Tescan Vega3 Operation

All samples must be conductive or sputter coated to make them conductive prior to SEM imaging. Samples mainly composed of particulates must be blown with an air duster. Loose particles will damage X-Ray detector.

1. Open Nitrogen tank valve ¼ turn counterclockwise
2. Turn on monitor (button lower right corner)
3. Double click on VegaTC icon
4. Log In under your name
5. Check that the chamber door is fully lowered.
6. Once program loads vacuum status will be “Standby”, select “VENT” to release vacuum
7. Slowly pull open chamber door after vacuum released (protect EDX detector)
8. Select “Widefield” Mode, then use Stage Control to turn turret to access set screw
9. Loosen set screw, place sample carefully on turret, and tighten set screw; **Watch sample as you Close chamber door to prevent sample hitting column**
10. Select “PUMP” – wait for “Vacuum ready”
11. Select 5.00 kV in drop down menu then click on “HV”
12. Wait 2 minutes for filament to warm up, then select desired HV (5, 10, 15, 20, 30)
13. Reduce magnification, find object of interest in/on sample
14. Check that **B.I.** (Beam Intensity) is set to **10** for SEM imaging
15. Set **WD** in pad panel, then turn large knob on sample chamber door to **raise sample until image comes in focus**
16. Select “SE” in Channel A for normal imaging or “BSE” in Channel A for backscatter or A/B (above channel A & B) to see both SE & BSE
17. “Continual” starts/stops scanning, “Acquire” takes photo
18. Select **Mode** – “Wide Field” - to see entire sample holder, always select “Continual Wide Field” (always select Continual wide field), then “Resolution” – to image sample
19. Select **Speed** – 1 (fastest scan) through 10 (slow scan but high resolution)
20. Sample/Stage **Movement**; place cursor over desired area, click on mouse wheel or use Joystick on control panel, or control arrows on stage control window
21. Select/change **Magnification** – Mag knob on control panel, or click on icon then select Mag in Pad panel, or right click to choose preset mags
22. **Focus** image – double click on image for focus box turn focus knob until clear or click on “Auto focus”
23. Contrast/Brightness: Use “Auto contrast brightness or knobs on control panel
24. Photo – Adjust for best focus, contrast and brightness and magnification, set scan speed (slower speed = higher resolution); then click on “Acquire Image” icon
25. Breaks, if you have to leave the SEM briefly –
	1. Click on “Continual” to stop the scan,
	2. Turn off HV and
	3. Set HV to 5kV before leaving the room
26. Shut down/end of session -

 a) Stop scan by clicking on “Continual”

 b) Set HV to 5kV, B.I. to 10 (if you changed it)

 c) Turn off HV

 d) Turn large knob (WD) on chamber door to COMPLETELY LOWER STAGE

 e) Click “HOME STAGE” on stage control panel

 f) Click on “VENT” & confirm

 g) **SLOWLY** Open chamber door and remove samples

 h) Close door and click on “PUMP” – wait until you see “Vacuum Ready”

 i) Wait for column pressure bar to turn green

 j)Click on “STANDBY”

 k) Exit program (“switch off and exit” is ok)

 l) Turn off monitor, do NOT turn off computer

 m) Close tank Valve

Troubleshooting:

No image - check to be sure: HV is on, low mag selected, good contrast/brightness

If image “grainy” after increasing kV: Go to “Adjustment”🡪 “Auto Gun Heating” 🡪 “Auto Contrast/Brightness

If working at or above 50kX try WD of 7 mm

If image moves while focusing:

Click on “Manual Column Centering” Icon

Manual Centering Wizard opens, follow direction and select “Next”

Box with cross hairs opens on image

Use “x” and “y” knobs on control box to adjust to least movement

Select “Finish”

If image is fuzzy/unclear even after focusing;

Move sample closer to column – select a working distance between 10 and 12 then focus and Adjust the stigmation