

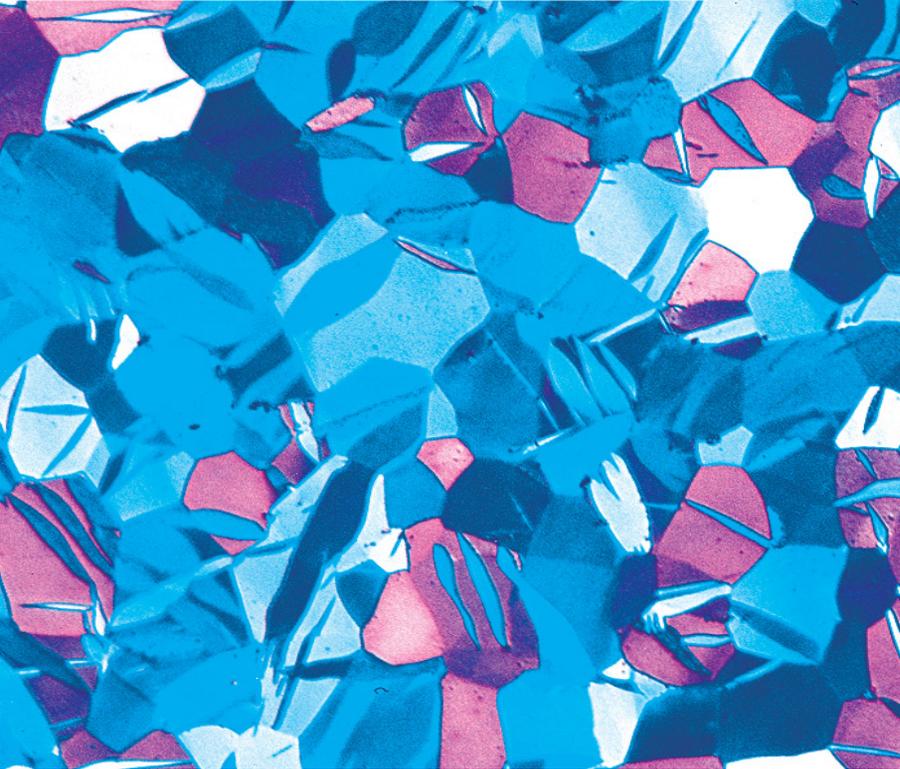


SumMet®

PREPARATION METHODS

A concise table guide for our SumMet preparation methods. This guide provides step by step preparation methods for common materials in metallography.

First Edition



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The Sum of our Experiences

SumMet® PREPARATION METHODS

This SumMet Preparation Methods Guide outlines our recommended preparation procedures for a wide variety of materials. Metallic materials are grouped based on common characteristics, generally aligned with their periodic table classifications and further refined—especially for iron-based alloys—due to their diverse properties. Non-metallic materials such as sintered carbides, ceramics, composites (metal, polymer, and ceramic matrix), printed wiring boards, electronic materials, plastics, and polymers are also addressed and categorized by material type.

The methods described were developed using a standard 8 in [203 mm] platen with six 1.25 in [32 mm] specimens in a 5 in [127 mm] holder. These procedures have been shown to deliver consistent results across various platen sizes (8, 10, and 12 in) with adjustments to head positioning and specimen alignment to optimize surface use and edge retention.

Load recommendations are based on a 1.25" diameter sample, and pressure settings should be adjusted proportionally according to the sample's surface area. For instance, 1" (25 mm) specimens require approximately 65% of the standard pressure. To determine equivalent settings for other sample sizes, Buehler offers an online Load Conversion Tool. When using Central Force holders, the total load is applied collectively to all specimens, so the machine's programmed load should equal the adjusted per-sample load multiplied by the number of samples in the holder.

Larger platen sizes allow specimens to travel greater distances per revolution (1.25x for 10 in and 1.5x for 12 in compared to 8 in), enabling shorter preparation times—though consumable usage and equipment costs increase. Larger machines are recommended for high-throughput or oversized specimens.

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SumMet® Preparation Method for: Soft Aluminum Alloys



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5-Step Method for Soft Aluminum Alloys

Sectioning	Abrasive Cutter with a wheel recommended for use on non-ferrous materials
Mounting	Compression or Castable, typically with PhenoCure, EpoxiCure, EpoThin or SamplKwick

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	5 [22]	300		Until Plane
TexMet® C	9µm MetaDi Supreme Diamond*	5 [22]	150		5:00
TexMet® C	3µm MetaDi Paste*	5 [22]	150		4:00
TexMet® C	1µm MetaDi Paste*	5 [22]	150		2:00
ChemoMet®	0.06µm MasterMet Colloidal Silica	5 [22]	150		1:30

● = Platen ● = Specimen Holder *MetaDi Fluid Extender as desired

Imaging & Analysis	Dendritic spacing, Porosity Assessment, Grain Size (depending on the type of aluminum and its processing)
Hardness Testing	Vickers, Knoop





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SumMet® Preparation Method for: Aluminum Alloys



4-Step Method for Aluminum Alloys

Sectioning	Abrasive Cutter with a wheel recommended for use on non-ferrous materials
Mounting	Compression or Castable, typically with PhenoCure, EpoxiCure, EpoThin or SamplKwick

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	5 [22]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	5 [22]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond*	5 [22]	150		4:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	5 [22]	150		1:30

● = Platen ● = Specimen Holder *MetaDi Fluid Extender as desired

Imaging & Analysis	Dendritic spacing, Porosity Assessment, Grain Size (depending on the type of aluminum and its processing)
Hardness Testing	Vickers, Knoop





SumMet® Preparation Method for: Magnesium Alloys



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5-Step Method for Magnesium Alloys

Sectioning	Precision saw, with no water and a 15HC blade recommended for use on Metal Matrix Composites, PCBs, Bone, Ti, TSC
Mounting	Castable, typically with PhenoCure, EpoxiCure, EpoThin or SamplKwick

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled*	3 [13]	300		Until Plane
TexMet® C	9µm MetaDi Oil-based Diamond	3 [13]	150		6:00
TexMet® C	3µm MetaDi Oil-based Diamond	3 [13]	150		5:00
TexMet® C	1µm MetaDi Oil-based Diamond	3 [13]	150		4:00
ChemoMet®	0.05µm MasterPolish	4 [18]	150		1:30

● = Platen ● = Specimen Holder

*SiC surfaces were coated with wax to minimize embedment

Imaging & Analysis	Dendritic spacing, Porosity Assessment, Grain Size
Hardness Testing	Brinell





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SumMet® Preparation Method for: **Beryllium**



4-Step Method for Beryllium

Sectioning	Precision saw, with no water and a 15HC blade recommended for use on Metal Matrix Composites, PCBs, Bone, TI, TSC
Mounting	Castable, typically with PhenoCure, EpoxiCure, EpoThin or SamplKwick

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	4 [18]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	4 [18]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond*	4 [18]	150		4:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	3 [13]	150		2:00

● = Platen ● = Specimen Holder *MetaDi Fluid Extender as desired

Imaging & Analysis	Dendritic spacing, Porosity Assessment, Grain Size
Hardness Testing	Brinell

Beryllium is hazardous and requires special precautions.





SumMet® Preparation Method for: Low-Melting Temperature Alloys

(Sb, Bi, Cd, Pb, Sn and Zn)



6-Step Method for Low-Melting Temperature Alloys

Sectioning	Precision saw, with a 30HC blade recommended for use on soft gummy materials
Mounting	Castable, typically with EpoThin

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled (wax coated)*	4 [18]	150		Until Plane
CarbiMet®	400 [P800] grit SiC water cooled (wax coated)*	4 [18]	150		1:00
CarbiMet®	600 [P1200] grit SiC water cooled (wax coated)*	4 [18]	150		1:00
CarbiMet®	1200 [P2500] grit SiC water cooled (wax coated)*	4 [18]	150		1:00
MicroFloc®	1µm MicroPolish II Alumina	5 [22]	150		5:00
MicroFloc®	0.05µm MasterPrep Alumina**	4 [18]	150		4:00

● = Platen

⊙ = Specimen Holder

*Rub candle was lightly across rotating disc prior to grinding

**For best results, follow this method with a vibratory polish step using MasterMet on MicroCloth® for times up to 1-2 hours.

Imaging & Analysis	Grain Size, Measurement & Analysis applications
Hardness Testing	N/A





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SumMet® Preparation Method for: Titanium Alloys



3-Step Method for Titanium Alloys

Sectioning	Abrasive Cutter with a wheel recommended for use on ductile materials
Mounting	Compression, typically with EpoMet

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	6 [27]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	6 [27]	150		10:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica**	5 [22]	150		10:00

● = Platen ● = Specimen Holder

* Plus MetaDi Fluid Extender as desired

** Attack polish may be used, 1 part Ammonium Persulfate solutions (10g Ammonium Persulfate per 100ml distilled water) or 30% Hydrogen Peroxide to 5 parts Silica.

Imaging & Analysis	Grain Size, Measurement & Analysis Applications
Hardness Testing	Vickers





SumMet® Preparation Method for: Zirconium and Hafnium



4-Step Method for Zirconium and Hafnium

Sectioning	Precision Saw with a 15LC blade recommended for use on hard brittle materials
Mounting	Compression, typically with EpoMet

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled*	5 [22]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond**	5 [22]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond**	5 [22]	150		3:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	5 [22]	150		7:00

● = Platen ● = Specimen Holder
 *Rub candle wax lightly across rotating disc prior to grinding **Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Grain Size, Measurement & Analysis Applications
Hardness Testing	Vickers





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SumMet® Preparation Method for: Refractory Metals



(Cr, Mo, Nb, Re, Ta, V and W)

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	6 [27]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	6 [27]	150		10:00
TriDent®	3µm MetaDi Supreme Diamond*	6 [27]	150		8:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica plus attack polish agent**	6 [27]	150		5:00

● = Platen

⊙ = Specimen Holder

*Plus MetaDi Fluid Extender as desired

** A good general purpose attack polish consists of a mixture of 5mℓ chromium trioxide solution (20g CrO₃ in 100mℓ water) to 95mℓ MasterMet colloidal silica. Avoid skin contact as this is a strong oxidizing solution. A number of chemical polishing solutions have been suggested [2]. For Nb, V and Ta, use a solution consisting of 30mℓ water, 30mℓ nitric acid, 30mℓ hydrochloric acid and 15mℓ hydrofluoric acid. Swab or immerse at room temperature. An alternative chemical polish for Nb, V and Ta consists of 120mℓ water, 6g ferric chloride, 30mℓ hydrochloric acid and 16mℓ hydrofluoric acid. Eary and Johnson recommend immersing the specimen in this solution 1 minute for V, 2 minutes for Nb and 3 minutes for Ta. Vibratory polishing is also very helpful for these metals and their alloys





SumMet® Preparation Method for: Hard Steel



4-Step Method for Hard Steel

Sectioning	Abrasive Cutter with a wheel recommended for use on ferrous materials HRC35-60
Mounting	Compression or Castable, typically with EpoMet or VariDur 3000

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Red	75µm Diamond water cooled	6 [27]	300		Until Plane
Apex Hercules H	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
MicroCloth®	0.05µm MasterPrep Alumina	6 [27]	150		2:00

● = Platen ●●● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Grain Size, Phase Area Percent, Object Measurement, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop, Rockwell





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SumMet® Preparation Method for: Soft Steel



4-Step Method for Soft Steel

Sectioning	Abrasive Cutter with a wheel recommended for use on ferrous materials HRC15-35
Mounting	Compression or Castable, typically with EpoMet or VariDur 200

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320grit [P400] SiC water cooled	6 [27]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
VerduTex®	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
MicroCloth®	0.05µm MasterPrep Alumina	6 [27]	150		2:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Grain Size, Phase Area Percent, Object Measurement, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop





SumMet® Preparation Method for: Heat-Treated Steel



3-Step Method for Heat-Treated Steel

Sectioning	Abrasive Cutter with a wheel recommended for use on ferrous materials HRC35-60
Mounting	Compression or Castable, typically with EpoMet or VariDur 3000

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Red	75µm Diamond water cooled	6 [27]	300		Until Plane
Apex Hercules S	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
MicroFloc®	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Case Depth, Decarburization Depth Assessment, Grain Size, Phase Area Percent, Object Measurement, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop, Rockwell





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SumMet® Preparation Method for: Stainless and Maraging Steel



4-Step Method for Stainless and Maraging Steel

Sectioning	Abrasive Cutter with a wheel recommended for use on ferrous materials HRC35-50
Mounting	Compression, typically with EpoMet

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	120 [P120] to 320grit [P400] SiC water cooled	6 [27]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
ChemoMet®	0.05µm MasterPrep Alumina	6 [27]	150		2:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Grain Size, Phase Area Percent, Object Measurement, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop, Rockwell





SumMet® Preparation Method for: Cast Iron



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4-Step Method for Cast Iron

Sectioning	Abrasive cutter with a wheel recommended for use on ferrous materials HRC35-50
Mounting	Compression or Castable

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320grit [P400] SiC water cooled	5 [22]	300		Until Plane
TexMet® C	9µm MetaDi Diamond Supreme*	5 [22]	150		5:00
TriDent®	3µm MetaDi Diamond Supreme*	5 [22]	150		4:00
MicroCloth®	0.05µm MasterPrep Alumina	5 [22]	150		2:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Graphite in Cast Iron
Hardness Testing	Brinell





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SumMet® Preparation Method for: Copper and Copper Alloys



5-Step Method for Copper and Copper Alloys

Sectioning	Abrasive Cutter with a wheel recommended for use on non-ferrous materials
Mounting	Compression or Castable, typically with PhenoCure or VariDur

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	220 [P240] to 320 [P400] grit SiC water cooled	5 [22]	300		Until Plane
TexMet® C	9µm MetaDi Supreme Diamond*	5 [22]	150		5:00
VerduTex®	3µm MetaDi Supreme Diamond*	5 [22]	150		3:00
VerduTex®	1µm MetaDi Supreme Diamond*	5 [22]	150		2:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica**	5 [22]	150		1:30

● = Platen ⦿ = Specimen Holder *Plus MetaDi Fluid Extender as desired

**Attack-polish additions have been used in the past to improve scratch removal but usually are not necessary using the contemporary method followed by vibratory polishing.

Imaging & Analysis	Grain Size, Coating Thickness Layer, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop





SumMet® Preparation Method for: Nickel-Based Superalloys



4-Step Method for Nickel-Based Superalloys

Sectioning	Abrasive Cutter with a wheel recommended for use on SuperAlloys
Mounting	Compression, typically with EpoMet

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	240 [P280] grit SiC water cooled	6 [27]	300		Until Plane
Apex Hercules H or S	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond*	6 [27]	150		5:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica**	6 [27]	150		2:00

● = Platen ⦿ = Specimen Holder *Plus MetaDi Fluid Extender as desired

**Attack-polishing agents may be used, 1 part ammonium persulfate solution (10 g ammonium persulfate per 100 mL distilled water) or 30% hydrogen peroxide to 5 parts silica. Another method to eliminate fine polishing scratches or residual damage is vibratory polishing. A brief vibratory polish, using the same materials as in the last step, can provide the needed improvement. MasterPrep alumina may give better results than colloidal silica for the more pure nickel compositions

Imaging & Analysis	Grain Size, Porosity Assesment, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop



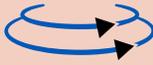


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SumMet[®] Preparation Method for: Nickel, Nickel-Copper and Nickel-Iron Alloys



5-Step Method for Nickel, Nickel-Copper and Nickel-Iron Alloys

Sectioning	Abrasive Cutter with a wheel recommended for use on SuperAlloys				
Mounting	Compression, typically with EpoMet				
Grinding & Polishing Process					
Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet [®]	240 [P280] grit SiC water cooled	6 [27]	300		Until Plane
UltraPad [®]	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TriDent [®]	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
TriDent [®]	1µm MetaDi Supreme Diamond*	6 [27]	150		2:00
ChemoMet [®]	0.02 - 0.06µm Master-Met Colloidal Silica**	6 [27]	150		2:00
<p>● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired</p> <p>**Attack-polishing agents may be used, 1 part ammonium persulfate solution (10 g ammonium persulfate per 100 mL distilled water) or 30% hydrogen peroxide to 5 parts silica. Another method to eliminate fine polishing scratches or residual damage is vibratory polishing. A brief vibratory polish, using the same materials as in the last step, can provide the needed improvement. MasterPrep alumina may give better results than colloidal silica for the more pure nickel compositions.</p>					
Imaging & Analysis	Grain Size, Porosity Assesment, Measurement & Analysis Applications				
Hardness Testing	Vickers, Knoop				





SumMet® Preparation Method for: Cobalt



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5-Step Method for Cobalt

Sectioning	Abrasive Cutter with a wheel recommended for use on SuperAlloys
Mounting	Compression, typically with EpoMet

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	6 [27]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TexMet® C	3µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TexMet® C	1µm MetaDi Supreme Diamond*	6 [27]	150		3:00
ChemoMet®	0.02 - 0.06µm MasterPrep Alumina**	6 [27]	150		2:00

● = Platen ⦿ = Specimen Holder *Plus MetaDi Fluid Extender as desired
 **Chemical polishing has been used after mechanical polishing. Morral (2) has recommended two chemical polishing solutions: equal parts of acetic and nitric acids (immerse) or 40ml lactic acid, 30ml hydrochloric acid and 5ml nitric acid (immerse). A wide variety of Co-based alloys have been prepared with the method above without need for chemical polishing. The 1µm diamond step could be eliminated for routine work.

Imaging & Analysis	Grain Size, Coating Thickness Layer, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop





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SumMet® Preparation Method for: Precious Metals



Stewart's Manual Procedure for Precious Metals

Sectioning	Precision Cutter with 30HC blade recommended for use on soft gummy materials
Mounting	Castable, typically with EpoThin

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Time [min:sec]
CarbiMet®	240 [P280] grit SiC water cooled (wax coated)*	Moderate	400	Until Plane
CarbiMet®	320 [P400] grit SiC water cooled (wax coated)*	Moderate	400	1:00
CarbiMet®	400 [P600] grit SiC water cooled (wax coated)*	Moderate	400	1:00
CarbiMet®	600 [P1200] grit SiC water cooled (wax coated)*	Moderate	400	1:00
TriDent®	6µm MetaDi Supreme Diamond**	Moderate	400	2:00
MasterTex®	1µm MetaDi Supreme Diamond**	Moderate	400	2:00

*Rub candle wax lightly across rotating disc prior to grinding **Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Porosity Assessment, OmniMet Object Measurements, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop





SumMet® Preparation Method for: Precious Metals



5-Step Method for Precious Metals

Sectioning	Precision Saw with a blade recommended for use on soft gummer materials
Mounting	Castable, typically with EpoThin

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	3 [13]	150		Until Plane
TexMet® C	9µm MetaDi Supreme Diamond*	3 [13]	150		5:00
TexMet® C	3µm MetaDi Supreme Diamond*	3 [13]	150		3:00
TexMet® C	1µm MetaDi Supreme Diamond*	3 [13]	150		2:00
ChemoMet®	0.05µm MasterPrep Alumina	2 [9]	150		2:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Porosity Assesment, OmniMet Object Measurements, Measurement & Analysis Applications
Hardness Testing	Vickers, Knoop





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SumMet® Preparation Method for: TSC and TBC Specimens with Metallic Coatings



4-Step Method for TSC and TBC Specimens with Metallic Coatings

Sectioning	Precision Saw with 15HC blade recommend for thermal spray coatings
Mounting	Castable, typically with epoxy drawn under vacuum

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Yellow	35µm Diamond water cooled	6 [27]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond*	6 [27]	150		5:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	4 [18]	150		2:00

● = Platen ●●● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Porosity Assessment, Coating Layer Thickness, Particle Sizing, Phase Area Percent
Hardness Testing	Vickers, Knoop





SumMet[®] Preparation Method for: Alternate TSC and TBC Specimens with Metallic Coatings



Alternate 4-Step Method for TSC and TBC Specimens with Metallic Coatings

Sectioning	Precision Saw with 15HC blade recommend for thermal spray coatings
Mounting	Castable, typically with epoxy drawn under vacuum

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
Apex Hercules H	30µm MetaDi Supreme Diamond*	6 [27]	300		Until Plane
UltraPad [®]	9µm MetaDi Supreme Diamond*	6 [27]	150		4:00
TriDent [®]	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
ChemoMet [®]	0.02 - 0.06µm Master-Met Colloidal Silica	4 [18]	150		2:00

● = Platen ●●● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Porosity Assessment, Coating Layer Thickness, Particle Sizing, Phase Area Percent
Hardness Testing	Vickers, Knoop





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SumMet® Preparation Method for: Ceramic Thermal Spray Coatings



4-Step Method for Ceramic Thermal Spray Coatings

Sectioning	Precision Saw with 15HC blade recommend for thermal spray coatings
Mounting	Castable, typically with epoxy drawn under vacuum

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Yellow	35µm Diamond water cooled	5 [22]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	5 [22]	150		5:00
TriDent®	3µm MetaDi Supreme Diamond*	6 [27]	150		5:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	6 [27]	150		2:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Porosity Assessment, Coating Layer Thickness, Particle Sizing, Phase Area Percent
Hardness Testing	Vickers, Knoop





SumMet® Preparation Method for: Sintered Carbides



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4-Step Method for Sintered Carbides

Sectioning	Precision Saw with 20LC blade recommended for hard tough materials
Mounting	Castable, typically epoxy with added flat-edge filler

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Ultra	45µm Diamond water cooled	6 [27]	300		5:00 [†]
TexMet® P	9µm MetaDi Supreme Diamond*	6 [27]	150		4:00
VerduTex®	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	6 [27]	150		2:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired †Grind longer than "until plane"

Imaging & Analysis	Porosity Assessment, Particle Sizing, Coating Layer Thickness
Hardness Testing	N/A





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SumMet® Preparation Method for: Sintered Carbides



4-Step Method for Sintered Carbides

Sectioning	Precision Saw with 20LC blade recommended for hard tough materials
Mounting	Castable, typically epoxy with added flat-edge filler

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
Apex Hercules H	30µm MetaDi Supreme Diamond*	6 [27]	150-200		5:00 [†]
Apex Hercules S	9µm MetaDi Supreme Diamond*	6 [27]	150		4:00
VerduTex®	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	6 [27]	150		2:00

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired †Grind longer than "until plane"

Imaging & Analysis	Porosity Assessment, Particle Sizing, Coating Layer Thickness
Hardness Testing	N/A





SumMet® Preparation Method for: Ceramic



4-Step Method for Ceramic

Sectioning	Precision Saw with 10LC or 20LC blade recommended for medium to soft ceramics or structural ceramics
Mounting	Castable, typically epoxy with flat edge filler if for very hard ceramic applications

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Ultra	45µm Diamond water cooled	8 [36]	150		Until Plane
Apex Hercules H	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
VerduTex®	3µm MetaDi Supreme Diamond*	6 [27]	150		5:00
TexMet® C	1µm MetaDi Supreme Diamond*	10 [44]	150		5:00

● = Platen ⦿ = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Grain Size, Porosity Assessment
Hardness Testing	Vickers





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SumMet[®] Preparation Method for: Ceramic



4-Step Method for Ceramic

Sectioning	Precision Saw with 10LC or 20LC blade recommended for medium to soft ceramics or structural ceramics
Mounting	Castable, typically epoxy with flat edge filler if for very hard ceramic applications

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Red	75µm Diamond water cooled	8 [36]	150		Until Plane
TexMet [®] P	15µm MetaDi Supreme Diamond*	6 [27]	150		6:00
VerduTex [®]	6µm MetaDi Supreme Diamond*	6 [27]	150		4:00
TexMet [®] C	3µm MetaDi Supreme Diamond*, MasterMet Colloidal Silica (50:50 Simultaneously)	6 [27]	150		4:00

● = Platen ●● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Grain Size, Porosity Assessment
Hardness Testing	Vickers





SumMet® Preparation Method for: Minerals in Bulk Mounts



4-Step Procedure for Preparing Bulk Mounts

Sectioning	Precision Saw with 15LC blade recommended for hard brittle materials
Mounting	Castable, typically EpoThin or EpoHeat

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Terra	45µm Diamond water cooled	5 [22]	300		3:00
TriDent®	9µm MetaDi Supreme Diamond Suspension	3 [13]	150		4:00
TriDent®	3µm MetaDi Supreme Diamond Suspension	3 [13]	150		4:00
TexMet® C	0.05µm MasterPrep Alumina Suspension	4 [18]	150		2:00

● = Platen ⦿ = Specimen Holder

Imaging & Analysis	Phase Area Percent
Hardness Testing	N/A





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SumMet® Preparation Method for: Glass



Traditional Procedure for Glass

Sectioning	Precision Saw with 15LC blade recommended for hard brittle materials
Mounting	Castable, typically EpoThin or EpoHeat

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	5[22]	300		Until Plane
CarbiMet®	400 [P800] grit SiC water cooled	5[22]	300		1:00
TexMet® P	MiroMet (CeO) 1µm	5[22]	150		5:00
MicroCloth®	MiroMet (CeO) 1µm	5[22]	150		2:00

● = Platen ⦿ = Specimen Holder

Imaging & Analysis	Measurement & Analysis Applications
Hardness Testing	N/A





SumMet[®] Preparation Method for: Glass



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Traditional Procedure for Glass

Sectioning	Precision Saw with 15LC blade recommended for glass
Mounting	Castable

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Terra	45µm Diamond water cooled	5[22]	300		5:00
DGD Terra	15µm Diamond water cooled	5[22]	300		5:00
DGD Terra	3µm Diamond water cooled	5[22]	300		5:00
TexMet [®] C	3µm MetaDi Supreme Diamond Suspension	5[22]	150		4:00
MasterTex [®]	MiroMet (CeO) 1µm*	5[22]	150		4:00

● = Platen ⦿ = Specimen Holder * MasterMet can also work for this final polishing step.

Imaging & Analysis	Measurement & Analysis Applications
Hardness Testing	N/A





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SumMet® Preparation Method for: Polymer-Matrix Composites



4 Step Method for Polymer-Matrix Composites

Sectioning	Precision Saw with 15HC blade recommended for metal matrix composites
Mounting	Castable, typically epoxy

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	6 [27]	300		Until Plane
TexMet® P	9µm MetaDi Supreme Diamond*	6 [27]	150		5:00
VerduTex®	3µm MetaDi Supreme Diamond*	6 [27]	150		5:00
MicroCloth®	0.05µm MasterPrep Alumina	6 [27]	150		1:30

● = Platen ● = Specimen Holder

*Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Phase Area Percent, Porosity Assessment, OmniMet Object Measurements
Hardness Testing	N/A





SumMet® Preparation Method for: Metal-Matrix Composites



4 Step Method for Metal-Matrix Composites

Sectioning	Precision Saw with 15HC blade recommended for metal matrix composites
Mounting	Castable, typically epoxy

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Yellow	35µm Diamond water cooled	5 [22]	300		Until Plane
UltraPad®	9µm MetaDi Supreme Diamond*	5 [22]	150		4:00
VerduTex®	3µm MetaDi Supreme Diamond*	6 [27]	150		3:00
ChemoMet®	0.02 - 0.06µm Master-Met Colloidal Silica	6 [27]	150		1:30

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Fiber density, Phase Area Percent, OmniMet Object Measurements
Hardness Testing	N/A





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SumMet[®] Preparation Method for: Ceramic-Matrix Composites



4 Step Method for Ceramic-Matrix Composites

Sectioning	Precision Saw with 15HC blade recommended for metal matrix composites
Mounting	Castable, typically epoxy

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
DGD Ultra	45µm Diamond water cooled	6 [27]	300		Until Plane
UltraPad [®]	15µm MetaDi Supreme Diamond*	6 [27]	150		4:00
VerduTex [®]	6µm MetaDi Supreme Diamond*	6 [27]	150		3:00
VerduTex [®]	1µm MetaDi Supreme Diamond*	6 [27]	150		2:00

● = Platen ● = Specimen Holder

*Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Phase Area Percent, Porosity Assessment, OmniMet Object Measurements
Hardness Testing	N/A





SumMet® Preparation Method for: Printed Wiring Boards



5 Step Method for Printed Wiring Boards (target preparation)

Sectioning	Precision Saw with 15HC blade recommended for PWBs
Mounting	Castable, typically a fast cure system like SamplKwick

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	3 [13]	150		Hit edge of the target /long stops
CarbiMet®	600 [P1200] grit SiC water cooled	3 [13]	150		Hit the level of interest /Short stops
TriDent®	9µm MetaDi Supreme Diamond*	5 [22]	150		3:00
TriDent®	3µm MetaDi Supreme Diamond*	5 [22]	150		3:00
ChemoMet®	0.05µm MasterPrep Alumina + 0.06µm MasterMet Colloidal Silica (50:50)	4 [18]	150		1:15

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Manual Interactive Thickness, Porosity Assessment
Hardness Testing	Knoop





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SumMet[®] Preparation Method for: Silicon in Microelectronic Devices



5 Step Method for Preparing Silicon in Microelectronic Devices

Sectioning	Precision Saw with blade recommended for microelectronic devices
Mounting	Castable, typically EpoThin

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet [®]	600 [P1200] grit SiC water cooled	3 [13]	100		Until Plane
VerduTex [®]	6µm MetaDi Supreme Diamond*	5 [22]	100		3:00
VerduTex [®]	3µm MetaDi Supreme Diamond*	5 [22]	100		3:00
VerduTex [®]	1µm MetaDi Supreme Diamond*	5 [22]	100		3:00
ChemoMet [®]	0.06µm MasterMet Colloidal Silica	2 [9]	100		2:00

● = Platen ●●● = Specimen Holder

*Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Measurement & Analysis Applications, Manual Interactive Thickness
Hardness Testing	N/A





SumMet® Preparation Method for: General Electronic Components



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5 Step Procedure for General Electronic Components

Sectioning	Precision Saw with blade recommended for microelectronic devices
Mounting	Castable, typically EpoThin

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	3 [13]	150		Hit the edge of the target
TexMet® P	9µm MetaDi Supreme Diamond*	5 [22]	150		5:00
VerduTex®	3µm MetaDi Supreme Diamond*	5 [22]	150		3:00
VerduTex®	1µm MetaDi Supreme Diamond*	5 [22]	150		3:00
ChemoMet®	0.05µm MasterPrep Alumina	3 [13]	150		1:30

● = Platen ● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Measurement & Analysis Applications, Coating Layer Thickness
Hardness Testing	N/A





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SumMet® Preparation Method for: Polymers



6 Step Method for Polymers

Sectioning	Precision Saw with blade recommended for microelectronic devices
Mounting	Castable, typically EpoThin

Grinding & Polishing Process

Surface	Abrasive / Size	Load - lbs [N] / Specimen	Base Speed [rpm]	Relative Rotation	Time [min:sec]
CarbiMet®	320 [P400] grit SiC water cooled	4 [18]	300		Until Plane
CarbiMet®	400 [P600] grit SiC water cooled	4 [18]	300		1:00
CarbiMet®	600 [P1200] grit SiC water cooled	4 [18]	300		1:00
CarbiMet®	1200 [P2500] grit SiC water cooled	4 [18]	300		1:00
TexMet® C	3µm MetaDi II Diamond Paste*	5 [22]	150		4:00
MasterTex®	0.05µm MasterPrep Alumina	3 [13]	150		3:00

● = Platen ●● = Specimen Holder *Plus MetaDi Fluid Extender as desired

Imaging & Analysis	Manual Interactive Thickness
Hardness Testing	N/A



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- Dardilly, FR 
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- Shanghai, CN 
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