

COSHH Assessment

WARWICK

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH (COSHH) REGULATIONS

RISK ASSESSMENT FORM FOR WORK INVOLVING CHEMICALS AND/OR MATERIALS THAT MAY CONTAIN THESE

Notes

(1) It is the responsibility of the Principal Investigator, or the Supervisor or Manager of the work, to undertake a risk assessment in relation to any work with chemical materials they, or members of their research group or staff, undertake. A COSHH risk assessment should always be made before the start of any work involving a hazardous substance. The assessment can be in any format as long as it includes the appropriate information. This form can be used or alternatively the headings and notes can be used as guidance for text format.

In particular:

A full written risk assessment will always be required for work involving chemicals.

(2) There is guidance on various related topics (containment levels, hazard groups, safety cabinets, etc)

(3) The information in the risk assessment must be communicated in a suitable way to all personnel involved or affected by the work. Completed assessments should (wherever possible) be kept in the area where the work takes place and their location should be known to all those involved.

(4) Standard risk assessment and control measures are based on risks to healthy workers. Any persons who might have compromised resistance to disease for any reason should be advised, prior to handling hazardous material, to seek advice from the University Occupational Health Adviser regarding the need for additional precautions.

(5) In the following form, the spaces expand as required. The spacing in the master version is not indicative of the length of answer expected.

School of Engineering

DIVISION / UNIT: WMG / Railway Project

Date: 16-Mar-2016

PRINCIPAL INVESTIGATOR: Janez Kosec

OR SUPERVISOR/MANAGER: Darren Hughes

TITLE OF PROCEDURE OR ACTIVITY:

Use of hydrogen for fuel cell

Location of activity

Ferry Meadows Railway and Stapleford Miniature Railway

Laboratory work:

1. SUMMARISE THE ACTIVITY

i) Overview of work: (Provide a brief summary and include aims and objectives in simple terms.)

Use of compressed hydrogen to supply 1kW fuel cell

ii) Description of procedures: (Describe the types of laboratory procedures to be used and highlight any non-standard laboratory operations.)

*Changing and transporting full or empty gas bottles
 *Connecting and disconnecting bottle regulators
 *Expulsion of entrapped air by system venting to atmosphere
 *Connecting and disconnecting supply lines
 *Inspection of regulating equipment
 *Inspection of supply lines and connectors / joining methods
 *Disposal of gas

iii) Substances used:

100% Hydrogen

iv) Quantities used and frequency of use: (This information is vital if potential exposure and hence potential risk are to be accurately assessed under the conditions of use in the particular application.)

One cylinder 1.48 m³ hydrogen tank under 185 bar used at 0.5 bar.
 Hydrogen will continuously supply PEM fuel cell up to 13L/min.

2. IDENTIFY THE HAZARDS AND ASSESS THE RISKS TO HEALTH AND SAFETY

Identify hazards:

*Entrapment injuries from moving or falling bottles
 *Gas leaks
 *Failure of regulating equipment

i) Identify potential route(s) of entry into the body:

Inhalation

Yes / No

Ingestion

Yes / No

Splash in eyes or mouth

Yes / No

ii) Identify any particular groups of workers who may be at increased risk: (for example pregnant)

workers, young persons under 18, disabled workers, those with pre-existing disease that increases susceptibility.)

N/A

Anyone who might have compromised resistance to disease for any reason should seek advice from the University Occupational Health Adviser regarding the need for additional precautions.

iii) Could a less hazardous substance (or form of the substance) be used instead? (If it can, then it should be used or justification be given here why it is not being used. COSHH requires substitution with less hazardous materials wherever possible, but there may be good reasons for not using them.)

No

3. DECIDE WHAT PRECAUTIONS ARE NECESSARY TO PREVENT OR CONTROL THE RISKS

Specify what measures are required to control the risk: (Risks must be adequately controlled to prevent exposure or to minimise it to such an extent that any harm is unlikely to result from the exposure. The COSHH Regulations require minimum containment measures for laboratories handling

Consider how your procedure may affect people who are not directly involved in the work (eg cleaners, security service engineers, contractors, visitors, members of the public) and ensure your control measures protect them

***ENTRAPEMENT**

Reduce risk by securing all bottles to a suitable immovable object or secure within a bottle carrier. Minimize manual handling by using bottle carrier for transporting bottles and use safety footwear to prevent foot / toe injuries.

***REGULATOR FAILURE**

Visually inspect regulators and replace worn or damaged parts. Ensure system design can withstand full bottle pressure. Contain friable elements inside other robust systems or install pressure relief devices.

***GAS LEAKS**

After refitting a pressure regulator or amending gas supply set up always use leak detector spray (NOT soapy water) to check for gas leaks. Tighten using proprietary tool and hand force only. If leak persists isolate gas then strip and replace connection. Entire procedure will be accompanied with hydrogen sensor.

i) Engineering control measures: (Specify whether required.)

Pressure regulators, leak detector spray, hydrogen sensor, fire extinguisher

ii) Personal protective equipment (PPE): (Specify what is needed. Lab coats will always be required; other protective clothing, eg coveralls or aprons, may be needed but this is unlikely as other measures should be taken to prevent splashing etc. Gloves may be required. If eye protection is needed, indicate whether safety spectacles, or face shields are appropriate, again this is unlikely as other measures should be taken to prevent splashing etc.)

Lab coat	Gloves	Eye or face (specify if yes)	Other (specify)
Yes / No <input type="text" value="Yes"/>	Yes / No <input type="text" value="No"/>	Yes / No <input type="text" value="Yes"/>	<input type="text" value="Safety spectacles"/>

iii) Other measures:

a) Containment level (Specify the containment level required and any other control measures. Refer to the local code of practice, local laboratory rules that set out the detailed control measures for work in the laboratory/facility and the local disinfection policy. However confirm that the local rules and policies are in place, you are familiar with them.)

N/A

b) Additional control measures (Specify any additional control measures that may be needed for specific risks identified above and not the general measures. Consider whether other controls on the work are needed such as restricting the quantity of substance which may be prohibited lone working or specifying the level of supervision required.)

N/A

iv) Waste disposal procedures: (Consider how any waste will be disposed of before the work is started as some wastes may be difficult to dispose of. Refer to the School waste disposal policy. If further advice is needed, then the School Safety Officer.)

*Unused or partially used bottles return to B.O.C

v) Emergency procedures: (In case of accident or spillage, general good practice principles apply with most substances and the procedures are detailed in the local laboratory rules and the School waste disposal policies. In this section **only** if a hazard has been identified which requires other, special procedures in an emergency)

N/A

4. ENSURE CONTROL MEASURES ARE USED AND MAINTAINED

Specify what, if any, checks on control measures are required and state the frequency of inspection needed: (It should be ensured that control measures work and continue to work properly. Simple visual inspections may suffice or in some cases more detailed examinations, especially of engineering control measures, may be required.)

On every bottle change visually inspect condition of pressure gauges for moisture ingress and dial not zeroing, check regulator body for corrosion, physical damage to bottle stem and nut causing burring of the hexagon nut.

Regular inspection of condition of supply lines for evidence of nicks, cuts, abrasion and damage caused by entrapment or kinking of supply lines.

5. MONITOR EXPOSURE OF WORKERS (IF NECESSARY)

Specify if environmental or personal monitoring is required: (This is very rarely required for Engineering work: before recommending it, check that it is feasible and decide who is competent to do it. Take advice from the Health and Safety Officer if in doubt.)

Specify if health surveillance is required: *(Indicate if workers must register with the Occupational Health Unit, take advice from the Unit if in doubt.)*

6. PROVIDE INFORMATION, INSTRUCTION AND TRAINING TO PERSONS AT WORK

Specify training requirements: *(Decide whether any special training is required to carry out the procedure safely.)*

7. SIGNATURES

The name and signature of the person making the assessment is required. In the case of a student (undergraduate or postgraduate) the supervisor must also sign. The assessment should be reviewed by the manager/supervisor who has been nominated as responsible for the area where the work is carried out.

Name of Assessor:

Signature:

Date:

Name of Reviewer:

Signature:

Date:

APPENDICES

The following are to be attached

1. *Personnel record*

- *list of all persons involved with the work detailed in this risk assessment*

2. *Review record*

- record of reviews of risk assessment

RECORD OF PERSONNEL INVOLVED Ref:

Name	Position and Qualifications	Experience	Start date	Finish date
	<input type="text" value="Undergraduates"/>	<input type="text" value="Regulator training from"/>	<input type="text" value="March 2016"/>	<input type="text" value="July 2016"/>

Janez Kosec Tom Needham Kauser Ismailjee Shamaun Javid Matt Holmes Marvin Lee				
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IMPORTANT

1. Print two copies of the form using **this** Print button **before** pressing the Submit Button
2. Sign both and send one signed copy to the Departmental Safety Officer and keep one for your records
3. You MUST keep a copy of the MSDS (Material Safety Data Sheet) with your COSHH form. You may be required to produce it by the Safety Office.
4. Then press the Submit button.

REVIEW OF RISK ASSESSMENT Ref:

This risk assessment should be reviewed **annually** or more frequently if there is any change in the work, or if new information becomes available that indicates the assessment may no longer be valid. Reviews have been carried out on the following dates and either the assessment remains valid or it has been amended as indicated.

Name of reviewer:

Date:

Signature:

Amendments:

Name of reviewer:

Date:

Signature:

Amendments:

Name of reviewer:

Date:

Signature:

Amendments:

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Amendments:

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