

Grinding is defined as abrasive material removal from the specimen surface using randomly oriented or fixed abrasives on a substrate such as paper or cloth. Grinding starts with the finest grit size that will establish an initially flat surface and remove the effects of sectioning within a few minutes. The abrasive used for each succeeding grinding operation should be one or two grit sizes smaller than that used in the preceding step. All grinding steps should be performed wet provided that water has no adverse effects on any constituents of the microstructure. Wet grinding minimizes specimen heating, and prevents the abrasive from becoming loaded with material removed from the specimen being prepared. Each grinding step, while producing damage itself, must remove the damage from the previous step. The depth of damage decreases with the abrasive size but so does the material removal rate.

Polishing is the final step, or steps, in producing a deformation-free surface that is flat, scratch free, and mirror-like in appearance. Such a surface is necessary to observe the true microstructure for subsequent metallographic interpretation, both qualitative and quantitative.

Tips, Tricks & Techniques:

- In selecting a grinding surface, choose the finest abrasive that will efficiently achieve planarity
- Polishing cloths typically last 20 cycles
- Diamond suspensions contain enough lubricant that they do not require an extender
- Diamond pastes should be used with MetaDi® Fluid or another extender

Grinding/Polishing Equipment Comparison Chart

		MiniMet® 1000 pg. 29	EcoMet® 250 pg. 24	EcoMet® 300 pg. 25	EcoMet® 250 Pro pg. 24	EcoMet® 300 Pro pg. 26	MetaSerr® 250 pg. 27	BuehlerVanguard® pg. 30
Platen Wheel Size	2 7/8"							
	8"							
	10"							
	12"							
Platen Quantity	Single							
	Six							
Variable Speed Controls	Yes							
	Membrane Keypad							
	LCD							
	Touch-Screen							
Method Programmability*	Yes							
Z-axis Material Removal*	Yes							
Preparation Type*	Manual							
	Semi-Automatic							
	Automatic							
Power Source	115 VAC, 60 Hz							
	230 VAC, 60 Hz							

* With Power Head

Grinding/Polishing Power Head Equipment Comparison Chart

		AutoMet® 250 pg. 24	AutoMet® 300 pg. 25	Vector® LC 250 pg. 28	Vector® pg. 28
Force Type	Single	████████	████████	████████	████████
	Central	████████	████████		████████
Force Power Source	Mechanical Springs			████████	
	Electric-Mechanical	████████	████████		
	Pneumatic	████████	████████		████████
Maximum Specimen Size*	Single	1.5" (40mm)	2" (50mm)	1.5" (40mm)	1.5" (40mm)
	Central	1.5" (40mm)	2" (50mm)	N/A	1.5" (40mm)
Maximum Specimen Capacity	Single	6	6	4	4
	Central	6	10	N/A	6
Maximum Force	Single	10 lbs. (45N)	20 lbs. (90N)	11 lbs. (50N)	15 lbs. (75N)
	Central	60 lbs. (260N)	120 lbs. (535N)	N/A	60 lbs. (300N)

* Only applies for circular mounts