Department of Engineering – Risk Assessment

Ref No. B874

Title of project/experiment/activity **Use of Spray Coaters**	
Location of activity Cambridge Graphene Centre : Ink Lab	**Start and end dates** 21/09/2015 - continuous

Brief description (or attach procedure/protocol)

The SCS spray coater is a commercially made system and will be used in accordance with the manufacturer's instructions. The system was delivered modified to incorporate a smaller liquid reservoir (max 100 mL) that has to be manually removed from the system to clean/refill.

The spray coater is used to deposit solutions on to a range of substrates including paper, glass, plastics and silicon. The spray coating process will take place in the Ink Lab. The preparation of the inks (weighting, mixing etc) will be done in the chemistry lab. It is expected to be used daily for several hours. Use COSSH forms where appropriate.

Hazard	**Effect**	**Control measures**	**Residual risk**
General hazards in lab	Inhalation of solvents Exposure to chemicals harmful to health	The use of various chemicals will be covered by dedicated risks assessments dealing with the preparation of nanomaterials composites and COSSH forms. When using solvents during operation an extractor will be used to prevent solvent vapours entering the open lab area. Gloves, eye protection and lab coat must be worn whilst in the laboratory. The Ink Lab rules will be respected. (Likelihood: 1, Severity: 1)	Low risk
Heat	Burns to the user	Do not place any body part inside the oven. Do not place any body part on the substrate until cooled. Do not operate the oven without factory guards installed. (Likelihood: 1, Severity: 2).	Low risk
Electric shock	Shock to user, damage to equipment	Extensive electrical grounding has been provided throughout the machine. If any ground wire is found damaged or disconnected do not operate the machine until the condition has been corrected. (Likelihood: 1, Severity: 1)	Low risk
Pinch points and motion hazards	User may trap fingers. Mechanical damage to equipment	Do not place any body part inside the coating booth. Do not place any body part within proximity of moving parts Do not operate this machine without factory guards installed Never interfere with motion of the gun or the conveyor	Low risk

		(Likelihood: 1, Severity: 1)	

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

Spillage:
Solvent spillage or water-based dispersion spillage should not be more than 60 mL, and can be dealt by wiping with cleanroom wipes. The wipes disposed into waste bins.

Fire:
In case of fire, the fire alarm should be sounded and fire service called. If safe to do so, the fire may be extinguished using an extinguisher containing carbon dioxide, located in the corridor outside the laboratory.

First aid:
General advice: Consult a physician. Show this safety data sheet to the doctor in attendance.
In case of skin contact, eye contact or inhalation: Use treatment measures that are appropriate to COSSH forms of the various chemicals that are sprayed.

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

Use dedicated COSSH risks assessments dealing with the various chemical exposure limits where appropriate.

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

Waste Disposal Procedures: Aqueous waste should be disposed in a container separate from solvent waste. Solvents will be disposed of in suitable chlorinated (e.g. DCB, chloroform), or non-chlorinated (all others) waste containers.

In the case of equipment malfunction/failure: shutdown instrument from power buttons or directly from plug socket. The emergency stop button can be pressure to shut down the heater.

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

Out of hours/Lone working

Out of hours/lone working is not permitted.

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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 Tian Carey Email: tc419@cam.ac.uk	**Signature** Tian Carey	**Date** 8/8/16
Name of Supervisor Prof A.C. Ferrari Email: acf26@cam.ac.uk	**Signature**	**Date** 2/11/16

Local Safety Coordinator	**Signature** David Hardy	**Date** 2/11/16
Departmental Safety Office IAN SLACK	**Signature**	**Date** 9 NOV 2016