Safety Documentation

Please select the forms you require by selecting the check boxes below.
You can select more than one.

☑ **Risk Assessment** ☑ **Method Statement** ☑ **Chemicals COSHH**

Once you have made your selections, scroll down and complete the forms.

Buttons: [+] will add a row to a list [X] will delete a row from a list

You may save this file to a local drive at any time.
When you have finished, save the file to a local drive and email it to your supervisor for authorisation.

Supervisors - There is a sign-off section at the end of the document set that must be completed.

Staff may "self authorise", (as a supervisor), but the forms must still be submitted to the DSO for approval.

IMPORTANT:

YOU ***MUST NOT*** START ANY PRACTICAL WORK UNTIL THESE FORMS HAVE BEEN RETURNED TO YOU WITH **BOTH** YOUR SUPERVISOR's AND DSO's APPROVAL SIGNATURES ATTACHED.

Please complete these fields

School or Service	Wolfson School of Mechanical, Electrical and Manufacturing Engineering
Department	Center for Biological Engineering
Originator name	J. Bowdrey
email address	j.bowdrey@lboro.ac.uk
Location	Centre for Biological Engineering, Holywell Park
Project / Activity / Task	Use and Maintenance of the NucleoCounter NC-3000
Supervisor Name	Carolyn Kavanagh

Version : 2.20

Loughborough University
Center for Biological Engineering

Risk Assessment

Reference: SAF/MM/6554

Location: Centre for Biological Engineering, Holywell Park

Originator: J. Bowdrey

Project / Activity / Task: Use and Maintenance of the NucleoCounter NC-3000

Is this process risk assessment for a : ☑ Laboratory / Workshop ○ General use

Category 1: Machinery & work equipment:				
Design and Construction	Mechanical hazards	Electrical hazards	Radiation hazards	+
N/A	N/A	Electrical test labels current	Lasers	x

Category 2: Workplace	+
Risk of asphixiation (Oxygen depletion)	x
Falls from height	x
Category 3: Hazardous and/or Harmful substances	+
Biological substances (Infection)	x
Reagents- possibly harmful	x
Category 4: Work activity	+
Highly repetitive actions	x
Lone working out of hours	x
Category 5: Work organisation	+
N/A	x

Explain the risks associated with these hazards

People / Groups at risk: Operator only — x

Enter risk details here:-	Impact	Probability	Risk Score
Risk of Electric shock/hazard	Slightly Harmful	Highly Unlikely	Low
What are the control measures?	**Lowers Impact**	**Lowers Probability**	+
Regular PAT testing, every two years , ensures equipment is in good working order and electrically safe to use.	Slightly	Significantly	x
Equipment and leads are checked regularly . If equipment is visibly damaged users know not to use but to notify lab manager and other users and stop equipment from being used.	Slightly	Significantly	x

Residual Risk: Low

Process Risk Assessment Form (Continued)

People / Groups at risk	Operator		x
Enter risk details here:-	Impact	Probability	Risk Score
Lasers	Harmful	Highly Unlikely	Low
What are the control measures?	Lowers Impact	Lowers Probability	+
The lasers are housed within a closed system, where access is not possible by the users.	Significantly	Significantly	x
Users are trained how to use equipment safely	Moderately	Moderately	x
		Residual Risk	Low

People / Groups at risk	Operator and people in proximity		x
Enter risk details here:-	Impact	Probability	Risk Score
Risk of asphyxiation	Very Harmful	Highly Unlikely	Medium
What are the control measures?	Lowers Impact	Lowers Probability	+
There are 4 cryobanks present in the room with the nucleocounter. There is an oxygen monitor present which is checked regularly and will alarm when the oxygen level falls.	Moderately	Significantly	x
Within the labs is an air handling system, this means that there is a regular turn over of air throughout the labs.	Moderately	Moderately	x
When the cryobanks are in use in H30, the door is propped open to increase air circulation.	Moderately	Slightly	x
		Residual Risk	Low

People / Groups at risk	Operator only		x
Enter risk details here:-	Impact	Probability	Risk Score
Biological Substances (infection)	Slightly Harmful	Highly Unlikely	
What are the control measures?	Lowers Impact	Lowers Probability	+
The biological substances such as cells will have been risk assessed before hand using a BRA. Most Biological material has good provenance and has been screened or will be used under quarantine conditions.	Significantly	Slightly	x
Users are trained to work with biological material and wear gloves at all times.	Moderately	Moderately	x
		Residual Risk	Low

People / Groups at risk	Operator and people in proximity		x
Enter risk details here:-	Impact	Probability	Risk Score
Hazards from working with Reagents	Slightly Harmful	Highly Unlikely	
What are the control measures?	Lowers Impact	Lowers Probability	+
The reagents used will be individually COSHHed before being used.	Moderately	Moderately	x

Process Risk Assessment Form (Continued)

Gloves and safety glasses will be worn when working with hazardous material.	Moderately	Moderately	x
		Residual Risk	Low

People / Groups at risk	Operator only		x
Enter risk details here:-	Impact	Probability	Risk Score
Highly repetitive action	Slightly Harmful	Highly Unlikely	
What are the control measures?	Lowers Impact	Lowers Probability	+
If used for long periods of time, there maybe repetitive actions, such as pipetting. Users are encouraged to take regular breaks.	Slightly	Slightly	x
		Residual Risk	Low

People / Groups at risk	Operator and people in proximity		x
Enter risk details here:-	Impact	Probability	Risk Score
slips trips falls	Slightly Harmful	Highly Unlikely	
What are the control measures?	Lowers Impact	Lowers Probability	+
Ensure that the area is clear and tidy of floor based obstacles. Consult SOP038 spill response for spilages and correct clean up	None	Slightly	x
		Residual Risk	Low

+ Add another Risk

Who may be at risk as a result of this activity?

Personnel Group	Maximum (Task setup/ Re-configuration)	High (Performing the task)	Medium (Observing the task)	Low (Present, but not involved)	Lone Working (Out of hours)	No Exposure Permitted	Total
Academic Staff	0	0	0	0	0	0	0
Technical Staff	0	1	1	0	0	0	2
Research Staff (PDRA)	0	2	0	0	0	0	2
Research Students (PhD)	0	8	0	0	0	0	8
Students (Undergraduate / MSc)	0	0	0	0	0	0	0
Visitors	0	0	0	0	0	0	0
Others - Over-type as needed	0	0	0	0	0	0	0
Total	0	11	1	0	0	0	12

With these controls in place, the risk is:

The activity is LOW RISK - and is effectively controlled

Loughborough University
Center for Biological Engineering
Safety Method Statement

Loughborough University

Reference: SAF/MM/6554

Location: Centre for Biological Engineering, Holywell Park

Originator: J. Bowdrey

Project / Activity / Task: Use and Maintenance of the NucleoCounter NC-3000

What equipment will be used in this activity?	+
NucleoCounter NC-3000	x
Via-1 Cassette	x
NC-slide A2 and NC-slide A8	x
Pipettes and tips	x
Vortex	x

What training must be completed to do this activity?	+
Initial lab training	x
Training from a competent user of the nucleocounter NC-3000	x

What chemicals are being used? (These must be included in the COSHH Form)	+
Solution 13 (A mix of Dapi and Acridine Orange)	x
Dapi	x
Acridine Orange	x
Other reagents may be used but they will be COSHHed separately	x

Spill and accident procedures.	+
Small quantities of reagents and cell suspension will be used. Spills will be small if any. Clear spills up immediately.	x
Follow SOP-038 Biological spill response.	x
For any reagents - see the COSHH from or if non-hazardous the SDS	x
All accidents or near misses should be reported through the University online system.	x

Procedure in the event of an emergency. (How to leave the process in a safe condition in such an event)	+
In case of emergency leave the nucleocounter and vacate the laboratory using the nearest fire escape.	x

References.	+
SOP038- Biological Spill response.	x
SOP121 Use and Maintenance of the Nucleocounter	x

Detailed sequential description of the process

Process step	Precautionary measures and comments	+
Follow SOP121 . For a cell count using a Via-1 cassette	Check equipment and leads for faults. The via-1 cassette is preloaded with Solution 13. So it does not need to be added to the cell sample.	x

Safety Method Statement (Continued)

Process step	Precautionary measures and comments	+
Log into the computer		x
Click on the Nucleocounter program		x
Allow the program to open, once ready the light on the nucleocounter will have turned to green.	The nucleocounter will not open or work until it has initialized with the program	x
Select Via-1 cassette, and cell count and viability test. Enter sample details. This includes how large the sample volume is.	Need to select the correct test cassette or slide otherwise it will not run. Correct test program needs to be selected or the wrong test will be run.	x
Take a 200ul sample and put in an eppendorf tube.	To be done in the BSC	x
Vortex for approx 10 seconds.		x
Using Via-1 cassette, take up sample by pressing down the white button.	Make sure that the pointy bit of the cassette is all the way down to the bottom of the eppendorf tube before the white button is pressed.	x
Press the eject button, the sample drawer will automatically eject out.		x
Place Via-1 cassette in the drawer.		x
Press the play button on the nucleocounter, or the screen. The sample drawer will shut and the cell count will begin.		x
Once the cell count is complete, the total cell number and viability will be shown on the screen, if more detail is needed click on the results tab. The sample drawer will also eject. Put Via-1 cassette into an autoclave bag. press button to close drawer.		x
Once completed, close down the nucleocounter program, and log out of the computer.	Do not turn the nucleocounter or the computer off.	x
		x
Cell Count using an A2 or A8 slide.		x
		x
As for the Via-1 cassette, repeat up to selecting either the A2 or A8 slide. The A2 slide does 2 cell counts while the A8 slide does 8. Select Cell count and viability assay. Fill in sample details.	Need to input the sample volume, it will also automatically calculate how much Solution 13 needs to be added.	x
The amount of sample needed for each test varies, for an A2 slide each chamber takes 30ul, while an A8 slide takes 10ul. Depending on the number of cell counts for each sample depends on the amount of sample needed. E.g take 95ul of cell sample. Add 5ul of Solution 13. (The slides do not contain solution 13)		x
Vortex the mix for 10 seconds.		x
Pipette the appropriate amount of cell sample into each chamber.		x
Press the eject button and the sample drawer will open.		x
Insert the slide.		x
Press play on the nucleocounter or the screen. It will begin.		x
Once the cell counts have completed. Press the eject button, and place the used slide into a sharps box, as made of glass.		x
Once completed, close the program down and log of the computer.		x

Loughborough University
Center for Biological Engineering

COSHH Form

Reference: SAF/MEME/766 - 769

Location: Centre for Biological Engineering, Holywell Park

Originator: J. Bowdrey

Project / Activity / Task: Use and Maintenance of the NucleoCounter NC-3000

CHEMICAL NAME

Solution 13- AO. DAPI

CAS No.

W.E.L. (Itel / stel)

Hazard Rating: High

OVERALL RISK: Medium

Amount used		Period of use (hrs)	The process is:	Physical State		Exposure Potential
0.005	ml	0.1	Open	Non-Volatile Liquid	☐ Eyes ☑ Skin ☑ Inhaled ☑ Ingested	Low

This chemical has a high health risk associated with it.

Hazard Statement and Description	Precaution Statement and Description
H300 Fatal if swallowed.	P270 Do no eat, drink or smoke when using this product.
H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inh	P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
H340 May cause genetic defects.	P263 Avoid contact during pregnancy/while nursing.
H341 Suspected of causing genetic defects.	P280 Wear protective gloves/protective clothing/eye protection/face protection.
H400 Very toxic to aquatic life.	P273 Avoid release to the environment.
H410 Very toxic to aquatic life with long lasting effects.	P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
EUH032 Contact with acids liberates very toxic gas.	P234 Keep only in original container.
EUH210 Safety data sheet available on request.	

Justify the use of this chemical:	Very low amounts of all chemicals are to be used. Less than 0.1%of Solution 13 is DAPI or Acridine Orange. 0.01% is sodium azide. This means that a lot of the dangers are minimise due to the very small quantities are being used.

How will the precautions listed above be implemented?

No eating or drinking is permitted in the labs. PPE will be worn at all times in the lab. As with all reagents and chemcials in the lab, they will be used cautiously and guidelines will be followed. Users, will have read the Risk assessments and SOP before hand. All users will be trained in use and correct disposal.

Special Storage and Containment Measures	Disposal Method
Store in a tight container, away from direct light and excessive heat.	Orange stream waste.

How will spillages be dealt with?

Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.
Click here to see spill procedures

Solution 13 comes in vials of 1ml, this means if spilled it is classed as a small spill, and can be cleared up following SOP038

CHEMICAL NAME

DAPI dilactate

CAS No. 28718-91-4

W.E.L. (Itel / stel)

Hazard Rating: High

OVERALL RISK: Low

Amount used		Period of use (hrs)	The process is:	Physical State		Exposure Potential
	g	0.1	Open	Non-Volatile Liquid	☐ Eyes ☐ Skin ☐ Inhaled ☐ Ingested	Low

This chemical has a high health risk associated with it.

COSHH Form (Continued)

Hazard Statement and Description	Precaution Statement and Description	+
H340 May cause genetic defects.	P263 Avoid contact during pregnancy/while nursing.	x
Justify the use of this chemical:	Very low amounts this reagent are used to make Solution 13 Less than 0.1% of Solution 13 is DAPI. This minimises the risks associated with it drastically.	
How will the precautions listed above be implemented?		
Use of appropriate PPE, users knowing the associated risks and how to minimise them.		
Special Storage and Containment Measures	Disposal Method	+
Tightly sealed in its container in the fridge	In its pure form to be disposed of via chemical waste route. When in solution 13, if an NC-Cassette orange stream waste. If an NC-slide - sharps box.	x
How will spillages be dealt with?	*Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.* *Click here to see spill procedures*	
Absorbent cloth / tissue- follow SOP038 if solution 13 has been mixed with cells.		

CHEMICAL NAME

Acridine Orange hemi (Zinc Chloride) Salt

CAS No. 10127-02-3

W.E.L. (Itel / stel)

Hazard Rating: High

X

OVERALL RISK: Low

Amount used		Period of use (hrs)	The process is:	Physical State		Exposure Potential
	g	0.1	Open	Non-Volatile Liquid	☐ Eyes ☐ Skin ☐ Inhaled ☐ Ingested	Low

This chemical has a high health risk associated with it.

Hazard Statement and Description	Precaution Statement and Description	+
H341 Suspected of causing genetic defects.	P201 Obtain special instructions before use.	x
	P202 Do not handle until all safety precautions have been read and understood.	x
	P280 Wear protective gloves/protective clothing/eye protection/face protection.	x
	P308 + P313 IF exposed or concerned: Get medical advice/attention.	x
	P405 Store locked up.	x
	P501 Dispose of contents through the chemical waste route.	x
Justify the use of this chemical:	This substance contains no components considered to be either persistent, bio accumulative and toxic (PBT), or very very bio accumulative(vPvB) at levels of 0.1% or higher. Within Solution 13 AO makes up less than 0.1% of the solution.	
How will the precautions listed above be implemented?		
Solution 13 comes premixed ready to use, or is already contained within the cassettes ready to use, so there will be no handling of the components separately. Appropriate PPE will be worn whilst using solution 13. If exposed or concerned, then medical advice will be sort.		
Special Storage and Containment Measures	Disposal Method	+
To be stored in a closed container in the fridge, avoid sunlight.	If using cassettes via the autoclave bags, if using a cassette use the orange stream sharps boxes.	x
How will spillages be dealt with?	*Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.* *Click here to see spill procedures*	
Absorbent cloth / tissue, also see SOP038- Spills		

COSHH Form (Continued)

CHEMICAL NAME									
Sodium Azide	 					Hazard Rating: High			OVERALL RISK: Medium
CAS No. 26628-22-8	Amount used: 0.0001 ml	Period of use (hrs): 0.1	The process is: Open	Physical State: Non-Volatile Liquid	☐ Eyes ☑ Skin ☑ Inhaled ☑ Ingested	Exposure Potential: Low			
W.E.L. (Itel / stel)									

Hazard Statement and Description	Precaution Statement and Description
H300 + H310 + H330 Fatal if swallowed, in contact with skin or if inhale	P262 Do not get in eyes, on skin, or on clothing.
H373 Causes damage to organs through prolonged or repeated expos	P273 Avoid release to the environment.
H410 Very toxic to aquatic life with long lasting effects.	P280 Wear protective gloves/protective clothing/eye protection/face protection.
EUH032 Contact with acids liberates very toxic gas.	P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
	P330 Rinse mouth.
	P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
	P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position com

How will the precautions listed above be implemented?

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. Wear appropriate PPE, all users will have read the risk assessments before use. Sodium azide will not be kept on its own, it comes as part of a premade solution.

Special Storage and Containment Measures	Disposal Method
Keep in a tightly closed container. Keep away from acids.	Via waste routes within the CBE.
How will spillages be dealt with?	*Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.* Click here to see spill procedures
Absorbent cloth / tissue	

+ Add another chemical

Statement of work (Process to be undertaken)

To be used for Cell counting and cell viability on the Nucleocounter NC3000.
NC-Cassettes are pre-loaded with Solution 13. A cell sample is is drawn up into the cassette when the white button is pushed. Then the cassette is loaded into the nucleocounter and a cell count is performed. The cassette is ejected, and thrown.
For the NC-slides, solution 13 is mixed with a cell sample, the smaple is then pippetted onto a NC-slide. The slide is then loaded onto the nucleocounter and a cell count is done.

Show image

Personal protection requirements not covered in the precaution statements above.

Wear gloves and wear safety spectacles.

Sources of information and references

Solution 13 - SDS, Acridine Orange Hemi (zinc Chloride) Salt SDS, DAPI Dilactate SDS and Sodium azide

Reference to **existing approved** Risk Assessment

With the current controls, the risk of using these chemicals is: Medium

COSHH Form (Continued)

Supervisor to check that the process involving the safe use of these chemicals has been satisfactorily evaluated

Loughborough University

Supervisor and Departmental Safety Office (DSO) Sign-off.

Supervisors

Please check the documents above and if you want to approve them:

1) Electronically sign this document
2) Save it to a local drive (You will be prompted to do this)
3) eMail the signed document to the DSO.

DSO

Please review the documents above and if you want to approve them:

1) Enter the reference numbers as appropriate
2) Electronically sign this document
3) Save it to a local drive (You will be prompted to do this)
3) eMail the signed document to the originator

IF YOU DO NOT WANT TO AUTHORISE THE FORMS,

Please do not sign the form, but click the "Not Approved" check-box and return it to the originator by email stating why and what you expect them to do to put it right in the comments box below.

Not Approved ☐

Supervisors Signature: Carolyn Kavanagh — Digitally signed by Carolyn Kavanagh Date: 2020.08.27 05:59:17 +01'00'

Form Reference Numbers

Risk Assessment	Method Statement	COSHH Assessment
SAF/MM/6554	SAF/MM/6554	SAF/MEME/766 - 769

DSO Signature: Keven G Smith — Digitally signed by Keven G Smith Date: 2020.09.24 15:41:25 +01'00'

This document set must be reviewed and re-approved at the following times:

1) After the first occurrence of the activity described above (Review only)
2) After any change to the procedure or reagents used
3) After any incident resulting from this activity
4) At least annually from the date of approval

Next Review: 24 Sep 2021

Review comments