (10/pkg)	PP-6012	10/pkg
Intermediate Diamond Polishing		
12-inch TEXPAN polishing pad (10/pkg)	TP-5012	10/pkg
12-inch DACRON II ® polishing pad (5/pkg)	DC2-3012	5/pkg
12-inch NYPAD polishing pad (10/pkg)	NY-3012	10/pkg
12-inch GOLDPAD polishing pad (10/pkg)	GP-4012	10/pkg
12-inch ATLANTIS polishing pad (5/pkg)	ATL-3012	5/pkg
Final Polishing		
12-inch TRICOTE polishing pad (10/pkg)	TRI-4012	10/pkg
12-inch MICROPAD polishing pad (10/pkg)	MP-9012	10/pkg
12-inch NAPPAD polishing pad (10/pkg)	NP-7012	10/pkg
12-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7012	5/pkg
12-inch FELTPAD polishing pad (5/pkg)	FP-8125-12	5/pkg
CMP Polishing		
12-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8012	10/pkg



12-inch ATLANTIS Pad
Catalog no. ATL-3012



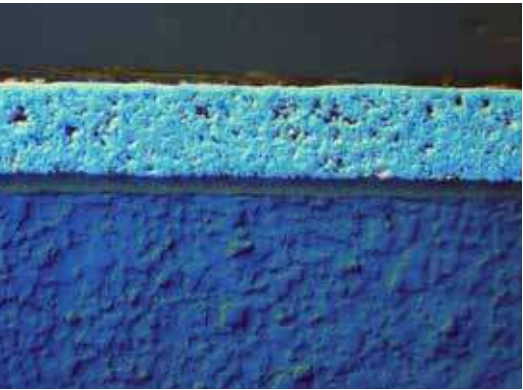
12-inch TRICOTE Pad
Catalog no. TRI-4012

12-inch Polishing Pads with Magnetic Rubber-Backing

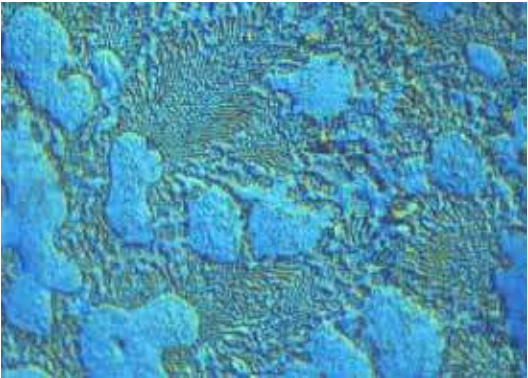
PACE Product Name	Catalog Number	Qty
Rough Polishing		
12-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2012-MAG	5/pkg
12-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6012-MAG	5/pkg
Intermediate Diamond Polishing		
12-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5012-MAG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

12-inch Polishing Pads with Magnetic Stainless Steel-Backing

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



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
Rough Polishing		
14-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2014	5/pkg
14-inch POLYPAD polishing pad (10/pkg)	PP-6014	10/pkg
Intermediate Diamond Polishing		
14-inch TEXPAN polishing pad (10/pkg)	TP-5014	10/pkg
14-inch DACRON II® polishing pad (5/pkg)	DC2-3014	5/pkg
14-inch NYPAD polishing pad (10/pkg)	NY-3014	10/pkg
14-inch GOLDPAD polishing pad (10/pkg)	GP-4014	10/pkg
14-inch ATLANTIS polishing pad (5/pkg)	ATL-3014	5/pkg
Final Polishing		
14-inch TRICOTE polishing pad (10/pkg)	TRI-4014	10/pkg
14-inch MICROPAD polishing pad (10/pkg)	MP-9014	10/pkg
14-inch NAPPAD polishing pad (10/pkg)	NP-7014	10/pkg
14-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7014	5/pkg
14-inch FELTPAD polishing pad (5/pkg)	FP-8125-14	5/pkg
CMP Polishing		
14-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8014	10/pkg



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
Rough Polishing		
14-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2014-MAG	5/pkg
14-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6014-MAG	5/pkg
Intermediate Diamond Polishing		
14-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5014-MAG	5/pkg
14-inch DACRON II® magnetic rubber polishing pad (5/pkg)	DC2-3014-MAG	5/pkg
14-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3014-MAG	5/pkg
14-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4014-MAG	5/pkg
14-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3014-MAG	5/pkg
Final Polishing		
14-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4014-MAG	5/pkg
14-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9014-MAG	5/pkg
14-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7014-MAG	5/pkg
14-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7014-MAG	5/pkg
14-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-14-MAG	5/pkg
CMP Polishing		
14-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8014-MAG	5/pkg

14-inch Polishing Pads with Magnetic Stainless Steel-Backing

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

Magnetic Base Disks and Plates

PACE Product Name	Catalog Number	Qty
8-inch MAGNETON Base Plate (PSA)	MAG-B08	each
10-inch MAGNETON Base Plate (PSA)	MAG-B10	each
12-inch MAGNETON Base Plate (PSA)	MAG-B12	each
14-inch MAGNETON Base Plate (PSA)	MAG-B14	each



MAGNETON
Base Plate



MAGNEPAD Stainless
Steel Base Plate

PACE Product Name	Catalog Number	Qty
8-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	each
10-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	each
12-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	each
14-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P14	each

PACE Product Name	Catalog Number	Qty
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each
14-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P14	each



MAGNEPAD Coated
Base Plate

POLYCRYSTALLINE DIAMOND (HIGH VISCOSITY)

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



Monocrystalline Diamond

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
1 micron (blue) DIAMAT PC diamond (1 liter)	PC-1001-1L	1-liter
3 micron (green) DIAMAT PC diamond (1 liter)	PC-1003-1L	1-liter
6 micron (yellow) DIAMAT PC diamond (1 liter)	PC-1006-1L	1-liter
9 micron (red) DIAMAT PC diamond (1 liter)	PC-1009-1L	1-liter
15 micron (brown) DIAMAT PC diamond (1 liter)	PC-1015-1L	1-liter
30 micron (orange) DIAMAT PC diamond (1 liter)	PC-1030-1L	1-liter
45 micron (purple) DIAMAT PC diamond (1 liter)	PC-1045-1L	1-liter



1 liter Dyed PC Diamond

Polycrystalline Diamond Suspensions (1-gallon Color Coded)

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



1 gallon Dyed PC Diamond

High Viscosity Polycrystalline Diamond Suspensions



0.10 micron High Viscosity Polycrystalline Diamond



0.25 micron High Viscosity Polycrystalline Diamond



1 micron High Viscosity Polycrystalline Diamond



9 micron High Viscosity Polycrystalline Diamond



45 micron High Viscosity Polycrystalline Diamond

PACE Product Name	Catalog Number	Qty
0.05 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0105-250	250 ml
0.05 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0105-500	500 ml
0.05 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0105-1GL	1 gallon
0.10 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0110-250	250 ml
0.10 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0110-500	500 ml
0.10 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0110-1GL	1 gallon
0.25 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0125-250	250 ml
0.25 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0125-500	500 ml
0.25 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0125-1GL	1 gallon
0.50 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0150-250	250 ml
0.50 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0150-500	500 ml
0.50 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0150-1GL	1 gallon
1 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1001-250	250 ml
1 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1001-500	500 ml
1 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1001-1GL	1 gallon
3 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1003-250	250 ml
3 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1003-500	500 ml
3 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1003-1GL	1 gallon
6 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1006-250	250 ml
6 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1006-500	500 ml
6 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1006-1GL	1 gallon
9 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1009-250	250 ml
9 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1009-500	500 ml
9 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1009-1GL	1 gallon
15 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1015-250	250 ml
15 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1015-500	500 ml
15 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1015-1GL	1 gallon
30 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1030-250	250 ml
30 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1030-500	500 ml
30 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1030-1GL	1 gallon
45 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1045-250	250 ml
45 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1045-500	500 ml
45 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1045-1GL	1 gallon

POLYCRYSTALLINE DIAMOND (LOW VISCOSITY)

Polycrystalline Diamond Suspensions (Low Viscosity)

PACE Product Name	Catalog Number	Qty
0.05 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0105-250	250 ml
0.05 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0105-500	500 ml
0.05 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0105-1GL	1 gallon
0.10 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0110-250	250 ml
0.10 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0110-500	500 ml
0.10 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0110-1GL	1 gallon
0.25 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0125-250	250 ml
0.25 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0125-500	500 ml
0.25 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0125-1GL	1 gallon
0.50 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0150-250	250 ml
0.50 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0150-500	500 ml
0.50 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0150-1GL	1 gallon
1 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1001-250	250 ml
1 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1001-500	500 ml
1 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1001-1GL	1 gallon
3 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1003-250	250 ml
3 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1003-500	500 ml
3 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1003-1GL	1 gallon
6 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1006-250	250 ml
6 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1006-500	500 ml
6 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1006-1GL	1 gallon
9 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1009-250	250 ml
9 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1009-500	500 ml
9 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1009-1GL	1 gallon
15 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1015-250	250 ml
15 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1015-500	500 ml
15 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1015-1GL	1 gallon
30 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1030-250	250 ml
30 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1030-500	500 ml
30 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1030-1GL	1 gallon
45 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1045-250	250 ml
45 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1045-500	500 ml
45 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1045-1GL	1 gallon



0.25 micron Low Viscosity Polycrystalline Diamond



1 micron Low Viscosity Polycrystalline Diamond



3 micron Low Viscosity Polycrystalline Diamond



6 micron Low Viscosity Polycrystalline Diamond



9 micron Low Viscosity Polycrystalline Diamond

POLYCRYSTALLINE DIAMOND (PASTE)

Polycrystalline Diamond Paste (5 gram syringes)



5 gram PC Diamond Paste

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

Polycrystalline Diamond Paste (20 gram syringes)



20 gram PC Diamond Paste

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

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.

Monocrystalline Diamond Suspensions (High Viscosity)

PACE Product Name	Catalog Number	Qty
1 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1001-250	250 ml
1 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1001-500	500 ml
1 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1001-1GL	1 gallon
3 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1003-250	250 ml
3 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1003-500	500 ml
3 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1003-1GL	1 gallon
6 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1006-250	250 ml
6 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1006-500	500 ml
6 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1006-1GL	1 gallon
9 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1009-250	250 ml
9 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1009-500	500 ml
9 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1009-1GL	1 gallon
15 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1015-250	250 ml
15 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1015-500	500 ml
15 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1015-1GL	1 gallon
30 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1030-250	250 ml
30 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1030-500	500 ml
30 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1030-1GL	1 gallon
45 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1045-250	250 ml
45 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1045-500	500 ml
45 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1045-1GL	1 gallon



Monocrystalline Diamond Paste (5 gram syringes)

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



Monocrystalline Diamond Paste (20 gram syringes)

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



Monocrystalline Diamond Suspensions (Low Viscosity)

PACE Product Name	Catalog Number	Qty
1 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1001-250	250 ml
1 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1001-500	500 ml
1 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1001-1GL	1 gallon
3 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1003-250	250 ml
3 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1003-500	500 ml
3 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1003-1GL	1 gallon
6 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1006-250	250 ml
6 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1006-500	500 ml
6 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1006-1GL	1 gallon
9 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1009-250	250 ml
9 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1009-500	500 ml
9 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1009-1GL	1 gallon
15 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1015-250	250 ml
15 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1015-500	500 ml
15 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1015-1GL	1 gallon
30 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1030-250	250 ml
30 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1030-500	500 ml
30 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1030-1GL	1 gallon
45 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1045-250	250 ml
45 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1045-500	500 ml
45 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1045-1GL	1 gallon



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
DIALUBE water based lube (16 oz)	DL-3000-16	16 oz
DIALUBE water based lube (32 oz)	DL-3000-32	32 oz
DIALUBE water based lube (1/2 gallon)	DL-3000-64	1/2 gallon
DIALUBE water based lube (1 gallon)	DL-3000-128	1 gallon
DIALUBE Blue alcohol based lube (32 oz)*	AOD-3000-32	32 oz
DIALUBE Blue alcohol based lube (1 gallon)*	AOD-3000-128	1 gallon
DIALUBE Blue alcohol based lube (5 gallons)*	AOD-3000-640	5 gallons
DIALUBE Purple alcohol based lube (32 oz)*	ADL-3000-32	32 oz
DIALUBE Purple alcohol based lube (1 gallon)*	ADL-3000-128	1 gallon
DIALUBE Purple alcohol based lube (5 gallons)*	ADL-3000-640	5 gallons
POLYLUBE non-aqueous lube (32 oz)	PDL-3000-32	32 oz
POLYLUBE non-aqueous lube (1 gallon)	PDL-3000-128	1 gallon
POLYLUBE Red (anti-corrosion lube) (32 oz)	PDL-3000R-32	32 oz
POLYLUBE Red (anti-corrosion lube) (1 gallon)	PDL-3000R-128	1 gallon

* May required dangerous goods shipping, extra charges may apply

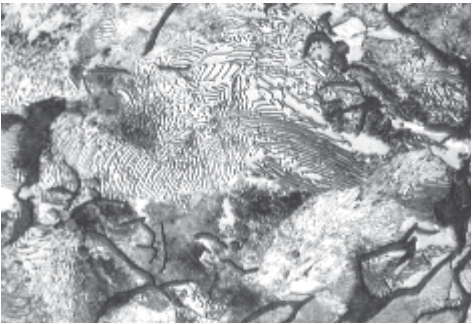
Metallographic Specimen Preparation (Example)



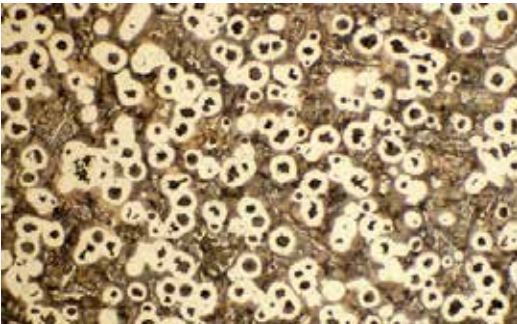
Cast Iron (Class 3 Procedures)

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		
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	0.5 min.	15 seconds / 5 seconds		

**Required for central polishing force. [Click here for more information on central vs. individual polishing force polishing.](#)



Graphite Cast Iron, 2% Nital etchant, 500X



Nodular Cast Iron, 2% Nital etchant, 100X (DIC)

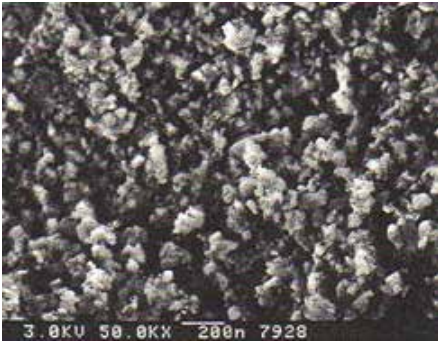
FINAL POLISHING

Final Polishing:

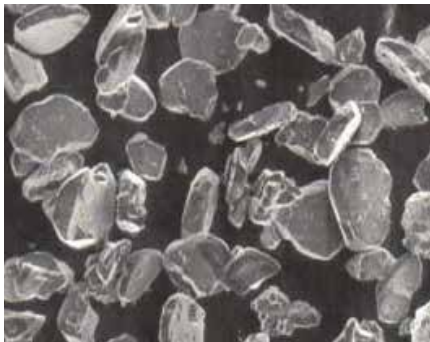
Final polishing can be accomplished with alumina, diamond, colloidal silica, ceria (cerium oxide) and rouge (iron oxide). However, the most commonly used abrasive for final polishing metals is alumina. Alumina abrasives are classified as calcined, levigated or polycrystalline based on their manufacturing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

Characteristics of Alumina Abrasives

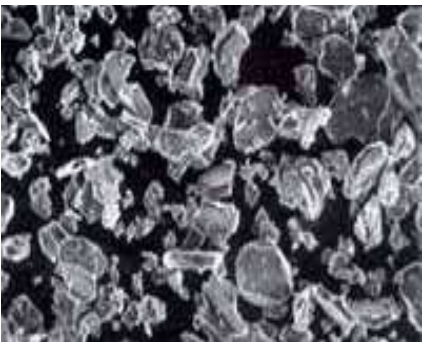
PROPERTY	POLYCRYSTALLINE	CALCINED	LEVIGATED
Crystal structure	Polycrystalline alpha alumina	Monocrystalline alpha alumina	Monocrystalline gamma or alpha alumina
Shape	Rough spherical particles	Hexagonal platelets	Hexagonal platelets
Particle size	0.05-0.25 microns	0.5-15 microns	<1 micron
Specific gravity	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

FINAL POLISHING (PC ALUMINA)

Polycrystalline Alumina:

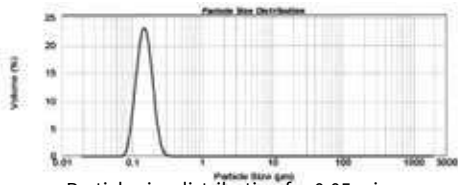
Polycrystalline or nanometer alumina is a colloidal alumina manufactured by a proprietary process. Polycrystalline abrasives are milled at either a low or higher pH value in order to avoid agglomeration which occurs near the point of zero charge (PZC). For alumina the PZC is around pH 7. This processing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

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

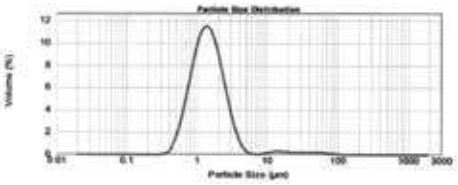
A tighter, more controlled particle size distribution is the result of less particle aggregation. For example, standard calcined 0.05 micron gamma alumina products form aggregate sizes as large as 5 microns. In some cases, these aggregates can be broken down during polishing with harder specimens; however, 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
16 oz Nanometer alumina (pH 10)	NA-1005-16	16 oz
32 oz Nanometer alumina (pH 10)	NA-1005-32	32 oz
1/2 gallon Nanometer alumina (pH 10)	NA-1005-64	1/2 gallon
1 gallon Nanometer alumina (pH 10)	NA-1005-128	1 gallon
16 oz Acidic Nanometer alumina (pH 4)	NA-1020-16	16 oz
32 oz Acidic Nanometer alumina (pH 4)	NA-1020-32	32 oz
1/2 gallon Acidic Nanometer alumina (pH 4)	NA-1020-64	1/2 gallon
1 gallon Acidic Nanometer alumina (pH 4)	NA-1020-128	1 gallon

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

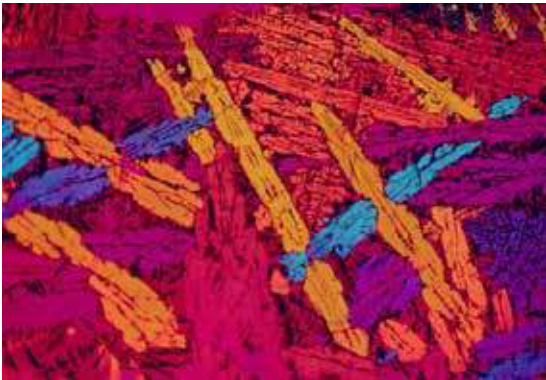
PACE Product Name	Catalog Number	Qty
0.05 micron Electronics Grade Deagglomerated Alumina (6 oz)	NANO2-1005-06E	6 oz
0.05 micron Electronics Grade Deagglomerated Alumina (16 oz)	NANO2-1005-16E	16 oz
0.05 micron Electronics Grade Deagglomerated Alumina (32 oz)	NANO2-1005-32E	32 oz
0.05 micron Electronics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



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
0.05 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1005-06	6 oz
0.05 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1005-16	16 oz
0.05 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1005-32	32 oz
0.05 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1005-128	1 gallon
0.3 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1003-06	6 oz
0.3 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1003-16	16 oz
0.3 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1003-32	32 oz
0.3 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1003-128	1 gallon
0.50 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1105-06	6 oz
0.50 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1105-16	16 oz
0.50 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1105-32	32 oz
0.50 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1105-128	1 gallon
1 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1010-06	6 oz
1 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1010-16	16 oz
1 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1010-32	32 oz
1 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1010-128	1 gallon
3 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1030-06	6 oz
3 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1030-16	16 oz
3 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1030-32	32 oz
3 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1030-128	1 gallon
5 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1050-06	6 oz
5 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1050-16	16 oz
5 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1050-32	32 oz
5 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1050-128	1 gallon

ALUMINA SUSPENSIONS (ELECTRONICS GRADE HIGH VISCOSITY)

ALUMINA SUSPENSIONS (LOW VISCOSITY)

FINAL POLISHING (ALUMINA POWDERS)

FINAL POLISHING (CMP ABRASIVES)

Deagglomerated Alumina Powders (For Electronics and Soft Materials)

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

Alumina Powders

PACE Product Name	Catalog Number	Qty
0.05 micron deagglomerated alumina powder (1 lb)	ALD-1005-01 (formally ALR-1005-01)	1 lb
0.05 micron deagglomerated alumina powder (5 lbs)	ALD-1005-05 (formerly ALR-1005-05)	5 lbs
0.3 micron deagglomerated alumina powder (1 lb)	ALD-0103-01 (formerly ALD-0103B-01)	1 lb
0.3 micron deagglomerated alumina powder (5 lbs)	ALD-0103-05 (formerly ALD-0103B-05)	5 lbs
0.3 micron alumina powder (high density) (1 lb)	ALR-0103-01	1 lb
0.3 micron alumina powder (high density) (5 lbs)	ALR-0103-05	5 lbs
0.5 micron alumina powder (1 lb)	ALR-0105-01	1 lb
0.5 micron alumina powder (5 lbs)	ALR-0105-05	5 lbs
1 micron alumina powder (1 lb)	ALR-0110-01	1 lb
1 micron alumina powder (5 lbs)	ALR-0110-05	5 lbs
3 micron alumina powder (1 lb)	ALR-0130-01	1 lb
3 micron alumina powder (5 lbs)	ALR-0130-05	5 lbs
5 micron alumina powder (1 lb)	ALR-0150-01	1 lb
5 micron alumina powder (5 lbs)	ALR-0150-05	5 lbs
9 micron alumina powder (5 lbs)	ALR-0190-05	5 lbs
12 micron alumina powder (5 lbs)	ALR-1200-05	5 lbs
15 micron alumina powder (5 lbs)	ALR-1500-05	5 lbs
20 micron alumina powder (5 lbs)	ALR-2000-05	5 lbs
30 micron alumina powder (5 lbs)	ALR-3000-05	5 lbs
40 micron alumina powder (5 lbs)	ALR-4000-05	5 lbs



Deagglomerated Fine Alumina Powders



Calcined Colloidal (<1 micron) Powders



Calcined Fine Alumina Powders



Coarse Alumina Powders

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
16 oz Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-16	16 oz
32 oz Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-32	32 oz
1/2 gallon Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-64	1/2 gallon
1 gallon Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-128	1 gallon

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 (NH₄OH) with hydrogen peroxide.

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

FINAL POLISHING (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
16 oz SIAMAT colloidal silica (0.06 micron)	SI-100A-16	16 oz
32 oz SIAMAT colloidal silica (0.06 micron)	SI-100A-32	32 oz
1/2 gallon SIAMAT colloidal silica (0.06 micron)	SI-100A-64	1/2 gallon
1 gallon SIAMAT colloidal silica (0.06 micron)	SI-100A-128	1 gallon
5 gallons SIAMAT colloidal silica (0.06 micron)	SI-100A-640	5 gallons
16 oz SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-16	16 oz
32 oz SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-32	32 oz
1/2 gallon SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-64	1/2 gallon
1 gallon SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-128	1 gallon
5 gallons SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-640	5 gallons
16 oz SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-16	16 oz
32 oz SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-32	32 oz
1/2 gallon SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-64	1/2 gallon
1 gallon SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-128	1 gallon
5 gallons SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-640	5 gallons



SIAMAT Colloidal Silica



SIAMAT Blue Colloidal Silica



Low Crystallizing SIAMAT 2 Colloidal Silica

CLEANING

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:

- 1. Intermediate cleaning
- 2. Final cleaning and drying

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 cleaned with water and a cotton swab to remove excess abrasive and swarf. A secondary cleaning with an ultrasonic cleaner and an appropriate surfactant (cleaning solution) is recommended for removing inaccessible abrasive and swarf which can be located in specimen cracks or pores, cavities in the mount, and in the specimen holder crevices. A tap water rinse is recommended in order to remove residual surfactant. Air drying is helpful but not always required for this step.

Final Cleaning:

Final cleaning is the most important cleaning step for removing residue prior to specimen examination. This cleaning step can be more difficult because of the tendency of the final polishing abrasives to crystallize or agglomerate on the specimen surface. Final cleaning should be performed immediately after or at the end of the final polishing step. For very fine abrasives such as SIAMAT colloidal silica and Nanometer alumina, rinsing the polishing pad with distilled

or deionized water for the last 10-15 seconds of the polishing stage helps to mechanically scrub the specimen surface as well as clean the polishing pad.

For difficult to clean specimens, a cotton swab dipped in alcohol can be useful for scrubbing the specimen.

A similar procedure is also recommended following etching.

Drying:

Following the pad/specimen cleaning it is recommended that the specimens be cleaned in an ultrasonic cleaner and then dipped or sprayed with an alcohol solution. The alcohol replaces the water and allows for more efficient drying. Air drying with compressed air or in a heated oven produces dried specimen surfaces.

Corrosion Inhibitors:

Corrosion or staining can occur if water remains on the surface or in any pores or gaps in the mounting resin. This corrosion can lead to water stains on the metal surface. The use of an organic corrosion inhibitor dip can eliminate this problem as well as protect sensitive surfaces from air oxidation over time.

Cleaning / Drying / Storage Products

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

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	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
	Hydrogen Peroxide (3%)	125 ml		
	DI Water	62.5 ml		
Adler 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
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	190 ml	10-30 second immersion. Use only fresh etchant	Excellent for aluminum and titanium alloys
	Nitric acid	5 ml		
	Hydrochloric acid	3 ml		
	Hydrofluoric acid	2 ml		
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	92 ml	Swab specimen up to 20 seconds	Excellent for titanium and alloys
	Nitric acid	6 ml		
	Hydrofluoric acid	2 ml		
Nital	Ethanol	100 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.
	Nitric acid	1-10 ml		
Marble's 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

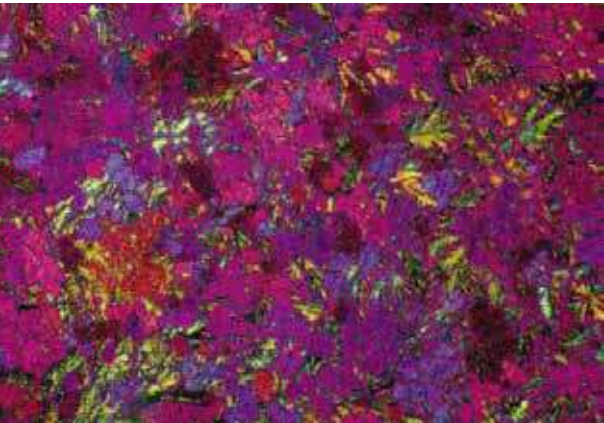
Common Aluminum and Titanium Etchants



PACE Product Name	Applications	Catalog Number	Qty
Kellers	Most common etchant for aluminum alloys (250 ml)	Kellers	250 ml
Kroll's	Most common etchant for titanium (250 ml)	Kroll's	250 ml
Titanium Attack Polish	Used as a CMP polishing compound for titanium (500 ml)	TI-AP-16	16 oz



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
Marble's	Nickel, nickel-iron alloys (250 ml)	Marbles	250 ml
Murakami's	Chromium alloys (250 ml)	Murakamis	250 ml
Waterless Kalling's	Iron and nickel base alloys (250 ml)	Waterless Kallings	250 ml

Common Stainless Steel Etchants

PACE Product Name	Applications	Catalog Number	Qty
Adlers etchant	Very effective for etching austenitic 300 series stainless steels (250 ml)	Adlers	250 ml
Carpenters	300 Series Stainless Steel Etchant (250 ml)	Carpenters	250 ml
Kalling's No. 2	Martensitic 400 series stainless steels (250 ml)	Kallings No. 2	250 ml
Frys Reagent	Precipitation hardened stainless steels (250 ml)	Frys Reagent	250 ml



Common Copper and Brass Etchants

PACE Product Name	Applications	Catalog Number	Qty
ASTM No. 30	Copper etchant (250 ml)	ASTM No. 30	250 ml
Copper No. 1	Copper & Brass (nitric acid and DI water) (250 ml)	Copper No. 1	250 ml
Copper No. 2	Copper & Brass (HCl and ferric chloride) (250 ml)	Copper No. 2	250 ml
Klemms	Stain etch for brass (250 ml)	Klemms	250 ml



Common Steel Etchants

PACE Product Name	Applications	Catalog Number	Qty
2% Nital	2% is the most common etchant for non-heat treated or welded steels (250 ml)	Nital-2	250 ml
3% Nital		Nital-3	250 ml
5% Nital		Nital-5	250 ml
8% Nital		Nital-8	250 ml
Picral	Heat treated steels (250 ml)	Picral	250 ml
Vilella's	Most common etchant for carburized/heat treated steels (250 ml)	Vilella's	250 ml



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 TESTERS

MICROHARDNESS TESTERS

ALPHA-MHT-1000Z MICROHARDNESS TESTER



ALPHA-MHT-1000Z

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

ALPHA-MHT-2000Z MICROHARDNESS TESTER



ALPHA-MHT-2000Z

- 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
- LCD speed display

ALPHA-MHT-AUTO MICROHARDNESS TESTER



ALPHA-MHT-AUTO

- Vickers or Knoop
- Auto-turret
- Load range 10-1000 grams
- Scales (HV, HK)
- Dwell time 5-60 seconds
- Auto hardness conversion to other scales (HRA, HRB, HRC, HV, HK, HBW, etc)
- Robust and durable design

CE 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

2 year warranty
Limited warranty

Microhardness Testers

FEATURE	ALPHA-MHT-1000Z	ALPHA-MHT-2000Z	ALPHA-MHT-AUTO
Indenter types	Vickers or Knoop	Vickers or Knoop	Vickers or Knoop
Objective Magnification	10X and 40X	10X and 40X	10X and 40X
Indenter Positioning	Auto turret	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, 2000	10, 25, 50, 100, 200, 300, 400, 500, 1000
Auto Hardness Conversion	n/a	HRA, HRG, HRK, HRB, HRC, HV, HK, HBW, etc	HRA, HRG, HRK, HRB, HRC, HV, HK, HBW, etc
Testing Range	1 HV ~ 3000 HV	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)	4 x 4-inch (100 x 100 mm)
X-Y Anvil Travel	5 x 1-inch (125 x 25 mm)	5 x 1-inch (125 x 25 mm)	5 x 1-inch (125 x 25 mm)
Dwell Time	5-60 seconds	5-60 seconds	5-60 seconds
Illumination	Halogen	Halogen	Halogen
Dimensions (W x D x H)	17 x 19 x 17-inch (425 x 490 x 425mm)	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	110V / 220V 50/60 Hz
Weight	88 lbs (40 kg)	88 lbs (40 kg)	115 lbs (52 kg)
Microhardness indentation measurement software (optional)	MICROHARDNESS PRO	MICROHARDNESS PRO	Built-in
C-Mount camera attachment (optional)	823-361	823-361	Built-in
Sample leveler (optional)	823-741	823-741	823-741
Direct Certification (optional)	3rd Party	3rd Party	3rd Party
Catalog Number	ALPHA-MHT-1000Z	ALPHA-MHT-2000Z	ALPHA-MHT-AUTO

Benefits:

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

METALLOGRAPHIC MICROHARDNESS TESTERS



Sample Leveler (part no. 823-741)



HARDNESS PRO Measurement Software



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

HARDNESS TESTING CONSUMABLES

Microhardness Test Blocks and Accessories

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

Rockwell Hardness Test Blocks

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

Rockwell Anvils

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



Rockwell Diamond Penetrators

PACE Product Name	Catalog Number	Qty
Type C, A, D Scale Grade B Diamond Regular Penetrator Certified	P10100	each
N Scale Grade B Regular Penetrator Certified	P10200	each
Carbide A-Carbide Penetrator	P10300	each
Type C, A, D Scale Grade B Diamond Versitron Penetrator Certified	P1040	each
Type C, A, D Scale Grade B Diamond Indentron Penetrator Certified	P10501	each
C & N Combo Scale Grade B Rockwell Diamond Penetrator - certified	P1070	each

Rockwell Ball Penetrators

PACE Product Name	Catalog Number	Qty
1/16-inch Carbide Ball Penetrator Indentron Certified	P20101	each
1/16-inch Carbide Ball, Certified	P20150	each
1/8-inch Carbide Ball Penetrator Indentron Certified	P20201	each
1/8-inch Carbide Ball, Certified	P20250	each
1/4-inch Carbide Ball Penetrator Indentron Certified	P20301	each
1/4-inch Carbide Ball, Certified	P20350	each
1/2-inch Carbide Ball Penetrator Indentron Certified	P20401	each
1/2-inch Carbide Ball, Certified	P20450	each

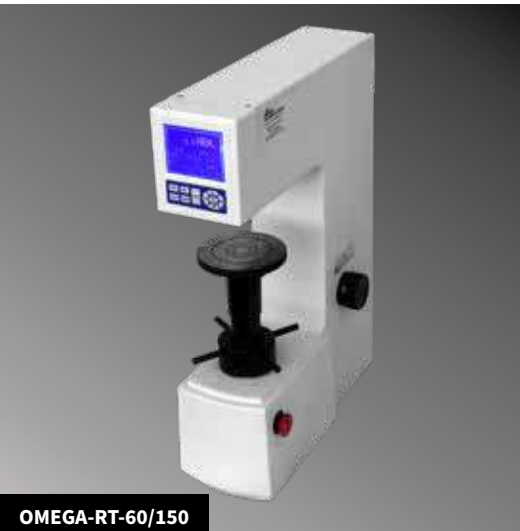
Superficial Rockwell Hardness Test Blocks

PACE Product Name	Catalog Number	Qty
15 N Scale, N Diamond, 15 kg, All, Steel, Superficial hardness test blocks	S15N10	each
30 N Scale, N Diamond, 30 kg, All, Steel, Superficial hardness test blocks	S30N10	each
45 N Scale, N Diamond, 45 kg, All, Steel, Superficial hardness test blocks	S45N10	each
15 T Scale, 1/16-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15T10	each
30 T Scale, 1/16-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30T10	each
45 T Scale, 1/16-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45T10	each
15 W Scale, 1/8-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15W10	each
30 W Scale, 1/8-inch Ball, 3015 kg, All, Brass, Superficial hardness test blocks	S30W10	each
45 W Scale, 1/8-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45W10	each
15 X Scale, 1/4-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15X10	each
30 X Scale, 1/4-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30X10	each
45 X Scale, 1/4-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45X10	each
15 Y Scale, 1/2-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15Y10	each
30 Y Scale, 1/2-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30Y10	each
45 Y Scale, 1/2-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45Y10	each



OMEGA-RT2

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



OMEGA-RT-60/150

- Semi-Automated Rockwell Tester
- 60, 100 and 150 Kgf loading
- Automatic conversion to 14 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
- 15, 30, 45, 60, 100 and 150 Kgf loading
- Automatic conversion to 14 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)

Benefits:

- Basic Rockwell Tester
- Economical
- Easy to Use

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, HRB, HRC, HRD, HRE, HRF, HRG,HRH, HRK, HRL, HRM, HRR, HRP, HRS, HRV, HR15N, HR30N, HR45N, HR15T, HR30T, HR45T	HRA, HRB, HRC, HRD, HRE, HRF, HRG,HRH, HRK, HRL, HRM, HRR, HRP, HRS, HRV, 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	HRA, HRB, HRC, HRF, HV, HK, HBW, HT15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15Y	HRA, HRB, HRC, HRF, HV, HK, HBW, HT15N, HR30N, HR45N, HR15T, HR30T, HR45T, HR15Y
Illumination	Halogen (LED optional)	Halogen (LED optional)
Instrument Throat Height	6.3-inch (160 mm)	6.3-inch (160 mm)
Power	110 or 220V	110 or 220V
Dimensions (W x D x H)	8.5 x 20 x 28 inch (216 x 508 x 711mm)	9 x 24 x 34.8 inches 225 x 615 x 885 mm)
Weight	200 lbs (90 kg)	265 lbs (120 Kg)
Direct Certification (optional)	3rd Party	3rd Party

CE 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



OMEGA-RT

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



OMEGA-DIGI-RT

- Digital Semi-Automated Rockwell Tester
- 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

- Digital Semi-Automated Dual Rockwell / Superficial Tester
- 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)

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,H R15T,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
Illumination	Halogen	Halogen
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

CE Machinery directive 2006/42/EC
Low Voltage Directive 2006/95/EC
Electromagnetic Compatibility directive 2004/108/EC



OMEGA-AUTO-RT

OMEGA-AUTO-RT

- Fully-automated Rockwell Tester
- 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



OMEGA-AUTO-ST

OMEGA-AUTO-ST

- Fully-automated Superficial Rockwell Tester
- 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



OMEGA-AUTO-RST

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

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
Illumination	Halogen (LED optional)	Halogen (LED optional)	Halogen (LED optional)
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

CE Low Voltage Directive 2014/35/EU
Standard EN 61010-1:2010

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



OMEGA-HB

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



OMEGA-HB-3000

- Digital Brinell Tester with Built-In Optics
- Semi-automated
- Built-in eyepiece filar
- Test Forces (kg) 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500 and 3000
- Test range (~8 to 650 HBW)
- LCD display
- User friendly
- Robust and durable design



OMEGA-AUTO-HB

- Fully-automated BRINELL Tester
- Testing range of ~8 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 (kg) 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 500, 3000

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	20X Optical Scope	Built-in	Built-in
Test forces (kg)	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	~8 to 650 HBW	~8 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)	200 lbs (170 kg)
Catalog Number	OMEGA-HB	OMEGA-HB-3000	OMEGA-AUTO-HB

Brinell Consumable Test Blocks

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

Brinell Indenters / Carbide Balls

PACE Product Name	Catalog Number	Qty
2.5 mm Brinell carbide balls (each) - certified	P3032	each
5 mm Brinell carbide balls (each) - certified	P3031	each
10 mm Brinell carbide balls (each) - certified	P3020	each
2.5 mm Brinell Indenter with carbide ball - certified	P3132	each
5 mm Brinell Indenter with carbide ball - certified	P3131	each
10 mm Brinell Indenter with carbide ball - certified	P3134	each

CE 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

OMEGA Macro Vickers Hardness Testers

2 year warranty
Limited warranty



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

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

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

Macro Vickers Test Blocks

PACE Product Name	Catalog Number	Qty	Price (\$)
Heavy Load Vickers (1 kg to 50 kg)	MV020	each	580.00

CE 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

IM-3000B INVERTED METALLURGICAL MICROSCOPE



IM-3000B Microscope

IM-3000B Microscope

- Basic Metallographic Microscope with Brightfield and Polarized Light Illumination
- 5 position turret for 4X, 10X, 20X, 50X and 100X Infinite Plan Achromatic Objectives
- Dual widefield eyepieces
- Mechanical X-Y stage control
- Bright Halogen Illumination
- Multiple camera ports
- Economical Basic Metallurgical Microscope

IM-3000B Brightfield Metallurgical Microscope

2 year warranty
Limited warranty

FEATURE	IM-3000B DESCRIPTION
Illumination Techniques	Brightfield and Polarized Light
Objectives:	Infinite Plan Achromatic 4X/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) ravel (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)

Benefits:

- Brightfield illumination
- Polarized light illumination
- X-Y Stage control
- Multiple camera ports



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)

Benefits:

- Brightfield illumination
- Darkfield illumination
- Polarized light illumination
- Differential interference contrast
- X-Y Stage control
- Multiple camera ports



IM-5000 Objectives



IM-5000 Microscope

IM-5000 Microscope

- Powerful Metallographic Microscope with Brightfield, Darkfield, Polarized Light and 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 Illumination
- Multiple camera ports
- Economical Performance Metallurgical Microscope

CE Low Voltage Directive 2014/35/EU
Standard EN 61010-1:2010

METALLOGRAPHIC MICROSCOPES

ZMS0745T Stereo Microscope

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

VM-100 Digital Stereo Microscope

- Digital High Resolution Stereo Microscope
- Photo and video recording capability
- Built-in zoom
- Unit includes monitor
- Adjustable bottom and top LED illumination

NEW

VM-500 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

ZMS07475T Stereo Metallographic Microscope

2 year warranty
Limited warranty

FEATURE	ZMS0745T DESCRIPTION
Illumination Techniques	Oblique Illumination
Total Magnification	7-45X (with 10X eyepieces)
Eyepiece Options	10X (standard), 15X and/or 20X (optional)
Trinocular Head	Inclined 45 degrees from main body (360 degree rotation)
Diopter Adjustment	+/- 6 degrees
Interpupillary Adjustment	2 ~ 3-inch (52 ~ 76 mm)
Focus Range	3-inch (76 mm)
Stage Size	5-inch (125 mm)
Color Filters:	Grey, Blue, Green color filters & ground glass
Catalog Number	ZMS0745T

ACCESSORIES	CATALOG NUMBER
Eyepieces: SWH10X/23mm SWH15X/17mm SWH20X/14mm	416-101 416-151 416-201
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
Digital camera	MD-50T
1X CCD adapter	417-101
4-Division LED Lightsouce (ML-144D)	413-136
Fiber optic light source (150 W)	413-227
Mechanical stage with X-Y micrometers	419-162

VM Digital Stereo Metallographic Microscope

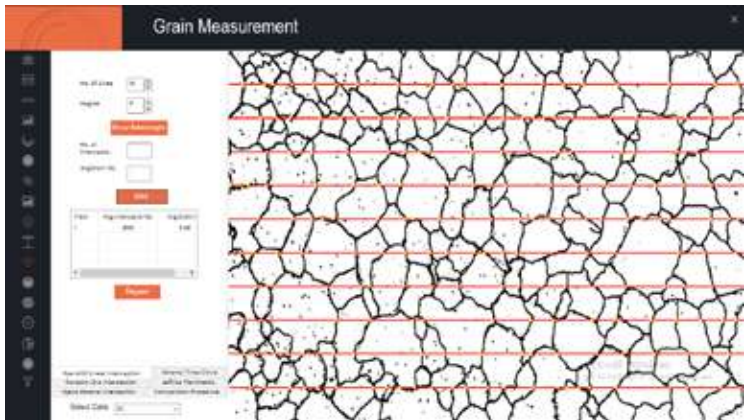
2 year warranty
Limited warranty

FEATURE	VM-100 DESCRIPTION	VM-500 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	• 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	• 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

CE Low Voltage Directive 2014/35/EU
Standard EN 61010-1:2010

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



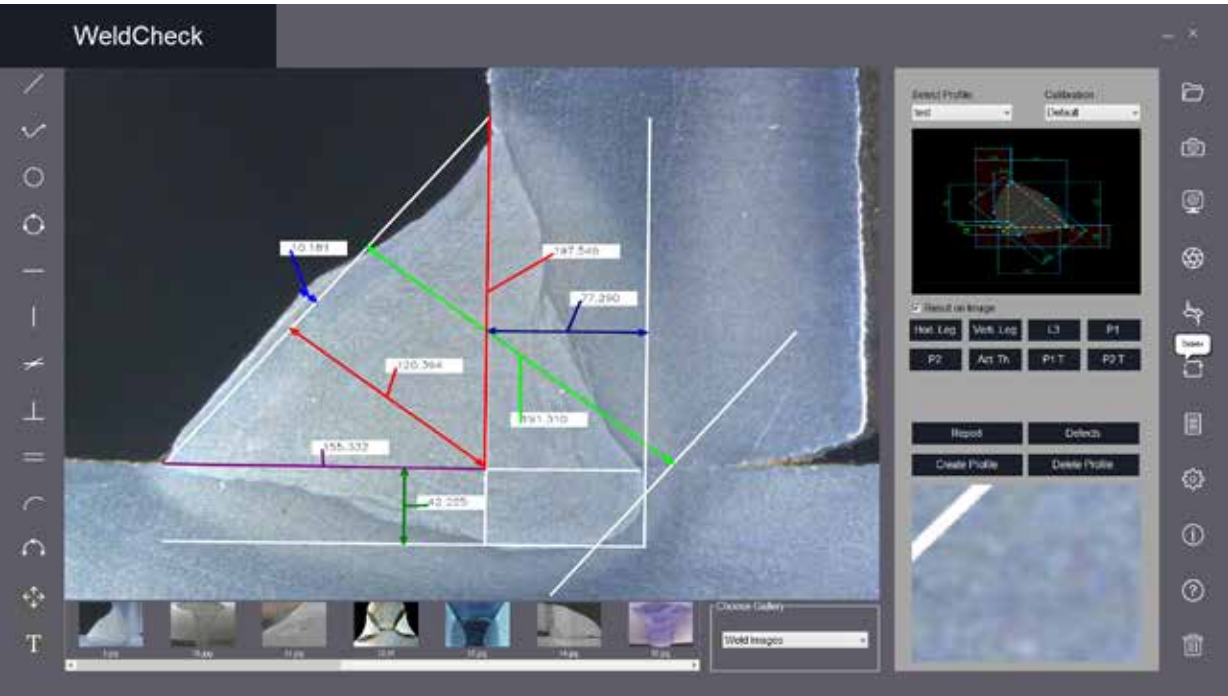
Measurement Modules

MODULE	MEASUREMENT	MEASUREMENT BASIS	ICON / web page link
Measurement	Manually draw lines on traces, shapes	Straight length, angle, curved length, width, area, radius, perimeter, area by keyboard	
Grain Size	Heyn lineal intercept procedure, Abrams Three-Circle Procedure, Random Line Intersection Methods, Jeffries Planimetric Method, Comparison Procedure Method	ASTM E112	
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	
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	
Carbide	Estimates the amount of iron carbide or cementation in steels and cast irons. Carbide is measured as a volume fraction	ASTM E562 & E1245	
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	
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	
Coating Thickness	Measures a coating thickness after cross sectioning the specimen	ASTM B487	
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	
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	
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	

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

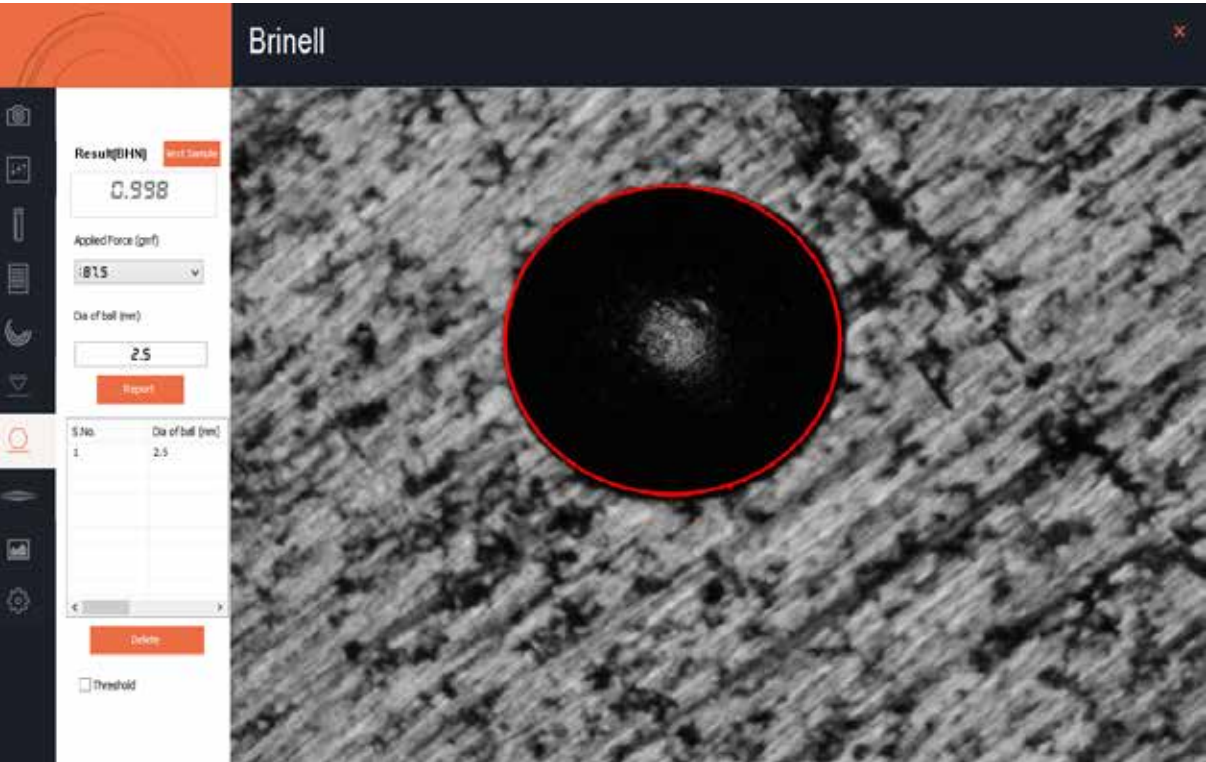
WELD CHECK Measurement Module



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

HARDNESS PRO Measurement Module





SPEC-STORE

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



CAB-C

CAB-F

SAFETY CABINETS

- Heavy Duty Steel Cabinets
- Yellow Ventilated Flammable Cabinet
- Blue Ventilated Chemical Cabinet
- Corrosion resistant shelves



FUME-HOOD

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

Specimen Storage Cabinet

DESCRIPTION	SPECIFICATIONS
Cabinet	Max diameter 8-inch (200 mm)
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

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

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



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

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-BENCH



LAB EQUIPMENT BENCHES

- Designed to fit with one another or stand-alone
- Double door cabinets and single drawer on the S 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

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

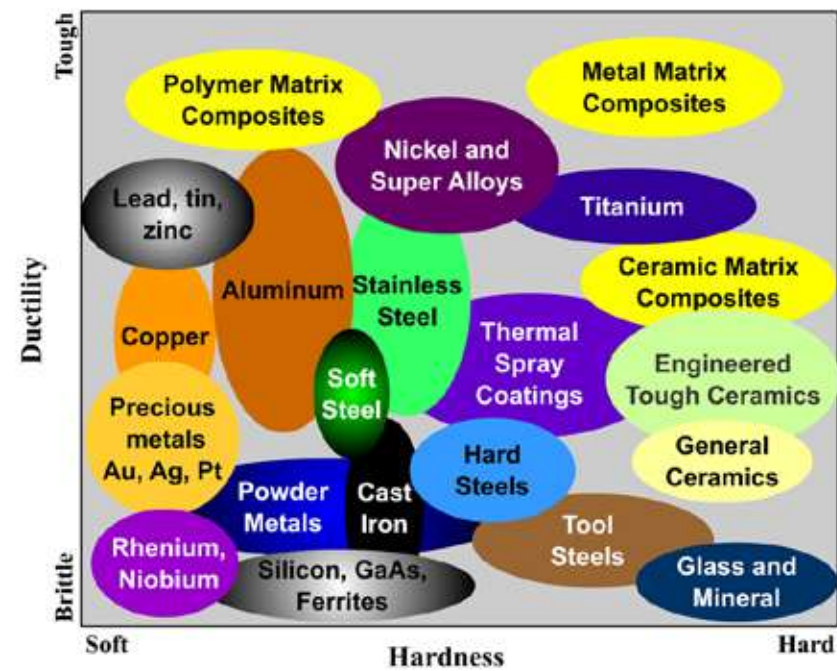
- Excellent for microscopes and microhardness testers
- Designed to include chair access
- Optional replaceable protective bench covers and back panels available

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

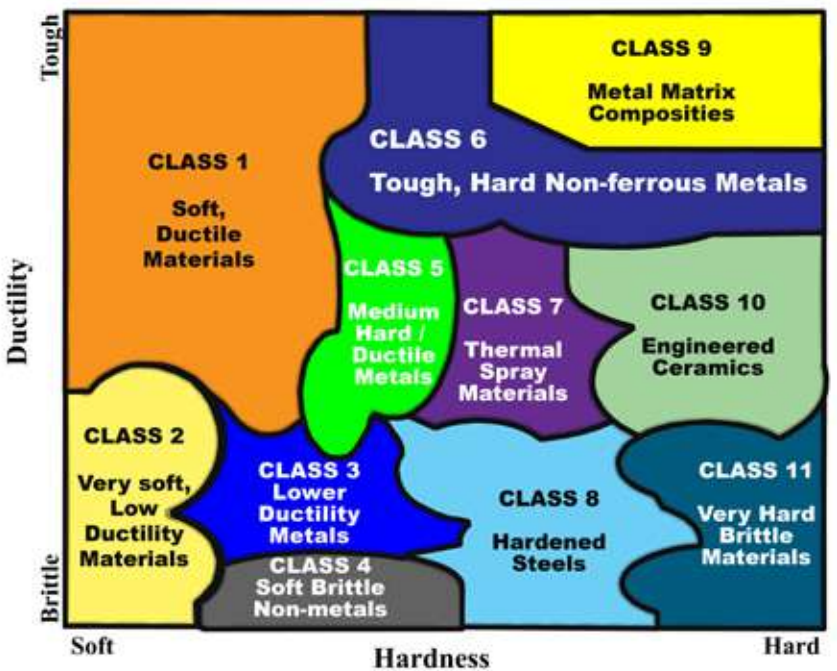
SAMPLE PREPARATION BASICS:

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, PMC's)	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

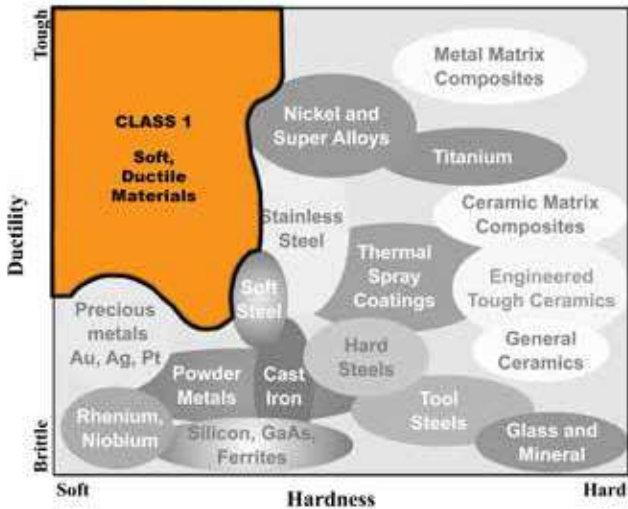
Examples include aluminum, copper, tin, lead, zinc and polymer matrix composites (PMC's).

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

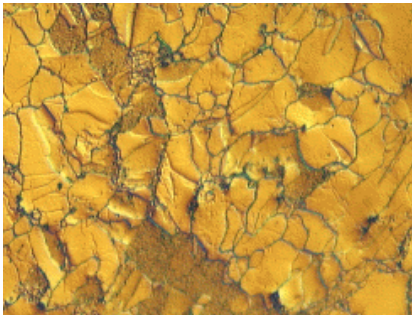
Preparation Challenges:
The difficulty in preparing these materials arises from the fact that these materials are very soft and often have oxide inclusions (aluminum and copper) in their macrostructures. Proper specimen preparation minimizes abrasive embedding and retains the specimen oxides, thus eliminating 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)

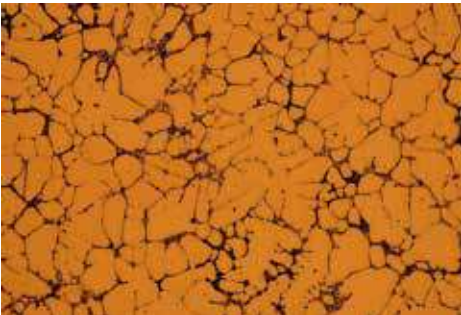
Mounting:
Compression mounting with Phenolic, Epoxy or Diallyl Phthalate compression mounting resins



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



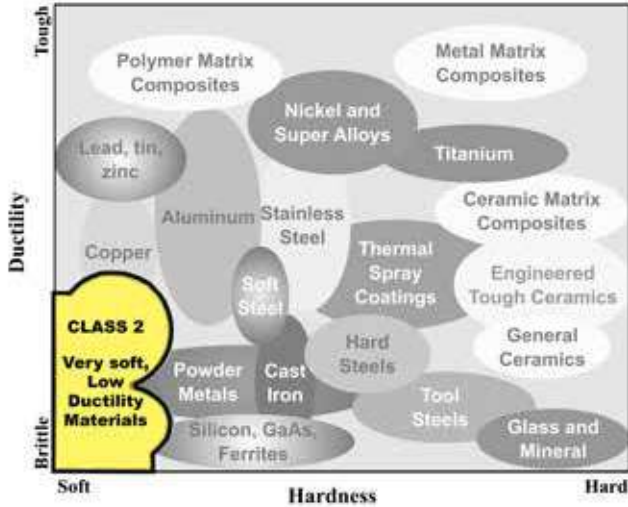
Tough Pitch Copper, 100X (B.F.), Etchant NH4OH/H2O2 for 5 seconds

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.

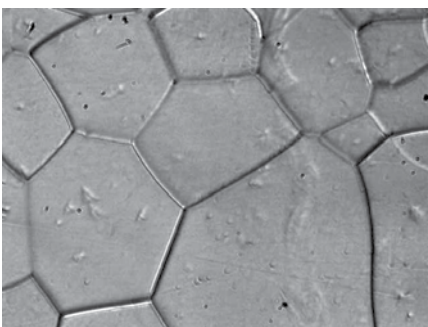
Preparation Challenges:
For very soft materials, any loose or fractured abrasive particles can become easily embedded. This makes specimen preparation very difficult because it gums up diamond grinding disks or the specimen can become embedded with fractured SiC particles when ground with SiC papers. 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

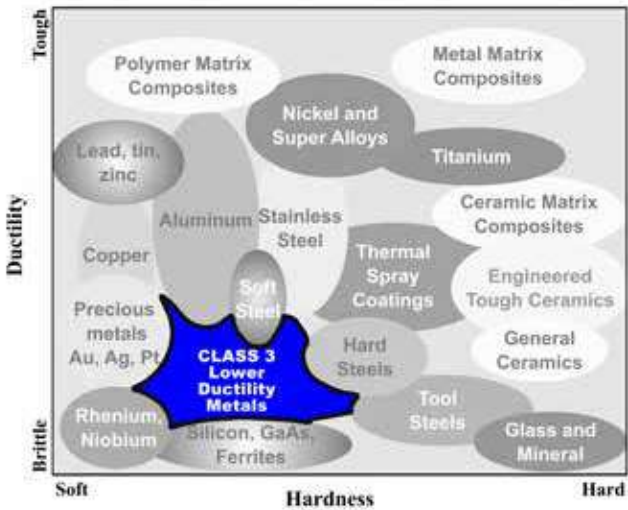
CLASS 3 - Lower Ductility Metals

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

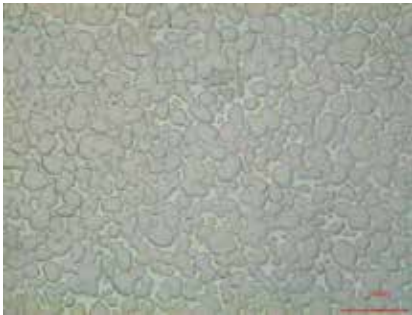
Description:
Powder metallurgy is an example of a CLASS 3 low ductility materials which is a very useful manufacturing process for parts designed with hard-to-machine geometries. The process includes pressing a metal powder into its shape and then sintering it just below the melting temperature of the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

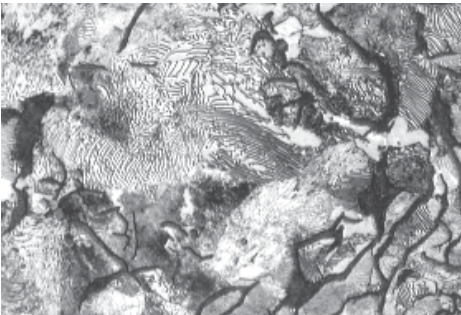
Vacuum impregnation is often used to support voids and porosity before initial grinding. In addition, metal smeared into pores can be removed by an intermediate etch in- between polishing steps.



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



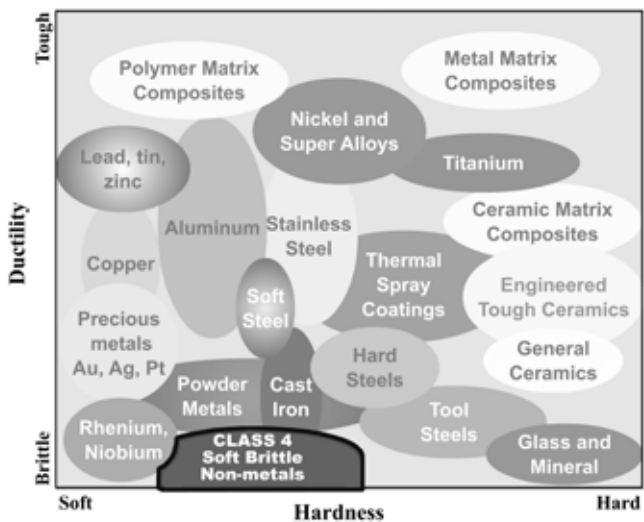
Graphite cast iron, 2% nital etchant, 500X

CLASS 4 - Soft, Brittle Nonmetals (Electronics)

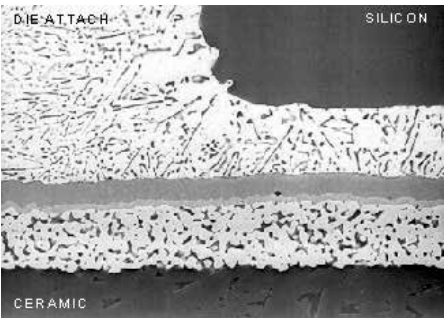
Examples include ceramic capacitors, silicon, GaAs, ferrites, PZT's, MEMS devices.

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.

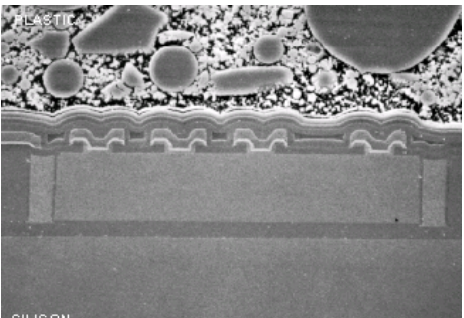
Preparation Challenges:
Microstructural analysis of a BaTiO₃ ceramic capacitor includes looking for missing metal layers, as well as examining for gaps and voids in the ceramic substrate. Microstructural preparation of multi-layer BaTiO₃ ceramic capacitors requires minimizing polishing relief and damage 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

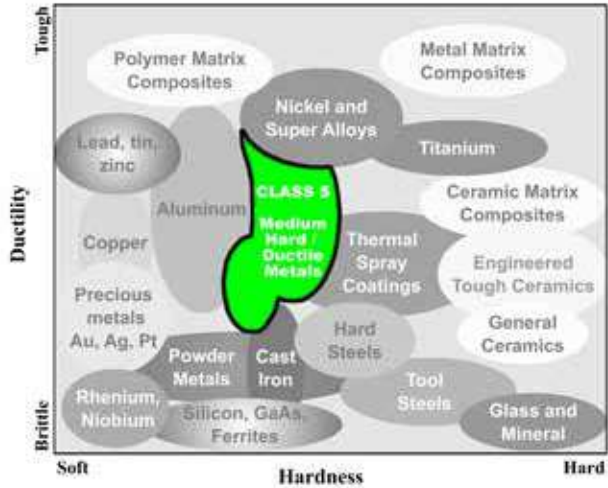
PROCEDURE RECOMMENDATIONS

CLASS 5 -Medium Hard, Ductile Metals

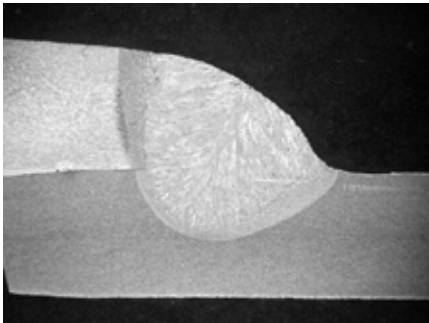
Examples include stainless steel, soft and medium hard steels.

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



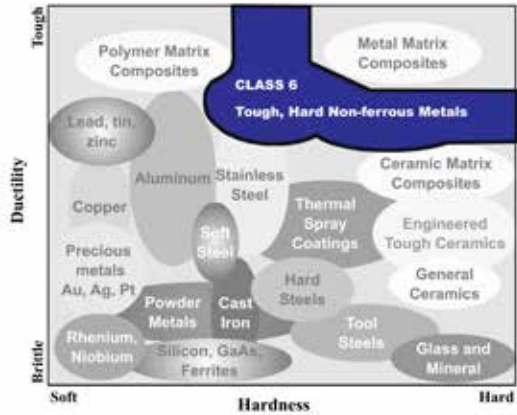
1018 Water Quenched steel, 400X (B.F.), etched with 2% nital, Structure is Bainite

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.

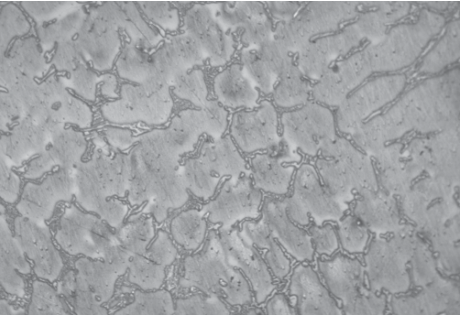
Preparation Challenges:
Metallographic preparation of titanium and titanium alloys is fairly straight forward by conventional metallographic techniques.



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	200/200	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper	Water	5-10 lbs	200/200	1 min. 1 min.	Off Off		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	3 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEXPAN polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	3 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	3 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		



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



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

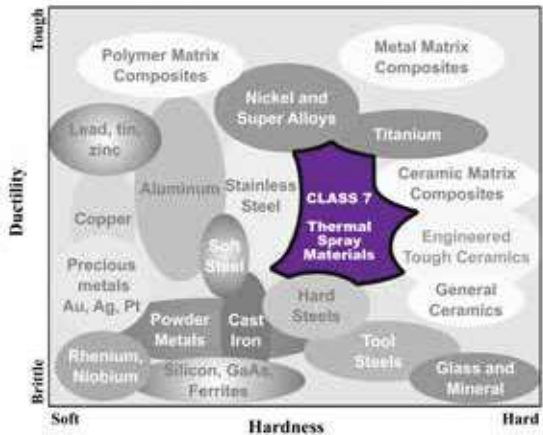
PROCEDURE RECOMMENDATIONS

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.

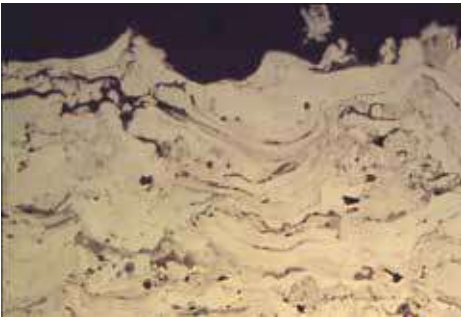
Preparation Challenges:
Metallographic preparation of thermal spray coatings can be tricky; however, minimizing damage and understanding the chemical and mechanical properties of the coating and substrate will greatly improve successful specimen preparation. Note for WC-Co coatings, the cobalt is reactive 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

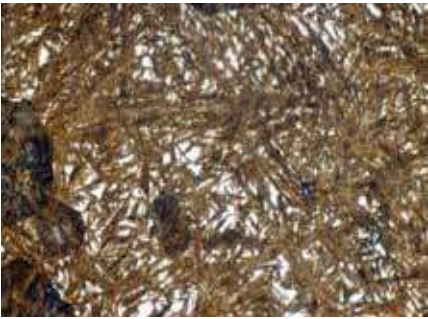
Examples include case hardened steels, tool steels, and through-hardened steels.

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.

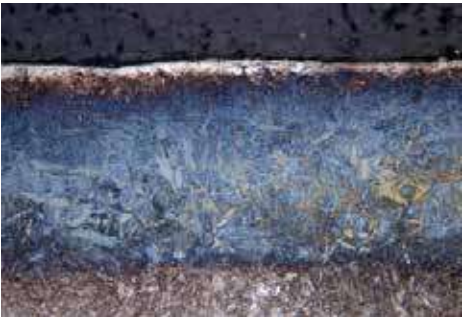
Preparation Challenges:
Metallographic specimen preparation is relatively straight forward.



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	200/200	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper	Water	5-10 lbs	200/200	1 min. 1 min.	Off Off		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	3 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEXPAN polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	3 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	3 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on NAPPAD polishing pad	-	5-10 lbs	100/100	30 sec.	15 seconds / 5 seconds		



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



Nitrided steel, 200X (BF), Etchant Picral

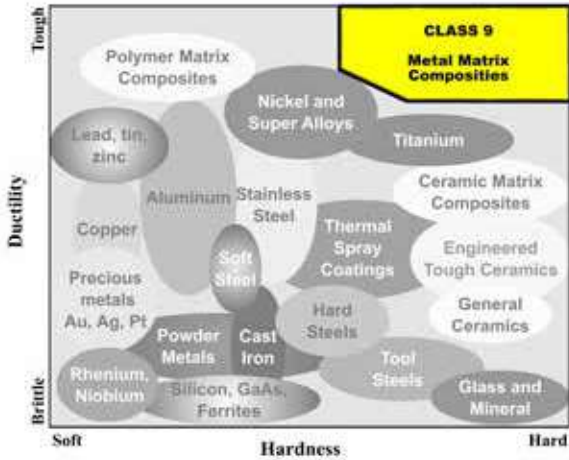
PROCEDURE RECOMMENDATIONS

CLASS 9 - Metal Matrix Composites

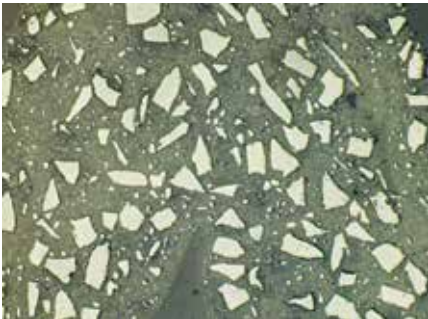
Examples include ceramic fibers in a metal matrix and/or ceramic particles in a metal matrix.

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.

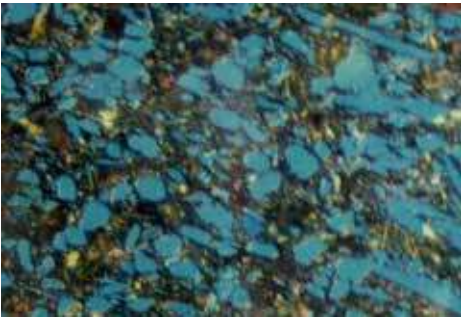
Preparation Challenges:
Hard particles in a metal matrix can be difficult to microstructurally prepare because of particle pull-out, as well as excessive polishing relief between the hard particles and the softer matrix.



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	200/200	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Metal Mesh cloth	-	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		
3 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		



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



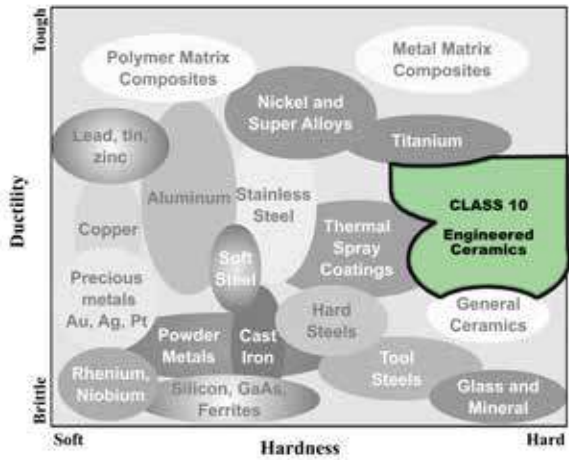
Zirconium Diboride particles in a Titanium Matrix Etched, 1000X (DIC)

CLASS 10 - Engineered Ceramics

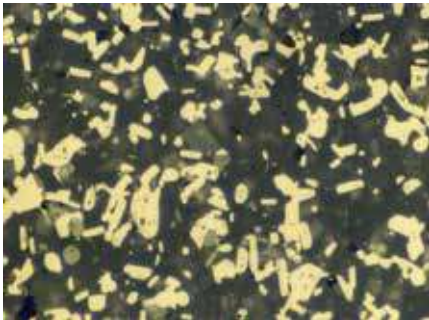
Examples include silicon nitride, zirconia, SiSiC, silicon carbide, boron carbide, alumina and ceramic matrix composites

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 (AION) 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
70 micron diamond grinding disk	Water	5-10 lbs	200/200	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Metal Mesh cloth	-	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEXPAN polishing pad	SIAMAT colloidal silica	10 lbs	200/200	5 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	SIAMAT colloidal silica	10 lbs	200/200	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	10 lbs	200/200	5 min.	15 seconds / 3 seconds		



AION 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

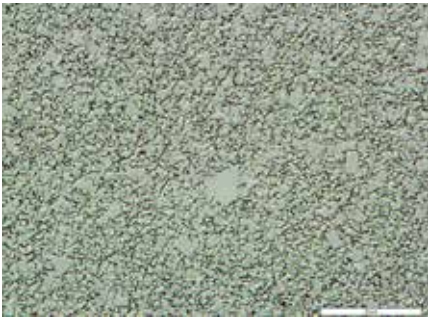
Examples include cermets such as tungsten carbide, glass and minerals.

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.

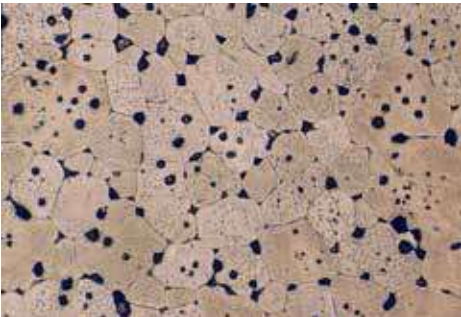
Preparation Challenges:
The key to proper specimen preparation of CERMET materials such as tungsten carbide is to grind with a semi-fixed abrasive (polycrystalline diamond on a metal mesh cloth), followed by combining diamond abrasives with a CMP (chemical mechanical polishing) abrasive such as SIAMAT™ 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	200/200	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Mesh cloth	-	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		
3 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	5-10 lbs	200/200	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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