



RiskAssess

RELEASE 3

Software for Risk Assessments in Science

I invite you to subscribe to RiskAssess for carrying out your Science laboratory risk assessments.

It is legally required for New Zealand schools to conduct risk assessments prior to experiments¹.

RiskAssess software provides a convenient and rapid method for schools to meet their legal obligations in a manner that closely follows the New Zealand / Australian ISO Standard on Risk Management [NZS / AS ISO 31000:2009 and its Guidelines, HB 436:2004]. RiskAssess also provides a convenient laboratory scheduling system.

RiskAssess is a web-based system that makes performing risk assessments quick and easy for teachers and laboratory technicians. This third release features:

- up-to-date chemical safety information for more than 1,000 chemicals
- safety information for equipment and living organisms
- facilities for equipment ordering, easy printing and emailing of risk assessments
- assessment of inherent risk level and recording of control measures
- approval by authorised person for experiments with “high” and “extreme” inherent risk
- electronic signature option, with automatic storage of risk assessments for legal purposes
- optional automated email of information between teachers and laboratory technicians
- on-line storage of risk assessments for sharing, review and reuse.

RiskAssess creates a simple, user-friendly system for performing risk assessments and assists with equipment ordering. RiskAssess was designed by teachers and laboratory technicians.

Since RiskAssess was launched in July 2008, more than 500 schools in Australia and New Zealand have subscribed and over 118,000 risk assessments have been performed.

The cost of a year’s subscription to Release 3 of RiskAssess is \$160.00 + GST per school campus, and includes access to all upgrades during the 12 months subscription at no additional cost.

You can subscribe on-line at www.riskassess.co.nz or contact me at phillip@riskassess.co.nz or on +612 9415 8677 if you wish to discuss RiskAssess further.

Dr Phillip Crisp

Phillip Crisp’s background:

- wrote most appendices of “Chemical Safety in Schools” package for NSW Department of School Education, including “Appendix D”.
- trained more than 3000 people in safety courses at schools and universities over 15 years.
- 40 years’ experience in University chemical laboratories.
- OHS Coordinator, Faculty of Engineering, University of New South Wales for 3 years.

¹Please see http://www.riskassess.co/info/legally_required for a summary of the legislation.

Risk Assess

RiskAssess is an integrated web-based tool that allows risk assessments to be produced in a standard printable format specially customised for school laboratories.

Safety data about chemicals, equipment and living organisms are stored in RiskAssess. When you choose a chemical or other item, RiskAssess automatically incorporates safety information into the risk assessment. A series of simple prompts leads users through the system, making it easy to perform and to document risk assessments for each experiment.

Each risk assessment contains sections in which the teacher and laboratory technician separately certify that risks have been assessed for their particular area of responsibility. If the inherent level of risk is "medium" or above, recording of control measures is required; experiments with "high" or "extreme" level of inherent risk require approval by an authorised person. RiskAssess includes provisions for monitoring and for review in each risk assessment, as required by law.

RiskAssess can also assist communication between teachers and laboratory technicians for planning and preparing experiments, and for laboratory scheduling. RiskAssess includes fields relating to the timetabling of the experiment and the items to be used. The teacher can then email this information with the risk assessment to the laboratory technician at the press of a button. Risk assessments can be printed, stored on-line, searched on-line, shared between staff, copied and archived for legal purposes. A paper-based or paperless work flow can be followed, depending on school policy.

All databases for chemicals, equipment and living organisms are regularly updated and extended. There have been many upgrades of RiskAssess since July 2008, including recording of control measures and laboratory scheduling system.

User feedback assists the RiskAssess team in deciding which features to include in upgrades.

Future upgrades planned include the following:

- chemical disposal information
- stepwise risk assessments for complex experiments
- library of risk assessments for common textbook experiments for download and customisation
- extension to all school activities, including TAS, VA, AgSci, Grounds, Drama and events/excursions.

Our team invites feedback and contributions from users, so that the system can be improved. The RiskAssess team provides prompt and personal service, should you have any problems.

>> EXAMPLE

See below for a screenshot of the RiskAssess software in use.

The screenshot displays the RiskAssess web application interface. At the top, it says 'RISKASSESS Risk Assessments For Schools'. The main form is titled 'Risk Assessment and Practical Order' and is for 'EcoSolve High School'. The user is 'Phillip Clisp'. The experiment name is 'Making Hydrogen'. The test reference is 'Science World 7, p. 32 Cork to be used to trap hydrogen gas prior to "popping"'. The classes for which the experiment is required are '10'. The teacher is 'Phillip Clisp'. The chemical user codes are 'Teacher' and 'Lab Tech'. The scheduling table shows three groups: Group 1 (1/4/09), Group 2 (2/4/09), and Group 4 (2/7/09). The equipment list includes 8 groups of: 2 x Magnesium ribbon, 2cm long; 1 x 100 mL beaker, 50mL. The equipment section lists 'cork', 'matches, box', 'taper', and 'test tube, small (~75 x 8 mm), borosilicate ("pyrex")'. The chemicals used section lists 'magnesium' and 'hydrochloric acid'. The chemicals produced section lists 'hydrogen gas, generated during experiment'. The living organisms section is empty. The others section is empty. At the bottom, there is a 'Generate Risk Assessment' button and a copyright notice for 2008 EcoSolve.

The following pages demonstrate the risk assessment that the system generates from the information entered in the screenshot above.

Data entered by the user are shown **shaded** for demonstration purposes. All other text is automatically generated by the RiskAssess software.

Making hydrogen

Written by: Phillip Crisp

Commenced on: 21 Aug 2011

Expires: 21 Aug 2012

Classes for which experiment is required

Teacher: Phillip Crisp (user code 1)

Year/Group: 10

Room: Period: Date:

611 2 24/8/11

614 4 25/8/11

Items to be prepared by laboratory technician (user code 2)

8 groups of

2 magnesium ribbon, 2 cm length

1 1 M hydrochloric acid, bottle, 50 mL

Procedure or reference, including variations

Science World 7, p. 52

Cork to be used to trap hydrogen gas prior to "popping".

Equipment to be used**box of matches***Potential hazards*

Box burns violently if ignited.

Standard handling procedures

Keep dry. Used matches never to be returned to the box. Count boxes of matches out and in.

cork**test-tube rack****test tube, small (~75 x ~8 mm), borosilicate ("pyrex")***Potential hazards*

Breakage of test tubes. Cuts from chipped test-tube rims. Small test tubes more likely to eject material during exothermic processes.

Standard handling procedures

Inspect and discard any damaged test tubes. Sweep up broken glass with brush and dustpan; do not use fingers.

wooden splint*Potential hazards*

When lit, acts as an ignition source; causes burns.

Standard handling procedures

Extinguish all tapers with water before disposal.

Chemicals to be used and produced**hydrochloric acid solution, 0.2 M – 4 M (1% to 14% wt/wt)**

Class: 8 PG: III 7-12 Users: 1,2,5

UN: 1789

CAS: 7647-01-0

HCl_(aq)*Potential hazards*

Toxic. Lung-irritant hydrogen chloride gas is evolved; skin irritant; corrosive; toxic if ingested.

Standard handling procedures

Do not breathe vapour. Avoid splashes to eyes or on skin.

hydrogen gas, generated during experiment

Class: 2.1 PG: none 7-12 Users: 1,2,5

UN: 1049

CAS: 1333-74-0

H₂*Potential hazards*

Highly flammable gas. Forms dangerously explosive mixtures with air. Non-toxic, but can act as asphyxiant; hydrogen/air mixture in lungs can explode if ignited. Detonation ("popping") of small volume of hydrogen/air mixture in sturdy test tube by ignition with match or wooden taper is generally safe; breakage of test tube is possible.

Standard handling procedures

Generate hydrogen only in small volumes (< 1 mL). Detonate hydrogen/air mixtures only in small undamaged test tubes (<8 cm; <5 mL). Use borosilicate ("pyrex") test tubes; do not use thin-walled soda-glass test tubes. Protect against flying broken glass from breakage of test tube. SAFETY GLASSES!

magnesium (magnesium metal, magnesium ribbon, magnesium turnings)**Mg**

Class: 4.1

PG: III

7-12

Users: 1,2,5

UN: 1869

CAS: 7439-95-4

Potential hazards

Burns with a white-hot flame; UV radiation emitted from flame may cause eye damage; do not allow students to view flame from close distance; otherwise harmless. Reaction with ethanol may be violent after a long induction period. Reactions of magnesium with dichromate salts, nitrate salts, sulfur, phosphorus or halogenated solvents can be dangerously violent. Reaction of magnesium with silica (sand) to form silicon may be dangerously exothermic if the silica is not completely dry. Do not use magnesium as an alternative to aluminium in the thermite reaction; the reaction is dangerously explosive. Magnesium ribbon can, however, be used as a fuse for the thermite reaction.

Standard handling procedures

Keep containers tightly sealed to prevent corrosion.

Knowledge

- I have read and understood the potential hazards and standard handling procedures of all the equipment, chemicals and living organisms.
- I have read and understood the Material Safety Data Sheets for all chemicals used and produced.
- I have copies of the Material Safety Data Sheets of all the chemicals available in or near the laboratory.

Risk assessment

I have considered the risks of

fire	breakage of equipment	electrical shock	radiation
explosion	cuts from equipment	escape of pathogens	waste disposal
chemicals in eyes	sharp objects	heavy lifting	inappropriate behaviour
inhalation of gas/dust	rotating equipment	slipping, tripping, falling	special needs
chemicals on skin	vibration and noise	falling objects	other risks
runaway reaction	pressure	heat and cold	

Certification by teacher

I have assessed the risks associated with performing this experiment in the classroom on the basis of likelihood and consequences using the School's risk-level matrix, according to Australia/New Zealand/International Organization for Standardization Standard AS/NZS ISO 31000:2009 and the Risk Management Guidelines, HB 436:2004.

I consider the inherent level of risk (risk level without control measures) to be:

Low risk **Medium risk** High risk Extreme risk*Control measures:*

Hold test tube away from body when popping.
 Explain possibility of test tube breakage and importance of safety glasses.
 Ensure students check test tubes for signs of damage before popping.
 Safety glasses.

With the specified control measures in place, I have found that all the risks are "low risk". Risks will therefore be managed by "routine procedures" in the classroom, in combination with the specified control measures.

Name:

Signature:

Date:

