BUEHLER

Polishing Guide

Superior polishing consumables and application expertise

Strong Partner, Reliable Solutions

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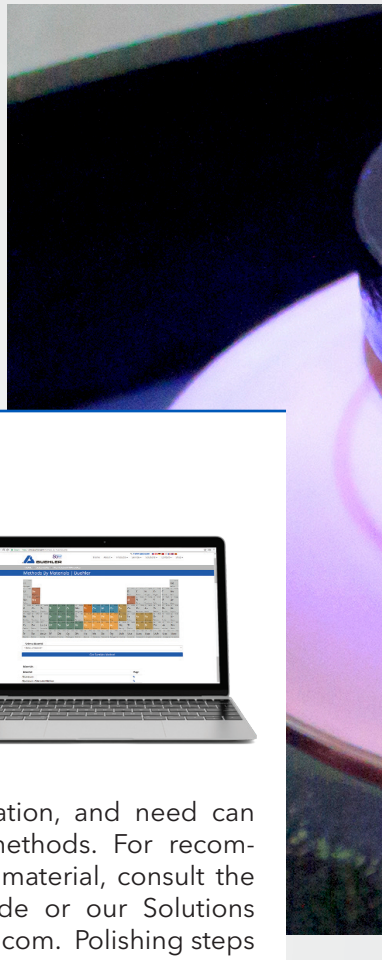
Why is **Polishing** Important?



Polishing removes damage created in the grinding process and prepares the specimen for optical, micro-hardness, or SEM/EBSD analysis. A high quality polish will make the specimen surface smooth and shiny through mechanical and/or chemo-mechanical abrasion, while retaining the true microstructure and flatness.

Many factors influence the surface finish, such as:

- Abrasive size and type
- Cloth texture
- Polish time
- Specimen load
- Rotational direction
- Rotational speed

Each material, application, and need can require specialized methods. For recommended methods by material, consult the Buehler SumMet Guide or our Solutions page on www.buehler.com. Polishing steps for some common materials can be found on page 12.

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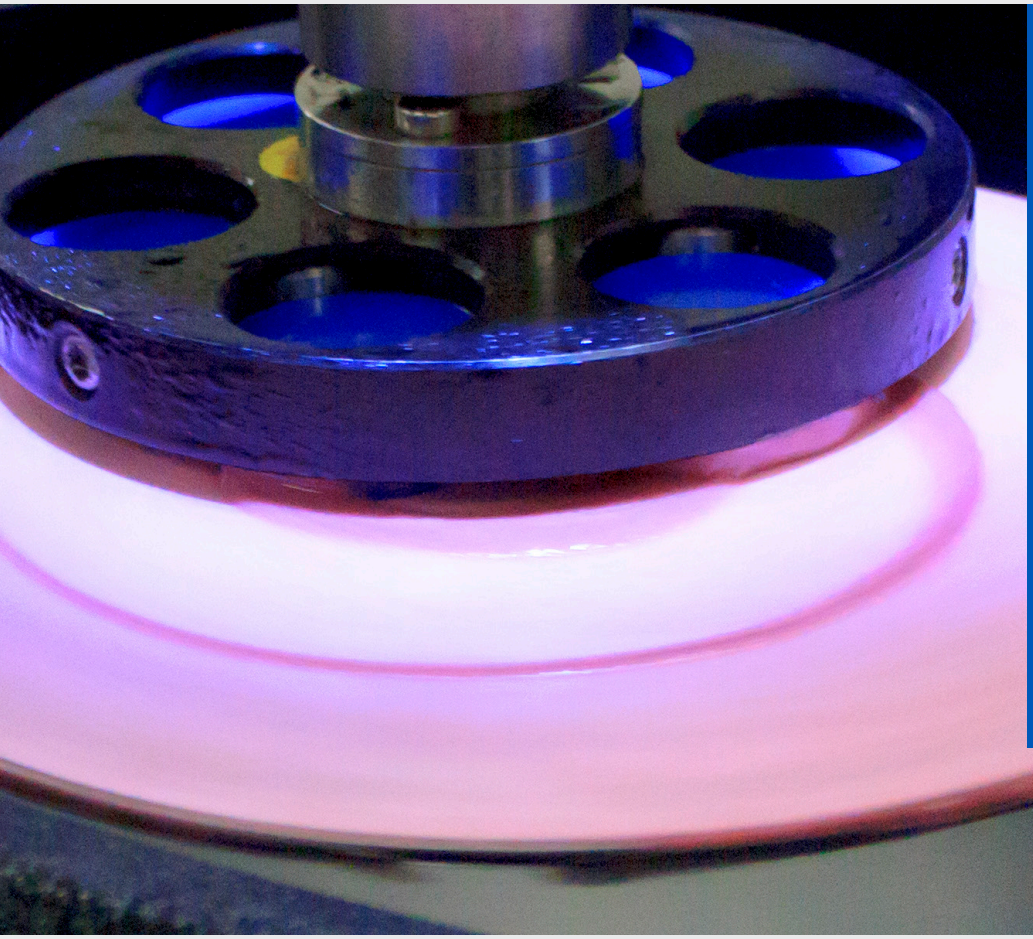


Polishing **Process**

Polishing consists of two or more main stages, using successively finer abrasives. Coarse polishing follows grinding and removes the bulk of the deformation created in the grinding process. Intermediate polishing stages may be required to further reduce surface deformation and leave smaller scratches. Lastly, fine polishing perfects the surface finish by removing any trace of deformation.

Coarse

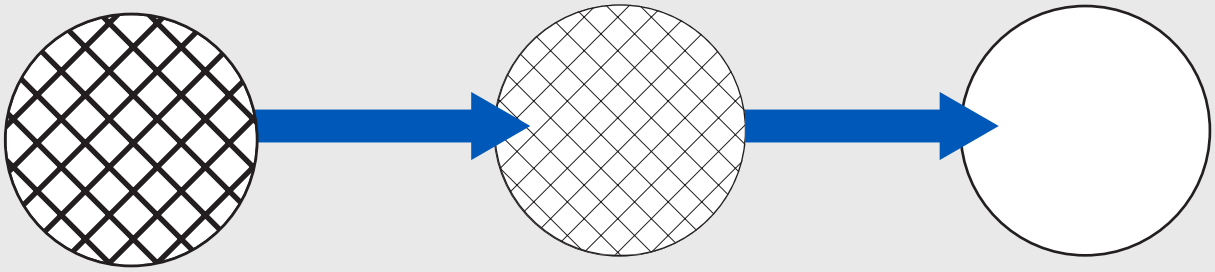
- Many large scratches
- Abrasive is added to a hard or medium napless polishing cloth

Intermediate

- Many light scratches
- Abrasive is added to a hard, medium, or soft cloth

Fine

- Scratch-free finish
- Suspended abrasives are applied to a softer, more resilient surface



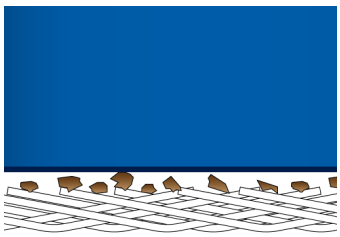
Poor polishing can cause excessive scratching, comet tails, relief, smearing, edge rounding, and embedding. These issues can lead to inaccurate results by impeding the ability to see a material's true structure and damaging the material. Refer to page 11 to learn how to correct these issues.

POLISHING CLOTHS

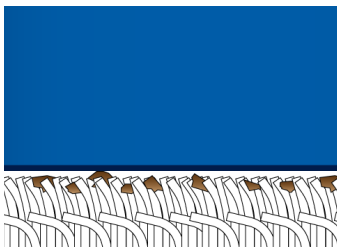
A Cloth for Every Application

The type of cloth used depends heavily on the material being processed and the requirements for final analysis. With a variety of fabrics, weaves, and naps, Buehler has a cloth to fit every application.

Napless Cloth



Napped Cloth



Easy to Use Magnetic Backing

Quickly change cloths without peeling and sticking. The durable magnetic backing reduces change-over time between cloths, increasing efficiency.

Napless Cloths (Hard)

With hard cloths, abrasives sit on the surface of the cloth for aggressive polishing. These cloths are best for maximizing flatness.

Napped Cloths (Soft)

Abrasives penetrate into the nap of softer cloths, allowing less aggressive material removal. These cloths are best for high quality surface finish.

Selection Guide

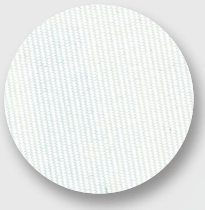
★ =Best choice for material type

● =Compatible with material type

		COARSE				INTERMEDIATE							FINE		
		UltraPad™	UltraPol™	TexMet™ P	Nylon	TexMet C	TriDent™	VerduTex	VelTex	WhiteFelt™	PoliCloth	MicroCloth™	MicroFloc	MasterTex™	ChemoMet™
MATERIAL TYPE	Aluminum	★			●	●	★	●	●	●	●	●	●		★
	Cast Iron	●		●		★	★	●		●		★	●	●	
	Ceramic		●	★		★	●	★				●			
	Ceramic Thermal Spray	★				●	★	●							★
	Copper				●	★		★	●	●	●	●	●		★
	Generic Bulk Mount		●	●		★	★	●				●			
	Generic Thin Section		★	●		●	★	●				★			
	Hard Steels			●	●	●	★	●		●		★	●		●
	Heat Treated Steels			●	●					●		●	★		●
	High Temperature Solder in Ceramic	●		★			●	★				●			★
	Metallic Thermal Spray	★					★	●							★
	Micro-Electronic Material	●		★				★	●			●		●	★
	Nickel Base Alloys	★		●	●	●	★	●		●	●	●	●		★
	Non Populated PCB	●				●	★	●				●		●	★
	Polymers					★						●	●	★	
	Silicon in Micro-Electronics						●	★				●		●	★
	Sintered Carbides			★	●			★							★
	Soft Steels	★			●	●	●	★	●	●	●	★	●	●	●
	Stainless Steel	★			●	●	★	●	●	●		●	●		★
	Titanium	★	●		●	●				●		●	●		★

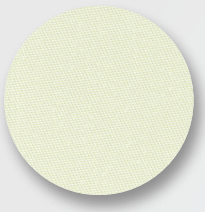
★ =Suited for most materials ◆ =Diamond Size ⬡ =Alumina ○ =Colloidal Silica

Coarse



★ **UltraPad™**
Hard woven, napless
◆ 6µm & up

UltraPol™
Hard woven, nonaggressive silk cloth
◆ 6µm & up



Nylon
Oil resistant, medium hard woven, napless
◆ 6µm & up

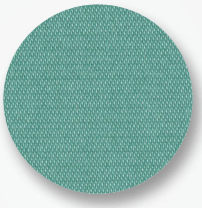
★ **TexMet™ P**
Hard perforated, non-woven cloth
◆ 6µm & up

Intermediate

★ **TriDent™**
Soft, durable, synthetic woven cloth, napless
◆ 15 to 0.02µm

★ **TexMet C**
Non-woven pressed cloth
◆ 15 to 0.02µm
⬡ ○

VelTex
Short napped synthetic velvet cloth
◆ 9 to 1µm

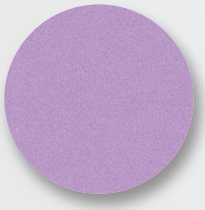


★ **VerduTex**
Durable, medium hard synthetic silk cloth
◆ 9 to 1µm

WhiteFelt™
Soft, durable matted wool cloth
◆ 6 to 0.02µm
⬡ ○

PoliCloth
Medium hard, woven wool cloth
◆ 6 to 1µm

Fine



MicroFloc
Soft, long napped cloth
◆ 3 to 0.02µm
⬡ ○

★ **MicroCloth™**
Soft, versatile, long napped synthetic rayon cloth
◆ 5 to 0.02µm
⬡ ○

MasterTex™
Soft synthetic velvet with low nap
◆ 1 to 0.05µm
⬡ ○

★ **ChemoMet™**
Soft, porous, chemically resistant, synthetic cloth
◆ 1 to 0.02µm
⬡ ○

DIAMOND SUSPENSIONS & PASTES

Diamond is routinely used for the preparation of most materials due it its high removal rates. Available in a wide range of micron sizes, carriers, and diamond type, MetaDi diamond products are a versatile preparation tool.

Best-In-Class Repeatability

Strict quality control for particle size and shape ensures a reproducible surface finish.

Avoid Contamination

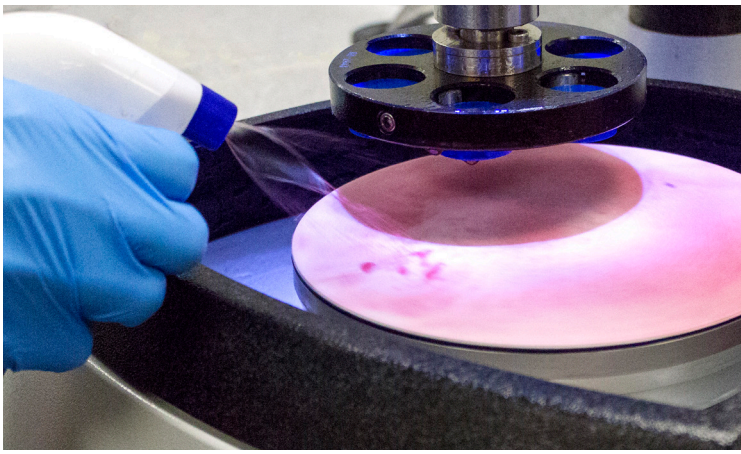
Color coding by micron size helps prevent cross contamination.

Ensure Safety & Compliance

MetaDi Supreme is nontoxic, noncombustible, and environmentally safe.

MetaDi Diamond Suspensions

- High concentration diamond is uniformly suspended for ease-of-use and consistent application.
- Apply using a spray bottle or go hands free—integrate into your grinder/polisher with the Burst Dispensing System.
- Available in polycrystalline, monocrystalline, and oil-based monocrystalline (for water sensitive materials).



MetaDi Diamond Pastes

- Materials such as very soft alloys, pure metals, or refractory metals are prone to diamond embedding, so a paste is better suited for polishing.
- Pair with a lubricant like: MetaDi Fluid or AutoMet Oil (for water sensitive materials).
- Available in natural monocrystalline, synthetic monocrystalline, and a blend of natural and synthetic polycrystalline.

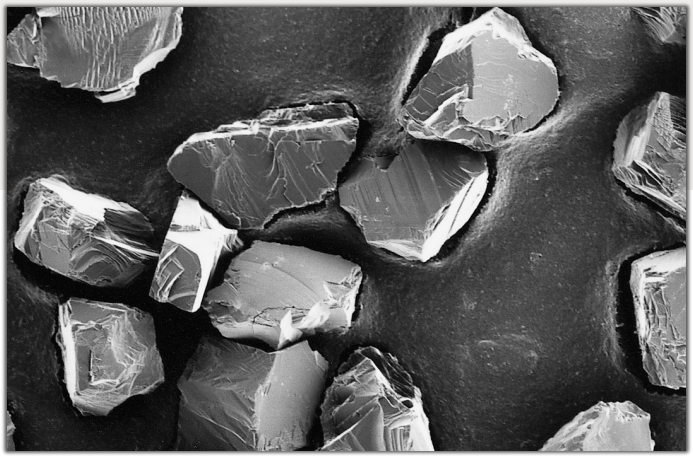
Monocrystalline vs. Polycrystalline

Material removal rate directly impacts the speed of each process step. A higher removal rate means moving on to the next step more quickly, allowing faster analysis and increasing throughput.

Because of its multi-faceted shape, polycrystalline diamond removes material faster and produces less deformation than monocrystalline.

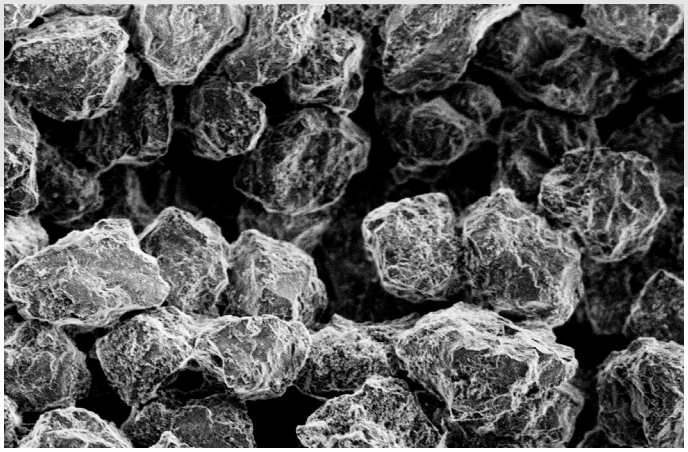
MetaDi | Monocrystalline

- Cost effective
- Sharp, blocky particles
- Best for ceramics

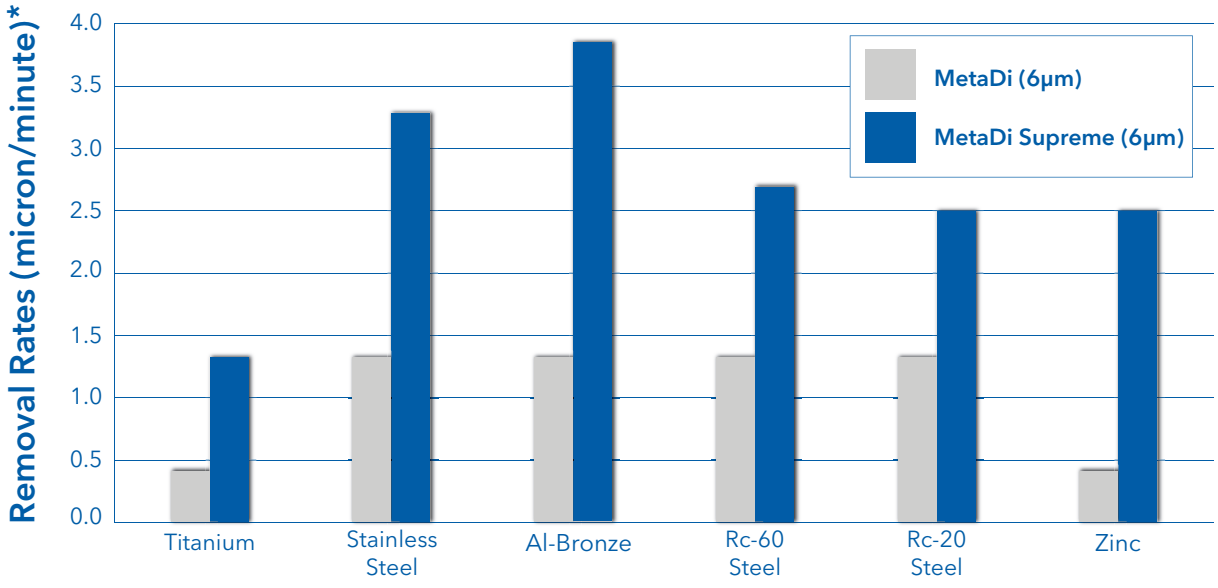


MetaDi Supreme | Polycrystalline

- Faster preparation times
- Reduced deformation
- Only small amount needed for high quality polish



Removal Rate of MetaDi vs. MetaDi Supreme



**Actual results may vary depending on material, cloth, and preparation parameters.*

FINAL POLISHING SUSPENSIONS

Final polishing suspensions are designed to remove the final layer of surface deformation often invisible to the naked eye. The removal of this deformation is essential when evaluating with high magnifications, polarized light, differential interference contrast, as well as using EBSD techniques.

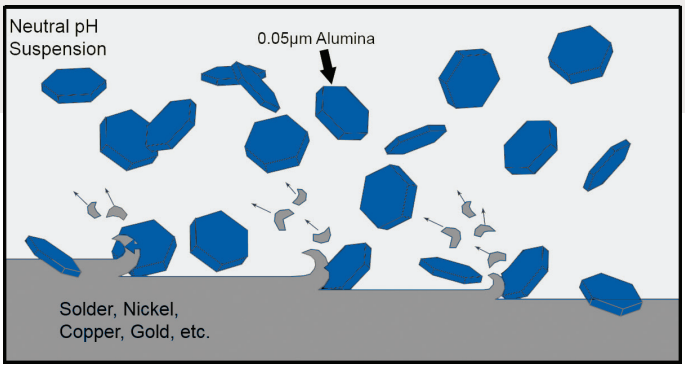
Different types of final polishing suspensions employ different mechanisms for material removal. MasterPrep Alumina contains seeded gel alumina, which provides efficient material removal combined with superior surface finish via a purely mechanical, abrasive process. MasterMet 2, on the other hand, contains colloidal silica, which has a soft reaction layer to chemically attack the specimen surface. The spherical shape of the colloidal silica enables it to wipe away the top surface layer without scratches.

The material type will dictate which final polishing suspension is best for the application. See below for general recommendations. For more detailed guidance, refer to the SumMet Guide.

MasterPrep Alumina

Uses purely mechanical removal

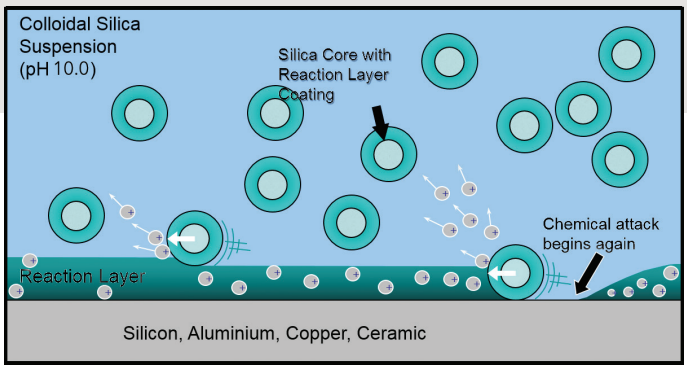
- Preferred for Iron, Steel, Stainless Steel, Copper, Polymers, minerals, micro-electronics, precious metals
- Best alumina quality due to sol-gel suspension
- 8.5 pH



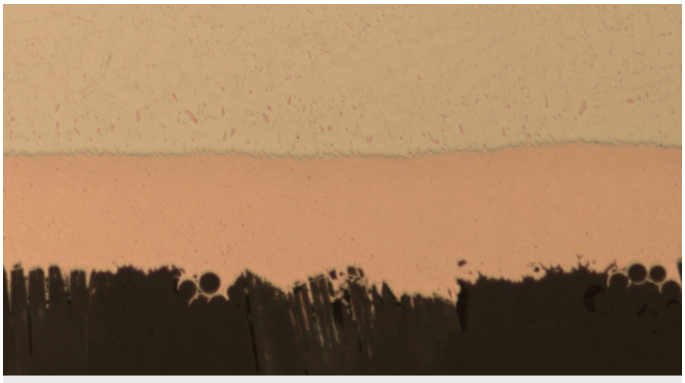
MasterMet 2 Colloidal Silica

Uses a chemical reaction to attack top layer, then mechanical removal to sweep away

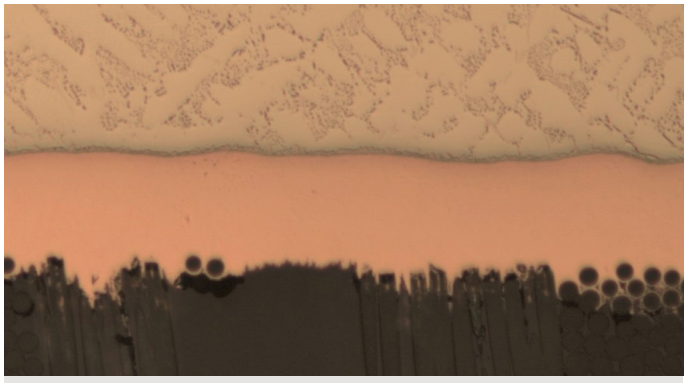
- Preferred for Aluminum, Refractory metals, silicon in micro-electronics, ceramic
- Non-crystallizing for a superior, scratch-free finish
- 10.5 pH



Selection of the polishing media can be critical. In the examples below of copper layer on solder, MasterPrep and MasterMet are suitable for different analyses.



MasterPrep: Purely mechanical polish keeps the sample flat, but the copper is not completely damage free. Best for coating measurement and boundary layer analysis.



MasterMet: Chemo-Mechanical polish creates etching in the solder, and slight polishing relief, but provides a damage free polish. Best for microstructural analysis of the copper and EBSD.

POLISHING ACCESSORIES

Burst Dispensing System

Burst is a flexible, easy to operate dispensing system for all diamond and final polishing suspensions. With a variety of operating modes, solutions can be tailored for any Buehler grinder-polisher set-up.

- Improve both productivity and consistency by dispensing suspensions at configurable rates.
- Connect up to 5 modules, with optional stadium seating (suggested when using more than 2).
- Positionable dispensing arm can apply diamond where needed.
- Manual, Semi-Automatic, and Automatic modes.
- Magnetically driven stir bar prevents settling of suspensions.

FAQ'S (FREQUENTLY ASKED QUESTIONS)

How do I know when to move to the next polishing step?

A specimen is ready to move to the next step once all the scratches are uniform and evidence of the previous step is gone. Polishing should be performed for the minimum amount of time required to achieve the desired results, as over-polishing can damage the specimen.

How much suspension/paste do I add?

The cloth should be visibly wet without casting off when rotating. Lubrication should be maintained throughout the polishing cycle. Too little will cause heat damage, reduce material removal, and can rapidly degrade the cloth. Too much can result in hydroplaning with little material removal and wastes abrasive.

What size abrasive should I use next?

Abrasive size should reduce during each step of polishing. As a general guideline for diamond abrasives, divide the current abrasive size by 3 for the next polishing step.

How long will my cloths last?

Often, a cloth may get contaminated from improper care or gouged before showing significant signs of wear. End of life for a cloth is typically indicated by unusually high polish time or a drastically different texture than when new.

How can I extend the life of polishing cloths?

Proper storage and maintenance will enhance cloth life. Rinsing will also extend cloth life, but requires extra abrasive to recharge. Chamfering the edges of your mount will reduce the likelihood of damaging your cloth with a sharp edge.

Do I have to use a different cloth for each polishing step?

To avoid cross contamination, each polishing cloth should only be used with one abrasive size. Applying multiple abrasive sizes to a single cloth can create scratches on the specimen during polishing.

My PSA backed cloths are hard to remove. How can I get them off more easily?

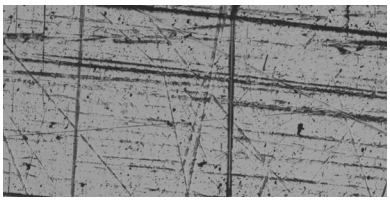
Use magnetic back cloths, which eliminate cloth removal time, or MagnoPad, a Teflon coated carrier plate.

Still have questions? Buehler is your lab partner.

Buehler Solution Centers provide materials preparation and analysis training to our customers worldwide. Our mission is to deliver valuable application solutions by employing Buehler methodologies.

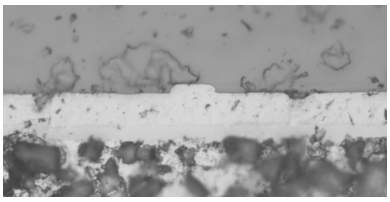
- Worldwide customer support labs
- Buehler SumMet Guide
- TechNotes and SumNotes
- Seminars, webinars, and classes

SOLUTIONS TO COMMON ISSUES



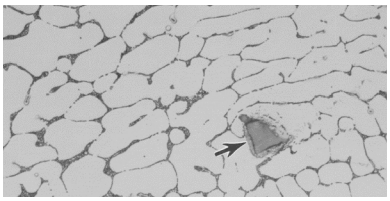
Large Scratches

Large scratches remaining in the finer polishing stages may be a symptom of cross-contamination. Rinsing the specimen, specimen holder, and platen between steps can help clean out the larger diamond, reducing cross-contamination. If a specimen is cracked or porous, rinse in an ultrasonic bath for the minimum time required to rinse it clean. Extended ultrasonic cleaning time can damage the specimen. During the last 30 seconds of final polishing, stop applying additional suspension, replacing it with water to flush the cloth surface and rinse the specimen.



Relief

Relief is demonstrated by harder phases or constituents being left raised above the surface of the softer matrix. Prevent relief by reducing polish time, using a shorter napped cloth, or applying diamond paste rather than suspension.

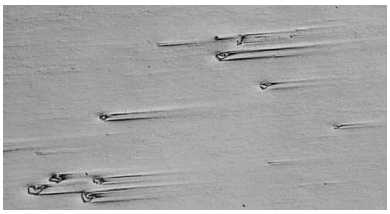


Diamond Embedding

Embedding occurs when harder particles become engrained in softer material or cracks and voids. Using a more fixed abrasive, such as MetaDi Diamond Paste, or ultrasonic cleaning between stages can reduce the likelihood of embedding.

Smearing

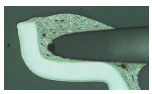
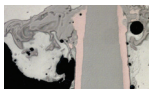
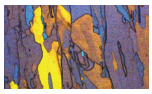
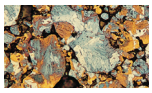
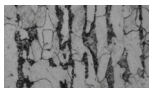
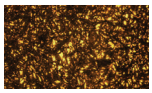
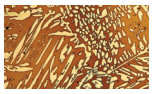
Smearing is a superficial but significant form of damage that makes microstructural details less distinct, often caused by soft materials or poor lubrication. Smearing can be improved by using short napped cloths, vibratory polishing, or etching and then repeating the final polish.



Comet Tails

Comet tails are a result of poorly bonded, very hard phase in softer matrix; pores in matrix results in unidirectional grooves emanating from particles or holes; or excessive lubrication. To avoid this, use hard, napless cloths and/or reduce applied pressure. For porous materials, impregnate the pores with epoxy or wax.

RECOMMENDED METHODS

	Material		Grinding Steps	Polishing Step 1	Polishing Step 2	Polishing Step 3	Polishing Step 4
ELECTRONIC MATERIALS	Non Populated Printed Circuit Board		**CarbiMet** 320grit [P400] 600grit [P1200]	**TriDent™** 9µm MetaDi™ Supreme Diamond	**TriDent** 3µm MetaDi Supreme Diamond	**ChemoMet™** MasterPrep™ Alumina	**ChemoMet™** MasterPrep™ Alumina
	Silicon in Micro-Electronics		**CarbiMet** 600grit [P1200]	**VerduTex™** 6µm MetaDi Supreme Diamond	**VerduTex** 3µm MetaDi Supreme Diamond	**VerduTex** 1µm MetaDi Supreme Diamond	**ChemoMet** MasterMet™ Silica
	Micro-Electronic Material		**CarbiMet** 320grit [P400]	**TexMet™ P** 9µm MetaDi Supreme Diamond	**VerduTex** 3µm MetaDi Supreme Diamond	**VerduTex** 1µm MetaDi Supreme Diamond	**ChemoMet** MasterPrep Alumina
FERROUS & NON-FERROUS MATERIALS	Soft Aluminum Alloys		**CarbiMet** 320grit [P400]	**TexMet C** 9µm MetaDi Supreme Diamond	**TexMet C** 3µm MetaDi Supreme Diamond	**TexMet C** 1µm MetaDi Supreme Diamond	**ChemoMet** MasterMet Silica
	Nickel Based Superalloys		**CarbiMet** 240grit [P280]	**Apex Hercules H or S** 9um MetaDi Supreme Diamond	**TriDent** 3µm MetaDi Supreme Diamond	**ChemoMet** MasterMet Silica	
	Titanium Alloys		**CarbiMet** 320grit [P400]	**UltraPad™** 9µm MetaDi Supreme Diamond	**ChemoMet** MasterMet Silica		
	Copper & Copper Alloys		**CarbiMet** 220grit [P240] - 320grit [P400]	**TexMet C** 9µm MetaDi Supreme Diamond	**VerduTex** 3µm MetaDi Supreme Diamond	**VerduTex** 1µm MetaDi Supreme Diamond	**ChemoMet** MasterMet Silica
	Hard Steels		**Apex DGD Red** 75µm Diamond	**Apex Hercules H** 9µm MetaDi Supreme Diamond	**TriDent** 3µm MetaDi Supreme Diamond	**MicroCloth™** MasterPrep Alumina	
	Soft Steels		**CarbiMet** 320grit [P400]	**UltraPad** 9µm MetaDi Supreme Diamond	**VerduTex** 3µm MetaDi Supreme Diamond	**MicroCloth** MasterPrep Alumina	
	Cast Iron		**CarbiMet** 320grit [P400]	**TexMet C** 9µm MetaDi Supreme Diamond	**TriDent** 3µm MetaDi Supreme Diamond	**MicroCloth** MasterPrep Alumina	
	Heat Treated Steel		**Apex DGD Red** 75µm Diamond	**Apex Hercules S** 9µm MetaDi Supreme Diamond	**MicroFloc** 3µm MetaDi Supreme Diamond		
	Stainless & Maraging Steel		**CarbiMet** 120grit [P120] - 320grit [P400]	**UltraPad** 9µm MetaDi Supreme Diamond	**TriDent** 3µm MetaDi Supreme Diamond	**ChemoMet** MasterPrep Alumina	
COMPOSITES	Polymer-Matrix Composites		**CarbiMet** 320grit [P400]	**TexMet P** 9µm MetaDi Supreme Diamond	**VerduTex** 3µm MetaDi Supreme Diamond	**MicroCloth** MasterPrep Alumina	
COATING	Metallic Thermal Spray Coating		**Apex DGD Yellow** 35µm Diamond	**UltraPad** 9µm MetaDi Supreme Diamond	**TriDent** 3µm MetaDi Supreme Diamond	**ChemoMet** MasterMet Silica	

INNOVATIONS SINCE 1936

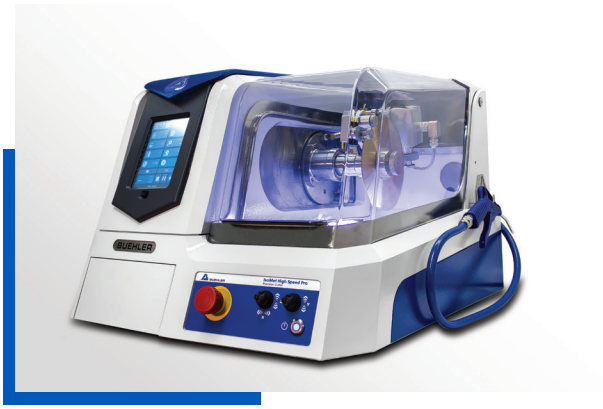
EcoMet/AutoMet™ 250 Pro

The best-selling EcoMet/AutoMet™ 250 Pro is part of a versatile line of grinder-polishers . All products have durable construction for reliability in high volume environments, unique quick-cleaning features, and plenty of enhancements for user friendly operation.

EcoMet™ 30

The EcoMet™ 30 provides simple operation for routine grinding and polishing and is available with one or two platens. The semi-automatic units are controlled with a smart touchscreen. Save time with its advanced cleaning features . It is also available in manual models with an emphasis on user comfort.

IsoMet™ High Speed



The IsoMet High Speed is a versatile table top precision saw that provides efficient and precise cuts for any application.

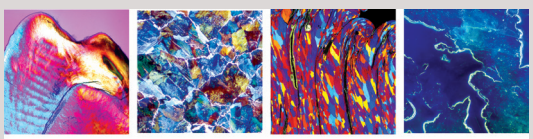
SimpliMet™ 4000

SimpliMet 4000 is the fastest mounting press designed for 24/7 use in high throughput labs.

Enter The Buehler Microstructure Calendar Contest!

Publication in the calendar is open to anyone who has achieved a level of excellence in materials preparation.

Submit your images today! A $200 honorarium will be awarded for each of the twelve images selected for the calendar.



WIN $200 USD

POLISHING ORDERING INFO

For full product listing, refer to the Buehler Product Catalog.

MetaDi™ Diamond Suspensions

MetaDi Supreme Polycrystalline Suspension

Color	Diamond Size	8oz [0.24L]*	32oz [0.95L]	1gal [3.8L]
Charcoal	0.05µm	40-6627		
Grey	0.25µm	40-6629		40-6629-128
Blue	1µm	40-6630	40-6630-032	40-6630-128
Blue	1µm Fine	40-6630F	40-6630F-032	40-6630F-128
Green	3µm	40-6631	40-6631-032	40-6631-128
Green	3µm Fine	40-6631F	40-6631F-032	40-6631F-128
Yellow	6µm	40-6632	40-6632-032	40-6632-128
Deep Red	9µm	40-6633	40-6633-032	40-6633-128
Brown	15µm	40-6634	40-6634-032	40-6634-128
Orange	30µm	40-6635	40-6635-032	40-6635-128
Purple	45µm	40-6636		40-6636-128

MetaDi Monocrystalline Suspension

Color	Diamond Size	16oz [0.47L]*	32oz [0.95L]	1gal [3.8L]
Blue	1µm	40-6530	40-6530-032	40-6530-128
Green	3µm	40-6531	40-6531-032	40-6531-128
Yellow	6µm	40-6532	40-6532-032	40-6532-128
Deep Red	9µm	40-6533	40-6533-032	40-6533-128
Brown	15µm	40-6534	40-6534-032	40-6534-128

Dye-Free MetaDi Supreme Polycrystalline Suspension

Diamond Size	8oz [0.24L]*
1µm	40-6730
3µm	40-6731
6µm	40-6732
9µm	40-6733

MetaDi Monocrystalline Suspension Oil Based

Color	Diamond Size	16oz* [0.47L]
Blue	1µm	40-6540
Green	3µm	40-6541
Yellow	6µm	40-6542
Deep Red	9µm	40-6543
Brown	15µm	40-6544

MetaDi Combo, Suspension & Extender

Color	Diamond Size	32oz [0.95L]
Blue	1µm	40-5530-032
Green	3µm	40-5531-032
Yellow	6µm	40-5532-032
Deep Red	9µm	40-5534-032

MetaDi™ Diamond Pastes

MetaDi Ultra Polycrystalline Paste

Color	Diamond Size	20g
Blue	1µm	40-1-6301
Green	3µm	40-1-6303
Yellow	6µm	40-1-6305
Deep Red	9µm	40-1-6307
Brown	15µm	40-1-6309

This product is grey in color with color coded packaging

MetaDi Monocrystalline Paste *(Natural)*

Color	Diamond Size	5g	20g
Grey	0.25µm	40-6112	40-6102
Blue	1µm	40-6138	40-6128
Green	3µm	40-6152	40-6142
Yellow	6µm	40-6172	40-6162
Deep Red	9µm	40-6192	40-6182
Brown	15µm	40-6212	40-6202

MetaDi II Monocrystalline Paste *(Synthetic)*

Color	Diamond Size	5g	20g
Grey	0.25µm	40-6241	40-6240
Blue	1µm	40-6244	40-6243
Green	3µm	40-6247	40-6246
Yellow	6µm	40-6250	40-6249
Deep Red	9µm	40-6253	40-6252
Brown	15µm	40-6256	40-6255

**8oz and 16oz are supplied with spray nozzle*

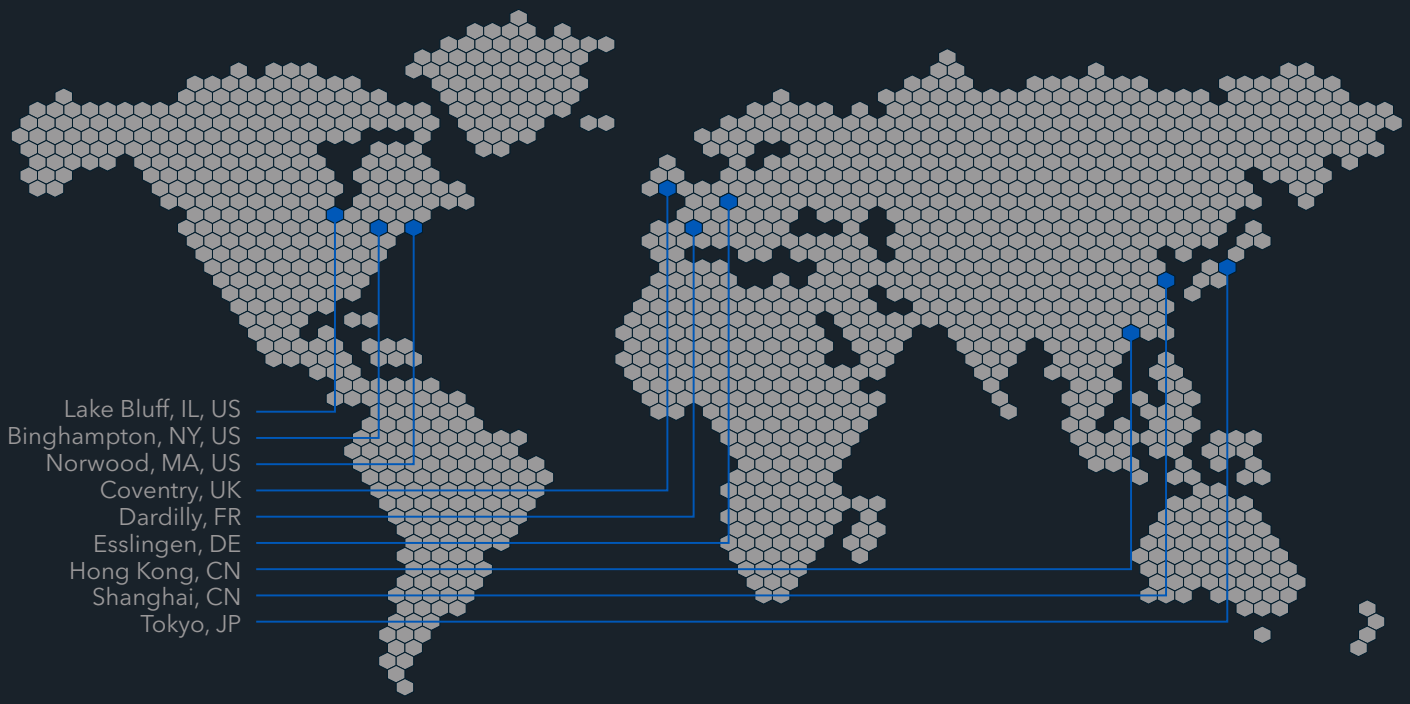
Final Polishing Suspensions

Description	Size	0.02µm	0.05µm	0.06µm	0.3µm	1µm
MasterPrep™ Alumina	64oz		40-6377-064			
MasterMet™ Colloidal Silica	64oz			40-6380-064		
MasterMet™ 2 Non-Crystalizing Colloidal Silica	64oz	40-6380-064				
MasterPolish™ Final Polish	32oz		40-10084			
MasterPolish™ 2 Final Polish	32oz			40-6376-032		
MicroPolish™ Alumina Powder	1lb		40-10075		40-10077	40-10079
MicroPolish™ Alumina Suspension	6oz		40-10083		40-10082	40-10081
MicroPolish™ II Alumina Powder	5lb				40-6323-080	40-6321-080
MicroPolish™ II Alumina Suspension	6oz				40-6363-006	40-6361-006

Polishing Cloths

	Cloth	Backing	Quantity	8in [203mm]	10in [254mm]	12in [305mm]	Description
COARSE	UltraPad™	PSA	10	40-7118	40-7120	40-7122	Hard woven, napless
		Magnetic	5	42-3008	42-3010	42-3012	
	UltraPol™	PSA	10	40-7448	40-7450	40-7452	Hard woven, non-aggressive silk
	TexMet™ P	PSA	5	40-7638	40-7640	40-7642	Hard non-woven, perforated
INTERMEDIATE	Nylon	PSA	10	40-7068	40-7070	40-7072	Medium hard woven, oil resistant, napless
		Magnetic	5	42-3108	42-3110	42-3112	
	TexMet C	PSA	10	40-1108	40-1110	40-1112	Non-woven, pressed
		Magnetic	5	42-3208	42-3210	42-3212	
	TriDent™	PSA	10	40-7518	40-7520	40-7522	Soft woven synthetic, napless
		Magnetic	5	42-3308	42-3310	42-3312	
	VerduTex	PSA	10	40-8018	40-8020	40-8022	Medium hard, synthetic silk
		Magnetic	5	42-3408	42-3410	42-3412	
	VelTex	PSA	10	40-8218	40-8220	40-8222	Short nap, synthetic velvet
		Magnetic	5	42-3508	42-3510	42-3512	
	WhiteFelt™	PSA	5	16-2002	16-2502	16-3002	Soft, durable, matted wool
	PoliCloth	PSA	10	40-8418	40-8420	40-8422	Medium hard, woven wool
		Magnetic	5	42-3608	42-3610	42-3612	
FINE	MicroCloth™	PSA	10	40-7218	40-7220	40-7222	Soft synthetic rayon, long nap
		Magnetic	5	42-3708	42-3710	42-3712	
	MicroFloc	PSA	10	40-8318	40-8320	40-8322	Soft, long nap
		Magnetic	5	42-3808	42-3810	42-3812	
	MasterTex™	PSA	10	40-7738	40-7740	40-7742	Soft synthetic velvet, low nap
		Magnetic	5	42-3908	42-3910	42-3912	
	ChemoMet™	PSA	10	40-7918	40-7920	40-7922	Soft synthetic, porous, chemically resistant
		Magnetic	5	42-4008	42-4010	42-4012	

Buehler Worldwide Locations



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