

Title of project/experiment/activity			
Deposition using the MiniLab T60M R&D Thermal Deposition System from Moorfield			
Location of activity Cambridge Graphene Centre, Class 1000 Cleanroom, EEDB Annexe, 2nd floor		Start and end dates 1/7/2017 – open-ended	
Brief description (or attach procedure/protocol)			
<p>The MiniLab T60M R&D Thermal Deposition System is a semi-custom thermal evaporation instrument. It is specifically configured to allow for production of high-quality thin films of metals for R&D application.</p> <p>The evaporator is intended for use with a small number of standard deposition materials: Gold, Chromium, Aluminium, Silver and Titanium.</p> <p>Any additional source material will require additional risk assessment. The chamber is vented with Nitrogen gas.</p>			
Hazard	Effect	Control measures	Residual risk
Exposure to Inert Gases	Asphyxiation	All gas connections are checked regularly. Gas sensors for all process gases and oxygen depletion are installed in the cleanroom and will detect any leakage early on.	Very Low
Exposure to High Temperature	Burns	During a process a source is heated enough to cause metal to sublime. This is controlled by an interlock and will only heat when the system is under vacuum, thus unreachable by users.	Very Low
Exposure to bright light from glowing metals	Blindness	There is a window with shutter on the tool designed for checking alignment. For running samples, this shutter must be shut at all times.	Low
Exposure to Metal Sources	Respiratory problems	The metal source materials shall be used in pellet form rather than powder, thus cause no risk.	Very Low
Personal Protective Equipment required [eye/face protection, respiratory protection, gloves, lab coat etc]			
Appropriate cleanroom clothing (gloves, eye protection, over-boots, and lab coat) must be worn during the process. No additional PPE is required.			
Emergency Instructions & First Aid			

If the gas alarms sound, the user is required to leave the cleanroom through the closest emergency exit.

In case of exposure or the occurrence of irritations, see a medical professional.

Any special monitoring required [e.g. hearing test, vibration monitoring, health surveillance]

Oxygen depletion monitors are installed all around the cleanroom to alert users for any leaks of gasses used in this risk assessment (Nitrogen, Compressed Air), and are serviced regularly.

Further control measures required? If yes, list with actions.


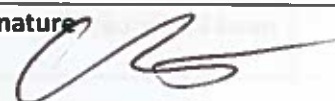
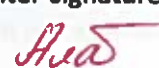
The guidelines for safe operation of the Moorfield MiniLab T60M R&D Thermal Deposition System provided by the manufacturer must be followed at all times.


Biological/Laser/Radiation Approval [requires relevant Specialist Safety Officer signature and date]

Out of hours/Lone working

Out of hours working must be authorised according to Engineering Department regulation. Access to the process gases at out of hours will be restricted until then. Permission from Head of Division and Facilities Manager must be sought.

Signature to confirm that this is a suitable and sufficient assessment of risk and that stated control measures are in place. This risk assessment should be reviewed if additional risks not covered in this assessment are identified or if there is any reason to indicate that the control measures are insufficient.

Name of Assessor James Macleod Email: ProcessTech@graphene.cam.ac.uk	Signature 	Date 7/7/17
Name of Supervisor Prof. A.C. Ferrari Email: acf26@cam.ac.uk	Signature 	Date
Facilities Manager Dr Yury Alaverdyan Email: facilities@graphene.cam.ac.uk	Counter-signature 	Date 11/7/17

Local Safety Coordinator	Signature 	Date 11/7/17
Departmental Safety Office IAN SLACK	Signature 	Date 27 JUL 2017