

INTRODUCTION

From the 1st October 2006 the Regulatory Reform (Fire Safety) Order 2005 (RRO) was brought into force, this revoked the Fire Precautions (Workplace) Regulations 1997. Whilst many of the new requirements are similar they now have a broader application as they apply to virtually all premises, other than domestic premises, whether or not such premises are a place of work. In addition the Order contains specific provisions relating to dangerous substances which are similar to those contained in the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSERA). This includes acetylene due to its flammability.

One of the key changes in the new requirements is the introduction of a general duty to minimise the risk of fire, as well as to take precautions to ensure the safety of persons should a fire occur. As was the case under the previous legal requirements, there is also a risk assessment duty. Critically, the RRO contains a specific duty on the "responsible person" to take general fire precautions to ensure the safety of employees, so far as is reasonably practicable.

To view the Regulatory Reform (Fire Safety) Order 2005 please visit www.opsi.gov.uk/si/si2005/20051541.htm

To view the Dangerous Substances and Explosive Atmospheres Regulations 2002 please visit www.opsi.gov.uk/si/si2002/20022776.htm

Every day thousands of gas cylinders are used in the workplace or transported by road without incident. However, if gas cylinders are involved in a fire and one of these is suspected of being an acetylene cylinder, it can cause serious local disruption due to the emergency services setting up a cordon around the incident scene.

Most of the reported incidents would not have happened if users:

- Fully understood the properties of the gases and the associated hazards
- Were properly trained on how to use oxygen and dissolved acetylene equipment
- Followed guidance on the safe handling and storage of gas cylinders

This simple model risk assessment has been produced for small businesses which store and use 1 or 2 oxygen and dissolved acetylene packages and associated equipment. A more detailed risk assessment entitled "**A guide to the safe storage and use of oxygen and dissolved acetylene equipment**" is available as a PDF download at www.bocindustrial.co.uk.

NOTE: The oxygen and dissolved acetylene package referred to in this document typically consists of oxygen cylinder, acetylene cylinder, gas regulators for both gases, flashback arrestors fitted to both regulator outlets, oxygen and dissolved acetylene hose assembly, gas torch and cylinder trolley.

How to carry out the assessment

This risk assessment should be carried out by a competent person who has been trained in the use of the equipment shouldn't take too long to complete.

1	<u>Obtain</u> the Risk Assessment form for the activity to be risk assessed.
2	<u>Enter</u> the general details in required fields at the top of the Risk Assessment form.
3	For each Hazard record the existing control measures in place (i.e. What you are doing already) beside each of the applicable recommended control measures.
4	<u>Compare</u> the existing control measures in place against the suggested control measures stated, <u>assess</u> the risk and <u>enter</u> a rating of Adequately Controlled (AC) or Not Adequately Controlled (NAC) .
5	If the result is " Not Adequately Controlled " <u>decide</u> what action is required, who should do it, and by when, to reduce the risk to as low as reasonably practicable (ALARP) and <u>record</u> the information in the appropriate columns.
6	Do not continue with the activity until the risk is adequately controlled.



Model Risk Assessment for Using a Single Oxygen and Dissolved Acetylene Package

Assessed by J Bloggs
 Location R Garage
 Reviewed by Mr Mgr
 Persons Affected Persons, property, or equipment in the vicinity of the oxygen and dissolved acetylene package or fire.

Assessment Date 05 Nov 07
 Workplace Description Small garage - vehicle repairs
 Review Date 12 Nov 07
 Situation/Activity Indoor cylinder storage, manual handling, use of oxygen and dissolved acetylene package

No.	Hazard	Recommended Control Measures	Existing Control Measures	ASSESSMENT AC - NAC*	Actions Required	By Whom	Completion Date
1	Incorrect Storage - External fire or heat impacting on the oxygen and dissolved acetylene package. - Empty cylinder abuse	1.1 Close oxygen and acetylene cylinder valves. Treat empty cylinders as though full, applying the same precautions. Remove cylinder key. Store empty cylinders in designated area. Return empty cylinders to gas supplier or agent as soon as possible.	Valves closed when not in use.	NAC	Create storage location for cylinder.	J Bloggs	
		1.2 Vent the torch, hoses and pressure regulator.	As per equipment instructions.	AC	-	-	-
		1.3 Back-off the pressure adjusting screw on regulators.	✓		-	-	-
		1.4 Roll up gas hoses then store hoses and torch on the appropriate stowage point on the package.	x	NAC	Ensure hoses are stored.	J Bloggs	31 Nov 07
		1.5 Store the oxygen and dissolved acetylene package & empty cylinders in a secure location away from flammable/combustible materials and sources of ignition.	x	NAC	See above	J Bloggs	31 Nov 07
2	Manual handling injury or property damage due to incorrect handling.	2.1 Move large cylinders using a suitable trolley or seek assistance.	Trolley available.	AC	-		
		2.2 Do not drop gas cylinders and never try to catch a falling cylinder.	Trained in cylinder handling.	AC	-		
		2.3 Secure cylinders in a suitable cylinder trolley, cylinder support bracket or placed in a cylinder pen.	Trolley available and used.				
3	Unknown quantity of gas cylinders in premises.	3.1 Maintain up-to-date list of gas cylinders stored on site (location and quantity). Display list at an easily accessible location.	x	NAC	Procedure list + display	J Bloggs	15 Nov 07
4	Incorrect use of oxygen and dissolved acetylene package and equipment causing a back fire, flashback or gas leak.	4.1 Train all users in: - Properties of the gases; - The safe use of the equipment; - Precautions to be taken; - The use of fire extinguishers; - Emergency Procedures including the BOC document entitled "KEY ACTIONS for dealing with cylinders in the event of fire".	As per recommendations although need to confirm training up to date.	NAC	Confirm training records.	J Bloggs	15 Nov 07
		4.2 Carry out pre-use equipment checks on the oxygen and dissolved acetylene package and equipment.	✓	AC	-		
		4.3 Provide procedures/work instructions for the safe use of the equipment.	Procedure available.	AC	-		
		4.4 Create and follow work rules: - FORBIDDING the use oxygen for dusting down work benches, machinery or clothing. - FORBIDDING the hanging up the welding or cutting torch whilst still alight.	Signs in place as per recommendations.	AC	-		
		4.5 Position gas hoses out of the line of fire from the flame or metal spatter.	Included in procedure.	AC	-		
		4.6 Use the correct pressures and nozzle size for the job. In particular the acetylene pressure must not exceed 0.62bar (9psi).	✓	AC	-		
		4.7 Investigate causes of flashback or backfire & identify any damage or faults to the equipment (particularly the nozzle).	Would contact BOC.	AC	-		
		4.8 Provide and use correct Personal Protective Equipment, such as: - welding gloves, - leather apron, - suitable coverall, - foot protection, - eye and head protection.	All available.	AC	-		
5	Use of faulty or incorrect equipment (regulator, flashback arrestors, torch, hoses, etc.) resulting in fire.	5.1 Only use equipment supplied by a reputable equipment supplier which has been designed for the intended gas service i.e. oxygen and acetylene compatible. Refer BCGA CP7 - routine inspection and maintenance.	Equipment bought at BOC retail centre.	AC	-		
		5.2 Use hoses manufactured to BSEN 559 and correctly coloured for the gas service i.e. blue for oxygen and red for acetylene. The hose assembly should be to EN ISO 8330.	Equipment bought at BOC retail centre.	AC	-		
		5.3 Fit Flash Back Arrestors to the outlet of both oxygen and acetylene pressure regulators in accordance with legislative recommendations (DSEAR).	x	NAC	Buy flashback and fit.	J Bloggs	31 Nov 07
		5.4 Replace Resetable Flash Back Arrestors at the manufacturers recommended intervals.	Not applicable.	-			
		5.5 Replace disposable Flash Back Arrestors after a flashback or backfire.	As per recommendations.	AC			
		5.6 Fit Non Return Valves on the hose end connecting to the blowpipe or torch.	✓ As per recommendations.	AC			
		5.7 Refurbish or replace regulators every 5 years.	Replaced every 3 years.	AC			
		5.8 Create and follow work rule: FORBIDDING the forcing of a regulator connection onto the cylinder (acetylene is left hand thread and oxygen is right hand thread).	x	NAC	Put sign in place.	J Bloggs	31 Nov 07
		5.9 Only use equipment designed for oxygen and label any such equipment appropriately.	✓ Bought from BOC.				
		5.10 Use clean hands or gloves when assembling oxygen equipment e.g. attaching a regulator to a new cylinder or attaching the hoses to the blowpipe or torch. DO NOT USE OIL OR GREASE during assembly.	✓	AC			
		5.11 Replace defective equipment before attempting to use the oxygen and dissolved acetylene package.	✓	AC			
6	Accidental ignition due to poor housekeeping, work area design, or inspection.	6.1 Clear the immediate work area of any flammable materials and or put in place suitable fire screens or blankets to prevent contact between sparks and flammables.	Weekly inspection performed.	AC			
		6.2 Carry out work site inspection after completion of hot work to ensure there are no residual hot spots or smouldering fires that could escalate to a large fire.	Weekly inspection performed.	AC			

*Key to Assessment

AC - Adequately Controlled

NAC - Not Adequately Controlled

For product and safety enquiries please phone
In the United Kingdom

0800 111 333

In the Republic of Ireland

Dublin (01) 409 1800

Email us at: custserv@boc.com

BOC, Customer Service Centre, Priestley Road, Worsley
Manchester M28 2UT, Fax: 0800 111 555

BOC Ireland, P.O. Box 201, Bluebell,
Dublin12, Fax: (01) 409 1801

www.bocindustrial.co.uk

Further reference

British Compressed Gases Association
www.bcga.co.uk

- GN2 Guidance for the Storage of Transportable Gas Cylinders for Industrial Use. Revision 3: 2005.
- CP7 The Safe Use of Oxy-Fuel Gas Equipment (Individual Portable or Mobile Cylinder Supply). Revision 4: 2004
- CP31 Safe Storage and Use of Cylinders in Mobile Workshops and Service Vehicles.

Health and Safety Executive
www.hse.gov.uk

- INDG 163 Five steps to a risk assessment
- INDG 308 The safe use of gas cylinders
- INDG 327 Take care with acetylene
- HSE 8 (rev2) Take care with oxygen
- HSG 139 The safe use of compressed gases in welding, flame cutting and allied processes

BSI Group
www.bsi-global.com

- BS EN ISO 2503:1998 Gas welding equipment. Pressure regulators for gas cylinders used in welding, cutting and allied processes up to 300 bar.
- BS EN 559: 2003 Gas welding equipment. Rubber hoses for welding, cutting and allied processes.

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