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. If the computer says “Updates are Ready” **DO NOT** update
4. Double click on VegaTC icon
5. Log In under emic586, Username; emic586 & Password; emic586
6. Check that the chamber door is fully lowered.
7. Once program loads vacuum status will be “Standby”, select “VENT” to release vacuum
8. Slowly pull open chamber door after vacuum released (protect EDX detector)
9. Select “Widefield” Mode, then use Stage Control to turn turret to access set screw
10. Loosen set screw, place sample carefully on turret, and tighten set screw; **Watch sample as you Close chamber door to prevent sample hitting column**
11. Select “PUMP” – wait for “Vacuum ready”
12. Select 5.00 kV in drop down menu then click on “HV”
13. Wait 2 minutes for filament to warm up, then select desired HV (5, 10, 15, 20, 30)
14. Reduce magnification, find object of interest in/on sample
15. Check that **B.I.** (Beam Intensity) is set to **10** for SEM imaging
16. Set **WD** (working distance)in pad panel to 10 mm

a) Increase mag to 100x, turn large knob on sample chamber door to **raise sample until image comes in focus,**

b) Increase mag to at least 1000x, turn knob again until sample in focus.

c) Focus using focus dial, check that WD is at 10mm – if not repeat steps to raise and focus sample.

1. 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
2. “Continual” starts/stops scanning, “Acquire” takes photo
3. Select **Mode** – “Wide Field” - to see entire sample holder, always select “Continual Wide Field” (always select Continual wide field), then “Resolution” – to image sample
4. Select **Speed** – 1 (fastest scan) through 10 (slow scan but high resolution)
5. 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
6. 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
7. **Focus** image – double click on image for focus box turn focus knob until clear or click on “Auto focus”
8. Contrast/Brightness: Use “Auto contrast brightness or knobs on control panel
9. Photo – Adjust for best focus, contrast and brightness and magnification, set scan speed (slower speed = higher resolution); then click on “Acquire Image” icon
10. 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
11. 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, “Finish”