WORKPLACE RISK ASSESSMENT SYSTEM
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Risk Assessment Details ID: RA_SCELSE_119357 Rev No: 1 Draft ID: 0

User's School/ Department/ Student Activity Group:	Singapore Centre for Environmental Life Sciences Engineering	**Project Title:**	Use of Critical Point Dryer and Sputter Coater for SEM sample preparation
Workplace:	Singapore Centre for Environmental Life Sciences Engineering	**Other workplace:**	-
Location:	SBS-B3n-27S	**Conducted By:**	Foo Yong Hwee(YHFOO);Radek Machan(RADEK.MACHAN)
Approved By:	Peter Torok (PETER.TOROK@ntu.edu.sg)	**Submitted By/Submitted Date:**	Foo Yong Hwee/31-Oct-23
Approved Date:	31-Oct-23	**Next Review Date:**	30-Oct-26
Status:	Approved	**Comments:**	-

1. Hazard Identification					2. Risk Evaluation				3. Risk Control			
1a.	**1b.**	**1c.**	**1d.**	**1e.**	**2a.**	**2b.**	**2c.**	**2d.**	**3a.**	**3b.**	**3c.**	**3d.**
No.	**Work Activity**	**Hazard**	**Sub Hazard**	**Possible Accident/Ill Health & Person-at-Risk**	**Existing Risk Control**	**S**	**L**	**R**	**Additional Risk Control**	**S**	**L**	**R**
1	Turning on the CO2 and argon tank for the critical point dryer and sputter coater respectively	Physical	Others:Heavy cylinder may topple and injure user or others nearby	Others:Bodily injuries	-Cylinders are secured in an upright position onto the cylinder wall bracket with chains.	3	1	3	NA			
		Chemical	Others:Gas leak from	Others:Gas inhalation may cause nausea,	-The designated laboratories used to store	4	1	4	NA			

			cylinder and equipment	dizziness, asphyxiation, and other symptoms	compressed gas cylinders have gas detectors and alarm systems installed to detect gas leaks (e.g., LPG, oxygen, carbon dioxide, etc...). -Laboratories are designed to operate with single-pass 8 ACH and 20 ACH, respectively, to ensure that they are well-ventilated and minimize the accumulation of hazardous substances (including inert gases). -User shall conduct a visual inspection to check for corrosion, damaged valve and evidence of tampering on the cylinder, as well as the connecting hose on the gas delivery system.				
2	Usage of the critical point dryer	Electrical	Contact with electrical energy	Electrocution	-Users must complete NTU OHSE eLearning - Basic Safety Training-Electrical Safety" via NTULearn or Workday@NTU. -When handling power socket, ensure that hands are dry.	4	1	4	NA
		Chemical	Flammable	Burns/ scalds	-Volume of ethanol used should be enough	3	1	3	NA

					(~100ml) to submerge the sample in the chamber and not more. -Equipment is nowhere near any heating equipment or open flame. -Proper PPE such as gloves and lab coat must be worn when handling sample.				
		Chemical	Others:CO2 leak from equipment	Others:Gas inhalation may cause nausea, dizziness, asphyxiation, and other symptoms	-Users must check that the lid to the chamber is closed properly and no sound of gas leaking can be heard. -There is also a sensor to check if the lid is closed properly. -The designated laboratories have gas detectors and alarm systems installed to detect CO2 gas leaks. -Laboratories are designed to operate with single-pass 8 ACH and 20 ACH, respectively, to ensure that they are well-ventilated and minimize the accumulation of hazardous substances (including inert gases).	4	1	4	NA

3	Usage of the sputter coater	Electrical	Contact with electrical energy	Electrocution	-Users must complete NTU OHSE eLearning - Basic Safety Training-Electrical Safety" via NTULearn or Workday@NTU. -When handling power socket, ensure that hands are dry.	4	1	4	NA
		Chemical	Others:Contact with platinum coating	Others:Platinum may cause a skin allergy	-Sputter coating is contained within the equipment and the amount used is very minimal (typically 4 nm coating). -Proper PPE such as gloves and lab coat must be worn when handling coated sample.	1	1	1	NA