

<b>Title of project/experiment/activity</b> Use of Weiss WKL 64 climatic chamber			
<b>Location of activity</b> Cambridge Graphene Centre : Ink Lab		<b>Start and end dates</b> 01/09/2015 - continuous	
<b>Brief description (or attach procedure/protocol)</b>  The Weiss WKL 64 is a commercially made climatic chamber of 64L and will be used in accordance with the manufacturer's instructions after training. It is used to test samples in various climatic environments (temperature and humidity).  The chamber is manufactured with an access port to connect the samples to external measurement system to monitor the sample while changing the environmental conditions.  During testing, a picoammeter will detect the resistance response of the sensor exposed to different atmospheres (e.g. gas type, humidity, temperature).  The chamber can work in a temperature range of -40°C to 180°C and humidity range 10% to 98% (temperature must be between 10°C and 95°C with regulating the humidity).  <i>The following samples may be tested as a sensor:</i> Various samples can be tested e.g. graphene, 2d materials, metal oxides, etc. (user should refer to personal risk assessments for sample handling)			
Hazard	Effect	Control measures	Residual risk
General hazards in lab	Inhalation of solvents	Other lab users will be using solvents with appropriate extraction in place. (Likelihood: 1, Severity: 1)  Gloves, eye protection and lab coat must be worn whilst in the laboratory. The Ink Lab rules will be respected.	Low risk
Substrate heating	Risk of burns	Climatic chamber substrate can be heated to ~180°C. If a sample is removed whilst the substrate holder is still hot, there is a risk of burns to the user. (Likelihood: 2, Severity: 1)  Tweezers should be used to place and remove samples. The equipment will have a safe operating procedure set of rules so that the burns risk and exposure to chamber contents is avoided as long as the users follow the rules.	Low risk
Substrate cooling	Risk of burns	Climatic chamber substrate can be cooled to ~-40°C. If a sample is removed whilst the substrate holder is still cold, there is a risk of burns to the user. (Likelihood: 2, Severity: 1)	Low risk

		<p>Tweezers should be used to place and remove samples. The equipment will have a safe operating procedure set of rules so that the burns risk and exposure to chamber contents is avoided as long as the users follow the rules.</p>	
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**Personal Protective Equipment required [eye/face protection, respiratory protection, gloves, lab coat etc]**

Lab coat, gloves (purple nitrile) and eye protection (safety specs) required in the lab at all times

**Emergency Instructions & First Aid**

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

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

In case of water spillage (from the water tank, the condensate container or from the chamber itself), use the spill kit to collect the water.

In the case of equipment malfunction/failure: an emergency shutdown button located on the rear side. This should be pressed if the system is malfunctioning.

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

N/A




**Out of hours/Lone working**

The system can be left working alone for several hours overnight. A label mentioning „running equipment / keep away“ must be displayed when the equipment is running unattended. *Requires an overnight running permit from Head of Division.*

# Department of Engineering – Risk Assessment

Ref No.

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.

<b>Name of Assessor</b> Panagiotis Karagiannidis Email: pk412@cam.ac.uk	<b>Signature</b> 	<b>Date</b> 31/8/2016
<b>Name of Supervisor</b> Prof A.C. Ferrari Email: acf26@cam.ac.uk	<b>Signature</b> 	<b>Date</b> 2/9/16
<b>Local Safety Coordinator</b>	<b>Signature</b> David Hards	<b>Date</b> 2/11/16
<b>Departmental Safety Office</b> IAN SLACK	<b>Signature</b> 	<b>Date</b> 9 NOV 2016