

NCEM 3010 *In situ* TEM driver license Checklist

1. Safety:

Understand emergency shut down procedure	
Know emergency contact numbers	
Know where Liquid N2 protective equipment is	

2. Prepare the TEM for your session.

Set from "DP" to "Normal" mode.	
Check gun and column IGP readings ($< 2 \times 10^{-5}$ mPa).	

3. Start HT with normal HT conditioning process.

Set HT to 200kV and turn on HT	
Slow condition to 300kv: 20 minutes and 0.1 KV steps required from 200KV to 300KV	

4. Fill up LN2 in ACD.

Check screen covered.	
Wear protective gear (goggles, mask, gloves), refill after 6 hrs.	

5. Load specimen in holder.

Each in-situ holder (heating, cooling, indentation, tensile, e-bias) requires separate training and qualification.	
Place double-tilt holder properly on provided stand.	
Load sample and tighten retaining screw gently.	
Check sample snugness by gently tapping the big end of the holder.	

6. Insert holder.

Insert sample to pump down position	
Switch to pump, pump for 10 minutes	
Check green light and P4 reading.	
Insert holder into column, pausing at first step.	
Check column IGP reading after insertion	

7. Start filament.

Check "filament ready" light.	
Follow filament warm-up procedure (slow to set position ~5 minutes)	

8. Carry out alignments

Find beam	
Eucentric height	
Gun alignment	
C2 aperture, C2 stigmation	
Pivot points	
Current center, voltage center	
Objective stigmation	

9. Basic TEM operations

Bright field imaging	
Dark field imaging	
SA diffraction	

10. Using CCD camera

Check "peltier cooler" on	
Check camera setup on computer	
Block central diffraction spot	
Record image	

11. Using film plates

Check CCD camera set to "Out"	
Warm up "peltier cooler" before venting camera	
Set exposure time and record picture	
Demonstrate darkroom skills and proper reloading of plates and cassettes	

12. Shut down

Turn off filament slowly	
Center holder positions and tilts (neutralize)	
Remove holder properly, unload sample, and store the holder in dessicator	
HT shut off (set to 200kV first)	
ACD heater inserted and turned on	
Vent camera chamber and unload film/reload new film cassette	

Switch on DP mode after film chamber has returned to vacuum and opened to column	
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13. Record session in log-book

Record number of images taken and any problems	
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Signature of NCEM Staff Member administering the test:

_____ Date

Signature of New 3010 User:

_____ Date

Minimum of 2 trouble-free weekday sessions before using evening/weekend sessions